Rasch Model Application on Character Development Instrument for Elementary School Students

Lutfi Nur*, Luthfi Ainun Nurani and Dodi Suryana
Universitas Pendidikan Indonesia, Bandung, Indonesia

Aslina Ahmad
Universitas Pendidikan Sultan Idris, Malaysia

Abstract. This research was motivated by the current conditions that require the younger generation to have good character values or ethics. Even nowadays humans begin to indicate that some professions will be lost and replaced by machines. However, the value of good character and ethics will not be able to be replaced by the machine. The purpose of this research is to ascertain how far elementary school students have good character values or ethics so that we can spot a trend whether character values are degenerating, getting better or simply staying the same. The research respondents were the fifth graders of SDN 1 Cikalang and the sixth graders of SDN Karsanagara. 105 participants took part in this study. A survey was carried out to measure the value of a student's character. The results showed the development of their character lied mostly in the medium category. Scores for reading interest, creativity, curiosity, perseverance (diligence, heart strength, persistence), and devotion (religious) lied mostly in the low category.

Keywords: Rasch model; character; ethics; elementary school students

1. Introduction
The current phenomenon concerning degradation one's personality are mushrooming in Indonesia community. It is proven by the rise of student abuse cases. Cases of abuse do not only happen between students, but also happens between teachers and students. This is due to the loss of mutual respect and appreciation. Mubarok, Rusmana, Budiman & Suryana (2019) argued that when individuals demonstrate disrespect attitude towards each other, it will adversely affect individuals with decreased learning outcomes, declining self-respect, and increased intimidation behavior to others in school as well as increasing violence or fostering unexpected immoral actions. The child's character can be influenced

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* Corresponding author: Lutfi Nur, Email: lutfinur@upi.edu

by the emotions of the child himself. It can even interfere the learning process if negative emotions arise in the child. Negative emotions such as feeling unhappy and disappointed then the learning process will experience obstacles (Nurillah, Zerlinda, Solehuddin & Suryana, 2020). The influence of the family environment is huge, especially in children who are constantly faced with family suffering, bad care and high levels of conflict. They will grow and rise into children who will generally fail to manage their negative emotions and they can become aggressive adults (Saomah, Suryana & Adzani, 2020). This is already in the realm of the destruction of the character of children at the age of the elementary school level. The prominent differences of children about learning, disciplined behavior, the way they dress, and the way they speak are clearly seen. These issues are caused by educational system such as zoning system (Yudha, Suryana & Nabella, 2020).

Indonesia as a developing country has demonstrated its participation in the development of its people. Participation in the world of education also requires the application of policies to the school system to keep the developments in the education sector in line with global challenges (Sumintono, Said & Mislan, 2012). The introduction of Information Technology amongst elementary school students has become a problem that needs to be confronted (Nur, Suherman & Subarjah, 2019). Meanwhile, some researchers have indicated that sophisticated machinery can replace several professions in certain areas. However, character education cannot be taught by a lump of sophisticated machines. This means that a good character must be preserved by human beings as a hallmark of the Indonesian society. A good character can be imbued by teacher interactions with children.

The term character can also be considered as a value which is closely related to culture. Transformational value is an effort or action that is done to preserve or develop the cultural values (Wahyuni, Aji, Tias & Sani, 2013). Good manners can be formed and inculcated through an educational process, which can be delivered by the teacher as a substitute of the parent's role at school. Character is etymologically derived from the Latin word "character" or the Greek word "kharassein", which means to mark it, or the French word "caracter", which means personality. In English, the word "character" means traits and roles. Character is seen as a personality trait which is associated with mental beings, namely mental conditions, and thought-forming processes. A person's character essentially consists of the qualities and relationships that exist between them. As for character traits, they are more than just a momentary state of mind, and just because someone shows certain thoughts does not mean that he has these underlying traits. A character adheres to the value of a person's behavior (Desstya, 2015).

This research has been carried out using the Rasch model approach through the Winstep program in order to assess the characters of elementary school students. Nurhudaya, Taufik, Yudha & Suryana (2019) have used the Rasch model because it can provide solutions to the limitations of the classical model. The use of the Rasch's model approach can also determine the reliability of research instruments without depending on the sample, unlike the classic model where reliability depends on the sample, even though reliability in a test does not always have to depend on the sample (Van Der Ven & Ellis, 2000).

According to Sumintono & Widhiarso (2015), the superiority of the Rasch's model compared to other model, especially the classical test theory, can be seen from its ability to predict missing data, based on individual response patterns. This advantage makes the statistical analysis results of Rasch model more accurate and authentic. It is certain that it the measurement of the character instrument of the primary school students is not employed based on the Rasch approach, it might cause research failure. Ardiyanti (2017) stated that the use of the Rasch model in instrument validation could result in more holistic information about the instrument and fulfill the measurement definitions. Therefore, the measurement of the character instrument of elementary school student uses the Rasch model approach to define the instrument measurements authentically and holistically.

Some research on character development has been done by Putri (2018) who discussed the character education of elementary school children in the digital age. Murniyetti, Engkizar and Anwar (2016) discussed the pattern of character education implementation in elementary school students. Supraptiningrum & Agustini (2015) discussed how to build students ' character through school culture in elementary schools. Research on using computer-based Rasch applications has also been widely done. Ardiyanti (2017) used a Rasch model on the development of efficacy scale in career decision-making whereas Aziz (2015) applied the Rasch model for testing mental health measuring equipment in the workplace. Purba (2018) used the Rasch model to measure performance test instruments on basic subjects and electrical measurements and Makransky, Rogers, & Creed (2015) used Rasch model to assess career decisions.

However, not much research has been done on the character measurement of elementary school students, especially by using the Rasch model approach through the Winstep program. This is evidenced by the fact that there is only one study by Misbach & Sumintono (2014) on the measurements of character instrument validation. However, they focused on discussing students' perception of teachers' morals and character rather than discussing the character of individual students. The improvement of character must start from the teacher because teacher's discipline will affect to classroom management (Shih, Wu, Lai, & Liao, 2015). There is no research focus on the character of elementary school students using Rasch modeling. Therefore, this article discusses the results of measuring student character with the Rasch model approach, through the Winstep program.

This research will answer the following questions:
1. How are the results of the distribution of instruments that reveal the character of students using the Rasch model?
2. Why Rasch Model can reveal the character of elementary school students?

2. Method

This study employed a quantitative descriptive method to describe the character of elementary school students in Tasikmalaya, Indonesia. A purposive sampling technique was used in the study whereby a total of 105 high-grade elementary school students aged between 11 and 12 years old were taken as participants. This age range was selected because these students have the ability to think abstractly and logically. The opportunity to answer a question correctly depends on the ratio between one's ability and the difficulty level of the problem (Sumintono & Widhiarso, 2014). Detail information of this student population is presented in Table 1.

Table 1. Selected Student Population

School	Population		Total
	M	**F**	
SDN 1 Cikalang	16	12	28
SDN Karsanagara	35	42	77
Total	**51**	**54**	**105**

The instrument used in this research was in the form of a questionnaire which is used to reveal the character of students. Twenty-eight questions were prepared based on the aspects of good characters, including interest (strong desire), beliefs, confidence, perseverance (persistence), devout (religious), disciplined, honesty, tolerance, hard-working, creativity, independence, curiousness, respect, social care, peace, democratic, love for reading, and nationalism. These questions were presented in the form of statements and were answered based on a certain scale in accordance with the character of students.

The data obtained were processed using the Rasch model application. This model is developed to overcome problems that arise when using classical test theory in instrument analysis (Boone, 2016; Jackson, Draugalis, Slack, Zachry & Agostino 2002). Thus, the Rasch model is seen as a measurement tool for mathematical analysis that can reveal the relationship between a person and the way he responds to the items in a given instrument (Jackson et al., 2002). The Rasch technique can be used to convert non-linear raw data on a linear scale which can then be evaluated using statistical parametric tests (Timofte & Siminiciuc, 2018). Rasch model also has an interesting and easy advantage to apply at all scale formats. The Rasch model continues to develop not only for the analysis of dichotomous data, but also for polytomous data (Salzberger & Sinkovics, 2006). Thus, the Rasch model is an excellent model for analyzing the validity of an instrument. However, there are important things to consider, for instance the number of participants and the number of parameters measured for each item. Having too many parameters with only few respondents may lead to the extraction of incorrect conclusions from the data (Timofte & Siminiciuc, 2018).

3. Results

Before analyzing the data further, it is worth measuring which instruments given to the respondent can be used to measure the character of elementary school students.

Table 2. Undimensionality

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Table of STANDARDIZED RESIDUAL variance in Eigenvalue units = Item information
units
                                          Eigenvalue   Observed   Expected
Total raw variance in observations    =    41.9522   100.0%       100.0%
  Raw variance explained by measures  =    13.9522    33.3%        34.9%
    Raw variance explained by persons =     4.4570    10.6%        11.1%
    Raw Variance explained by items   =     9.4952    22.6%        23.7%
  Raw unexplained variance (total)    =    28.0000    66.7% 100.0%  65.1%
    Unexplned variance in 1st contrast =    3.3410     8.0%  11.9%
    Unexplned variance in 2nd contrast =    2.5825     6.2%   9.2%
    Unexplned variance in 3rd contrast =    1.8051     4.3%   6.4%
    Unexplned variance in 4th contrast =    1.7771     4.2%   6.3%
    Unexplned variance in 5th contrast =    1.7392     4.1%   6.2%
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Table 3. Person-Item Map

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MEASURE                                   PERSON - MAP - ITEM
                                              <MORE>|<RARE>
       3                                      0932  +
                                              0862  |
                                                    |
                                              0822  |
                                              0732  |
                                                    |
                                                   T|
                                         0642 0702  |
                                              0311  |
                                              0242  |
       2                                 0192 0232  +
                     0121 0152 0332 0542 0912  |
                          0141 0381 0802 0831 S|
                               0112 0292 0532  |
          0101 0301 0511 0692 0811 0872 0951 1012  |
                    0062 0502 0841 0892 1002  |
          0091 0202 0421 0462 0681 0712 0752  |
                    0401 0452 0722 0982  |
        0211 0262 0442 0572 0781 0921 1011 M|   P25
                    0271 0562 0941 0962 1041  |T
       1        0221 0342 0371 0522 0611 0851 0902  +   P17    P19
    0081 0251 0411 0431 0652 0662 0671 0972 1031  |   P5
          0391 0482 0582 0631 0761 0991  |
                         0071 0161  |   P9
        0011 0031 0171 0321 0551 0592 0792 S|   P22
              0042 0182 0741 0771 0882 1021  |S
                    0021 0361 0601 0622  |   P1
                         0052 0352 0472  |
                                         |   P8
                                         |   P2
       0                    0282 0491 T+M P15    P16
                                         |   P23    P24    P27
                                         |   P10    P20    P28    P6
                              0131  |   P12    P4
                                         |   P14    P21    P3     P7
                                        |S P13
                                         |   P26
                                         |   P18
                                         |
                                         |
      -1                                  +   P11
                                          <LESS>|<FREQ>
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Table 2 shows that raw variance observe is 33.3%, including adequate categories, while unexplained variance in the 1st to the 5th contrast of residuals are 11.9%, 9.2%, 6.4%, 6.3% and 6.2%. The spread of the respondent (the person) and the problem (item) can be seen in Table 3.

Based on the Person-Item Map as shown in Table 3, we can see that the difficulty level of the items is spreads in the range 1 to 2 logits. A total of 27 items were positioned between -2SD with +2SD, while one item, i.e., p25 number is above +2SD. The average level of ability of elementary school students (person) is above the standard difficulty level of the items.

Table 4. Difficulty level of items

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	ZSTD	OUTFIT MNSQ	ZSTD	PTMEASUR-AL CORR.	EXP.	EXACT MATCH OBS%	EXP%	Item
25	311	105	1.21	.10	.88	-.96	.90	-.76	.49	.51	31.7	35.0	P25
17	335	105	.98	.10	.98	-.10	1.00	.02	.40	.50	41.3	35.4	P17
19	338	105	.96	.10	.93	-.53	.91	-.67	.43	.50	37.5	35.3	P19
5	346	105	.88	.10	1.94	6.16	2.06	6.63	.26	.49	28.8	35.3	P5
9	364	105	.71	.10	1.06	.52	1.07	.55	.37	.48	31.7	35.6	P9
22	374	105	.61	.10	1.07	.62	1.07	.55	.50	.47	31.7	35.7	P22
1	397	105	.37	.10	.82	-1.42	.87	-.99	.35	.45	39.4	37.2	P1
8	411	105	.22	.11	1.02	.23	1.12	.86	.43	.43	32.7	37.9	P8
2	417	105	.15	.11	.60	-3.48	.59	-3.29	.56	.42	57.7	38.6	P2
16	431	105	-.02	.11	.94	-.37	.88	-.74	.50	.40	45.2	41.9	P16
15	432	105	-.04	.11	.87	-.88	.86	-.90	.33	.40	49.0	41.9	P15
23	435	105	-.08	.12	.95	-.28	.99	.00	.40	.40	48.1	42.9	P23
24	436	105	-.09	.12	1.17	1.14	1.43	2.46	.46	.40	48.1	42.9	P24
27	436	105	-.09	.12	1.15	1.06	1.09	.59	.42	.40	39.4	42.9	P27
10	443	105	-.19	.12	1.03	.27	.88	-.75	.54	.38	47.1	44.9	P10
28	443	105	-.19	.12	1.05	.36	1.12	.75	.36	.38	38.5	44.9	P28
6	445	105	-.21	.12	.95	-.31	.94	-.33	.41	.38	50.0	45.6	P6
20	447	105	-.24	.12	1.41	2.47	1.35	1.92	.35	.38	46.2	45.7	P20
12	448	105	-.26	.12	.93	-.44	.84	-.93	.47	.37	49.0	46.7	P12
4	452	105	-.32	.12	.93	-.40	.96	-.16	.44	.37	53.8	48.1	P4
7	454	105	-.35	.13	1.10	.69	.96	-.18	.40	.36	54.8	48.3	P7
14	455	105	-.37	.13	1.03	.23	1.04	.28	.38	.36	50.0	48.4	P14
21	456	105	-.38	.13	.96	-.23	.91	-.46	.38	.36	54.8	49.3	P21
3	460	105	-.45	.13	.76	-1.55	.77	-1.30	.31	.35	55.8	50.9	P3
13	464	105	-.52	.13	.81	-1.17	.89	-.54	.43	.34	68.3	52.0	P13
26	470	105	-.63	.14	1.20	1.16	1.06	.37	.35	.33	57.7	55.1	P26
18	472	105	-.67	.14	.77	-1.37	.68	-1.74	.39	.32	61.5	56.0	P18
11	486	105	-1.00	.16	1.20	.99	1.07	.36	.32	.28	67.3	66.0	P11
MEAN	423.5	105.0	.00	.12	1.02	.1	1.01	.1			47.0	44.3	
P.SD	45.8	.0	.54	.02	.24	1.6	.26	1.7			10.6	7.4	

From Table 4, we can see that the standard deviation (SD) is 0.54. If the elementary school value is combined with the mean value of logit (0.0), then the grain difficulty level of the instrument (item) can be grouped into 3 categories: a very difficult category with provisions greater than 0.54, a difficult category with provisions between -0.54 and 0.54 and a very easy category with value less than -0.54. This form of research instrument used multiple choice questions (MCQs). The suitability of each option is shown in Table 5.

Table 5. Rating Scale Diagnostic

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|CATEGORY     OBSERVED|OBSVD SAMPLE|INFIT OUTFIT|| ANDRICH  |CATEGORY|
|LABEL    SCORE COUNT %|AVRGE EXPECT| MNSQ  MNSQ||THRESHOLD| MEASURE|
|--------------------+-----------+-----------++--------+-------|
|   1    1     66   2|  .29  -.08| 1.42  1.57||  NONE   |( -2.50)| 1
|   2    2    231   8|  .30   .30|  .99  1.06||  -1.15  |  -.96  | 2
|   3    3    509  17|  .65   .72|  .89   .83||  -.28   |   .03  | 3
|   4    4    867  29| 1.15  1.16|  .96   .91||   .41   |   .97  | 4
|   5    5   1267  43| 1.64  1.61| 1.01  1.01||  1.03   |( 2.42)| 5
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The value of the Andrich Threshold in Table 5 shows that there is a match between the choice of answers from 1 to 5 as evidenced by an increase in the value of alternative answers from 1 to 5, with the following values: NONE, -1.15, -0.28, 0.03, 0.97, and 2.42. From Table 6, it is concluded that there are 4 items that are biased: item 6 (p = 0.445), item 8 (p = 0.079), item 12 (p = 0.047) and item 15 (p = 0.031).

Table 6. Item Bias Detection

| Person | SUMMARY DIF | | | BETWEEN-CLASS/GROUP | | Item | |
CLASSES	CHI-SQUARED	D.F.	PROB.	UNWTD MNSQ	ZSTD	Number	Name
2	1.3792	1	.2402	1.4241	.74	1	P1
2	.7637	1	.3822	.7825	.30	2	P2
2	.5063	1	.4767	.5172	.05	3	P3
2	3.7116	1	.0540	3.9479	1.70	4	P4
2	1.7878	1	.1812	1.8487	.95	5	P5
2	4.0379	1	.0445	4.3277	1.81	6	P6
2	.3768	1	.5393	.3842	-.11	7	P7
2	7.0661	1	.0079	7.8155	2.56	8	P8
2	.4280	1	.5130	.4351	-.04	9	P9
2	.0000	1	1.0000	.0096	-1.20	10	P10
2	.1630	1	.6864	.1655	-.49	11	P11
2	7.9763	1	.0047	8.9529	2.75	12	P12
2	.0305	1	.8614	.0389	-.93	13	P13
2	3.6832	1	.0550	3.9170	1.69	14	P14
2	8.7299	1	.0031	10.0054	2.92	15	P15
2	.4728	1	.4917	.4827	.01	16	P16
2	.0186	1	.8916	.0262	-1.02	17	P17
2	.0000	1	1.0000	.0004	-1.49	18	P18
2	.0305	1	.8613	.0431	-.91	19	P19
2	2.6726	1	.1021	2.8105	1.34	20	P20
2	.2128	1	.6446	.2160	-.38	21	P21
2	1.9646	1	.1610	2.0433	1.04	22	P22
2	.1225	1	.7264	.1250	-.59	23	P23
2	.0231	1	.8792	.0291	-1.00	24	P24
2	.0310	1	.8602	.0435	-.90	25	P25
2	1.0688	1	.3012	1.1054	.54	26	P26
2	.1175	1	.7317	.1195	-.60	27	P27
2	.0000	1	1.0000	.0096	-1.20	28	P28

Based on Table 6, it can be concluded that there are four items that are biased, i.e. item 6 (p = 0.445), 8 (p = 0.079), 12 (p = 0.047), and 15 (p = 0.031). Figure 1 (on page 9) shows that items 6 and 15 were the easiest to do for the sixth-graders at SDN Karsanagara, but tends to disadvantage the fifth-grade students at SDN 1 Cikalang. Items 8 and 12 were found to be the easiest ones to attempt by the fifth-graders at SDN 1 Cikalang, but they were found to be more difficult by the sixth-graders at SDN Karsanagara.

Table 7. Person Measure

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	ZSTD	OUTFIT MNSQ	ZSTD	PTMEASUR-AL CORR.	EXP.	EXACT MATCH OBS%	EXP%	Person
93	140	28	5.73	1.83	MAXIMUM MEASURE				.00	.00	100.0	100.0	09322
86	135	28	2.92	.45	.97	.12	.64	-.53	.50	.25	85.7	83.2	08622
82	134	28	2.74	.41	1.91	1.65	2.27	1.94	.02	.27	82.1	80.7	08222
73	133	28	2.58	.38	2.32	2.29	1.38	.85	.31	.29	75.0	75.5	07322
64	131	28	2.33	.34	.93	-.04	1.13	.42	-.13	.33	53.6	70.1	06422
70	131	28	2.33	.34	1.19	.57	1.27	.71	.17	.33	67.9	70.1	07022
31	130	28	2.22	.32	1.65	1.52	1.43	1.02	.35	.34	67.9	68.8	03112
24	129	28	2.12	.31	.93	-.07	.75	-.52	.65	.35	71.4	67.4	02421
19	128	28	2.03	.30	1.54	1.40	1.52	1.26	.15	.37	53.6	65.0	01921
23	128	28	2.03	.30	1.35	.99	.89	-.14	.68	.37	82.1	65.0	02321
12	127	28	1.94	.29	1.06	.29	1.18	.56	.58	.38	67.9	62.6	01211
33	127	28	1.94	.29	1.21	.68	.91	-.11	.49	.38	67.9	62.6	03322
15	126	28	1.86	.28	1.04	.22	.94	-.03	.17	.39	50.0	60.3	01521
54	126	28	1.86	.28	.67	-1.00	.50	-1.55	.88	.39	78.6	60.3	05422
91	126	28	1.86	.28	1.29	.90	1.28	.81	.40	.39	64.3	60.3	09122
14	125	28	1.79	.27	1.04	.23	1.14	.49	.58	.40	64.3	59.2	01411
38	125	28	1.79	.27	.99	.07	.87	-.26	.64	.40	64.3	59.2	03812
80	125	28	1.79	.27	.95	-.03	.77	-.56	.70	.40	75.0	59.2	08022
83	125	28	1.79	.27	1.06	.28	1.08	.35	.58	.40	64.3	59.2	08312
11	124	28	1.72	.26	1.02	.16	.88	-.23	.23	.41	42.9	58.0	01121
29	124	28	1.72	.26	1.11	.44	.94	-.07	.73	.41	71.4	58.0	02922
53	124	28	1.72	.26	.74	-.77	.69	-.88	.61	.41	53.6	58.0	05322
10	123	28	1.65	.26	1.07	.33	1.22	.72	.52	.42	57.1	54.8	01011
30	123	28	1.65	.26	1.42	1.28	.96	-.01	.83	.42	67.9	54.8	03012
95	123	28	1.65	.26	.59	-1.43	.52	-1.57	.55	.42	67.9	54.8	09512
51	122	28	1.58	.25	.56	-1.59	.61	-1.25	.34	.42	67.9	50.9	05112
69	122	28	1.58	.25	.91	-.18	1.00	.11	.36	.42	32.1	50.9	06922
81	122	28	1.58	.25	.43	-2.26	.48	-1.82	.66	.42	53.6	50.9	08112
87	122	28	1.58	.25	.91	-.21	1.01	.15	.42	.42	50.0	50.9	08722
102	122	28	1.58	.25	.80	-.60	.67	-1.00	.64	.42	75.0	50.9	10222
50	121	28	1.52	.24	.78	-.67	.74	-.78	.56	.43	35.7	48.1	05022
89	121	28	1.52	.24	.95	-.08	.80	-.56	.58	.43	42.9	48.1	08922
6	120	28	1.46	.24	1.67	1.97	1.99	2.51	.19	.44	50.0	45.5	00621
84	120	28	1.46	.24	.90	-.26	.79	-.58	.63	.44	39.3	45.5	08412
100	120	28	1.46	.24	1.16	.62	.97	.00	.64	.44	35.7	45.5	10022
9	119	28	1.41	.24	.95	-.07	1.13	.50	.50	.44	42.9	44.1	00911
20	119	28	1.41	.24	.79	-.67	.86	-.35	.65	.44	42.9	44.1	02021
42	119	28	1.41	.24	1.31	1.06	1.23	.80	.43	.44	35.7	44.1	04212
68	119	28	1.41	.24	1.78	2.26	1.73	2.03	.34	.44	35.7	44.1	06812
46	118	28	1.35	.23	1.49	1.57	1.86	2.34	-.11	.45	53.6	40.7	04622
71	118	28	1.35	.23	1.32	1.11	1.09	.37	.18	.45	42.9	40.7	07122
75	118	28	1.35	.23	.96	-.03	.79	-.63	.30	.45	42.9	40.7	07522
40	117	28	1.30	.23	1.19	.73	1.08	.37	.59	.45	35.7	39.7	04012
45	117	28	1.30	.23	.58	-1.65	.55	-1.69	.16	.45	64.3	39.7	04522
72	117	28	1.30	.23	.69	-1.14	.73	-.91	.57	.45	28.6	39.7	07222
98	117	28	1.30	.23	1.48	1.58	1.43	1.37	.26	.45	32.1	39.7	09822
44	116	28	1.25	.22	1.04	.23	.90	-.25	.76	.46	35.7	38.8	04422
57	116	28	1.25	.22	.97	-.02	1.00	.08	.36	.46	57.1	38.8	05722
21	115	28	1.20	.22	.95	-.08	.94	-.11	.29	.46	50.0	37.8	02111
26	115	28	1.20	.22	.85	-.48	.93	-.14	.32	.46	46.4	37.8	02621
78	114	28	1.15	.22	1.25	.94	1.35	1.20	.39	.47	42.9	37.9	07812
92	114	28	1.15	.22	.98	.02	.95	-.09	.68	.47	28.6	37.9	09212
101	114	28	1.15	.22	.71	-1.08	.77	-.78	.41	.47	42.9	37.9	10112
27	113	28	1.10	.22	.85	-.48	.86	-.44	.48	.47	39.3	38.0	02711
94	113	28	1.10	.22	.60	-1.64	.62	-1.49	.69	.47	39.3	38.0	09412
96	113	28	1.10	.22	.76	-.89	.76	-.82	.70	.47	32.1	38.0	09622
56	112	28	1.06	.21	1.31	1.14	1.31	1.13	.41	.48	42.9	37.0	05622
105	112	28	1.06	.21	1.29	1.09	1.24	.90	.56	.48	17.9	37.0	10512
34	111	28	1.01	.21	.58	-1.79	.64	-1.41	.49	.48	57.1	36.2	03422
52	111	28	1.01	.21	1.38	1.39	1.38	1.33	.51	.48	28.6	36.2	05222
90	111	28	1.01	.21	1.65	2.15	1.54	1.79	.64	.48	10.7	36.2	09022
22	110	28	.97	.21	.83	-.62	.81	-.67	.65	.48	39.3	36.3	02211
37	110	28	.97	.21	1.11	.51	1.10	.44	.45	.48	25.0	36.3	03712
61	110	28	.97	.21	.76	-.91	.79	-.73	.52	.48	35.7	36.3	06112
85	110	28	.97	.21	.88	-.38	.77	-.85	.59	.48	50.0	36.3	08512
25	109	28	.93	.21	1.93	2.93	1.69	2.25	.49	.48	21.4	36.4	02511
43	109	28	.93	.21	.80	-.77	.83	-.59	.43	.48	39.3	36.4	04312
66	109	28	.93	.21	1.34	1.27	1.36	1.32	.54	.48	21.4	36.4	06622
67	109	28	.93	.21	.96	-.06	.99	.04	.68	.48	35.7	36.4	06712
97	109	28	.93	.21	.56	-1.97	.56	-1.87	.60	.48	50.0	36.4	09722
104	109	28	.93	.21	.75	-1.00	.79	-.77	.55	.48	35.7	36.4	10412
8	108	28	.88	.20	.91	-.27	.80	-.72	.66	.49	46.4	36.5	00811

```
| 41   108   28    .88    .20| .87  -.43| .83  -.58| .49   .49| 46.4  36.5| 04112 |
| 65   108   28    .88    .20| .83  -.61| .75  -.94| .43   .49| 46.4  36.5| 06522 |
| 58   107   28    .84    .20| .89  -.36| .92  -.25| .51   .49| 42.9  36.5| 05822 |
| 63   107   28    .84    .20| .63 -1.62| .56 -1.92| .31   .49| 60.7  36.5| 06312 |
| 39   106   28    .80    .20|1.24   .98|1.22   .89| .72   .49| 21.4  36.5| 03912 |
| 76   106   28    .80    .20| .94  -.15| .86  -.49| .00   .49| 60.7  36.5| 07612 |
| 48   105   28    .76    .20| .20 -4.95| .19 -4.95| .76   .49| 78.6  36.6| 04822 |
| 99   105   28    .76    .20|1.34  1.33|1.45  1.64| .23   .49| 28.6  36.6| 09912 |
|  7   103   28    .68    .20|1.19   .82|1.19   .79| .27   .49| 42.9  35.4| 00711 |
| 16   103   28    .68    .20| .31 -3.83| .31 -3.80| .44   .49| 71.4  35.4| 01611 |
|  3   102   28    .65    .19| .38 -3.32| .38 -3.22| .68   .50| 60.7  35.4| 00311 |
| 17   102   28    .65    .19| .26 -4.42| .26 -4.34| .55   .50| 75.0  35.4| 01711 |
| 59   102   28    .65    .19|1.13   .60|1.11   .49| .52   .50| 35.7  35.4| 05922 |
| 79   102   28    .65    .19| .54 -2.18| .55 -2.09| .59   .50| 46.4  35.4| 07922 |
| 32   101   28    .61    .19| .52 -2.33| .51 -2.35| .30   .50| 50.0  35.3| 03212 |
|  1   100   28    .57    .19| .82  -.71| .80  -.78| .50   .50| 42.9  35.2| 00111 |
| 55   100   28    .57    .19|1.94  3.17|1.96  3.17| .01   .50| 25.0  35.2| 05512 |
| 18    99   28    .53    .19| .69 -1.40| .66 -1.54| .63   .50| 46.4  35.3| 01821 |
| 77    98   28    .50    .19| .96  -.09| .94  -.20| .23   .50| 35.7  35.4| 07712 |
| 88    98   28    .50    .19|1.00   .09|1.00   .06| .23   .50| 28.6  35.4| 08822 |
|  4    97   28    .46    .19|1.09   .44|1.04   .26| .29   .50| 42.9  35.3| 00421 |
| 74    97   28    .46    .19| .84  -.66| .79  -.86| .45   .50| 39.3  35.3| 07412 |
|103    97   28    .46    .19|1.60  2.22|1.65  2.35| .37   .50| 39.3  35.3| 10312 |
| 36    95   28    .39    .19| .55 -2.25| .53 -2.35| .42   .50| 42.9  35.1| 03612 |
| 60    95   28    .39    .19|1.38  1.53|1.48  1.84| .47   .50| 28.6  35.1| 06012 |
|  2    94   28    .35    .19|1.93  3.21|1.93  3.19| .45   .50| 25.0  34.9| 00211 |
| 62    94   28    .35    .19|1.11   .52|1.12   .57| .47   .50| 35.7  34.9| 06222 |
| 47    93   28    .32    .19|1.15   .70|1.14   .64| .35   .50| 28.6  34.9| 04722 |
|  5    92   28    .28    .19| .78  -.95| .77  -.99| .58   .50| 35.7  34.9| 00521 |
| 35    92   28    .28    .19| .78  -.95| .79  -.90| .32   .50| 35.7  34.9| 03522 |
| 28    85   28    .04    .18|1.22   .98|1.18   .79| .45   .49| 46.4  35.0| 02821 |
| 49    85   28    .04    .18|3.00  5.83|3.08  5.94| .04   .49| 14.3  35.0| 04912 |
| 13    76   28   -.26    .19| .78  -.93| .80  -.82| .40   .47| 25.0  35.2| 01311 |
|------------------------------------------------------------------------------------|
| MEAN 112.9  28.0  1.22   .25|1.04   .0|1.01  -.1|          | 47.0  44.3|         |
| P.SD  12.2   .0    .74   .16| .43  1.5| .43  1.5|          | 16.8  11.9|         |
```

Table 7 shows the Person Measure or the level of ability of students in working with the character instrument of elementary school students. The standard deviation (SD) of their abilities is 0.74. This value if combined with the mean of logit values (1.22), the individual ability level of students regarding their character can be grouped into three categories: a high ability category with the provision of a value greater than 1.22 + 0.74 = 1.96, a medium ability category with provisions between 0.48 (1.22 – 0.74) and 1.96 (1.22 + 0.74) and a low level ability category with value less than 0.48. Thus, from the 105 students who were surveyed, there are 10 high ability students, 82 with moderate ability, and 13 with low ability.
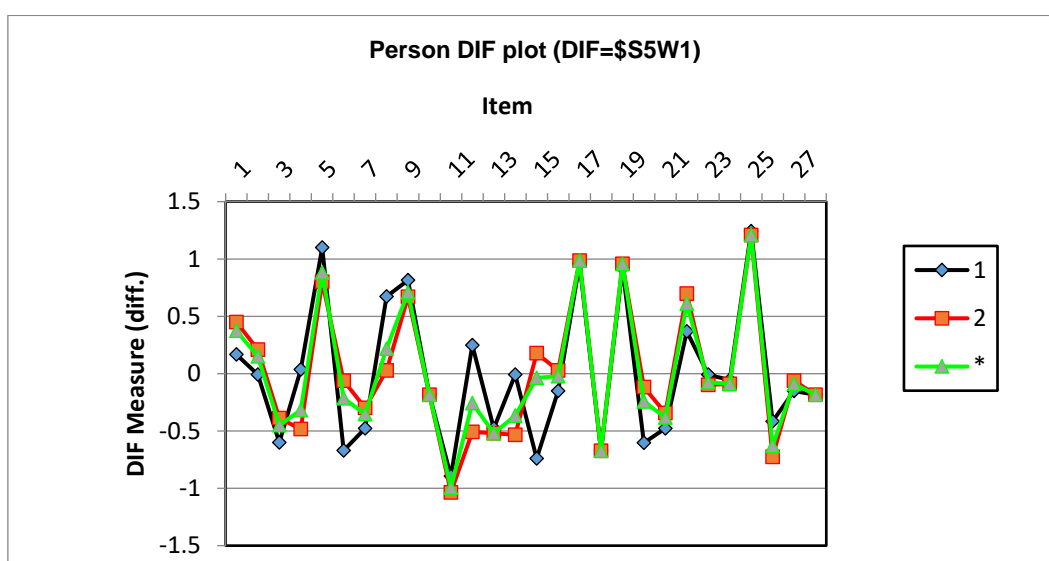

Figure 1. Item Bias Detection

Table 8. Person Fit Order

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PTMEASUR-AL CORR.	PTMEASUR-AL EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	Person
49	85	28	.04	.18	3.00	5.83	3.08	5.94	A .04	.49	14.3	35.0	04912
73	133	28	2.58	.38	2.32	2.29	1.38	.85	B .31	.29	75.0	75.5	07322
82	134	28	2.74	.41	1.91	1.65	2.27	1.94	C .02	.27	82.1	80.7	08222
6	120	28	1.46	.24	1.67	1.97	1.99	2.51	D .19	.44	50.0	45.5	00621
55	100	28	.57	.19	1.94	3.17	1.96	3.17	E .01	.50	25.0	35.2	05512
2	94	28	.35	.19	1.93	3.21	1.93	3.19	F .45	.50	25.0	34.9	00211
25	109	28	.93	.21	1.93	2.93	1.69	2.25	G .49	.48	21.4	36.4	02511
46	118	28	1.35	.23	1.49	1.57	1.86	2.34	H-.11	.45	53.6	40.7	04622
68	119	28	1.41	.24	1.78	2.26	1.73	2.03	I .34	.44	35.7	44.1	06812
31	130	28	2.22	.32	1.65	1.52	1.43	1.02	J .35	.34	67.9	68.8	03112
90	111	28	1.01	.21	1.65	2.15	1.54	1.79	K .64	.48	10.7	36.2	09022
103	97	28	.46	.19	1.60	2.22	1.65	2.35	L .37	.50	39.3	35.3	10212
19	128	28	2.03	.30	1.54	1.40	1.52	1.26	M .15	.37	53.6	65.0	01921
60	95	28	.39	.19	1.38	1.53	1.48	1.84	N .47	.50	28.6	35.1	06012
98	117	28	1.30	.23	1.48	1.58	1.43	1.37	O .26	.45	32.1	39.7	09822
99	105	28	.76	.20	1.34	1.33	1.45	1.64	P .23	.49	28.6	36.6	09912
30	123	28	1.65	.26	1.42	1.28	.96	-.01	Q .83	.42	67.9	54.8	03012
52	111	28	1.01	.21	1.38	1.39	1.38	1.33	R .51	.48	28.6	36.2	05222
66	109	28	.93	.21	1.34	1.27	1.36	1.32	S .54	.48	21.4	36.4	06622
23	128	28	2.03	.30	1.35	.99	.89	-.14	T .68	.37	82.1	65.0	02321
78	114	28	1.15	.22	1.25	.94	1.35	1.20	U .39	.47	42.9	37.9	07812
71	118	28	1.35	.23	1.32	1.11	1.09	.37	V .18	.45	42.9	40.7	07122
42	119	28	1.41	.24	1.31	1.06	1.23	.80	W .43	.44	35.7	44.1	04212
56	112	28	1.06	.21	1.31	1.14	1.31	1.13	X .41	.48	42.9	37.0	05622
91	126	28	1.86	.28	1.29	.90	1.28	.81	Y .40	.39	64.3	60.3	09122
105	112	28	1.06	.21	1.29	1.09	1.24	.90	Z .56	.48	17.9	37.0	10412
70	131	28	2.33	.34	1.19	.57	1.27	.71	.17	.33	67.9	70.1	07022
39	106	28	.80	.20	1.24	.98	1.22	.89	.72	.49	21.4	36.5	03912
10	123	28	1.65	.26	1.07	.33	1.22	.72	.52	.42	57.1	54.8	01011
28	85	28	.04	.18	1.22	.98	1.18	.79	.45	.49	46.4	35.0	02821
33	127	28	1.94	.29	1.21	.68	.91	-.11	.49	.38	67.9	62.6	03322
64	131	28	2.33	.34	.93	-.04	1.13	.42	-.13	.33	53.6	70.1	06422
86	135	28	2.92	.45	.97	.12	.64	-.53	.50	.25	85.7	83.2	08622
	BETTER FITTING NOT SHOWN												
75	118	28	1.35	.23	.96	-.03	.79	-.63	.30	.45	42.9	40.7	07522
80	125	28	1.79	.27	.95	-.03	.77	-.56	.70	.40	75.0	59.2	08022
89	121	28	1.52	.24	.95	-.08	.80	-.56	.58	.43	42.9	48.1	08922
76	106	28	.80	.20	.94	-.15	.86	-.49	.00	.49	60.7	36.5	07612
24	129	28	2.12	.31	.93	-.07	.75	-.52	.65	.35	71.4	67.4	02421
84	120	28	1.46	.24	.90	-.26	.79	-.58	.63	.44	39.3	45.5	08412
85	110	28	.97	.21	.88	-.38	.77	-.85	.59	.48	50.0	36.3	08512
20	119	28	1.41	.24	.79	-.67	.86	-.35	.65	.44	42.9	44.1	02021
74	97	28	.46	.19	.84	-.66	.79	-.86	.45	.50	39.3	35.3	07412
43	109	28	.93	.21	.80	-.77	.83	-.59	.43	.48	39.3	36.4	04312
65	108	28	.88	.20	.83	-.61	.75	-.94	.43	.49	46.4	36.5	06522
13	76	28	-.26	.19	.78	-.93	.80	-.82	.40	.47	25.0	35.2	01311
102	122	28	1.58	.25	.80	-.60	.67	-1.00	.64	.42	75.0	50.9	10122
35	92	28	.28	.19	.78	-.95	.79	-.90	z .32	.50	35.7	34.9	03522
61	110	28	.97	.21	.76	-.91	.79	-.73	y .52	.48	35.7	36.3	06112
104	109	28	.93	.21	.75	-1.00	.79	-.77	x .55	.48	35.7	36.4	10312
5	92	28	.28	.19	.78	-.95	.77	-.99	w .58	.50	35.7	34.9	00521
50	121	28	1.52	.24	.78	-.67	.74	-.78	v .56	.43	35.7	48.1	05022
101	114	28	1.15	.22	.71	-1.08	.77	-.78	u .41	.47	42.9	37.9	10112
96	113	28	1.10	.22	.76	-.89	.76	-.82	t .70	.47	32.1	38.0	09622
53	124	28	1.72	.26	.74	-.77	.69	-.88	s .61	.41	53.6	58.0	05322
72	117	28	1.30	.23	.69	-1.14	.73	-.91	r .57	.45	28.6	39.7	07222
18	99	28	.53	.19	.69	-1.40	.66	-1.54	q .63	.50	46.4	35.3	01821
54	126	28	1.86	.28	.67	-1.00	.50	-1.55	p .88	.39	78.6	60.3	05422
34	111	28	1.01	.21	.58	-1.79	.64	-1.41	o .49	.48	57.1	36.2	03422
63	107	28	.84	.20	.63	-1.62	.56	-1.92	n .31	.49	60.7	36.5	06312
94	113	28	1.10	.22	.60	-1.64	.62	-1.49	m .69	.47	39.3	38.0	09412
51	122	28	1.58	.25	.56	-1.59	.61	-1.25	l .34	.42	67.9	50.9	05112
95	123	28	1.65	.26	.59	-1.43	.52	-1.57	k .55	.42	67.9	54.8	09512
45	117	28	1.30	.23	.58	-1.65	.55	-1.69	j .16	.45	64.3	39.7	04522
97	109	28	.93	.21	.56	-1.97	.56	-1.87	i .60	.48	50.0	36.4	09722
36	95	28	.39	.19	.55	-2.25	.53	-2.35	h .42	.50	42.9	35.1	03612
79	102	28	.65	.19	.54	-2.18	.55	-2.09	g .59	.50	46.4	35.4	07922
32	101	28	.61	.19	.52	-2.33	.51	-2.35	f .30	.50	50.0	35.3	03212
81	122	28	1.58	.25	.43	-2.26	.48	-1.82	e .66	.42	53.6	50.9	08112
3	102	28	.65	.19	.38	-3.32	.38	-3.22	d .68	.50	60.7	35.4	00311
16	103	28	.68	.20	.31	-3.83	.31	-3.80	c .44	.49	71.4	35.4	01611
17	102	28	.65	.19	.26	-4.42	.26	-4.34	b .55	.50	75.0	35.4	01711
48	105	28	.76	.20	.20	-4.95	.19	-4.95	a .76	.49	78.6	36.6	04822
MEAN	112.9	28.0	1.22	.25	1.04	.0	1.01	-.1			47.0	44.3	
P.SD	12.2	.0	.74	.16	.43	1.5	.43	1.5			16.8	11.9	

Table 8 shows the ability of students with the difficulty of each item at grain level. The criteria for checking the suitability of a person (person fit) or inconsistency of a person (outlier or misfit) are as follows: (1) an OUTFIT MNSQ value greater than 0.5 but smaller than 1.5 and closer to 1 is a good value; (2) an OUTFIT ZSTD value between -2.0 and +2.0 and closer to 0 is a good value; and (3) a value between 0.4 and 0.85 for PT MEASURE CORR is a good value. A participant can be considered fit if it meets at least 1 of these 3 criteria. Table 9 shows the instrument used for character measurement of elementary school students.

Table 9. Summary Statistics

```
TABLE 3.1 Pengolahan Data Instrumen Karakter     ZOU696WS.TXT  Dec  6, 2019, 21:40
INPUT: 105 Person  28 Item  REPORTED: 105 Person  28 Item  5 CATS WINSTEPS 4.4.5
-------------------------------------------------------------------------------

       SUMMARY OF 104 MEASURED (NON-EXTREME) Person
-------------------------------------------------------------------------------
|         TOTAL                      MODEL      INFIT        OUTFIT         |
|         SCORE    COUNT   MEASURE   S.E.    MNSQ   ZSTD   MNSQ   ZSTD      |
|-----------------------------------------------------------------------------|
| MEAN    112.7     28.0     1.18     .23    1.04    .01   1.01   -.08      |
|  SEM      1.2       .0      .06     .00     .04    .15    .04    .15      |
| P.SD     11.9       .0      .60     .05     .43   1.54    .43   1.52      |
| S.SD     12.0       .0      .60     .05     .43   1.55    .44   1.52      |
| MAX.    135.0     28.0     2.92     .45    3.00   5.83   3.08   5.94      |
| MIN.     76.0     28.0     -.26     .18     .20  -4.95    .19  -4.95      |
|-----------------------------------------------------------------------------|
| REAL RMSE    .26 TRUE SD    .54  SEPARATION  2.10  Person RELIABILITY  .81 |
|MODEL RMSE    .24 TRUE SD    .55  SEPARATION  2.34  Person RELIABILITY  .85 |
| S.E. OF Person MEAN = .06                                                  |
-------------------------------------------------------------------------------

 MAXIMUM EXTREME SCORE:     1 Person 1.0%

       SUMMARY OF 105 MEASURED (EXTREME AND NON-EXTREME) Person
-------------------------------------------------------------------------------
|         TOTAL                      MODEL      INFIT        OUTFIT         |
|         SCORE    COUNT   MEASURE   S.E.    MNSQ   ZSTD   MNSQ   ZSTD      |
|-----------------------------------------------------------------------------|
| MEAN    112.9     28.0     1.22     .25                                   |
|  SEM      1.2       .0      .07     .02                                   |
| P.SD     12.2       .0      .74     .16                                   |
| S.SD     12.2       .0      .75     .16                                   |
| MAX.    140.0     28.0     5.73    1.83                                   |
| MIN.     76.0     28.0     -.26     .18                                   |
|-----------------------------------------------------------------------------|
| REAL RMSE    .31 TRUE SD    .68  SEPARATION  2.15  Person RELIABILITY  .82 |
|MODEL RMSE    .30 TRUE SD    .68  SEPARATION  2.31  Person RELIABILITY  .84 |
| S.E. OF Person MEAN = .07                                                  |
-------------------------------------------------------------------------------
Person RAW SCORE-TO-MEASURE CORRELATION = .90
CRONBACH ALPHA (KR-20) Person RAW SCORE "TEST" RELIABILITY = .85  SEM = 4.64

       SUMMARY OF 28 MEASURED (NON-EXTREME) Item
-------------------------------------------------------------------------------
|         TOTAL                      MODEL      INFIT        OUTFIT         |
|         SCORE    COUNT   MEASURE   S.E.    MNSQ   ZSTD   MNSQ   ZSTD      |
|-----------------------------------------------------------------------------|
| MEAN    423.5    105.0      .00     .12    1.02    .09   1.01    .06      |
|  SEM      8.8       .0      .10     .00     .05    .31    .05    .32      |
| P.SD     45.8       .0      .54     .02     .24   1.61    .26   1.66      |
| S.SD     46.7       .0      .55     .02     .24   1.64    .27   1.69      |
| MAX.    486.0    105.0     1.21     .16    1.94   6.16   2.06   6.63      |
| MIN.    311.0    105.0    -1.00     .10     .60  -3.48    .59  -3.29      |
|-----------------------------------------------------------------------------|
| REAL RMSE    .12 TRUE SD    .53  SEPARATION  4.28  Item  RELIABILITY  .95 |
|MODEL RMSE    .12 TRUE SD    .53  SEPARATION  4.47  Item  RELIABILITY  .95 |
| S.E. OF Item MEAN = .10                                                    |
-------------------------------------------------------------------------------
Item RAW SCORE-TO-MEASURE CORRELATION = -.99
Global statistics: please see Table 44.
UMEAN=.0000 USCALE=1.0000
```

Table 10. Summary Statistics

	Mean	SD	Separation	Reliability	Cronbach Alpha
Person	1.18	0.60	2.10	0.81	0.85
Item	0.00	0.54	4.28	0.95	

Referring to Table 10, reliability values for person and item are 0.81 and 0.95. This means that the instrument (character) of the elementary school students are considered reliable within a special category. As for the Cronbach Alpha value of 0.85, which represents the interaction between persons and items, this falls in the excellent category. This categorisation is based on Sumintono & Widhiarso (2014) where they considered a value which is less than 0.6 to be in a bad category, a value in the range 0.6-0.7 to be in the moderate category, a value between 0.7 and 0.8 to be in a good category and a value greater than 0.8 to be in the excellent category. There are several aspects of character in students that are different from the two schools studied. This difference occurs in one of them due to different environmental influences. SDN 1 Cikalang is located in an urban area while SDN Karsanagara is located next to an urban area. This difference can be seen in Table 6 which shows that there are some biased items, involving students at SDN 1 Cikalang and SDN Karsanagara.

4. Discussion

Character Education in Elementary Schools
Character can be defined as a set of individual psychological characteristics that affect one's ability and tendency to function morally (Osman, 2019) where moral is defined as the reality of personality. A positive character is a driver which will determine the right direction and acts as a protector against the occurrence of immoral actions (Fauziyah & Jailani, 2014). Moral is not the result of personal development by itself, but includes a person's actions and behavior, as well. It is indispensable to give examples when teaching moral education. However elementary school-age students are still in the imitation stage, so it can be said indirectly that elementary school students still need something tangible so they can learn. The virtuous behavior or virtue of a person can grow through observations of other people doing such virtuous actions (Schnall et al., 2010). The discipline included in students' character can be generated through the drive to control behavior so that it can also affect the general academic performance of students (Stanley, 2014).

The teacher and his caring attitude can help students to develop positive attitudes in learning (Rahimi & Karkami, 2015). Character development should start from the moral improvement of the teacher. Elementary school-age students are still in the imitation stage, so they still need concrete examples to copy and to learn from. Children aged 6-12 are at a concrete operational level where they still need something tangible to help develop their intellectual abilities (Desstya, 2015; Ibda, 2015). Giving concrete examples have more impact because it includes aspects of moral, cognitive, and motivational education (Mannan, 2017; Szutta, 2019). Character values raised by educators can be indirectly admired by their students.

Zagzebski (2015) noted that someone's admiration is an emotion where the object is seen as something which is acceptable. This means that the character values shown by educators can be imitated by students through the admiration to the teacher. Character education is a process of applying moral and religious values to learners through the sciences and then applying these values to oneself, to our family, friends, educators and the surrounding environment and to God the Almighty (Putri, 2018). Character development inculcates a lot of values inside students such as being careful, thorough, ability to face problems, being honest, objectivity, perseverance and tolerance (Widodo & Kadarwati, 2013).

Application of character education can be implemented through the Character Building (CB) subject aims at improving the quality of the students' personality so that they are ready to contribute to the community after graduation. Character education will enable them to apply many important values in life, including caring, honest, responsible, disciplined, and tolerant attitudes (Pane & Patriana, 2016). Positive characters can grow through watching films in which students are involved in discussions to foster positive thinking and develop their character (Iii & Waters, 2014). To achieve the goal of character education, it is therefore necessary to assume that educators are "knowledge brokers", effectively repackaging information and participating in teacher training (Walker et al., 2015).

Character Instrument Development of Elementary School Students
The development of the character instrument of the elementary school students was conducted with 28 fifth-graders of SDN 1 Cikalang and 77 sixth-graders of SDN Karsanagara. Aspects studied include interest (strong desire), beliefs (mental attitude), confidence, perseverance (persistence), fear, responsibility, discipline, honesty, tolerance, hard work, creativity, independence, curiosity, respect, social concern, love, peace, democratic, and patriotism. The study was conducted using Rasch model. This model is considered as the only model that view numbers as a truth so that the results of the analysis are considered to be authentic with adequate statistical results (Van Der Ven & Ellis, 2000)

Table 2 (Undimensionality table) indicates that the raw variance value of 33.3% belongs to the 'adequate' category. The value of Unexplained variance in the 1st to the 5th contrast of residuals is 8.0%, 6.2%, 4.3%, 4.2%, and 4.1%. All of these values are also less than 15%. The use of the instrument is measured by the character variable. The general criteria for the interpretation of the variance is as follows: unexplained variance if <15%, adequate if 20%-40%, good if 40%-60%, and very good if above 60%.

The findings of the study revealed that the majority character (78.1 % or 82 students out of 105) of elementary school students are in the medium category. This means that the character and ethics of many elementary school students still need to be improved and this can be done at school. It is proven by Table 3 and Table 7 where only 10 students were in the high-ability (positive character) category while the majority of the students are in the medium category. Thirteen students fell into the poor character value category.

Although the results of the analysis in Table 7 showed that each student has a logit value that varies from negative to positive values, this is not a problem because the average item size has a standard value of 0.0 logit (Boone, Staver & Yale, 2014). A negative value implies that the respondent or student has an ability level less than the average difficulty of the item the instrument is measuring. Positive characters that have not embedded in elementary school students can be influenced by several factors such as environmental factors. The surrounding environment is one of the greatest influences on human growth, starting from the family, school, and community environments.

Referring to Table 3, the difficulty level of 27 items is between -2SD and + 2SD, except for item for which it is above +2SD. The difficulty level of item 25 can be considered as an outlier. It means that this item is not an appropriate one to give to students to measure character while the other 26 items are appropriate to measure the character of elementary school students. Table 4 shows that there are 6 items that are categorized as '*very difficult*'. These are items P5, P9, P17, P19, P22 and P25. There are three items that are categorized as '*difficult*'. These are item P1, P2 and P8. In the '*easy category*', there are 16 items namely P3, P4, P6, P7, P10, P12, P13, P14, P15, P16, P20, P21, P23, P24, P27 and P28. The '*very easy category*' includes 3 items, which are P11, P18, and P28. Items within the difficult categories are aspects of character that are not possessed by students yet. These characters are devout (religious) and interest (strong desire). These two character traits are influenced by several factors including the ability of individuals to socialize with the environment, with people who have a high level of faith, with individuals who have the ability to adapt, and the ability of individuals to interact socially with the family, school and the community (Akbar, 2015).

Besides using the scales in the character instruments of elementary school students, this research also use Likert scales with a score ranges from 1 to 5. The Likert scale were used in several questions to measure individual behavior by responding to 5 choices on each item of inquiry: strongly agree, agree, neutral, disagree, and strongly disagree (Budiaji, 2013). Four items are based on the aspect of perseverance (diligence, heart strength, persistence). Students of SDN 1 Cikalang was found to be weak in tolerance. Therefore, the fifth graders at SDN 1 Cikalang must be taught this value in more detail. Students at SDN Karsanagara had difficulty with managing their fear and things that could harm them. Therefore, they must be taught this aspect with more care and diligence and this can be delivered by the educator. These aspects are essential, giving rise to a biased tendency to one of the groups. The aspect of discipline was low for students at SDN Karsanagara. This could be explained by the fact that teachers are not giving the right examples, for example, by coming late to his class (Wardhani, 2018). This aspect of discipline is not so much a problem at SDN 1 Cikalang.

The Rasch model can provide great benefits, but researchers should evaluate it carefully and conscientiously (Boone, Staver & Yale, 2014). Table 8 shows that 99 students have been able to answer most questions to a satisfactory extent. Only 6 students were unable to provide satisfactory answers according to their abilities. This can occur due to the possibility of students choosing random answers and

therefore it is inaccurately measuring the character of these students. Based on the results obtained from the data collection, data processing and data analysis procedures regarding the development of the character of elementary school students, we conclude that the character development of the majority of elementary school students is in the medium category. This means that the character of elementary school students still needs much improvement through character education which must be integrated with the main subjects that are taught in elementary schools. The basic aspects of religion and interest must also be strongly emphasized. Moreover, five-graders tend to be weak in the perseverance (diligence, strength of heart, persistence) and tolerance aspects while the sixth graders tend to be weak in devout and discipline. Thus, necessary adjustments must be made to customize the teaching of character development to each group of students.

5. Conclusions and Recommendations

The results of data analysis using the Rasch model revealed that the character of the majority of elementary school students is in the medium category. This means that the character of elementary school students still needs to be improved through character education which needs to be integrated with the main subjects that are being taught in elementary schools. Reading, creativity, curiosity, perseverance (strength of heart) and devotion (religion) are some of the character traits that need to be emphasized in character development education. Character development of the fifth-grade students tends to be low in aspects such as perseverance (diligence, strength of heart, persistence) and tolerance while the sixth-graders tend to be weak in devotion and discipline. Based on the above findings, it can be concluded that the Rasch model is able to reveal the character of students through the use of dichotomous (multiple choice questions) data by utilizing statistical parametric tests. In other words, the Rasch model is a relevant and appropriate tool to discover the relationship between a person's ability and the difficulty level of question items.

Our final recommendations are as follows:
1. Both schools involved in this study, SDN 1 Cikalang and SDN Karsanagara, need to improve the strictness of their regulations so that they can get the desired character development traits from their students.
2. Teachers must foster positive attitudes and values in elementary school students. Teachers are central to the life of students and they have a strong influence on how many students will live their life afterwards.
3. The community and the society at large have a vital role to play to imbue youngsters (and especially students) with a positive character by providing a environment that is conducive for such developments.

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Character Instrument

No	Dimensions /Aspects	Indicator	Statement	Item No.
The development of this instrument begins from the theory that character deals with distinguishing features (differentiation) which are unique (typical or single) and are owned by each nation and nations' superiority to be considered and respected equally.				
1	Interest (strong desire)	A strong will or desire to a particular object.	I am interested in fraction addition materials.	1
			I want to know the actual distance by using the scale on the map.	2
2	Beliefs (mental attitude associated with true)	Behavioral conception that arises from the soul as a reaction on the basis of the situation that affects it.	I am sure with my own answer.	3
3	Confidence (mental attitude of trust))	Attitude grows on the basis of confidence.	I answer the questions with my own ability.	4
4	Perseverance (diligence, strength of heart, persistence)	Behavior shows diligence.	I work on my assignments a week before the due date.	5
			I study before getting the test.	6
Character is closely related to the characteristics of a nation.				
1	Devout (religious)	Abstain from deviant deeds and obey the rules of his religion.	I pray before the class begins.	7
			I pray on time.	8
			I pray Dhuha.	9
2	Responsible	Self-awareness towards all intentional or unintentional behavior and actions.	I apologize when I make mistake.	10
3	Disciplined	Feelings of obedience and submissive to the values implemented in their environment.	I do my duty to clean the classroom.	11
			I come to classroom on time.	12
4	Honest	No cheating, no lying.	I agree if any items lying around will be returned to their owners.	13
			I do my assignments honestly.	14

5	Tolerant	Respect and appreciate each group or each individual .	I agree to befriend with someone from different religion.	15
6	Hard working	Never be tired and never stop to pursue goals.	I try to answer the questions about fraction subtraction.	16
7	Creative	Able to bring up new ideas.	I find another way to solve the question about ratio.	17
8	Independent	Attitude of not depending on others.	I agree to come to school without bothering my parents.	18
9	Curious	Behavior of finding out something, exploring, investigating, and learning.	I study at home first before the teacher explains the fraction material.	19
10	Respect	Appreciate	I value the work of others honestly.	20
			I shake hands when I meet my teacher.	21
11	Social care	Interest or willingness in helping others.	I help my friends to understand the material about the fraction division.	22
12	Love peace	Attitudes, utterances, actions that make other people feel safe and happy.	I agree if the teacher gives rewards to students who have never make trouble in the class.	23
13	Democratic	Discuss to appoint the class leader.	I am involved in determining the class chairman.	24
14	Love reading	Reading textbooks, reading novels.	I read at least two story books every week.	25
15	Nationalism	Proud as an Indonesian citizen, exalt nation face. Proud to use Indonesian products.	I am proud to wear a red and white T-shirt.	26
			I want to win the International Math Olympiad.	27
			I love local products rather than foreign products.	28

Name	:
Class	:
School	:

Direction:

1. Write down your identity in the available column!
2. Pray before working on the test!
3. Answer all the questions individually!
4. Cross (X) one of the options!

Good Luck^^

1. I am interested in fraction addition material.
   a. Not very interested   b. Not interested   c. Neutral
   d. Interested   e. very interested

2. I want to know the actual distance by using the scale on the map.
   a. very unwilling   b. unwilling   c. Neutral
   d. willing   e. very willing

3. I am sure with my own answer.
   a. very unsure   b. unsure   c. Neutral
   d. Sure   e. very sure

4. I answer the questions with my own ability.
   a. Never   b. Seldom   c. Sometimes
   d. Often   e. Always

5. I work on my assignments a week before the due date.
   a. Never   b. Seldom   c. Sometimes
   d. Often   e. Always

6. I study before getting the test.
   a. Never   b. Seldom   c. Sometimes
   d. Often   e. Always

7. I pray before the class begins.
   a. Never   b. Seldom   c. Sometimes
   d. Often   e. Always

8. I pray on time.
   a. Never   b. Seldom   c. Sometimes
   d. Often   e. Always

9. I pray Dhuha.
   a. Never   b. Seldom   c. Sometimes
   d. Often   e. Always

10. I apologize when I make mistake.
    a. Never   b. Seldom   c. Sometimes
    d. Often   e. Always

11. I do my duty to clean the classroom.
    a. Never   b. Seldom   c. Sometimes
    d. Often   e. Always

12. I come to classroom on time.
    a. Never   b. Seldom   c. Sometimes
    d. Often   e. Always

13. I agree if any items lying around will be returned to their owners.
    a. Strongly disagree   b. Disagree   c. Neutral
    d. Agree   e. Strongly agree

14. I do my assignments honestly.
    a. Never   b. Seldom   c. Sometimes
    d. Often   e. Always

15. I agree to befriend with someone from different religion.
    a. Strongly disagree   b. Disagree   c. Neutral
    d. Agree   e. Strongly agree

16. I try to answer the questions about fraction subtraction.
    a. Never   b. Seldom   c. Sometimes
    d. Often   e. Always

17. I find another way to solve the questions about ratio.
    a. Never   b. Seldom   c. Sometimes
    d. Often   e. Always

18. I agree to come to school without bothering my parents.
    a. Strongly disagree   b. Disagree   c. Neutral
    d. Agree   e. Strongly agree

19. I study at home first before the teacher explains the fraction material.
    a. Never   b. Seldom   c. Sometimes
    d. Often   e. Always

20. I value the work of others honestly.
    a. Never   b. Seldom   c. Sometimes
    d. Often   e. Always

21. I shake hands when I meet my teacher.
    a. Never   b. Seldom   c. Sometimes
    d. Often   e. Always

22. I help my friends to understand the material about the fraction division.
    a. Never   b. Seldom   c. Sometimes
    d. Often   e. Always

23. I agree if the teacher give rewards to the students who never make trouble in the class.
    a. Strongly disagree   b. Disagree   c. Neutral
    d. Agree   e. Strongly agree

24. I am involved in determining the class chairman.
    a. Never   b. Seldom   c. Sometimes
    d. Often   e. Always

25. I read at least two story books every week.
    a. Never   b. Seldom   c. Sometimes
    d. Often   e. Always

26. I am proud to wear a red and white T-shirt.
    a. Strongly disagree   b. Disagree   c. Neutral
    d. Agree   e. Strongly agree

27. I want to win the International Math Olympiad.
    a. very unwilling   b. unwilling   c. Neutral
    d. willing   e. very willing

28. I love local products rather than foreign products.
    a. Strongly disagree   b. Disagree   c. Neutral
    d. Agree   e. Strongly agree