Optimalisation of E-Resources from National Library and Online Information of Covid-19 to Develop Literacy and Numeracy Test Like PISA

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Abstract

By utilising the online information of Covid-19 from e-resources including the national library and online information, the development of literacy and numeracy item test called PISA-*Cosains* (science context of Covid-19) was carried out. The process was oriented to the PISA (Programme for International Student Assessment) science framework that has been carried out to produce an instrument product that is valid and practical. The method used in this study is the Research and Development method. The analysis in this study uses Rasch's Item Response Theory (IRT) model. The development process utilises e-resources from national library and online portal of Indonesian government. Based on the theoretical validation, the results showed that the questions developed were valid. The practicality of the questions can be known through the results of questionnaire analysis of the test takers at the trial stage. The results of the practicality questionnaire show that this question belongs to the practical category. The results of quantitative analysis through field test trials show a significant influence from the application of the PISA model question instrument to the improvement of scientific literacy and numeracy skills of junior high school students obtained. However, the level of separation is still relatively low. It indicates that the items are less sensitive to cover the entire continuum of all respondents. Furthermore, when viewed from the item, most of them are fit and have a pretty good point measure correlation.

Key words: information science, Covid-19, literacy, numeracy, PISA

Introduction

Several studies have shown that prolonged distance learning during the Covid-19 pandemic has decreased literacy interest and ability (called: *literacy loss*) among Indonesian students (Tagar.id, 2021). The problem of literacy loss should be addressed and be concerned by the educators and researchers (Yuniar, Suprapto, & Mubarok, 2020). The role of library that producing many resources for literacy should be addressed.

On the other hand, in the era of the industrial revolution 4.0, as it is today, all things in life cannot be separated from information technology. It is reinforced by the statements of Mintasih (2018), Prasetyo and Trisyanti (2018), Purwandini and Irwansyah (2018), which in principle are the same, namely stating that today's life cannot be separated from the influence of advances in

information technology (IT), because all components that support human life have changed from conventional forms to digitisation through the application of IT. It has also penetrated explicitly into various things in education, starting from the preparation of learning tools, implementing the learning process, to evaluating learning. The huge information of Covid-19 from online resources should be optimised. The existence of national library that provide many links and information as well as some online information from government website like Covid19.go.id; pedulilindungi.id should be utilised.

Moreover, to encounter the literacy loss, one effort of the Indonesian government is changing the policy of national examination (Ujian Nasional - UN) into a Minimum Competency Assessment (AKM). A limited meeting to discuss the UN, Kemdikbud on March 24, 2020, resulted in the decision that the National Examination be abolished (detikNews, 2020). The main reason for the removal was the Covid-19 pandemic. The basis of the regulation used is the Circular of the Minister of Education and Culture (Mendikbud) Number 4 of 2020 concerning the implementation of education policies in the emergency period of the spread of the coronavirus disease (Covid-19) (Kemdikbud, 2020). Furthermore, starting in 2021, the National Examination will be replaced with AKM and a Character Survey. These two new assessments are specifically designed to map and improve the quality of education nationally. National assessment needs to be placed within the framework of the overall education evaluation system under the National Education System Law (Articles 57, 58, 59), that "Evaluation is carried out in the context of controlling the quality of education nationally as a form of accountability of education providers to interested parties" (Article 57, paragraph 1) (UU 20, 2003).

The AKM is new for all parties, including the government as the provider of education and, of course, schools and all stakeholders. Meanwhile, AKM socialisation has been carried out starting from preparation, instrument development, and implementation, which are summarised in standard operating procedures. Specifically related to the AKM items, the point is to adopt the items in PISA, where each question is based on a specific stimulus regarding a particularly relevant context, both personal, socio-cultural, and scientific. On the other hand, Covid-19 has become a different problem for the community, including the education community, personally and in all aspects of life. Therefore, to support the implementation of this AKM, researchers will optimise the Covid-19 context as a basis for developing the AKM

instrument named PISA-COsains to explore the reading and numeracy skills of junior high school students. This is what makes the urgency of this research. Junior high school students have gone through abstract thinking so that it is possible to analyse questions in a scientific context, including Covid-19.

Research on the relevant topics have been conducted by several authors. Sinaga, Fauzi, and Dewi (2019) researched on the development of PISA model problems in integrated natural science lessons content physics to know the reasoning of students resulted learning materials that is valid, practical, reliable science questions for physics content in the PISA model. In addition, Caesaria (2018) developed the integrated science question oriented by PISA framework for grade eight. In a similar way, Setyawarno, Rosana, Widodo, and Setianingsih (2018) have also developed PISA model assessment instruments to measure literature capability of Junior High School students. Therefore, research on the development of instrument like PISA is still novel in the currently year.

In summary, the objectives of this research are:
1. To develop valid and reliable items for reading literacy and numeracy in the Covid-19 context for junior high school students.
2. To explore the literacy and numeracy skills of junior high school students.

The urgency of this research can be reviewed for teachers, students, and the government. For teachers, the instruments developed later can be used as references regarding AKM questions such as PISA in the context of Covid-19 and obtain an initial picture of the students' reading and numeracy literacy skills. For students, it provided additional training as a vehicle for dealing with similar questions. For the government, to provide an initial description of the results of trials of equivalent AKM questions carried out outside the education unit or from external parties, including universities as carried out by the research team and to improve the quality of education (UNDP, 2021).

Research Method

This research utilised research and development (R and D). Initially, the researchers conducted preliminary research on optimising enormous information about Covid-19 from online resources (Bhat, 2021). Then, the researchers developed an instrument to capture scientific literacy and numeracy called *PISACo-Sains* (science PISA in Covid-19). Figure 1

illustrates data sources from e-resources of the national library and online information of covid-19 to develop an instrument. There are many multicultural perspectives in public library services, including e-resources of the national library (Akbar & Asmiyanto, 2021; Bhat, 2021; Suprapto & Qosyim, 2022). The digital library facilitates sources of information in the package of book, bulletin, journal articles, and relevant information. The research procedure consisted of several stages, namely the theory synthesis and needs analysis stage, the design stage (variable construction, learning objectives, instrument writing, and scoring), and the evaluation stage. The evaluation stage is divided into three: validity, reliability, and item analysis. The validation of the PISACosains questions was carried out in two stages, namely theoretical validation (content experts, PISA experts, constructors, and linguists) and empirical validation (test takers' answers). Based on the theoretical validation, the results showed that the questions developed were valid.

a.   b.
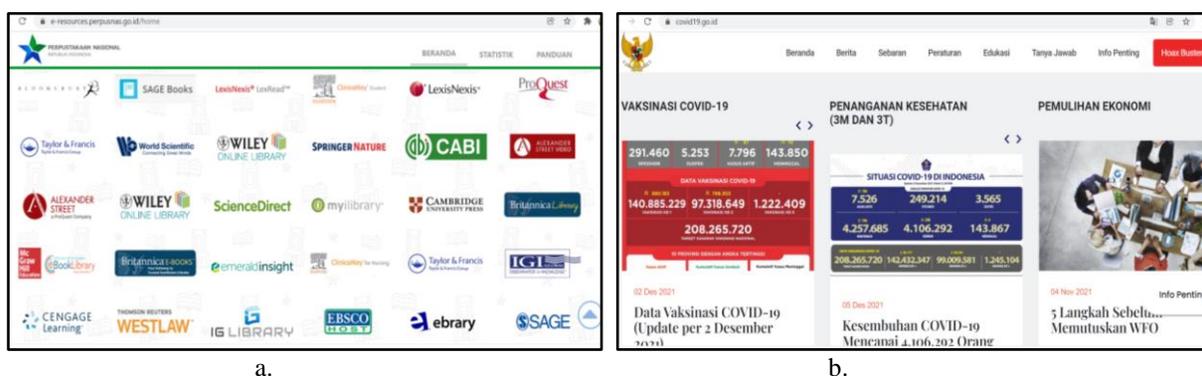
Figure 1. Data sources portal, i.e. (a) e-resources of national library (b). online information of covid19.go.id

Table 1. Demographic factors of person (participants)

Demographic Factor	*N*	Percentage
Gender		
Male	30	40
Female	45	60
Total	75	100

After the validation process, the data collections were targeted to Junior High School students in East Java, Indonesia. The data were collected from August to October 2021.

In Indonesia, as a pearl of local wisdom, demographic sources have a potency of education researchers conducting survey research (Suprapto, 2019). Table 1 shows the demographic factors of participants of this research. Initially, the instrument consisted of 30 items. After the validation process, then finally 25 items were analysed through Rasch analysis with *Winstep* software (Smith, 2003). Figure 2 indicates the cover of the instrument developed. The practicality of the questions can be known through the results of the questionnaire analysis at the trial stage. The results of the practicality questionnaire show that this question belongs to the practical category.
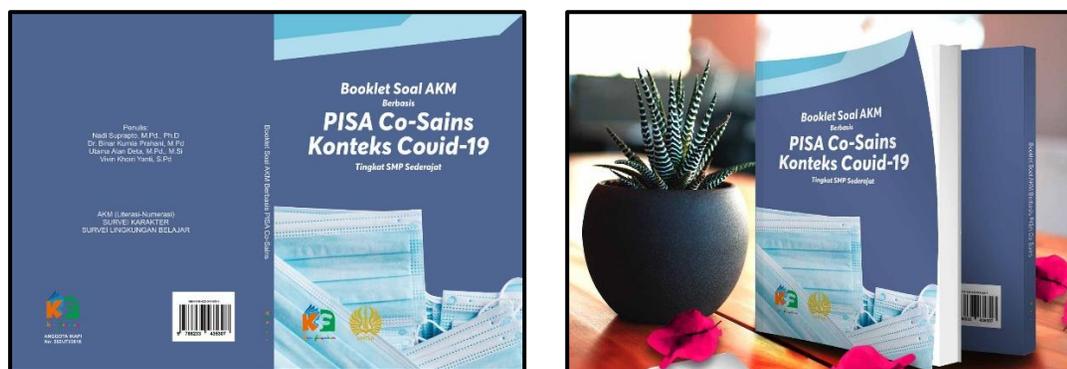
Figure 2. The instrument of *PISACo-Sains* in the booklet form (science PISA in the context of Covid-19

Findings and Discussion

Analysing of items developed

After the national exam in Indonesia was abolished, the evaluation form was replaced with a minimum competency assessment system (AKM). AKM is focused on literacy and numeracy because literacy and numeracy are general and essential competencies (Kemdikbud, 2020). The ability to think about and with language and mathematics is required in various contexts, whether personal, social, or professional. By measuring essential competencies (not a curriculum or lesson content), the message is that teachers are expected to innovate to develop student competencies through various lessons through student-centred teaching.

Meanwhile, subjects other than language and mathematics remain essential. The focus of the assessment is thinking competence, so the measurement results do not only reflect academic achievement in Indonesian and Mathematics lessons. Reading literacy and numeracy can and should indeed be developed through various subjects, including science, social studies, citizenship, religion, and art. Teachers, schools, and students need to understand this message to minimise the risk of narrowing the curriculum in Indonesian and Mathematics lessons.

The forms of AKM questions or PISACosains include multiple-choice, multiple complex choices, matchmaking, short answer or essay, and essay or description. The context of the AKM questions includes three things, namely personal, socio-cultural, and scientific, under the PISA model questions (OECD, 2013; 2014; 2018). The context of the AKM issue aligns with the idea of education reform in Indonesia (Suprapto, Prahani, & Cheng, 2021; Suprapto, 2016). Personal context relates to the activities of a person, family or group. The socio-cultural context relates to community or community problems, whether local, national, or global. The scientific context relates to the application of mathematics in science and technology. These three primary contexts will be set and linked by researchers with the global context of Covid-19 as a stimulus in developing AKM items.

In the context of PISACosains items utilises Multiple Choice (MC), Multiple Complex Choices (MCC), and Essay. The following is an example of an instrument including stimulus and question item that are being developed:

#Multiple Choice: Literacy
Take a look at the map of the cumulative distribution of active Covid-19 cases in Indonesia below.

Stimulus

Figure 3. Cumulative distribution of active cases (*source: covid19.go.id*)

Based on the map above, it can be stated that:
   A.   *Indonesia is in a country of emergency Covid-19*
   B.   *Most of the Covid-19 patients are on the island of Sumatra*
   C.   *The island of Bali has a small number of Covid-19 cases due to its small population*
   D.   *Active cases of Covid-19 in Indonesia continue to increase due to people who are still ignorant of the health protocols set by the government*

#Multiple Choice: Numeracy
The following is a table of data for countries with the most Covid-19 cases in the world as of November 11, 2020

UPDATE TERPAPAR COVID-19 DI DUNIA
TERSEBAR DI 216 NEGARA DAN WILAYAH/ TERITORIAL
Update 11 November 2020 Pkl. 12.00 WIB

No.	Negara	Total Kasus	Meninggal	Jumlah Penduduk	Kematian / 1 Juta Penduduk
	Dunia	50,676,072	1,261,075	7,794,798,739	162
1	Amerika Serikat	9,868,389	236,042	331,002,651	713
2	India	8,591,730	127,059	1,380,004,385	92
3	Brazil	5,664,115	162,397	212,559,417	764
4	Rusia	1,817,109	31,161	145,934,462	214
5	Prancis	1,772,551	40,665	65,273,511	623
6	Spanyol	1,328,832	38,833	45,195,774	859
7	Argentina	1,242,182	33,560	50,882,891	660
8	Inggris	1,213,367	49,238	67,886,011	1053
9	Kolombia	1,143,887	32,791	46,754,778	483
10	Meksiko	967,825	95,027	128,932,753	737
21	Indonesia	448,118	14,836	269,603,400	55

Sumber : World Health Organization (WHO), worldometers.info (UN Population Division), BPS

Figure 4. The countries with the most Covid-19 cases in the world (s*ource: covid19.go.id*)

Based on this information, which country has the highest death toll as of November 11, 2020?
   A. *Brazil*
   B. *England*
   C. *India*
   D. *Indonesia*

 # Multiple Complex Choices: Literacy

Read the following informational text!

Covid-19 Mitigation Readiness on Sumba Island
       In dealing with the Covid-19 pandemic, the number of Health Human Resources in handling COVID-19 on Sumba Island is still limited, as are the supporting tools, facilities and infrastructure. All hospitals referring to Covid-19 on Sumba Island already have isolation rooms, but the supporting equipment is insufficient; they do not even have protective clothing/apron. The need for health workers in hospitals in handling COVID-19 is still lacking.
       Not all public transportation managers, such as terminals on Sumba Island, have a public transportation protocol for controlling Covid-19. All terminals have not checked the body temperature of terminal visitors, do not have access to wash hands with soap and water or hand sanitisers and do not have posters regarding ethics when coughing/sneezing. In addition, almost all people on Sumba

Island have not taken all preventive measures against COVID-19. Preventive measures that are mostly not taken are hand sanitiser, avoiding touching the face and keeping a distance. The community considers that the village is still not ready to prevent COVID-19 on Sumba Island. Therefore, cooperation from various parties is needed so that Sumba Island can have good mitigation readiness in dealing with the Covid-19 pandemic. [Source: www.litbang.kemkes.go.id]

Question item

Based on the information above, which of the following statements is a fact or an opinion?

Statement	Fact	Opinion
Readiness to mitigate Covid-19 on Sumba Island is not going well		
The people of Sumba rarely wash their hands		
The Sumba Island Government pays little attention to the readiness of Covid-19 mitigation on Sumba Island		
Readiness to mitigate Covid-19 on Sumba Island is still lagging		

Multiple Complex Choices: Numeracy
Check out the following infographic!

Figure 5. The infrared thermometer *[Source: @lipiindonesia]*

Based on the information above, classify the following statements into true statements and false statements!

Statement	True	False
Medical thermometers are more accurate than industrial thermometers.		
Thermo guns that are often used in public places such as malls, offices, and places of worship utilize laser light technology.		
Mr. Jamal wants to enter a shopping centre, when Mr. Jamal's temperature was measured, Mr. Jamal's temperature at that time was 29.2ºR, and he was 40 years old, then Mr. Jamal's temperature was declared normal and allowed to enter the shopping centre.		
Reno is 5 years old, when he checked Reno's temperature reached 311 K, Reno's temperature was still within normal limits.		
Ari's body temperature is 100ºF, while Adi's body temperature is 35.5ºC, both are the same temperature.		

#Essay: Numeracy
The following is a weekly cumulative graph of Covid-19 cases in the Riau Islands Province from January to May 2021.

Figure 6. A weekly cumulative graph of Covid-19 cases in the Riau Islands

Has there been a significant decrease in the number of COVID-19 cases in the Riau Islands Province? If so, on what date was it?

#Essay: Literacy
Read the following informational text!

Infectious disease pandemics such as the Covid-19 pandemic that is currently happening can give rise to several psychosocial stressors, such as health threats to oneself or family members. The government's implementation of restrictions on activities to prevent the spread of disease will affect people's routines, have to be separated from family and friends, lack daily necessities, reduce income,

and close schools. Psychological conditions Individuals can also vary in response to this condition. It is common for individuals to respond negatively through stress and worry during this pandemic.

Stress coping mechanisms that are used by the community to maintain or overcome the problems they experience are spiritual activities (worshipping, praying, dhikr, or meditation), recreational activities (doing hobbies, watching movies, gardening), exercising/physical activities, telling stories to others. Family or friends about the feelings experienced, relaxation activities/breathing exercises, and smoking or drinking alcohol. [Source: www.litbang.kemkes.go.id]

Based on the information above, what is meant by coping with stress?

The results of Rasch Analysis

As the comparison criteria, Table 2 lists the rating scale instrument quality criteria.

Table 2. Rating scale instrument quality criteria (Linacre, 2021; Smith, 2003).

Criterion	Poor	Fair	Good	Very Good	Excellent
Targeting *	> 2 errors	1-2 errors	< 1 error	< .5 error	< .25 error
Item Model Fit Mean-Square Range Extremes	< .33 - >3.0	.34 - 2.9	.5 - 2.0	.71 - 1.4	.77 - 1.3
Person and Item Measurement Reliability	<.67	.67-.80	.81-.90	.91-.94	>.94
Person and Item Strata Separated	2 or less	2-3	3-4	4-5	>5
Ceiling effect: % maximum extreme scores	>5%	2-5%	1-2%	.5-1%	<.5%
Floor effect: % minimum extreme scores	>5%	2-5%	1-2%	.5-1%	<.5%
Variance in data explained by measures	<50%	50-60%	60-70%	70-80%	>80%
Unexplained variance in contrasts 1-5 of PCA of residuals	>15%	10-15%	5-10%	3-5%	<3%

This Table has been developed by William P. Fisher, Jr. based on the Rasch literature and his many years of experience conducting Rasch analyses in different settings.

```
| PERSON      75 INPUT      75 MEASURED              INFIT        OUTFIT   |
|           TOTAL     COUNT     MEASURE   REALSE    IMNSQ  ZSTD  OMNSQ  ZSTD|
| MEAN        8.3      25.0      -1.16      .59      .99    .0   1.10    .1|
| P.SD        4.1       .0        1.20      .11      .26   1.0   1.06    .9|
| REAL RMSE    .60 TRUE SD      1.04  SEPARATION  1.74  PERSON RELIABILITY  .75|
|-------------------------------------------------------------------------|
| ITEM        25 INPUT      25 MEASURED              INFIT        OUTFIT   |
|           TOTAL     COUNT     MEASURE   REALSE    IMNSQ  ZSTD  OMNSQ  ZSTD|
| MEAN       24.9      75.0       .00      .35      .99    .0   1.10    .0|
| P.SD       17.3       .0        1.59      .11      .12    .9    .66   1.0|
| REAL RMSE    .37 TRUE SD      1.54  SEPARATION  4.20  ITEM   RELIABILITY  .95|
```

Figure 7. Result of *Winstep* Analysis

Based on these data, it can be seen that from 75 respondents, a separation value of 1.74 was obtained; this value was relatively low (included in the poor category), which indicates that the items are less sensitive to cover the entire continuum of all respondents. Meanwhile, for person reliability, the score is 0.75, which shows that the consistency of the respondents is still at an acceptable level.

From 25 questions/items, a separation value of 4.20 was obtained, the value was classified as very good (included in the very good category); this indicates that the respondents were varied enough to detect the items given. Meanwhile, item reliability shows a value of 0.95, which is also classified as very good (included in the very good category) (Linacre, 2021).

```
      Table of STANDARDIZED RESIDUAL variance in Eigenvalue units = ITEM information units
                                            Eigenvalue   Observed    Expected
Total raw variance in observations     =      41.4944 100.0%          100.0%
  Raw variance explained by measures   =      16.4944  39.8%           39.1%
    Raw variance explained by persons  =       4.9982  12.0%           11.8%
    Raw Variance explained by items    =      11.4962  27.7%           27.2%
  Raw unexplained variance (total)     =      25.0000  60.2% 100.0%    60.9%
    Unexplned variance in 1st contrast =       2.2189   5.3%   8.9%
    Unexplned variance in 2nd contrast =       2.1092   5.1%   8.4%
    Unexplned variance in 3rd contrast =       1.8012   4.3%   7.2%
    Unexplned variance in 4th contrast =       1.7759   4.3%   7.1%
    Unexplned variance in 5th contrast =       1.5952   3.8%   6.4%

      STANDARDIZED RESIDUAL VARIANCE SCREE PLOT
```

Figure 8. Dimensionality Map

Based on the uni-dimensionality data, it can be seen that the value of variance explained by the measure obtained is 39.8%; this value is classified as poor (poor) (Linacre, 2021). Meanwhile, the unexplained variance in the first contrast value obtained is 5.3%; this is classified as good. It shows that the scale we use is still heavily influenced by other factors unrelated to extraversion or that this extraversion scale measures other things that we do not want to measure.

```
SUMMARY OF CATEGORY STRUCTURE.  Model="R"
-------------------------------------------------------------------------
|CATEGORY      OBSERVED|OBSVD SAMPLE|INFIT OUTFIT| COHERENCE       |ESTIM|
|LABEL   SCORE COUNT % |AVRGE EXPECT| MNSQ  MNSQ | M->C C->M  RMSR |DISCR|
|---------------------+------------+------------+-----------------+-----|
|    0    0   1253  67| -1.99 -1.99|  .99   .99 | 84%  90%  .2891|     | 0
|    1    1    622  33|   .53   .52|  .99  1.15 | 76%  66%  .4840| 1.00| 1
-------------------------------------------------------------------------
OBSERVED AVERAGE is mean of measures in category. It is not a parameter estimate.
M->C = Does Measure imply Category?
C->M = Does Category imply Measure?


-----------------------------------------------------------
| Category Matrix : Confusion Matrix : Matching Matrix|
|           Predicted Scored-Category Frequency       |
|Obs Cat Freq|          0              1 |      Total |
|-----------+---------------------------+-------------|
|         0 |     1000.95        252.05 |    1253.00 |
|         1 |      251.75        370.25 |     622.00 |
|-----------+---------------------------+-------------|
|     Total |     1252.70        622.30 |    1875.00 |
-----------------------------------------------------------
```

Figure 9. Category Function

Data category function is used to determine whether the score used is functioning well or not.
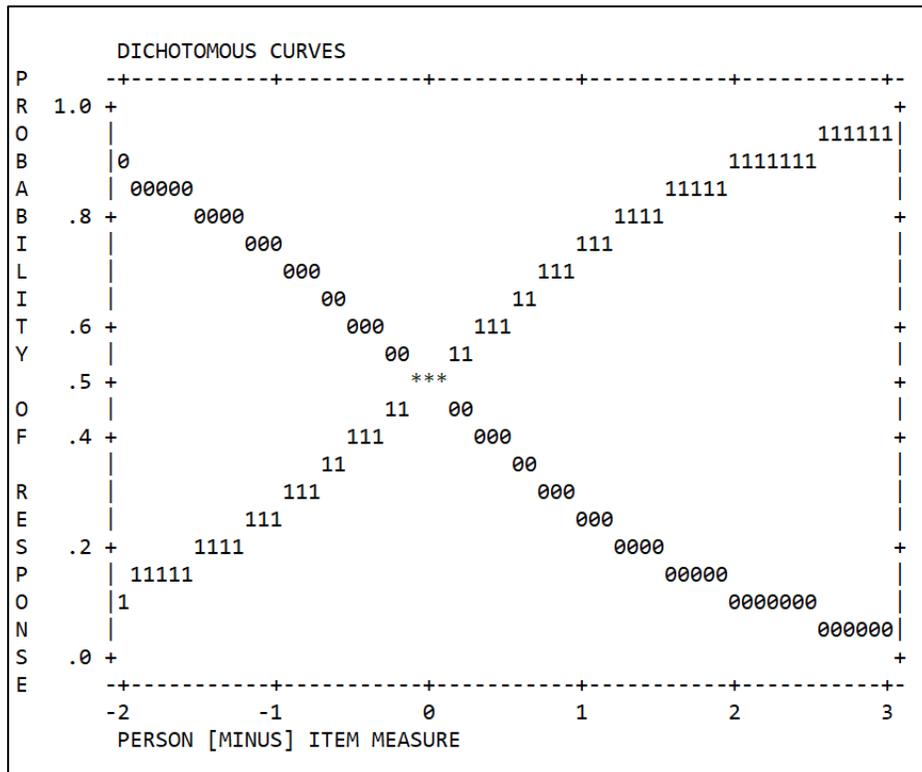

Figure 10. Dichotomous curve

Based on the graph, it can be seen that for respondents with a low level of person item measure, the probability will be more likely to get a score of 0. The higher the respondent's ability, the lower the probability of a zero score. Conversely, the higher the level of the person item measure, the higher the chance of getting a score of 1. That way, it can be seen that the function of the rating scale has been running well (Linacre, 2021).

The data is the average ability of each respondent. Based on these data, it can be seen that all items are functioning correctly.
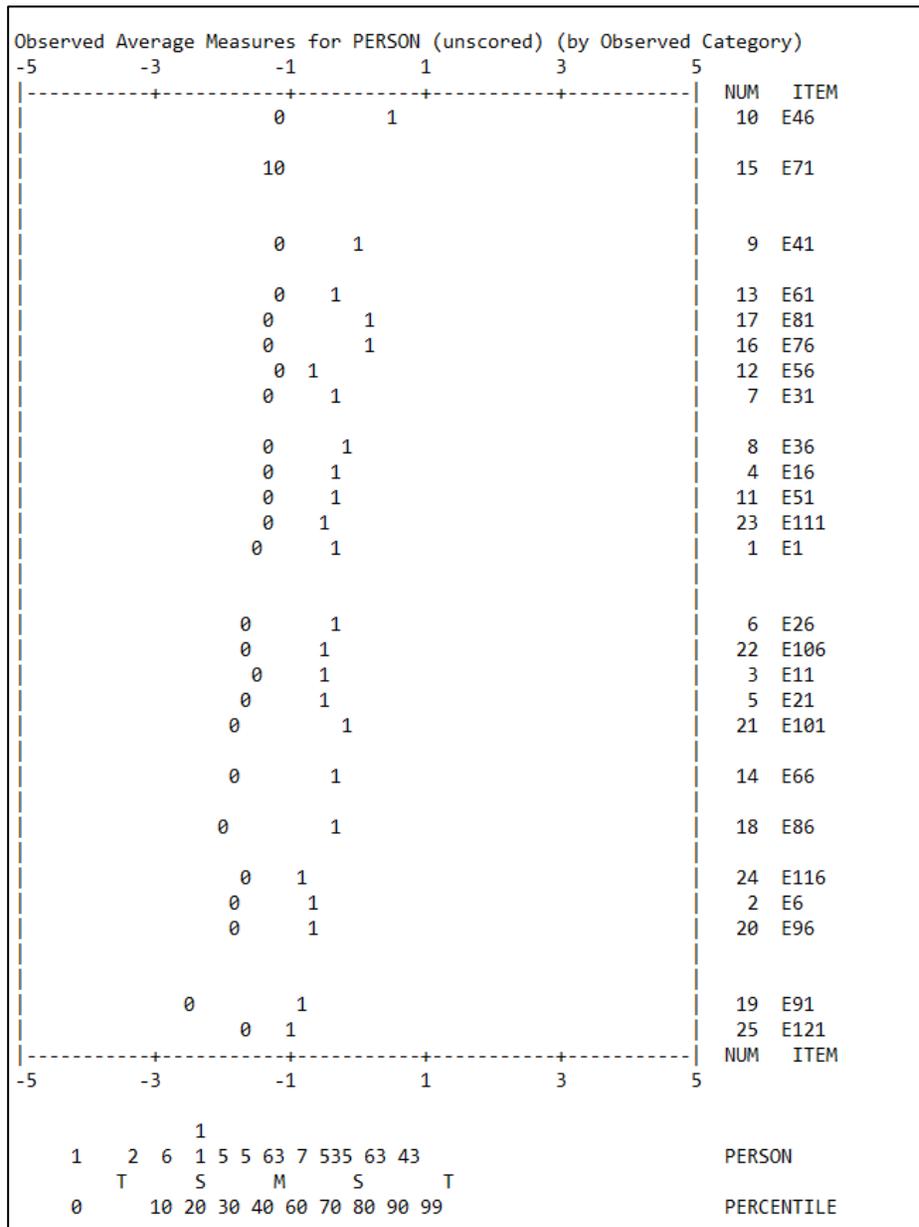
```
Observed Average Measures for PERSON (unscored) (by Observed Category)
-5          -3          -1           1           3           5
|-----------+-----------+-----------+-----------+-----------|  NUM   ITEM
|                       0           1                       |   10   E46
|                                                           |
|                      10                                   |   15   E71
|                                                           |
|                                                           |
|                       0       1                           |    9   E41
|                                                           |
|                       0    1                              |   13   E61
|                      0               1                    |   17   E81
|                      0               1                    |   16   E76
|                      0  1                                 |   12   E56
|                      0       1                            |    7   E31
|                                                           |
|                       0        1                          |    8   E36
|                      0     1                              |    4   E16
|                      0     1                              |   11   E51
|                      0    1                               |   23   E111
|                     0      1                              |    1   E1
|                                                           |
|                                                           |
|                      0         1                          |    6   E26
|                      0       1                            |   22   E106
|                        0     1                            |    3   E11
|                      0       1                            |    5   E21
|                     0          1                          |   21   E101
|                                                           |
|                      0         1                          |   14   E66
|                                                           |
|                    0           1                          |   18   E86
|                                                           |
|                       0   1                               |   24   E116
|                      0      1                             |    2   E6
|                      0      1                             |   20   E96
|                                                           |
|                                                           |
|                 0          1                              |   19   E91
|                     0  1                                  |   25   E121
|-----------+-----------+-----------+-----------+-----------|  NUM   ITEM
-5          -3          -1           1           3           5

                  1
      1     2  6  1 5 5 63 7 535 63 43                          PERSON
         T     S     M     S       T
      0        10 20 30 40 60 70 80 90 99                       PERCENTILE
```

Figure 11. Empirical Item-Category Measure

```
        ITEM STATISTICS:  MISFIT ORDER

-----------------------------------------------------------------------------
|ENTRY  TOTAL  TOTAL   JMLE   MODEL|  INFIT  |  OUTFIT  |PTMEASUR-AL|EXACT MATCH|       |
|NUMBER SCORE  COUNT MEASURE  S.E. |MNSQ  ZSTD|MNSQ  ZSTD|CORR.  EXP.| OBS%  EXP%| ITEM |
|---------------------------------+----------+----------+-----------+-----------+------|
|   15      3     75   2.59    .60|1.07   .31|3.93  2.12|A-.04   .18| 96.0  96.0| E71  |
|   13      7     75   1.63    .42| .95  -.06|1.91  1.35|B .23   .27| 90.7  90.6| E61  |
|   12     10     75   1.18    .36|1.17   .79|1.59  1.16|C .15   .32| 86.7  86.6| E56  |
|   25     62     75  -3.14    .33|1.27  1.39|1.39  1.01|D .18   .39| 81.3  83.6| E121 |
|    3     30     75   -.61    .27|1.10   .83|1.22  1.18|E .40   .48| 69.3  72.4| E11  |
|   24     45     75  -1.68    .27|1.14  1.15|1.14   .83|F .39   .49| 69.3  72.9| E116 |
|    7     11     75   1.05    .35|1.12   .62| .98   .12|G .26   .34| 85.3  85.3| E31  |
|   11     17     75    .43    .30|1.05   .36|1.12   .47|H .36   .40| 81.3  78.7| E51  |
|   20     47     75  -1.83    .27|1.00   .02|1.09   .55|I .47   .48| 77.3  73.5| E96  |
|   23     18     75    .33    .30|1.09   .63|1.06   .31|J .34   .41| 78.7  77.8| E111 |
|    4     15     75    .62    .32| .99  -.03|1.06   .27|K .37   .38| 78.7  80.5| E16  |
|    8     14     75    .72    .32| .97  -.11|1.04   .22|L .39   .37| 82.7  81.6| E36  |
|   22     29     75   -.54    .27|1.04   .39| .97  -.11|M .46   .47| 72.0  72.7| E106 |
|    2     47     75  -1.83    .27|1.03   .29| .95  -.21|l .47   .48| 72.0  73.5| E6   |
|    1     20     75    .16    .29|1.01   .12| .94  -.10|k .42   .43| 78.7  76.3| E1   |
|    5     30     75   -.61    .27|1.01   .10| .98  -.07|j .48   .48| 69.3  72.4| E21  |
|    9      5     75   2.03    .48| .98   .06| .79  -.05|i .25   .23| 93.3  93.3| E41  |
|    6     28     75   -.46    .27| .91  -.72| .97  -.11|h .52   .47| 76.0  73.0| E26  |
|   10      2     75   3.03    .73| .95   .13| .38  -.34|g .23   .15| 97.3  97.3| E46  |
|   17      8     75   1.47    .39| .93  -.17| .62  -.56|f .36   .29| 89.3  89.3| E81  |
|   16      9     75   1.32    .38| .92  -.25| .58  -.75|e .40   .31| 88.0  88.0| E76  |
|   14     34     75   -.90    .27| .86 -1.25| .79 -1.32|d .60   .49| 78.7  71.9| E66  |
|   19     61     75  -3.03    .33| .82 -1.04| .60 -1.13|c .54   .40| 85.3  82.4| E91  |
|   18     40     75  -1.32    .27| .76 -2.24| .73 -1.82|b .66   .49| 85.3  72.1| E86  |
|   21     30     75   -.61    .27| .75 -2.31| .66 -2.05|a .67   .48| 82.7  72.4| E101 |
|---------------------------------+----------+----------+-----------+-----------+------|
| MEAN   24.9   75.0    .00    .34| .99  -.04|1.10   .04|           | 81.8  80.6|      |
| P.SD   17.3    .0    1.59    .11| .12   .88| .66   .96|           |  7.9   8.1|      |
-----------------------------------------------------------------------------
```

Figure 12. Item Fit

The data above is item fit data that shows each item is fit or not (Linacre, 2021). It shows that most item items have been fitted with the Rasch Model. Based on the data above, it can be seen that the outfit mean square value of most of the items is in the range of 0.66 to 1.91. Meanwhile, for item number 15, the outfit means the fair value is 3.93. This value is still included in the more minor (fair) category, and therefore for item number 15, it still does not fit with the Rasch Model.

Based on the data above, it can also be seen that the value of the point measure correlation can show the differentiating power of items but by using a score measure. Most of the item items have a point measure correlation above 0.3, so it can be seen that in terms of the items, they are fit and get a pretty good point measure correlation (Linacre, 2021).
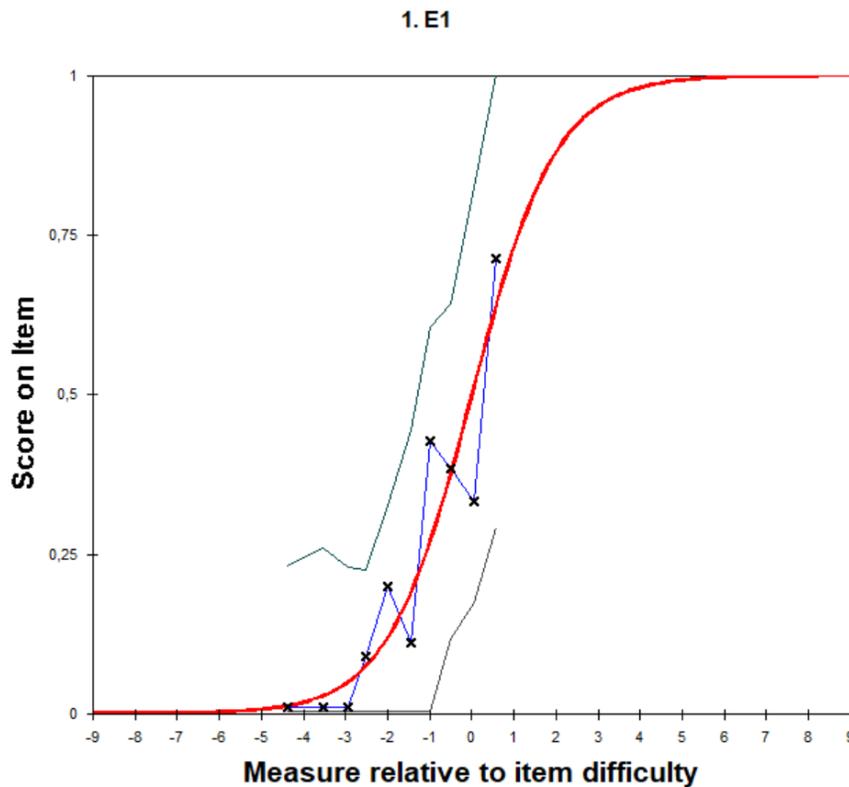
1. E1

Figure 13. Rasch Model

Conclusion

This research utilises some online information from e-resources of Covid-19 and develops literacy and numeracy items called PISA-*Cosains* (science context of Covid-19). The process was oriented to the PISA (Programme for International Student Assessment) science framework that has been carried out to produce an instrument product that is valid and practical. Based on the research that has been done, the level of separation is still relatively low. This indicates that the items are less sensitive to cover the entire continuum of all respondents. The results of uni-dimensionality are also still relatively low; it shows that the scale we use is still heavily influenced by unnecessary pollutant factors. However, when viewed from the item, most of them are fit and have a pretty good point measure correlation. Therefore, this research supports the effort of Indonesian government to implement AKM programme.

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