Submission Files

Search

165189 shahibul, Article Jurnal Elemen.docx	January 12, 2024	Article Text
165190 Turnitin	January 12, 2024	Other

Download All Files

Pre-Review Discussions

Add discussion

Name	From	Last Reply	Replies	Closed
Comments for the Editor	muhtarom 12-01-2024 08:55 PM	-	0	

Notifications

[jel] Editor Decision	23-04-2024 11:38 AM
[jel] Editor Decision	30-04-2024 07:43 AM

Reviewer's Attachments

Search

168717	5. Article+Text,+25040-165189-1-SM.docx	April 23, 2024

Revisions

Search Upload File

▸	168975	Article Jurnal Elemen - Revisi.docx	April 29, 2024 Article Text

Review Discussions

Add discussion

Name	From	Last Reply	Replies	Closed
▸ Konfirmasi hasil review	muhtarom 05-04-2024 09:44 AM	-	0	☐

Name	From	Last Reply	Replies	Closed
First revision	gazali 23-04-2024 11:38 AM	-	0	
Revisi artikel	muhtarom 29-04-2024 05:39 AM	-	0	
Add your questionnaire	gazali 29-04-2024 11:19 AM	-	0	
Revisi artikel	muhtarom 29-04-2024 06:05 PM	muhtarom 30-04-2024 07:29 AM	2	

Notifications

[jel] Editor Decision

23-04-2024 11:38 AM

Dear Muhtarom Muhtarom:

Thank you for submitting your manuscript entitled "Developing assessment instruments to measure prospective teacher beliefs about mathematical problem-solving using the Rasch model" to Jurnal Elemen. The editorial team and a group of expert reviewers have assessed your submission. They feel it has potential for publication, so we invite you to revise the paper and resubmit it for further review.

You have five days to respond to this revised and resubmitted request, ending on April 28, 2024. Please see the reviewer's comments in your account. Please feel free to contact me with any questions at jurnalelemen@hamzanwadi.ac.id. Thank you.

Sincerely,
Editorial Team

168717	5. Article+Text,+25040-165189-1-SM.docx	April 23, 2024	

Revisions Search Upload File

168975	Article Jurnal Elemen - Revisi.docx	April 29, 2024	Article Text

Review Discussions Add discussion

Name	From	Last Reply	Replies	Closed
Konfirmasi hasil review	muhtarom 05-04-2024 09:44 AM	-	0	

First revision

Participants

Muhammad Gazali (gazali)

Tarom Muhtarom Muhtarom (muhtarom)

Messages

Note	From
Please see the reviewer's comments. Submit your final revision within 5 days. Thank you. 5. Article+Text,+25040-165189-1-SM.docx	gazali 23-04-2024 11:38 AM

Add Message

[jel] Editor Decision	23-04-2024 11:38 AM
[jel] Editor Decision	30-04-2024 07:43 AM

Reviewer's Attachments

Search

Jurnal Elemen

← Back to Submissions

Revisions

Search Upload File

168975 Article Jurnal Elemen - Revisi.docx	April 29, 2024	Article Text	

Review Discussions

Add discussion

Name	From	Last Reply	Replies	Closed
Konfirmasi hasil review	muhtarom 05-04-2024 09:44 AM	-	0	

Notifications

[jel] Editor Decision

30-04-2024 07:43 AM

Dear Muhtarom Muhtarom:

I am pleased to inform you that Jurnal Elemen would like to publish your manuscript entitled "Developing an instrument to measure prospective teacher beliefs about mathematical problem-solving using the Rasch model" in our next issue, Vol. 10 No. 2, May 2024. Thank you for being so cooperative during the review process.

Once your manuscript is moved to publishing, our production editor will keep you informed of your article's progress in the production process. You will also receive proof of your manuscript for final review.

I am attaching an invoice for the publication fee below. I am excited to move forward with your submission. Please feel free to email me with any questions. Thank you.

Sincerely,

Editorial Team

2024

Revisions Search Upload File

168975 Article Jurnal Elemen - Revisi.docx	April 29, 2024	Article Text	

Review Discussions Add discussion

Name	From	Last Reply	Replies	Closed
Konfirmasi hasil review	muhtarom 05-04-2024 09:44 AM	-	0	

99+
Mail
Chat
Meet

Tulis

Kotak Masuk 109
Berbintang
Ditunda
Terkirim
Draf 1
Selengkapnya

Label

Jurnal Elemen
kepada saya

07.42 (3 jam yang lalu)

Dear Muhtarom:

I am pleased to inform you that Jurnal Elemen would like to publish your manuscript entitled "Developing an instrument to measure prospective teacher beliefs about mathematical problem-solving using the Rasch model" in our next issue, Vol. 10 No. 2, May 2024. Thank you for being so cooperative during the review process.

Once your manuscript is moved to publishing, our production editor will keep you informed of your article's progress in the production process. You will also receive proof of your manuscript for final review.

I am attaching an invoice for the publication fee below. I am excited to move forward with your submission. Please feel free to email me with any questions. Thank you.

Sincerely,

Editorial Team

Jurnal Elemen, 8(1), 1-9, January 2022
https:/doi.org/10.29408/jel.v8i1.XXXX

e- ISSN: 2442 - 4226

Check for updates

Developing assessment instruments to measure prospective teacher beliefs about mathematical problem-solving using the Rasch model

Muhtarom

Department of Mathematics Education, Universitas PGRI Semarang, Central Java, Indonesia

* Correspondence: muhtarom@upgris.ac.id

Abstract

Beliefs in solving mathematical problems become the basis for action, the basis for change, and the basis for learning mathematics. This research describes the development of an instrument for measuring prospective teachers' beliefs in solving mathematical problems. One hundred sixty prospective teachers' with experience in problem-solving and learning mathematics became research respondents. Research data was analyzed using Rasch modeling. The results of the data analysis show that the instrument developed is declared reliable and valid. Fifty-five items can be used to measure prospective teachers' beliefs in solving mathematical problems. The instruments that have been developed can be used as initial assessments in implementing problem-based learning to help students develop critical thinking and reasoning to face challenges in real life.

Keywords: beliefs; problem-solving; measure; Rasch.

Received: Date Month Year | Revised: Date Month Year
Accepted: Date Month Year | Published: Date Month Year

Commented [e1]: Test or non-test?
Please write explicitly, what is your product

Commented [e2]: Please write more eye catching of the title

Commented [e3]: It is more interesting if you make a collaboration in writing this manuscript, especially with your overseas colleagues

Commented [e4]: Please use grammatical correct. Please check others

Commented [e5]: Why critical thinking and reasoning, why not for problem-solving or others?
Please explain them in discussion section

Introduction

Mathematical problems must be able to be solved within the framework of the maturation process that must be gone through and is a means of self-maturation to ensure one's existence both as an individual and as part of one's environment (Bal, 2015; Memnun et al., 2012; Muhtarom et al., 2020; Siswono et al., 2019). The ability to solve problems is an essential skill that a person must have. To solve mathematical problems, a person tries to direct his mind to recall and utilize mathematical procedures appropriate to the problem (Muhtarom et al., 2019; Siswono et al., 2019). Through mathematical problem solving, students are directed to develop their abilities, including building new mathematical knowledge, solving problems in various contexts related to mathematics, applying the necessary strategies, and reflecting on the mathematical solving process (Arikan, 2016; Harisman et al., 2019; Mkomange et al., 2012).

Positive beliefs in solving mathematical problems are the basis for action, change, and learning mathematics (Muhtarom et al., 2020). This is due to the benefits that can be obtained when problem-solving involves thought processes and self-regulation abilities, thereby enabling the development of a strong understanding and belief in problems accompanied by logical reasons. Beliefs in solving mathematical problems influence mathematics achievement, for example, the problem's difficulty level, the formula to be used, and the decision to recheck the solution (Siswono et al., 2017). Beliefs are cognitive and affective constructs important for the problem-solving learning process (Bal, 2015; Ozturk & Guven, 2016).

Beliefs about mathematics directly influence students' mathematical problem-solving performance. Teaching and gender do not affect the beliefs in problem-solving of prospective mathematics teachers (Memnun et al., 2012). Furthermore, Mkomange et al. (2012) concluded that most future mathematics teachers have positive beliefs about the importance of understanding mathematical problems, ways of solving problems, and learning mathematics that emphasizes contemporary principles. Ozturk ~~&~~ and Guven (2016) research concluded that beliefs influence problem-solving. Students who believe solving problems takes a short time can solve them by memorizing the rules. When faced with a more challenging task, students believe in solving the problem as quickly as possible within the allotted time. They assume they will solve the problem soon if they have the ability.

It is essential to measure beliefs in problem-solving. Beliefs in problem-solving can be measured using various techniques such as questionnaires, interviews, and observations (Dorimana et al., 2021; Prendergast et al., 2018; Sağlam & Dost, 2014; Siswono et al., 2016, 2019; Stage & Kloosterman, 1992). Several questions can be used to explore mathematics teachers' problem-solving beliefs (Siswono et al., 2016). Another study using a mixed methods approach with 36 respondents showed that most respondents indicated a positive attitude towards the progress of problem solving in mathematics classes (Dorimana et al., 2021). Sağlam's research was conducted on 413 respondents using the Beliefs about Mathematical Problem Solving instrument developed by Kloosterman and Stage and adapted into Turkish by Haciomeroglu (Sağlam & Dost, 2014).

However, the studies above still carried out measurements using classical test theory. Item response theory, whose main component is Rasch modeling, has advantages compared to

Field Code Changed

Formatted: Swedish (Sweden)

Formatted: Swedish (Sweden)

Commented [e6]: What happen with the classical theory? Please add your academic reasons

classical test theory (Rahim & Haryanto, 2021). One of these advantages is that the probability of the subject answering an item correctly depends on the subject's skills and the characteristics of the item (Adi et al., 2022). The Rasch model in analyzing instrument validity can be carried out from several aspects so that the resulting instrument can be more reliable (Andrich & Marais, 2019; Atikah et al., 2022; Indihadi et al., 2022; Saidi & Siew, 2019). Validity analysis using the Rasch model can be better because of its consistency (Sharif et al., 2019; Sumintono, 2018). Another advantage of Rasch modeling is that three reliabilities are obtained, namely person reliability, item reliability, and Cronbach's alpha (Sumintono & Widhiarso, 2015). The Rasch model can show instrument items that are difficult for respondents to agree on and compare the respondent's abilities. Analysis of instrument items related to the respondent's abilities is beneficial in preparing instruments to cover the aspects to be measured (Kaspersen et al., 2017; Muntazhimah & Wahyuni, 2022; Sharif et al., 2019; Sumintono & Widhiarso, 2014). Therefore, this research uses Rasch modeling to examine the reliability and validity of belief instruments in problem solving for prospective mathematics teachers.

Formatted: Swedish (Sweden)

Field Code Changed

Formatted: Swedish (Sweden)

Methods

This research is part of research developing an assessment of problem-solving beliefs of prospective mathematics teachers'. The respondents for this research were 160, selected using the random sampling method. Respondents are prospective teachers' with experience in solving mathematical problems and have taken courses in mathematics learning strategies.

Commented [e7]: What are the criteria of the respondents? For example, how many males and females, how about the age, etc.

Table 1. Questionnaire Grid for Beliefs in Problem Solving

Descriptor	Positive Items	Negative Items
Beliefs about the time needed to solve the problem	1, 6, 11	16, 21, 26
Steps in solving mathematical problems	2, 7, 12, 27	17, 22, 32, 33
The relationship between mathematical concepts in solving mathematical problems	3, 13, 23, 28	8, 18, 31, 34
Beliefs about various ways of solving mathematical problems	9, 14, 24	4, 19, 29
Exercises to improve mathematical problem-solving abilities	5, 25, 30	10, 15, 20
Problem-solving learning objectives	36, 51	41
Views on mathematics	40, 50	35, 45, 55
Questions asked in problem-solving learning	57	37
The role of students in problem-solving learning	47, 49, 53, 59	39, 43, 46, 56
The role of the teacher in problem-solving learning	44, 52, 60, 58	38, 42, 54, 48

Commented [e8]: Are these yours or adaptations or adoptions?? Including the items. Please describe them

The development research used is design research and development study type. The emphasis of this type of research is on development with iterative cycles using formative evaluation. The stage consists of three phases: initial investigation, prototype phase, and assessment (Nieveen & Folmer, 2013; van den Akker et al., 2012). Initial observations and analysis of problem-solving beliefs are carried out in the initial investigation phase. In the prototype phase, researchers designed a questionnaire including a grid and questionnaire instrument for mathematical problem-solving beliefs. The grid for developing belief

Commented [e9]: Please use past tense rather than others in this section. Please check others

Commented [e10]: I hope like this, more than one researchers or authors

instruments in solving mathematical problems is presented in Table 1 in detail. Next, the assessment phase carried out expert validation and trials of the problem-solving beliefs questionnaire.

Respondents' answers were measured using a Likert scale with five rating options by eliminating neutral answers. The research results were analyzed using Rasch modeling via Winsteps software version 3.73. The output used for data analysis is testing the reliability of the instrument using summary statistics, testing the validity of instrument items using output item unidimensionality, output item fit order, using a rating (partial-credit) scale with the criterion that if all ratings have a peak point then the instrument has validity (Huei et al., 2020; Saidi & Siew, 2019; Sumintono & Widhiarso, 2015), and testing instrument items that were difficult and easy for respondents to agree with.

Commented [e11]: Please use more academic conjuctions

Commented [e12]: Please explain more technically based on what did you do, not explain generally like this.

Commented [e13]: What did you mean by eliminating neutral answer? The neutral answer become what??

Why did not use four rating scale directly?

Results

Instrument reliability

Figure 1 provides overall information about the quality of respondents, the quality of the instrument, and the interaction between person and item. Person measure = 0.36 shows respondents' mean score in the instrument of prospective teacher students' beliefs in solving mathematical problems. An average value more significant than the logit value of 0.00 indicates a tendency for respondents to answer more in agreement with statements in various items (Sumintono & Widhiarso, 2014). Cronbach's alpha value = 0.70 is located in the interval 0.70-0.80, which is considered good. Cronbach's alpha value measures reliability, namely the interaction between the person and the item. The value of person reliability = 0.67, which is classified as sufficient, and the value of item reliability = 0.99, which is classified as unique, so it can be concluded that the consistency of the answers from respondents is sufficient, but the quality of the items in the prospective teachers' belief instrument is categorized as unique. This shows that the instrument of prospective teachers' beliefs in solving mathematical problems will provide relatively stable results if used by other researchers.

The average INFIT MNSQ and OUTFIT MNSQ for the person table are 1.01 and 1.03, respectively. The ideal value is 1.00 (the closer to 1.00, the better). The average values for INFIT ZSTD and OUTFIT ZSTD are 0.00 and 0.10, respectively. The ideal value is 0.00 (the closer to 0.00, the better). Likewise, for the item table, the average values obtained for INFIT MNSQ and OUTFIT MNSQ are 1.03 and 1.03, respectively. The ideal value is 1.00 (the closer to 1.00, the better). The average values for INFIT ZSTD and OUTFIT ZSTD are 0.20 and 0.20, respectively. The ideal value is 0.00 (the closer to 0.00, the better).

```
TABLE 3.1 Keyakinan                                              Dec 19 14:42 2023
INPUT: 160 Person  60 Item  REPORTED: 160 Person  60 Item  5 CATS  WINSTEPS 3.73
-------------------------------------------------------------------------------

     SUMMARY OF 160 MEASURED Person
-------------------------------------------------------------------------------
|          TOTAL                          MODEL          INFIT        OUTFIT    |
|          SCORE     COUNT     MEASURE   ERROR      MNSQ   ZSTD   MNSQ   ZSTD |
|-----------------------------------------------------------------------------|
| MEAN     195.4      60.0         .36     .15      1.01     .0   1.03     .1 |
| S.D.      12.1        .0         .28     .00       .28    1.5    .32    1.4 |
| MAX.     241.0      60.0        1.50     .17      1.90    3.8   1.77    2.8 |
| MIN.     160.0      60.0        -.47     .15       .45   -3.5    .46   -2.9 |
|-----------------------------------------------------------------------------|
| REAL RMSE    .16 TRUE SD     .23  SEPARATION  1.44  Person RELIABILITY  .67 |
|MODEL RMSE    .15 TRUE SD     .24  SEPARATION  1.56  Person RELIABILITY  .71 |
| S.E. OF Person MEAN = .02                                                   |
-------------------------------------------------------------------------------
Person RAW SCORE-TO-MEASURE CORRELATION = 1.00
CRONBACH ALPHA (KR-20) Person RAW SCORE "TEST" RELIABILITY = .70

     SUMMARY OF 60 MEASURED Item
-------------------------------------------------------------------------------
|          TOTAL                          MODEL          INFIT        OUTFIT    |
|          SCORE     COUNT     MEASURE   ERROR      MNSQ   ZSTD   MNSQ   ZSTD |
|-----------------------------------------------------------------------------|
| MEAN     521.0     160.0         .00     .10      1.03     .2   1.03     .2 |
| S.D.     155.0        .0        1.21     .03       .29    1.8    .28    1.8 |
| MAX.     735.0     160.0        2.54     .16      2.40    6.7   2.34    6.7 |
| MIN.     244.0     160.0       -2.22     .07       .51   -3.5    .48   -3.7 |
|-----------------------------------------------------------------------------|
| REAL RMSE    .11 TRUE SD    1.20  SEPARATION 10.52  Item   RELIABILITY  .99 |
|MODEL RMSE    .11 TRUE SD    1.20  SEPARATION 11.31  Item   RELIABILITY  .99 |
| S.E. OF Item MEAN = .16                                                     |
-------------------------------------------------------------------------------
UMEAN=.0000 USCALE=1.0000
Item RAW SCORE-TO-MEASURE CORRELATION = -.99
9600 DATA POINTS. LOG-LIKELIHOOD CHI-SQUARE: 16345.56 with 9378 d.f. p=.0000
Global Root-Mean-Square Residual (excluding extreme scores): .8484
```

Figure 1. Quality output of respondents and instruments

Commented [e14]: Based on this figure, I saw that the person separation is less than 2, it means that your participants are in same level, not have level diversity. I think the sampling was not good enough

Instrument validity

Instrument validity tests whether the instrument developed can be used to measure prospective teachers' abilities in solving mathematical problems. The tables used in the Winstep software are Item unidimensionality and item fit order. Undimensionality is an important measure to evaluate whether the instrument for prospective mathematics teacher students' mathematical beliefs developed by researchers can measure what it is supposed to measure (Andrich & Marais, 2019; Sharif et al., 2019; Sumintono & Widhiarso, 2015). Rasch model analysis uses principal component analysis of residuals, namely measuring the extent of diversity of instruments that measure what should be measured. Clearly presented in Figure 2 shows that the total value of raw variance in observations is 57.6%. Referring to the opinion of Sumintono & Widhiarso (2014) explain that the minimum unidimensionality requirement is 20%, and the unidimensionality value in instrument development can be met. In addition, it is clear that the variance that cannot be explained by the beliefs instrument is 3.5% with an eigenvalue of 5.0.

TABLE 23.0 Keyakinan Dec 19 14:42 2023
INPUT: 160 Person 60 Item REPORTED: 160 Person 60 Item 5 CATS WINSTEPS 3.73

Table of STANDARDIZED RESIDUAL variance (in Eigenvalue units)

		-- Empirical --		Modeled
Total raw variance in observations	=	141.5	100.0%	100.0%
Raw variance explained by measures	=	81.5	57.6%	58.1%
Raw variance explained by persons	=	8.2	5.8%	5.9%
Raw Variance explained by items	=	73.3	51.8%	52.2%
Raw unexplained variance (total)	=	60.0	42.4% 100.0%	41.9%
Unexplned variance in 1st contrast	=	5.0	3.5% 8.3%	
Unexplned variance in 2nd contrast	=	3.0	2.1% 5.1%	
Unexplned variance in 3rd contrast	=	2.8	2.0% 4.7%	
Unexplned variance in 4th contrast	=	2.4	1.7% 3.9%	
Unexplned variance in 5th contrast	=	2.3	1.6% 3.8%	

Figure 2. Unidimensionality value

TABLE 10.1 Keyakinan Dec 19 14:42 2023
INPUT: 160 Person 60 Item REPORTED: 160 Person 60 Item 5 CATS WINSTEPS 3.73

Person: REAL SEP.: 1.44 REL.: .67 ... Item: REAL SEP.: 10.52 REL.: .99

Item STATISTICS: MISFIT ORDER

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	Item
10	712	160	-1.71	.14	2.40	6.7	2.34	6.7	A .30	.15	46.9	55.2	10
19	265	160	2.12	.13	1.73	3.6	1.59	3.1	B .33	.17	45.6	59.3	19
48	278	160	1.91	.13	1.62	3.0	1.60	2.9	C .20	.19	50.0	63.1	48
5	735	160	-2.22	.16	1.61	4.6	1.57	4.5	D .24	.14	65.0	60.0	5
29	426	160	.63	.07	1.31	3.6	1.29	3.1	E .38	.29	20.0	23.5	29
11	724	160	-1.96	.15	1.26	1.9	1.25	1.9	F .17	.14	60.6	55.5	11
24	723	160	-1.94	.15	1.25	1.8	1.23	1.7	G .19	.15	53.1	55.4	24
18	573	160	-.16	.08	1.17	1.8	1.24	2.1	H .26	.26	36.9	42.3	18
32	685	160	-1.22	.13	1.22	1.2	1.11	.7	I .39	.17	56.9	62.1	32
26	642	160	-.68	.10	1.15	1.0	1.21	1.3	J .22	.21	64.4	66.8	26
3	716	160	-1.79	.15	1.17	1.1	1.18	1.3	K .23	.15	59.4	54.8	3
49	702	160	-1.51	.14	1.16	1.0	1.13	.8	L .39	.16	58.8	57.6	49
36	679	160	-1.13	.12	1.14	.8	1.16	.9	M .33	.17	59.4	63.5	36
8	602	160	-.35	.08	1.11	1.0	1.15	1.2	N .15	.24	53.1	57.1	8
14	498	160	.26	.07	1.12	1.7	1.15	2.0	O -.04	.29	6.3	9.3	14
38	287	160	1.77	.12	1.14	.8	1.10	.6	P .28	.20	60.0	64.6	38
56	402	160	.77	.08	1.12	1.3	1.12	1.3	Q .32	.29	30.6	35.7	56
28	623	160	-.51	.09	1.08	.6	1.11	.8	R .23	.22	64.4	64.8	28
6	492	160	.29	.07	1.05	.8	1.11	1.6	S -.14	.29	6.3	9.6	6
12	449	160	.51	.07	1.09	1.3	1.08	1.1	T .26	.30	15.0	15.6	12
53	634	160	-.60	.10	1.08	.6	1.09	.6	U .13	.22	66.9	66.0	53
47	440	160	.56	.07	1.08	1.1	1.07	.9	V .34	.29	18.8	16.5	47
31	423	160	.65	.07	1.06	.8	1.08	1.0	W .22	.29	24.4	23.6	31
57	518	160	.15	.07	1.05	.7	1.07	.9	X .14	.28	9.4	13.4	57
39	338	160	1.21	.09	1.07	.5	1.05	.4	Y .20	.25	61.3	64.2	39
2	534	160	.07	.07	1.00	.0	1.07	.8	Z .04	.28	16.9	19.8	2
BETTER FITTING OMITTED													
22	501	160	.24	.07	.97	-.4	.98	-.3	z .22	.29	8.8	9.3	22
58	678	160	-1.11	.12	.96	-.2	.96	-.1	y .29	.18	63.8	63.7	58
4	603	160	-.35	.08	.96	-.3	.94	-.5	x .24	.24	61.3	57.2	4
33	253	160	2.35	.14	.95	-.3	.89	-.7	w .23	.16	54.4	55.8	33
1	439	160	.56	.07	.95	-.7	.95	-.6	v .15	.29	18.1	17.7	1
37	556	160	-.05	.08	.92	-1.0	.94	-.6	u .32	.27	33.8	30.4	37
43	398	160	.79	.08	.94	-.7	.93	-.7	t .44	.29	39.4	37.9	43
25	683	160	-1.19	.12	.91	-.5	.93	-.3	s .21	.17	63.8	62.6	25
23	717	160	-1.81	.15	.92	-.5	.91	-.6	r .28	.15	60.6	54.8	23
21	384	160	.88	.08	.92	-.8	.90	-.9	q .18	.28	50.6	46.8	21
34	423	160	.65	.07	.91	-1.1	.91	-1.0	p .38	.29	24.4	23.6	34
59	643	160	-.69	.10	.85	-1.0	.89	-.7	o .28	.21	71.3	66.8	59
9	702	160	-1.51	.14	.88	-.7	.88	-.7	n .26	.16	61.9	57.6	9
60	688	160	-1.27	.13	.86	-.8	.88	-.7	m .31	.17	63.1	61.3	60
30	660	160	-.87	.11	.84	-.9	.87	-.7	l .16	.19	72.5	65.9	30
42	300	160	1.60	.11	.85	-.8	.86	-.8	k .04	.22	73.1	66.5	42
52	595	160	-.30	.08	.85	-1.3	.84	-1.3	j .20	.25	59.4	52.9	52
54	333	160	1.26	.09	.85	-1.0	.81	-1.3	i .39	.25	67.5	64.4	54
44	672	160	-1.03	.12	.84	-.9	.85	-.8	h .31	.18	67.5	64.8	44
17	244	160	2.54	.15	.82	-1.3	.84	-1.2	g .19	.16	57.5	54.8	17
41	343	160	1.17	.09	.75	-2.0	.78	-1.6	f .25	.26	71.3	63.3	41
50	661	160	-.89	.11	.63	-2.4	.65	-2.2	e .40	.19	74.4	66.2	50
16	633	160	-.59	.10	.60	-3.2	.58	-3.2	d .33	.22	77.5	65.9	16
55	298	160	1.63	.11	.57	-2.9	.54	-3.1	c .07	.21	79.4	66.3	55
51	659	160	-.86	.11	.53	-3.3	.54	-3.1	b .22	.19	78.1	66.0	51
35	307	160	1.52	.11	.51	-3.5	.48	-3.7	a .22	.22	80.6	67.1	35
MEAN	521.0	160.0	.00	.10	1.03	.2	1.03	.2			50.4	49.4	
S.D.	155.0	.0	1.21	.03	.29	1.8	.28	1.8			21.4	19.3	

Figure 3. Item fit order output in winstep

After the item unidimensionality stage, it continues with the item fit order. To check items that are Fit and Misfit, the INFIT MNSQ value of each item is used. The average value and standard deviation are added up and then compared; a logit value more excellent than this value indicates a misfit item. Other criteria, according to Sumintono & Widhiarso (2015) which are used to check the suitability of inappropriate question items (Outliers or Misfits) are: 1) Acceptable Outfit Mean Square (MNSQ) value: 0.5 < MNSQ < 1.5; 2) Outfit Z-Standard (ZSTD) value received: -2.0 < ZSTD < +2.0; and 3) Point Measure Correlation (Pt Mean Corr) value received: 0.4 < Pt Measure Corr < 0.85. A valid item meets at least one of these three criteria. For example, in the first row are the output results for item number 10 on the prospective teacher beliefs instrument in solving mathematical problems, respectively the scores are 2.34 and 6.7 and 0.30. The third row is item 48, whose scores are 1.60, 2.9, and 0.20, respectively. The item fit order output is presented in Figure 3 in detail.

Validity testing by paying attention to the rating results (partial-credit) found that each rating (1, 2, 4, 5) had a separate peak. This means that the probability of each rating is visible to the research respondents. Figure 4 shows that the instrument for prospective teachers' beliefs in solving mathematical problems can be differentiated in their ratings by research respondents.

Commented [e15]: You may add the reasons based on the value of probablity

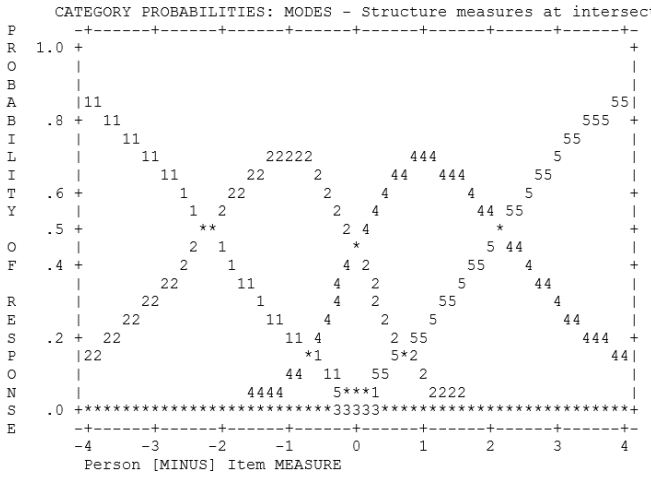

Figure 4. Rating (partial–credit) scale results

The test results use item measures and variable maps to determine which items are most difficult for respondents to agree with and the easiest to blend with respondents (Adi et al., 2022; Boone, 2016; Saidi & Siew, 2019). Figure 5 shows that the measure logit items have been sorted from highest to lowest logit value. The 17th item with 2.54 logits shows that this item is the most difficult to agree on, while the 5th item with -2.22 logits is the item that is most easily agreed upon by respondents in the instrument of problem solving beliefs for prospective mathematics teacher students. Furthermore, taking into account the standard deviation value of 1.21, this means that the range of item difficulty levels is quite diverse so there is no need to correct it.

TABLE 13.1 Keyakinan Dec 19 14:42 2023
INPUT: 160 Person 60 Item REPORTED: 160 Person 60 Item 5 CATS WINSTEPS 3.73

Person: REAL SEP.: 1.44 REL.: .67 ... Item: REAL SEP.: 10.52 REL.: .99

Item STATISTICS: MEASURE ORDER

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	Item
17	244	160	2.54	.15	.82	-1.3	.84	-1.2	.19	.16	57.5	54.8	17
33	253	160	2.35	.14	.95	-.3	.89	-.7	.23	.16	54.4	55.8	33
19	265	160	2.12	.13	1.73	3.6	1.59	3.1	.33	.17	45.6	59.3	19
48	278	160	1.91	.13	1.62	3.0	1.60	2.9	.20	.19	50.0	63.1	48
38	287	160	1.77	.12	1.14	.8	1.10	.6	.28	.20	60.0	64.6	38
55	298	160	1.63	.11	.57	-2.9	.54	-3.1	.07	.21	79.4	66.3	55
42	300	160	1.60	.11	.85	-.8	.86	-.8	.04	.22	73.1	66.5	42
35	307	160	1.52	.11	.51	-3.5	.48	-3.7	.22	.22	80.6	67.1	35
54	333	160	1.26	.09	.85	-1.0	.81	-1.3	.39	.25	67.5	64.4	54
39	338	160	1.21	.09	1.07	.5	1.05	.4	.20	.25	61.3	64.2	39
27	342	160	1.18	.09	1.04	.3	1.04	.3	.12	.26	63.8	63.3	27
41	343	160	1.17	.09	.75	-2.0	.78	-1.6	.25	.26	71.3	63.3	41
46	351	160	1.11	.09	.99	-.1	.99	.0	.31	.26	58.8	59.8	46
45	368	160	.98	.08	.99	-.1	.96	-.3	.32	.27	56.9	55.6	45
15	374	160	.94	.08	1.04	.4	1.04	.4	.16	.28	53.1	52.1	15
21	384	160	.88	.08	.92	-.8	.90	-.9	.18	.28	50.6	46.8	21
43	398	160	.79	.08	.94	-.7	.93	-.7	.44	.29	39.4	37.9	43
56	402	160	.77	.08	1.12	1.3	1.12	1.3	.32	.29	30.6	35.7	56
31	423	160	.65	.07	1.06	.8	1.08	1.0	.22	.29	24.4	23.6	31
34	423	160	.65	.07	.91	-1.1	.91	-1.0	.38	.29	24.4	23.6	34
29	426	160	.63	.07	1.31	3.6	1.29	3.1	.38	.29	20.0	23.5	29
1	439	160	.56	.07	.95	-.7	.95	-.6	.15	.29	18.1	17.7	1
47	440	160	.56	.07	1.08	1.1	1.07	.9	.34	.29	18.8	16.5	47
12	449	160	.51	.07	1.09	1.3	1.08	1.1	.26	.30	15.0	15.6	12
7	462	160	.44	.07	1.01	.2	1.00	.1	.37	.29	11.9	11.5	7
6	492	160	.29	.07	1.05	.8	1.11	1.6	-.14	.29	6.3	9.6	6
14	498	160	.26	.07	1.12	1.7	1.15	2.0	-.04	.29	6.3	9.3	14
22	501	160	.24	.07	.97	-.4	.98	-.3	.22	.29	8.8	9.3	22
20	513	160	.18	.07	.97	-.5	.98	-.3	.26	.29	11.9	11.8	20
57	518	160	.15	.07	1.05	.7	1.07	.9	.14	.28	9.4	13.4	57
2	534	160	.07	.07	1.00	.0	1.07	.8	.04	.28	16.9	19.8	2
37	556	160	-.05	.08	.92	-1.0	.94	-.6	.32	.27	33.8	30.4	37
18	573	160	-.16	.08	1.17	1.8	1.24	2.1	.26	.26	36.9	42.3	18
52	595	160	-.30	.08	.85	-1.3	.84	-1.3	.20	.25	59.4	52.9	52
8	602	160	-.35	.08	1.11	1.0	1.15	1.2	.15	.24	53.1	57.1	8
4	603	160	-.35	.08	.96	-.3	.94	-.5	.24	.24	61.3	57.2	4
28	623	160	-.51	.09	1.08	.6	1.11	.8	.23	.22	64.4	64.8	28
16	633	160	-.59	.10	.60	-3.2	.58	-3.2	.33	.22	77.5	65.9	16
53	634	160	-.60	.10	1.08	.6	1.09	.6	.13	.22	66.9	66.0	53
26	642	160	-.68	.10	1.15	1.0	1.21	1.3	.22	.21	64.4	66.8	26
59	643	160	-.69	.10	.85	-1.0	.89	-.7	.28	.21	71.3	66.8	59
51	659	160	-.86	.11	.53	-3.3	.54	-3.1	.22	.19	78.1	66.0	51
30	660	160	-.87	.11	.84	-.9	.87	-.7	.16	.19	72.5	65.9	30
50	661	160	-.89	.11	.63	-2.4	.65	-2.2	.40	.19	74.4	66.2	50
40	666	160	-.95	.11	.92	-.4	.98	.0	.22	.19	67.5	65.7	40
44	672	160	-1.03	.12	.84	-.9	.85	-.8	.31	.18	67.5	64.8	44
58	678	160	-1.11	.12	.96	-.2	.96	-.1	.29	.18	63.8	63.7	58
36	679	160	-1.13	.12	1.14	.8	1.16	.9	.33	.17	59.4	63.5	36
25	683	160	-1.19	.12	.91	-.5	.93	-.3	.21	.17	63.8	62.6	25
32	685	160	-1.22	.13	1.22	1.2	1.11	.7	.39	.17	56.9	62.1	32
60	688	160	-1.27	.13	.86	-.8	.88	-.7	.31	.17	63.1	61.3	60
9	702	160	-1.51	.14	.88	-.7	.88	-.7	.26	.16	61.9	57.6	9
49	702	160	-1.51	.14	1.16	1.0	1.13	.8	.39	.16	58.8	57.6	49
13	711	160	-1.69	.14	1.06	.4	1.06	.4	.17	.15	58.1	55.4	13
10	712	160	-1.71	.14	2.40	6.7	2.34	6.7	.30	.15	46.9	55.2	10
3	716	160	-1.79	.15	1.17	1.1	1.18	1.3	.23	.15	59.4	54.8	3
23	717	160	-1.81	.15	.92	-.5	.91	-.6	.28	.15	60.6	54.8	23
24	723	160	-1.94	.15	1.25	1.8	1.23	1.7	.19	.15	53.1	55.4	24
11	724	160	-1.96	.15	1.26	1.9	1.25	1.9	.17	.14	60.6	55.5	11
5	735	160	-2.22	.16	1.61	4.6	1.57	4.5	.24	.14	65.0	60.0	5
MEAN	521.0	160.0	.00	.10	1.03	.2	1.03	.2			50.4	49.4	
S.D.	155.0	.0	1.21	.03	.29	1.8	.28	1.8			21.4	19.3	

Figure 5. Items measure test results

Discussion

The instrument of prospective teacher beliefs in solving the mathematical problems studied is highly reliable. Table 2 shows that the Cronbach alpha interpretation is good. This indicates a match between the research instrument items and the research respondents. Then, the consistency of the respondents' answers can be considered sufficient, with the quality of the research instrument items being excellent. This shows that the instrument of prospective teachers' beliefs in solving mathematical problems can be reliable and provide relatively stable results when used by other researchers. An instrument that has high reliability is one of the characteristics of a good instrument (Huei et al., 2020; Indihadi et al., 2022; Sharif et al., 2019; Sumintono & Widhiarso, 2015).

Table 2. Results of instrument reliability test analysis

Cronbach Alpha	Interpreta-tion	Item Reliability	Interpreta-tion	Person Reliability	Interpreta-tion	Conclusion
0.70	Good	0.99	Excellent	0.67	Fairly	Reliable

Instrument validity is used to test how far the test items can measure prospective teacher beliefs and abilities in solving mathematical problems (Huei et al., 2020; Sumintono & Widhiarso, 2014). The validity test based on item unidimensionality shows that the total value of raw variance in observations is 57.6%. Interpretation of item unidimensionality based on the raw variance explained by measures value is indicated by a score of > 20%, which is said to be fulfilled, > 40% is good, and > 60% is for special criteria. Furthermore, to find out whether or not there are instrument items that do not match, you can look at the eigenvalue and observed values in the unexplained variance 1st contrast. The eigenvalue must be less than 3 to indicate no problematic instrument items, and the observed value must be less than 15% to show appropriate instrument items (Sumintono & Widhiarso, 2015). The analysis results concluded that there was no tendency for item discrepancies so that the instrument could be used. An eigenvalue of more than 3 indicates a problematic instrument item, so an item fit order analysis is carried out to determine whether the instrument item can be retained or discarded. A complete summary of the results of the validity analysis using Winstep 3.73 software is presented in Table 3.

Table 3. Results of instrument validity test analysis

Raw variance explained by measures	Interpretation	Unexplained variance 1st contrast		Interpretation
		Eigenvalue	observed	
57.6%	Good	5.0	3.5%	There are problematic items

Item fit is used to explain whether the instrument items usually function to carry out measurements. To see whether an item fits or not, the outfit means-square, outfit z-standard, and point measure correlation values are used (Huei et al., 2020; Saidi & Siew, 2019; Sharif et al., 2019; Sumintono & Widhiarso, 2015). The criteria used to check the suitability of items are: 1) Acceptable Outfit Mean Square (MNSQ) value: 0.5 < MNSQ < 1.5; 2) Outfit Z-Standard

(ZSTD) value received: -2.0 < ZSTD < +2.0; and 3) Point Measure Correlation (PT Mean Corr) value received: 0.4 < Pt Measure Corr < 0.85. An instrument item is valid if it meets at least one of these criteria. If the three criteria are met on an instrument item, it is said that the item is "suitable," and it can be confirmed that the quality of the instrument item is good and can be used. However, if only two criteria or one criterion are met, the instrument item can still be maintained and does not need to be changed. Table 4 summarizes the results of the analysis of invalid instrument items.

Table 4. Invalid items

Item	Statement	Outfit MNSQ	Outfit ZTSD	PT Measure Corr	Information
5	Mathematical problem-solving abilities increase if you study	1.57	4.5	0.24	Invalid
10	Everyone cannot solve problems	2.34	6.7	0.30	Invalid
19	A good math teacher shows students the right way to answer math questions	1.59	3.1	0.33	Invalid
35	Mathematics is a collection of processes and rules which describe exactly how to solve a problem	0.48	-3.7	0.22	Invalid
48	A calm environment is needed for mathematics learning so that students can focus on listening to explanations of the material	1.60	2.9	0.20	Invalid

In accordance with the analysis's results, five instrument items that did not meet the validity criteria were obtained, so it could be said that these items were invalid (Misfit) and could not be maintained. Overall, the development of the instrument for measuring prospective teacher beliefs in solving mathematical problems in this study was declared reliable and valid, with 55 of the 60 statement items said to be useful.

Rasch modeling can help to address item measurements more consistently and correctly (Adi et al., 2022; Andrich & Marais, 2019; Boone, 2016). Another advantage of Rasch modeling is that three reliabilities are obtained: person reliability, item reliability, and Cronbach's alpha (Saidi & Siew, 2019; Sumintono & Widhiarso, 2015). Furthermore, Rasch modeling can be used to evaluate the construct validity of the instruments developed. The Rasch model can show instrument items that are difficult for respondents to agree on while also matching the respondent's abilities (Adi et al., 2022; Boone, 2016; Saidi & Siew, 2019). Analysis of instrument items related to the respondent's abilities is beneficial in preparing instruments to cover the aspects to be measured (Kaspersen et al., 2017; Sharif et al., 2019; Sumintono & Widhiarso, 2014).

Commented [e16]: Please discuss more about your product, compare with the previous item of belief questionnaire and other researchers results, not only discuss the Rasch model.

Conclusion

Using Rasch modeling in instrument validation has produced more holistic information about the instruments being developed. Based on the test results, it was concluded that the instrument

for prospective teacher beliefs in solving mathematical problems was declared reliable and valid. A total of five instrument items did not meet the validity criteria. Thus, fifty-five instrument items were obtained to measure prospective teachers' beliefs in solving mathematical problems.

Commented [e17]: Please add the implications and the limitations of your study in the second paragraph of this section

Conflicts of Interest

The authors declare no conflict of interest regarding the publication of this manuscript.

Commented [e18]: Please add the subheading:
Funding Statement
Author Contributions

Formatted: Font: (Default) Calibri, Font color: Auto

Formatted: Normal, Left, Line spacing: single

References

Adi, N. R. M., Amaruddin, H., Adi, H. M. M., & A'yun, I. L. Q. (2022). Validity and Reliability Analysis Using the Rasch Model to Measure the Quality of Mathematics Test Items of Vocational High Schools. *Journal of Research and Educational Research Evaluation*, *11*(2), 103–113.

Andrich, D., & Marais, I. (2019). *A Course in Rasch Measurement Theory: Measuring in the Educational, Social and Health Sciences*. Springer Nature Singapore. https://doi.org/10.1007/978-981-13-7496-8

Arikan, E. E. (2016). Prospective Teachers' Beliefs about Problem Solving in Multiple Ways. *Universal Journal of Educational Research*, *4*(7), 1727–1733.

Atikah, A., Sudiyatno, S., Rahim, A., & Marlina, M. (2022). Assessing the item of final assessment mathematics test of junior high school using Rasch model. *Jurnal Elemen*, *8*(1), 117–130.

Bal, A. P. (2015). Examination of the Mathematical Problem-Solving Beliefs and Success Levels of Primary School Teacher Candidates through the Variables of Mathematical Success and Gender. *Educational Sciences: Theory and Practice*, *15*(5), 1373–1390.

Boone, W. J. (2016). Rasch Analysis for Instrument Development: Why, When, and How? *CBE—Life Sciences Education*, *15*(4), rm4. https://doi.org/10.1187/cbe.16-04-0148

Dorimana, A., Uworwabayeho, A., & Nizeyimana, G. (2021). Examining mathematical problem-solving beliefs among rwandan secondary school teachers. *International Journal of Learning, Teaching and Educational Research*, *20*(7), 227–240.

Harisman, Y., Kusumah, Y. S., & Kusnandi, K. (2019). Beliefs of junior high school teachers on learning process on mathematical problem solving. *Journal of Physics: Conference Series*, *1157*(3), 032112. https://iopscience.iop.org/article/10.1088/1742-6596/1157/3/032112/meta

Huei, O., Rus, R., & Kamis, A. (2020). Construct validity and reliability in content knowledge of design and technology subject: A Rasch measurement model approaches for pilot study. *Int J Acad Res Bus Soc Sci*, *10*(3), 497–511.

Indihadi, D., Suryana, D., & Ahmad, A. B. (2022). The analysis of construct validity of Indonesian creativity scale using Rasch model. *Creativity Studies*, *15*(2), 560–576.

Kaspersen, E., Pepin, B., & Sikko, S. A. (2017). Measuring prospective teachers' practices and beliefs about teaching mathematics using the Rasch model. *International Journal of Research & Method in Education*, *40*(4), 421–442. https://doi.org/10.1080/1743727X.2016.1152468

Memnun, D. S., Hart, L. C., & Akkaya, R. (2012). Research on the mathematical problem-solving beliefs of mathematics, science and elementary pre-service teachers in Turkey in

Formatted: Swedish (Sweden)

terms of different variables. *International Journal of Humanities and Social Science*, *2*(24), 172–184.

Mkomange, W. C., Chukwuekezie, S. C., Ajagbe, M. A., & Long, C. S. (2012). A Model of the Effects of Change in Teachers' Beliefs in Mathematical Problem Solving in Malaysia. *IRACST-International Journal of Computer Science and Information Technology & Security*, *2*(5), 916–925.

Muhtarom, M., Juniati, D., & Siswono, T. Y. E. (2019). Examining prospective teacher beliefs and pedagogical content knowledge towards teaching practice in mathematics class: A case study. *Journal on Mathematics Education*, *10*(2), 185–202.

Muhtarom, M., Nizaruddin, N., Sutrisno, S., & Pathudin, P. (2020). Capturing Prospective Teachers' Beliefs about Mathematical Problem Solving. *Universal Journal of Educational Research*. https://eprints.upgris.ac.id/888/

Muntazhimah, M., & Wahyuni, R. (2022). The development and validation of mathematical reflective thinking test for prospective mathematics teachers using the Rasch model. *Jurnal Elemen*, *8*(1), 175–186.

Nieveen, N., & Folmer, E. (2013). Formative evaluation in educational design research. *Design Research*, *153*(1), 152–169.

Ozturk, T., & Guven, B. (2016). Evaluating students' beliefs in problem solving process: A case study. *Eurasia Journal of Mathematics Science and Technology Education*, *12*(3). https://avesis.ktu.edu.tr/yayin/1cd209ab-9adc-4ca8-9ca0-97ee45572eea/evaluating-students-beliefs-in-problem-solving-process-a-case-study

Prendergast, M., Breen, C., Bray, A., Faulkner, F., Carroll, B., Quinn, D., & Carr, M. (2018). Investigating secondary students' beliefs about mathematical problem-solving. *International Journal of Mathematical Education in Science and Technology*, *49*(8), 1203–1218. https://doi.org/10.1080/0020739X.2018.1440325

Rahim, A., & Haryanto, H. (2021). Implementation of item response theory (IRT) Rasch model in quality analysis of final exam tests in mathematics. *Journal of Research and Educational Research Evaluation*, *10*(2), 57–65.

Sağlam, Y., & Dost, S. (2014). Preservice science and mathematics teachers' beliefs about mathematical problem solving. *Procedia-Social and Behavioral Sciences*, *116*, 303–306.

Saidi, S. S., & Siew, N. M. (2019). Reliability and Validity Analysis of Statistical Reasoning Test Survey Instrument Using the Rasch Measurement Model. *International Electronic Journal of Mathematics Education*, *14*(3), 535–546.

Sharif, M. S., Hanapi, Z., Nashir, I. M., Ghani, C., Kob, C., & Abdullah, A. S. (2019). Construct Validity and Reliability of Manufacturing Industry: A Rasch Measurement Model Approaches for Pilot Study. *International Journal of Academic Research in Business and Social Sciences*, *9*(3), 654–665.

Siswono, T. Y. E., Kohar, A. W., Hartono, S., Rosyidi, A. H., Kurniasari, I., & Karim, K. (2019). Examining teacher mathematics-related beliefs and problem-solving knowledge for teaching: Evidence from Indonesian primary and secondary teachers. *International Electronic Journal of Elementary Education*, *11*(5), 493–506.

Siswono, T. Y. E., Kohar, A. W., Kurniasari, I., & Astuti, Y. P. (2016). An investigation of secondary teachers' understanding and belief on mathematical problem solving. *Journal of Physics: Conference Series*, *693*(1), 012015. https://iopscience.iop.org/article/10.1088/1742-6596/693/1/012015/meta

Siswono, T. Y. E., Kohar, A. W., Rosyidi, A. H., & Hartono, S. (2017). Primary school teachers' beliefs and knowledge about mathematical problem-solving and their performance on problem-solving task. *World Transactions on Engineering and Technology Education*, *15*(2), 126–131.

Stage, F. K., & Kloosterman, P. (1992). Measuring beliefs about mathematical problem solving. *School Science and Mathematics*, *92*(3), 109–115.

Sumintono, B. (2018). Rasch model measurements as tools in assesment for learning. *1st International Conference on Education Innovation (ICEI 2017)*, 38–42. https://www.atlantis-press.com/proceedings/icei-17/25892886.

Sumintono, B., & Widhiarso, W. (2014). *Aplikasi model Rasch untuk penelitian ilmu-ilmu sosial (edisi revisi)*. Trim Komunikata Publishing House. http://eprints.um.edu.my/11413/

Sumintono, B., & Widhiarso, W. (2015). *Aplikasi pemodelan rasch pada assessment pendidikan*. Trim komunikata. http://eprints.um.edu.my/14228/

van den Akker, J., Branch, R. M., Gustafson, K., Nieveen, N., & Plomp, T. (2012). *Design approaches and tools in education and training*. Springer Science & Business Media. https://books.google.com/books?hl=id&lr=&id=KDDpCAAAQBAJ&oi=fnd&pg=PP8&dq=plomp+and+nieveen+design+based&ots=rZ0lKBSjMa&sig=6BAcI80HJHlmyZFddTS5SmsZpm8

Formatted: Swedish (Sweden)

Commented [e19]: Please use APA style version 7 correctly, for example: The title should be in Sentence case, not Capital Each Word and CAPITAl; if the title in Bahasa, please add the English translation in bracket sign [ ] after Bahasa title, see the article published for the sample.

Make sure that all the metadata are complete.

Please use more international article about mathematical belief, especially for discussing your research results

Commented [e20]: Please add your final questionnaire items after Reference list.

e- ISSN: 2442 - 4226

JURNAL ELEMEN

PROGRAM STUDI PENDIDIKAN MATEMATIKA
FMIPA UNIVERSITAS HAMZANWADI
Jln. TGKH. M. Zainuddin Abdul Madjid No. 132 Pancor-Selong, Lombok Timur, NTB, 83611
Telp. (0376) 21394, 22953, Fax. (0376) 22953, Email: jurnalelemen@hamzanwadi.ac.id
Website: http://e-journal.hamzanwadi.ac.id/index.php/jel

No. : 25040/jel/UH.FMIPA/2024
Appendix : -
Subject : **Letter of Acceptance**

Dear **Muhtarom**
at –
Department of Mathematics Education, Universitas PGRI Semarang

Bismillahiwabihamdihi
Assalamualaikum Warahmatullahi Wabarakatuh

We are pleased to inform you that Jurnal Elemen would like to publish your manuscript "**Developing an instrument to measure prospective teacher beliefs about mathematical problem-solving using the Rasch model**" in our next issue, Vol. 10 No. 2, May 2024. I appreciate your cooperation during the review process.

Once your manuscript is moved to publishing, our production editor will keep you informed of your article's progress in the production process. We are excited to move forward with your submission. Please feel free to email us with any questions at jurnalelemen@hamzanwadi.ac.id. Thank you.

Wallahulmuwaffiqu wal hadi ila sabilirrasyad
Wassalamualaikum Warahmatullahi Wabarakatuh

Selong, April 30, 2024

Editor-in-Chief,

Shahibul Ahyan