4621-17784-5-PB-1

by Turnitin

Submission date: 26-Apr-2023 04:18AM (UTC-0500)
Submission ID: 2068344449
File name: 4621-17784-5-PB-1.pdf (501.24K)
Word count: 3942
Character count: 21296

TADBIR JURNAL STUDI MANAJEMEN PENDIDIKAN
http://journal.iaincurup.ac.id/index.php/JSMPI
DOI: http://dx.doi.org/10.29240/jsmp.v6i1.4621

Rasch Test for Digital Learning Material Development Based on MOOCS

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Abstract: *This study aims to examine the needs of students for digital teaching materials based on MOOCs. The research was carried out in February 2022. The research sample was 75 postgraduate students from 4 study programs, namely Guidance and Counseling, Islamic Family Law, Islamic Education Management, and Islamic Religious Education. The research instrument used was a questionnaire on the needs of IAIN Curup postgraduate students for digital teaching materials based on MOOCs. The test and data analysis technique used is the Rasch model analysis with the help of the Winstep application. The result of this research is that MOOCs-based digital teaching materials are very much needed by IAIN Curup postgraduate students. This is evidenced by the percentage value ofalpha cronbach 0.96 belongs to the special categorywhich means that students strongly agree with the development.*

Keywords: *Needs Analysis; Digital Teaching Materials; MOOCS; Rasch Model*

INTRODUCTION

Fulfillment of aspects of learning resources is a crucial step for a teacher in teaching learning materials in every lecture. Teaching materials are basic things that must be owned by each educational unit. Every lecturer is required to have teaching materials as a reference for teaching in each subject. Availability of teaching materials in each educational unit is regulated on the standard content & standard of the educational process. These two regulations are the principles of education implementation (Nuryasana & Desiningrum, 2020). In the digital era, using internet network facilities that can be accessed easily, for example at this time, has slightly updated learning using a manual system to an online system. To support learning activities at home, you can use access to open online courses that have unlimited capacity, or in English it is claimed to be Massive Open Online Courses (MOOC) (Maqbul, 2020). The new era of learning places greater opportunities for learners in exploring & disseminating knowledge & skills using technology. Students can study independently, take courses on the desired themes & topics in sync with the desired learning outcomes. Currently there is still a learning media that accommodates this opportunity, namely Massive Open Online Courses (MOOC), an online course that is offered openly by many organizers, both carried out by companies and educational institutions (Sumarsono, 2021).

One form of innovation from digital teaching materials is digital teaching materials based on Massive Open Online Courses (MOOCs). MOOC is here as a new education and learning model(Risdianto et al., 2021).MOOC or Massive Open Online Course (MOOC) is an online learning method that many internet users follow, and is generally provided free of charge. In Indonesia, MOOC poly is currently being offered by various universities using various methods & platforms. MOOC is another easy and cheap way to learn because it doesn't require a photo and specific requirements to be able to follow it(Hardi, 2018). MOOCs are present on an online basis with the aim of large-scale interactive participation & open access via the website. In addition to traditional course materials such as videos, readings, and problem sets, MOOCs provide interactive user boards, quizzes that help form a community for students, professors, and assistants to discuss online learning content over the Internet to almost anyone who wants to take a free course at no cost and attendance limit (Husna, 2019). Massive Open Online Courses (MOOC) - e.g. the existing open & distance learning programs, MOOC is well known for using the promise of increasing access to education for students of all backgrounds. MOOC is a free online course using tens of thousands of students, starting with more collaborative use (Pambudi & Authority, 2020).

Studies show that MOOC is gaining popularity among students, finding the content offered by MOOC to be more convenient & interesting. MOOCs give students the opportunity to learn independently or to increase their learning potential by collaborating and helping other students (Usman et al., 2017). In order to form more objective and thorough data, the measurement of the need for digital teaching materials for postgraduate students is carried out using the Rasch model. The Rasch model is part of the fruit response theory, which is a measurement theory that was developed to overcome the weaknesses of classical test theory (Danni & Torahiya, 2020). Rasch measurement model can prove that an instrument has a high level of validity & reliability. This is because the use of the Rasch model is a solution to the problem of validity where the Rasch model provides useful statistics and provides an excellent opportunity to check validity (Bond & Fox, 2007). A study to identify the validity and reliability of the instrument is very important to do to maintain the accuracy of the instrument. This is expected to ensure that the instrument can measure what is intended to be measured consistently and accurately (Napitupulu, 2017).

The advantage based on RASCH Modeling is the ability to identify incorrect answers, identify incorrect evaluations, & predict missing data from systematic response patterns (Tyas et al., 2020). In this research, the instrument will be analyzed using classical theory using Iteman software &Rasch modeling analysis using Winstep software. Both analyzes were carried out, the instruments obtained had relatively good validity & reliability to measure the need for digital teaching materials (Nuryanti et al., 2018).

Based on the description above, it is crucial to develop digital teaching materials based on MOOCs. However, before doing the development needs analysis needs to be done. based onUtami & Atmojo (2021), analysis of teaching material needs is the primary step for developing digital teaching materials. Therefore, this study will analyze the need for digital teaching materials that are focused on postgraduate students at IAIN Curup.

METHODOLOGY

This study aims to determine the needs of IAIN Curup postgraduate students for digital teaching materials based on MOOCs. The research was carried out in January 2022. The research sample was 75 postgraduate students from 4 study programs, namely Islamic Religious Education Guidance and Counseling, Islamic Family Law, Islamic Education Management, and Islamic Religious Education. The research instrument used was a questionnaire on the needs of IAIN Curup postgraduate students for digital teaching materials based on MOOCs. The data analysis technique used is Rasch model analysis. Needs analysis is carried out on the data obtained in the form of percentages.

Percentages were obtained based on a modified Likert scale calculation. With a Likert scale, the variables to be measured are translated into variable indicators.The questionnaire was tested using the Rasch model with the help of the Winstep application.Instrument items are assigned quantitative values as shown in Table 1 below:

Table1. Likert Scale Interpretation

Percentage (%)	Category
1	Strongly Disagree
2	Disagree
3	Agree
4	Strongly agree

(Hayati et al., 2015)

Data analysis was carried out using the Rasch model and assisted by the developed Winstep software (Linacre, 2011). The Rasch model is able to see the interaction between respondents and items at once. In the Rasch model, a value is not seen based on the raw score, but a logit value that reflects the probability of selecting an item in a group of respondents (Wibisono, 2016). The use of the Rasch model for polytomy data was developed by Andrich based on 2 basic theorems, namely the level of individual ability / agreement and the level of difficulty of items to be approved (B. Sumintono, 2014).

The value of reliability between students and items can be determined using Table 2.

Table 2. Reliability Value

No	Range	Category
1	< 0.67	Weak
2	0.67 – 0.80	Enough
3	0.80 – 0.90	Good
4	0.91 – 0.94	Very good
5	>0.94	Special

(Sultan & Tirtayasa, 2019)

RESULTS AND DISCUSSION

This study analyzes the Rasch model usingthe needs of IAIN Curup graduate students for MOOCs-based digital teaching materials. The questions in the questionnaire made are multiple choice questions (dichotomies) with a total of 22 questions and the number of postgraduate students in 4 study programs with a sample of 75 students. The following is the data from the analysis using the Rasch model assisted by the Winstep application on the responses of IAIN

Curup postgraduate students, to determine the characteristics of the questions/items and student responses, it can be seen in Figure 1 below:

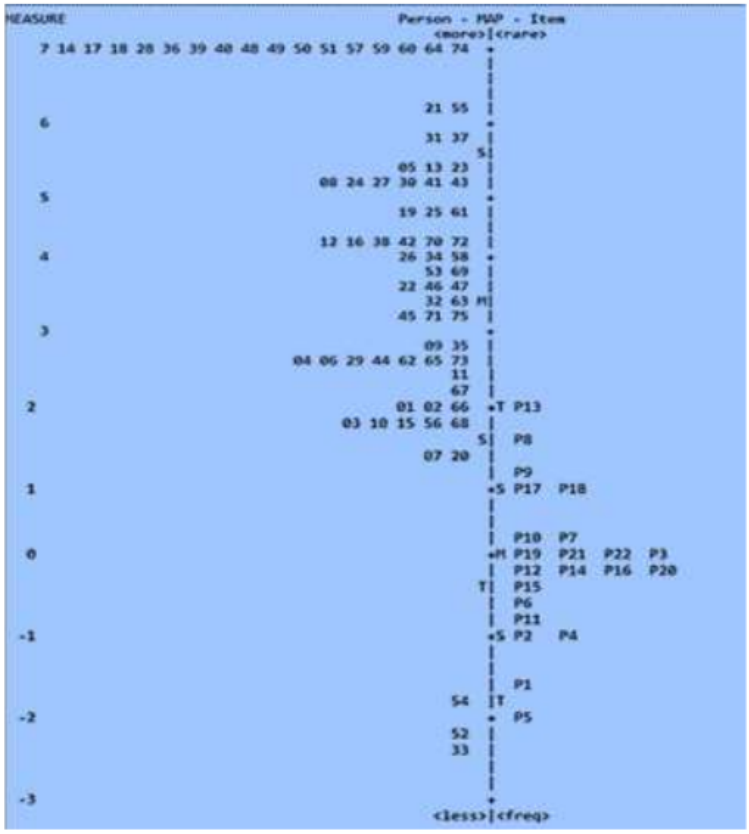


Figure 1. Variable Maps

If comparing homogeneous logit items using the logit person, it appears that the logit person is larger (+2.20 logit) this indicates that the holistic ability is only slightly higher than using the difficulty of the question (Untary et al., 2020). If we compare the gaps between MST in Wright's map above, it can be seen that the distribution of student abilities (on the left) is wider than the distribution on the difficulty level of the items (on the right). In the context of the level of difficulty of the questions, this shows that the results of the questions of diversity are not far apart; However, based on the student's ability aspect, it can be seen that the gap in ability is very wide.

Reliability is the determination or constancy of the tool in assessing what it is "assessed", meaning that an instrument is said to be reliable if the output according to the instrument used earlier will always put relatively the same or stable output (B. and W. Sumintono, 2015).Based on the table, the analysis of

students' abilities using the Rasch model was carried out using the Winsteps application. The following is the output of the Ministep analysis:

Table 3. Output Summary Measured Items

	TOTAL SCORE	COUNT	MEASURE	SE MODELS	INFIT		OUTFIT	
					MNSQ	ZSTD	MNSQ	ZSTD
MEAN	263	75	0	0.28	0.97	-0.39	0.97	-0.09
SEM	2.7	0	0.2	0.01	0.1	0.52	0.12	0.48
P.SD	12.4	0	0.94	0.03	0.46	2.39	0.57	2.2
S.SD	12.7	0	0.96	0.03	0.47	2.44	0.58	2.25
MAX.	286	75	2.02	0.36	2.41	6.12	2.39	5.96
MIN.	233	75	-2.05	0.25	0.43	-3.8	0.31	-3.09
REAL RMSE .30 TRUE SD .89 SEPARATION 2.97 Item RELIABILITY .90 | |MODEL RMSE .28 TRUE SD .89 SEPARATION 3.19 Item RELIABILITY .91 | | SE OF Items MEAN = .20								

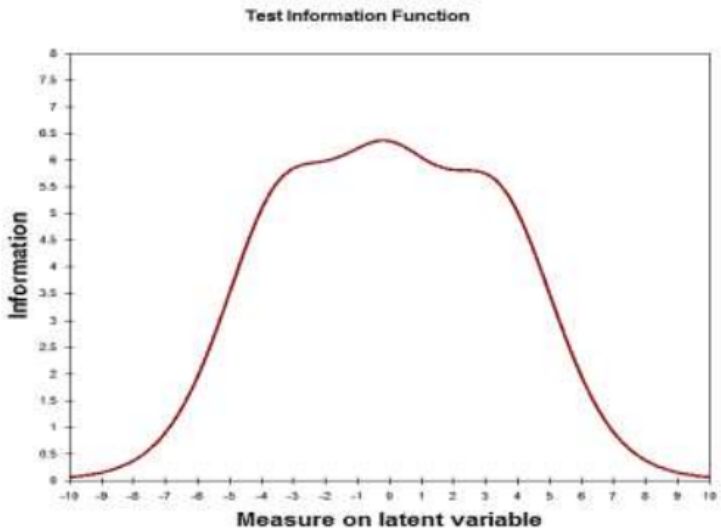
Table 4. Output Summary Measured Person

	TOTAL SCORE	COUNT	MEASURE	SE MODELS	INFIT		OUTFIT	
					MNSQ	ZSTD	MNSQ	ZSTD
MEAN	74.9	22	3.53	0.5	1.07	-0.08	0.97	-0.32
SEM	1.3	0	0.25	0.02	0.09	0.24	0.09	0.21
P.SD	10	0	1.93	0.15	0.7	1.91	0.68	1.62
S.SD	10.1	0	1.94	0.15	0.7	1.92	0.69	1.63
MAX.	87	22	6.99	1.04	3.83	4.4	4.46	2.9
MIN.	40	22	-2.46	0.41	0.24	-3.48	0.22	-3.52
REAL RMSE .59 TRUE SD 1.83 SEPARATION 3.12 Person RELIABILITY .91 | |MODEL RMSE .52 TRUE SD 1.86 SEPARATION 3.58 Person RELIABILITY .93 | | SE OF PERSON MEAN = .25								
Person RAW SCORE-TO-MEASURE CORRELATION = .95 CRONBACH ALPHA (KR-20) Person RAW SCORE "TEST" RELIABILITY = .96 SEM = 2.06 STANDARDIZED (50 ITEMS) RELIABILITY = .94								

The results of data analysis in Table 3 and Table 4 above. Crucial information that can be obtained based on the Summary Statistics table is Person Reliability & Item Reliability, Cronbach alpha value & Person Measure. It can be seen the amount of Person Reliability in the needs questionnaireIAIN graduate students Curup on MOOCs-based digital teaching materials 0.91 while Item Reliability is 0.90. The magnitude of Cronbach's Alpha is 0.96. Person Measure 3.53 logit, this shows the student response to digital teaching materials based on MOOCs is very high.

The validity of the respondents can be reviewed based on the distribution of respondents' answer patterns (on the left) using the level of difficulty of the questions (on the right). The logit value shows that if the respondent is at the top, then he or she can solve difficult questions (the higher

up, the more difficult the item items). The identity of the respondent is based on the number (numbers 1-75). The pattern of responses based on respondents to the item questions is relatively interesting. Thus, this question item can be used to measure critical intelligence in the 4 study programs, this is reinforced using the information function test graph obtained based on the Winstep analysis in Figure 2.



Picture2. Distribution of Respondents and Question Items

Distribution of Respondents & Question Items From Figure 2 it can be seen the distribution of the level of difficulty of the critical intelligence test questions. It appears that not all aspects of critical thinking have the same level of difficulty. Question number 1 measuring interpretation ability is a difficult question and even this question is included as an outlier. If it is observed based on the six aspects of critical intelligence, this question instrument still needs revision because the six aspects of critical intelligence have varying degrees of difficulty. The average logit item is 2.02, which means the item can measure what it should measure. In Figure 2 it can be seen that the item questions have a range based on logit -6 to logit 6. This is reinforced by using the separation value 3.19 & reliability 0.90 which strengthens the needs questionnaire. IAIN graduate students Curup on MOOCs-based digital teaching materials agree. From Figure 2 regarding the test information function graph, it appears that the curve is normally distributed, synchronous using the model. This shows that the testtowards MOOCs-based digital teaching materialsdeveloped can measure what should be measured.

Furthermore, the following is a table of 5 results based on the statistics of the questions:

Table 5. Item Measure Order

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL SE	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PTMEASUR-AL CORR.	PTMEASUR-AL EXP.	EXACT OBS%	MATCH EXP%	Items
13	233	75	2.02	.25|	2.41	6.12	2.39	5.96|	0.54	.80|	41.9	65.0|	P13
8	241	75	1.54	.25|	0.92	-.45|	0.88	-.63|	0.77	.78|	74.2	64.9|	P8
9	247	75	1.16	.25|	1.61	3.14	1.53	2.57|	0.65	.76|	69.4	66.5|	P9
17	250	75	0.97	.25|	1.13	.78|	1.1	.60|	0.72	.75|	64.5	67.6|	P17
18	251	75	0.91	.26|	1.08	.53|	1.06	.39|	0.72	.75|	66.1	67.8|	P18
10	259	75	0.37	.26|	1.24	1.3	1.11	.56|	0.66	.72|	71	70.4|	P10
7	261	75	0.22	.27|	1.06	.40|	0.98	.01|	0.71	.72|	72.6	71.1|	P7
22	262	75	0.15	.27|	0.75	-1.47	0.81	-.80|	0.75	.71|	83.9	71.4|	P22
3	263	75	0.08	.27|	1.53	2.55	2	3.32	0.62	.71|	67.7	71.7|	P3
21	263	75	0.08	.27|	0.47	-3.6	0.47	-2.65	0.81	.71|	90.3	71.7|	P21
19	264	75	0	.27|	0.45	-3.69	0.4	-3.09	0.82	.70|	90.3	72.2|	P19
12	265	75	-0.07	.27|	1.38	1.9	2.24	3.71	0.62	.70|	72.6	72.6|	P12
14	265	75	-0.07	.27|	0.79	-1.18	0.72	-1.13	0.76	.70|	82.3	72.6|	P14
16	265	75	-0.07	.27|	0.6	-2.49	0.53	-2.14	0.79	.70|	85.5	72.6|	P16
20	266	75	-0.15	.28|	0.61	-2.37	0.54	-2.01	0.78	.70|	80.6	73.0|	P20
15	269	75	-0.38	.28|	0.43	-3.8	0.38	-2.77	0.8	.68|	91.9	74.1|	P15
6	270	75	-0.46	.29|	1.08	0.48	0.92	-.19|	0.68	.68|	79	74.4|	P6
11	274	75	-0.8	.30|	0.94	-0.26	0.93	-.08|	0.66	.65|	75.8	75.3|	P11
2	275	75	-0.89	.30|	0.78	-1.17	0.71	-.75|	0.7	.65|	83.9	75.6|	P2
4	276	75	-0.98	.30|	0.66	-1.95	0.65	-.94|	0.71	.64|	85.5	75.7|	P4
1	282	75	-1.58	.33|	0.75	-1.31	0.65	-.62|	0.65	.60|	87.1	79.2|	P1
5	286	75	-2.05	.36|	0.58	-2.14	0.31	-1.25	0.66	.56|	88.7	82.8|	P5
MEAN	263	75	0	.28|	0.97	-.4|	0.97	-1|	|		77.5	72.2|	
P.SD	12.4	0	0.94	.03|	0.46	2.4|	0.57	2.2|	|		11.3	4.2|	

Item statistics results The measure column tells the logit value for each item sorted from highest to lowest. For the 13th item, which is 2.02 logit, it tells the most difficult questions, while the 5th item is the easiest item as much as -2.05 logit. The results of the validity can be seen & analyzed using the Winsteps event in the Out fit order table to see the suitability of the questions that function in the normal category to be used as a measurement of respondents' misconceptions by paying attention to the criteria in table 6. To check the appropriate items (outliers or misfits) using reviewing -the following are:

Table 6. Item Validity Criteria

Reference	Limit Value
Outfit Mean Square (MNSQ)	0.5 < MNSQ < 1.5
Outfit Z-Standard (ZSTD)	-2.0 < ZSTD < +2.0
Point Measure Correlation (Pt Mean Corr)	0.4 <Pt Mean Corr< 0.85

(Untary et al., 2020)

To find out the aspect of the inappropriateness of the response using an ideal example, for example, it is shown in Table 7 person fit order, for example in the table below:

Table 7. Person Misfit Order

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL SE	INFIT |MNSQ	INFIT ZSTD	OUTFIT |MNSQ	OUTFIT ZSTD	PTMEASUR-AL CORR.	PTMEASUR-AL EXP.|	EXACT OBS%	MATCH| EXP%|	Person
31	85	22	5.71	.65|	3.83	3.87	4.46	2.90|A	-.02	.30|	95.5	86.4|	31
30	83	22	5.03	.54|	3.1	4.23	2.72	2.56|B	0.28	.35|	86.4	78.9|	30
37	85	22	5.71	.65|	2.86	2.91	1.2	.50|C	0.47	.30|	95.5	86.4|	37
42	80	22	4.29	.46|	2.59	4.4	2.08	2.60|D	0.49	.39|	68.2	70.5|	42
70	80	22	4.29	.46|	2.3	3.79	1.93	2.33|E	0.43	.39|	72.7	70.5|	70
26	79	22	4.08	.45|	1.9	2.97	1.86	2.37|F	0.17	.40|	72.7	68.2|	26
3	66	22	1.77	.41|	1.88	2.31	1.84	2.20|G	0.84	.44|	36.4	68.9|	3
53	78	22	3.88	.44|	1.78	2.7	1.59	1.88|H	0.46	.41|	54.5	65.8|	53
20	64	22	1.43	.41|	1.71	1.95	1.68	1.86|I	0.38	.44|	68.2	68.3|	20
7	64	22	1.43	.41|	1.58	1.66	1.48	1.40|J	0.26	.44|	68.2	68.3|	7
22	77	22	3.69	.43|	1.54	2.01	1.44	1.52|K	0.57	.41|	59.1	63.5|	22
12	80	22	4.29	.46|	1.19	.78|	1.47	1.34|L	0.08	.39|	59.1	70.5|	12
41	83	22	5.03	.54|	1.42	1.23	1.25	.63|M	0.38	.35|	90.9	78.9|	41
13	84	22	5.34	.58|	1.4	1.06|	0.98	.16|N	0.42	.33|	86.4	82.5|	13
59	87	22	6.99	1.04|	1.11	.42|	1.34	.69|O	0.02	.19|	95.5	95.4|	59
68	66	22	1.77	.41|	1.34	1.06	1.28	.90|P	0.25	.44|	59.1	68.9|	68
47	77	22	3.69	.43|	1.33	1.33	1.24	.90|Q	0.52	.41|	68.2	63.5|	47
45	74	22	3.15	.42|	1.3	1.14	1.25	.96|R	0.44	.43|	59.1	63.9|	45
33	40	22	-2.46	.41|	1.27	.94|	1.29	.98|S	-.15	.44|	59.1	66.8|	33
23	84	22	5.34	.58|	1.2	.62|	0.68	-.40|T	0.59	.33|	86.4	82.5|	23
5	84	22	5.34	.58|	1.05	.25|	1.19	.50|U	0.23	.33|	77.3	82.5|	5
25	82	22	4.75	.50|	1.05	.25|	1.13	.44|V	0.26	.37|	77.3	75.6|	25
4	71	22	2.63	.42|	1.08	.38|	1.08	.37|W	0.16	.43|	77.3	66.4|	4
72	80	22	4.29	.46|	1.04	.24|	1.01	.15|X	0.29	.39|	59.1	70.5|	72
19	82	22	4.75	.50|	1.03	.20|	0.87	-.19|Y	0.34	.37|	68.2	75.6|	19
38	80	22	4.29	.46|	0.95	-.10|	1.01	.13|Z	0.34	.39|	68.2	70.5|	38
55	86	22	6.21	.77|	1.01	.21|	0.58	-.20|	0.32	.25|	90.9	90.9|	55
BETTER FITTING NOT SHOWN +----------+----------+													
58	79	22	4.08	.45|	0.74	-1.07	0.89	-.26|	0.52	.40|	81.8	68.2|	58
43	83	22	5.03	.54|	0.86	-.34|	0.7	-.52|	0.48	.35|	77.3	78.9|	43
61	82	22	4.75	.50|	0.79	-.64|	0.86	-.20|	0.49	.37|	77.3	75.6|	61
21	86	22	6.21	.77|	0.85	-.07|	0.41	-.48|	0.46	.25|	90.9	90.9|	21
67	68	22	2.12	.41|	0.84	-.44|	0.78	-.64|	-.54	.44|	81.8	68.6|	67
34	79	22	4.08	.45|	0.83	-.67|	0.75	-.79|z	0.5	.40|	72.7	68.2|	34
9	72	22	2.81	.42|	0.79	-.73|	0.78	-.77|y	0.54	.43|	63.6	65.6|	9
24	83	22	5.03	.54|	0.79	-.56|	0.58	-.83|x	0.56	.35|	77.3	78.9|	24
27	83	22	5.03	.54|	0.78	-.61|	0.66	-.61|w	0.54	.35|	86.4	78.9|	27
69	78	22	3.88	.44|	0.78	-.91|	0.73	-.98|v	0.52	.41|	72.7	65.8|	69
48	87	22	6.99	1.04|	0.75	-.01|	0.22	-.37|u	0.47	.19|	95.5	95.4|	48
74	87	22	6.99	1.04|	0.75	-.01|	0.22	-.37|t	0.47	.19|	95.5	95.4|	74
63	76	22	3.51	.43|	0.74	-1.10	0.7	-1.17|s	0.75	.42|	72.7	62.6|	63
8	83	22	5.03	.54|	0.72	-.80|	0.61	-.75|r	0.58	.35|	86.4	78.9|	8
32	76	22	3.51	.43|	0.71	-1.25	0.68	-1.29|q	0.78	.42|	72.7	62.6|	32
29	71	22	2.63	.42|	0.69	-1.11	0.68	-1.15|p	0.57	.43|	77.3	66.4|	29

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL SE	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PTMEASUR-AL CORR.	PTMEASUR-AL EXP.	EXACT OBS%	MATCH EXP%	Person
71	75	22	3.33	.42	0.68	-1.37	0.65	-1.42 o	0.54	.42	72.7	63.3	71
1	67	22	1.95	.41	0.61	-1.31	0.62	-1.29 n	0.18	.44	86.4	68.7	1
44	71	22	2.63	.42	0.6	-1.56	0.59	-1.56 m	0.39	.43	77.3	66.4	44
75	75	22	3.33	.42	0.59	-1.84	0.57	-1.86 l	0.63	.42	81.8	63.3	75
6	71	22	2.63	.42	0.56	-1.75	0.54	-1.82 k	0.71	.43	77.3	66.4	6
35	72	22	2.81	.42	0.56	-1.80	0.55	-1.84 j	0.51	.43	81.8	65.6	35
73	71	22	2.63	.42	0.45	-2.38	0.43	-2.42 i	0.58	.43	86.4	66.4	73
52	42	22	-2.12	.41	0.43	-2.26	0.43	-2.24 h	0.21	.44	81.8	67.5	52
66	67	22	1.95	.41	0.41	-2.35	0.41	-2.32 g	-.02	.44	86.4	68.7	66
11	70	22	2.46	.42	0.33	-3.02	0.32	-3.06 f	0.64	.43	90.9	67.5	11
2	67	22	1.95	.41	0.27	-3.26	0.25	-3.34 e	0.68	.44	86.4	68.7	2
10	66	22	1.77	.41	0.24	-3.46	0.22	-3.52 d	0	.44	90.9	68.9	10
15	66	22	1.77	.41	0.24	-3.46	0.22	-3.52 c	0	.44	90.9	68.9	15
54	44	22	-1.79	.41	0.24	-3.48	0.23	-3.52 b	0	.44	90.9	67.9	54
56	66	22	1.77	.41	0.24	-3.46	0.22	-3.52 a	0	.44	90.9	68.9	56
MEAN	77.2	22	4.35	.73	1.07	-1	0.97	-.3			77.5	72.2	
P.SD	10.4	0	2.51	.53	0.7	1.9	0.68	1.6			12.1	8.7	

From the output of the analysis, it can be seen that all items fit, as a result, questions that do not need to be revised or eliminated. From Table 7 above, we can see that the person measure that has the top measure is the respondent number 31 with a logit value of 5.71, there are also those who have a measure that reaches 6.99 logit, namely respondents with numbers 48 and 74. has the lowest measure, namely respondent number 56 with a logit value of 1.77, which has the lowest measure value, namely respondent number 33 with a logit value of 2.46. Below is a table of results based on the Guttman scale based on graduate student responses.

Table 8. Guttman Scologram

GUTTMAN SCALOGRAM OF RESPONSES:

Person |Item

| 1 121111 22 111 1

|514216502469312708 7983

|----------

14 +44444444444444444 14

17 +444444444444444444 17

18 +44444444444444444 18

28 +44444444444444444 28

36 +44444444444444444 36

GUTTMAN SCALOGRAM OF RESPONSES:

Person |Item

| 1 121111 22 111 1

|514216502469312708798 3

|----------

39 +44444444444444444444 39

40 +44444444444444444444 40

49 +44444444444444444444 49

50 +444444444444444444444 50

51 +44444444444444444444 51

57 +44444444444444444444 57

60 +44444444444444444444 60

64 +44444444444444444444 64

48 +44444444444444444444 48

59 +444444444443444444444 59

74 +4444444444444444443 74

21 +444444444444444444334 21

55 +444444444444444433444 55

31 +444444441444444444444 31

37 +44444444444444444444 37

5 +444434443444444444334 05

13 +444444444444334444442 13

23 +444444444444444433442 23

8 +444444443444444344333 08

24 +444444444444443433334 24

27 +444444434444443434433 27

30 +444444444441444444442 30

GUTTMAN SCALOGRAM OF RESPONSES:

Person |Item

| 1 121111 22 111 1

|514216502469312708798 3

|----------

41 +44444444444423444433 41

43 +4444444444444334433443 43

19 +4444444443434433434343 4 19

25 +4434444343444444344343 25

61 +4443444443444444433433 61

12 +4334434444443434344343 12

16 +4434434434443444443333 16

38 +4443344434443444344333 38

42 +4444444444444434244142 42

70 +4443444444444443443124 70

72 +4444343344434443344433 72

26 +4444323444444444234334 26

34 +4444444344434334333334 34

58 +4344444434443443433333 58

53 +4444444344334443422424 53

69 +4444434434343344333433 69

22 +4444343444444344422233 22

46 +4444444433344333433432 46

47 +4444444344433443322334 47

32 +4444444344434333333332 32

63 +4444444344334334333332 63

71 +4444433443334333334333 71

1

GUTTMAN SCALOGRAM OF RESPONSES:

Person |Item

| 1 121111 22 111 1

|514216502469312708798 3

|----------

75 +4444344343433343333333 75

45 +444434343234334344332 45

9 +434343344433343333332 09

35 +443434333333434333333 35

4 +4433423333333333444333 04

6 +444343334343333333332 06

29 +44334333433343334333332 29

44 +434334333433333433333 3 44

62 +443434333333234333343 62

65 +4444333333334333344232 65

73 +443433434333333333333 73

11 +44433433333333333333 11

67 +3333333333333333333434 67

1 +433332333333334333333 01

2 +4433333333333333333323 02

66 +333333333334333333333 66

3 +4444433324343332222 21 03

10 +3333333333333333333333 10

15 +3333333333333333333333 15

56 +3333333333333333333333 56

68 +3334433433233333322324 68

7 +3333433333333332422314 07

GUTTMAN SCALOGRAM OF RESPONSES:

Person |Item

| 1 121111 22 111 1

|51421650246931270879 83

|----------

20 +34334333233333314324 22 20

54 +22222222222222222222 54

52 +22222222222212222221 22 52

33 +22212221211122223222 22 33

|----------

| 1 121111 22 111 1

|51421650246931270879 83

The results of the Guttman Scalogram of Responses Analysis based on the Person Measure table found that Person 30 was not suitable (misfit) because the respondents did not respond well to Question 13 which had a high level of difficulty, while the other respondents were able to respond well. In addition, there are also many patterns of the same respondent's answers that are misfit, it can be suspected that the respondent cooperates or the respondent fills out the questionnaire inaccurately.

CONCLUSION

Based on the discussion above, it can be concluded that the need for digital teaching materials based on MOOCs using the help of the Winsteps application tells that Person Reliability in the needs questionnaire is 0.91 while Item Reliability is 0.90. The magnitude of Cronbach's Alpha is 0.96. Person Measure 3.53 it shows that the response of students to digital teaching materials based on MOOCs is very high. The results of the analysis also determine that all items fit, as a result, the questions do not need to be revised or eliminated. Based on the research output, it can be concluded that some of the questions regarding the need for digital teaching materials based on MOOCs have a pattern of fit items, as a result it is assumed that in the current needs questionnaire as a whole, graduate program students strongly agree with the existence of digital teaching materials based on MOOCs.

ACKNOWLEDGEMENT

Acknowledgments are addressed to all parties who have assisted in this research, especially the postgraduate students of the IAIN Curup program who have been willing to become research samples to be able to collect data as expected.■

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