



How to Measure the Entrepreneurial Competences of SME's Using the Rasch Model?

Edi Fitriana Afriza¹✉, Rendra Gumilar¹, Betanika Nila Nirbita²

DOI: 10.15294/dp.v18i1.42988

¹Economic Education Study Program, Faculty of Teacher Training and Education, Universitas Siliwangi, Indonesia

²Accounting Study Program, Department of Business and Finance, Faculty of Vocational Studies, Universitas Negeri Yogyakarta, Indonesia

History Article

Received February 27, 2023
Approved July 22, 2023
Published July 23, 2023

Keywords

Entrepreneurship Competence; Measurement; MSMEs; Rasch Model

Abstract

This study focused on measuring the entrepreneurial competence of MSME actors in the post-pandemic period. A purposive sampling technique was utilized to recruit the respondents. The respondents encompassed perpetrators, owners, and managers of SMEs assisted by the Indonesian Business Development Services Association (ADBSI) given government assistance (N=100). Technically, the Rasch Model was employed to measure Entrepreneurial competency since it is assumed to be the most appropriate model for quantitative data analysis in the field of human sciences. It enables the researchers to produce ordinal data. Tests with Winstep were carried out on entrepreneurial competency data in the pandemic era. They covered: summary statistics, item measures and Wright maps, item (column) fit order, item test (dimensionality), rating (partial-credit) scale test, differential item functional (DIF) test and probability value. The results of the study proved that the applied entrepreneurial competency instrument indicated good persons, Cronbach Alpha, and item reliability. The personal reliability coefficient obtained a value of 0.88. An item of 0.76 revealed good and fairly good. The results of one of the instruments were considered the most essential aspects related to entrepreneurial competencies. The competencies should be possessed by students to face the post-pandemic business competition.

How to Cite

Afriza, E.F., Gumilar, R., & Nirbita, B.N.(2023).How to Measure the Entrepreneurial Competences of SME's Using the Rasch Model?.*Dinamika Pendidikan*, 18 (1), 96-109.

© 2023 Universitas Negeri Semarang

✉ Correspondence Author:
Jln. Siliwangi No. 24 Kahuripan, Kota Tasikmalaya, Jawa Barat 46115
Indonesia, 50125
Email: edifitriana@unsil.ac.id

p-ISSN 1907-3720
e-ISSN 2502-5074

INTRODUCTION

Micro small and Medium Enterprises (MSMEs) as a forum for productive economic activities owned by individuals and groups with a business scale built from the informal sector. Even though the scope of MSMEs business is in the informal sector, its contributions to the Indonesian economy are significant and crucial. Liedholm and Mead (2013) argue that micro-entrepreneurs contribute to the development process by increasing household income thereby increasing welfare, building self-confidence, bringing social stability, and conveying changes in income distribution and demographic situation. In addition, informal micro-enterprises also provide more affordable goods and services for the community because the prices tend to be cheaper.

Prices are negotiable. It means that they can be controlled by the type of transaction (Ratten, 2016). For many of them, informal economic activities are the only way to generate income because it allows them flexibility in where, when, and how they work and are subject to personal behaviour (Zainol and Mamun, 2018). To illustrate, based on Data from the Ministry of Cooperatives and Small and Medium Enterprises (KemenkopUKM) for March 2021, the number of MSMEs reached 64.2 million with a contribution to the Gross Domestic Product of 61.07 percent or IDR 8,573.89 trillion. MSMEs can absorb 97 percent of the total existing workforce. Further, it can collect up to 60.42 percent of the total investment in Indonesia.

The conditions caused by the Covid-19 pandemic have indicated a very broad impact, notably in the economic sector which is the focus of the government's attention. The movement of the domestic economy is synonymous with MSMEs experiencing a decline in sales during the Covid-19 period. The decline in MSME activities as an essential sector to maintain the sustainability of a country's business makes economic activities unstable (Kijkasiwat, Wellalage, & Locke, 2021). The consequences of the pandemic were some

of which included a decline in economic activities due to industrial cessation, decreased purchasing power, increased layoffs, and the company's operational capabilities could not be maintained.

There are more than 950 affected micro, small, and medium business sectors. More specifically, 68% of MSMEs experienced a decrease in income, 6% of MSMEs complained about the scarcity of raw materials, 10% experienced delays in distributing problems, 12% experienced working capital difficulties, and 4% admitted experiencing production delays (Catriona, 2020). Many MSMEs have never had access to financing from both the financial sector and the government. Thus, business actors are pessimistic and unsure about economic recovery with a 50-70% reduction in their household income (Dahiya et al, 2020).

The impacts of the Covid-19 pandemic are also perceived by MSME actors, notably in Tasikmalaya City town. Every MSME seeks to maintain its business by continuing to operate in producing goods and services. However, changes in people's purchasing patterns have drastically resulted in business actors experiencing a decrease in sales volume. As a result, the earned business income cannot cover operational expenses. In this case, the government took various efforts to restore MSME businesses.

One of them was to provide support incentives for MSME business actors through the National Economic Recovery Program (PEN) in 2020 and continued in 2021. The realization of the PEN program to support government MSMEs distributing a budget of IDR 112.84 trillion has been enjoyed by more than 30 million MSMEs in 2020. Conversely, in 2021, the Government had also budgeted PEN to support MSMEs with funds of IDR 121.90 trillion to maintain the momentum of economic recovery.

Through the stimulus program of government assistance, MSMEs can increase their resistance to the impacts caused by the pandemic. Even, they should be able to restore their business activities progressively. Con-

cerning the investigative phenomenon, business actors can make it a challenge to achieve optimal business performance. In other words, business actors are required to carry out a comprehensive revitalization of their business activities during the new normal period. For instance, they can be in the form of business transformation towards digital, product and service development innovation, restructuring of business organizations, and increasing the competence of business owners. This is an arena for proving that MSME actors ideally have entrepreneurial competence with tentative conditions. To illustrate, the provision of government assistance programs has contributed to the recovery and development of MSMEs in the new normal period.

In the context of post-COVID-19, MSME recovery and entrepreneurial competency is the key to rebuilding a business, increasing competitiveness, identifying new opportunities, managing resources efficiently, and adapting to changes. Entrepreneurial competencies (e.g. creativity and innovation) will enable MSMEs to develop new ideas, create new products or find ways to meet customer needs. Further, entrepreneurial competence allows MSMEs to adapt quickly so that they have good opportunities in developing their business. Entrepreneurial competencies can help business owners overcome company problems through a unique strategy so that entrepreneurs with high levels of competence can extract opportunities from problems (Man & Lau, 2000; Man, Lau, & Chan, 2002).

Entrepreneurial competence encompasses committed competence, conceptual competence, competence to recognize business opportunities, organizational competence, relational competence, strategic competence, and economic vulnerability. In particular, commitment competence reflects the drive (motivation) indicated by the entrepreneur to get ahead with the business. Therefore, commitment competence facilitates entrepreneurs to set a long-term direction for the company. As an illustration, entrepreneurs with a high level of commitment competence devote their

time and hard work towards their performance. Then, conceptual competence refers to competencies related to miscellaneous conceptual abilities reflected in the behavior carried out by entrepreneurs.

Moreover, economic vulnerability indicates the risk of exposure to shocks and the potential to fall into poverty due to limited income and assets to absorb shocks from uncertainty. Likewise, conceptual competence helps entrepreneurs shape the competitive scope of a company. Furthermore, opportunity recognition competence refers to competencies related to recognizing market opportunities through assorted means and forms of a company's competitive scope. In addition, organizational competence refers to organizational-related competencies from a variety of internal and external human, physical, financial, and technological resources assisting to build organizational capabilities.

Besides, relational competencies are competencies related to person-to-person or individual-to-group interactions as a result of organizational capabilities and the competitive scope of a company. Finally, strategic competence refers to competencies related to setting, evaluating, and implementing strategies designed by the company. Thus, this research has focused on measuring the entrepreneurial competencies possessed by MSME actors in the post-covid, by highlighting the efforts made by MSMEs in dealing with their business activities during the new normal period.

METHODS

This investigative attempt employed a quantitative approach (Plumeyer et al., 2019), namely measuring respondents' answers on a nominal scale and Likert rating then inputting statistical data into the master table or tabulation to be processed with Winstep software from the Rasch Model (Setiawan et al., 2018). The Rasch model is a statistical model utilized to calibrate the levels of individual ability based on responses to several items measuring particular attributes or constructs.

The Rasch model is based on the assumption of individual probabilities. In this case, the Rasch model offers an estimate of individual abilities strongly supporting the measurement of this research. Also, the Rasch model assumes that uni-dimensionality measures one characteristic. In other words, it facilitated the researchers to interpret the measurement results. Additionally, it allowed a more valid comparison between the individual and the object being measured. Briefly stated the abovementioned reasons underlie the employment of the Rasch model in this investigative effort.

A descriptive explanation was adopted to delineate the characteristics of the respondents and the quality of the statement items developed from each variable and to explain the results of the research-based Winstep software (Sumintono et al., 2014). The investigative population is respondents consisting of 100 actors or owners, and MSME managers located in Tasikmalaya City. The sampling technique was the purposive sampling technique. The respondents' data originated from the Indonesian Business Development Services Association (ADBSI) Tasikmalaya City Branch where the MSMEs were assisted and under the coordination of SOEs. MSME actors included in the category of respondents had qualifications from gender (males and females) and business scale including MSME in the Start-Up category where the business has a turnover of around <50 million while the turnover in the Scale-Up category is >50 million.

RESULT AND DISCUSSION

The samples of this study consisted of 100 SMEs spread across West Java. The characteristics of the recruited respondents as a reference in the study consisted of gender and business scale with Start-Up and Scale-Up criteria. The collected demographic data of respondents are specifically outlined in the following Table 1.

Table 1. Characteristics of Respondents

Respondent Identities	Persentase	
	M	F
Gender	36%	64%
Business Scale	33%	67%

Source: Processed Data (2022)

Table 1, it can be viewed that the respondent data from 100 MSME actors indicated 36% men and 64% women based on gender. On the other hand, there were 33% of businesses at the Start-Up level and 67% at the Scale-Up level viewed from the business scale. The indicators of measuring entrepreneurial competence in MSMEs in Tasikmalaya City are as follows Table 2 (Next Page).

Summary Statistics

Measurement through Summary Statistics was employed to determine the overall quality of responses, items, and the interaction of both. Based on the results of the test using Winstep with Summary Statistics, an overview of the quality of respondents and entrepreneurial competency instrument items for MSME actors in the post-covid-19 pandemic era was obtained. The results can be viewed in Table 3.

The results from Table 3 reveal that the average person size was +3.07 logit. It means that the average value of MSME actors in the entrepreneurial competency instrument was greater than 0.00 logit. In other words, the respondents tended to think that entrepreneurial competence was very pivotal in the entrepreneurial competency instrument. Furthermore, the reliability of the person was 0.88 implying the consistency of the respondents' answers was good. Besides, the reliability of the item was 0.76. It means that the research instrument items were in the fairly good category. These two values explained that there was good consistency in respondents' responses.

Tabel 2. Entrepreneurship Competency Indicator

No.	Indicators	Sub-Indicators
1.	Committed competence	Being committed to giving full time for business development.
2.		Being committed to providing owned resources for business development.
3.		Fighting power not to let the business fail.
4.		Being committed to building a long-term business
5.	Conceptual Competence	Applying ideas, issues, and observations to business planning.
6.		Integrating ideas, problems, and observations into business objectives
7.		Being daring to take risks in running a business
8.		Supervising business development to minimize risk.
9.		Exploring creative and innovative business ideas and ideas
10.		Observing problems as business opportunities
11.	Competence to Recognize Business Opportunities	Identifying goods or services according to customer desires
12.		Understanding the use of tool/technology service methods to improve business performance
13.		Being responsive to unmet consumer needs
14.		Always looking for business opportunities that have promising prospects
15.	Organizational Competence	Planning business operations
16.		Managing resources in business
17.		Coordinating various tasks within the business
18.	Relational competence	Establishing trust with other people/business partners
19.		Negotiating with other people/business partners
20.		Interacting with other people/business partners
21.		Maintain relationships with business partners
22.	Strategic Competence	Awareness of industry changes and their impact on the company
23.		Prioritizing work that is in line with business objectives
24.		Aligning between actions taken with strategic goals
25.		Always supervising business development in accordance with strategic goals
26.		Evaluating business results against strategic goals
27.	Economic Vulnerability	Being sensitive to the economic situation in the region

Source: Man, et al. (2008)

Table 3. Output Summary Statistics Results

Summary Statistic	Person		Item	
	Total Score	Measure	Total Score	Measure
Mean	119.10	3.07	454.80	0.00
Reliability	0.88		0.76	
Separation	2.72		1.78	
Cronbach Alpha	0.95			

Source: Processed Primary Data (2022)

Given this fact, the quality of the instruments is fairly good to measure entrepreneurial competence (Sumintono, 2014). The grouping of persons and items on the instrument was assumed to be the higher the value, the better the quality of the instrument in terms of all respondents and items (Sumintono, 2016). Identifying the grouping can be noticed in the value of the person and item separation. These results reported that the value of the person separation instrument was 2.72. It means that if you rounded it up, there were three groups of respondents. Furthermore, the item separation value was 1.78. It implies that if you rounded it up, there were two groups of instruments responded to by the respondents. Statistically speaking, Cronbach's alpha of the

overall reliability of the instrument was 0.95. It means that there was a very good interaction between the items and the respondents' responses (Sumintono, 2014).

Item Measure and Wright Map

Testing the item measure and Wright map was carried out to explore and examine the extent to which the item in the instrument was the most difficult to agree with and the easiest to agree with by the respondents. Also, it functions to detect the possibility of the respondents' responses to the item of the instrument. The results of the item measure and wright map can be noticed in the following Table 4 and Figure 1.

Table 4. Item Measure Test Results

Item STATISTICS: MEASURE ORDER													
ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	ZSTD	OUTFIT MNSQ	ZSTD	PTMEASUR-CORR.	AL-EXP.	EXACT OBS%	MATCH EXP%	Item
10	434	100	.97	.20	1.54	2.41	1.80	3.33	.59	.71	67.5	64.8	I10
17	443	100	.59	.21	.92	-.34	.86	-.59	.71	.69	75.3	67.5	I17
24	444	100	.55	.21	.91	-.40	.85	-.67	.70	.68	75.3	67.7	I24
19	446	100	.46	.22	1.18	.94	1.11	.57	.64	.68	62.3	68.3	I19
27	446	100	.46	.22	1.17	.90	1.31	1.35	.63	.68	57.1	68.3	I27
23	447	100	.41	.22	.83	-.85	.81	-.86	.70	.67	68.8	68.5	I23
22	448	100	.36	.22	.73	-1.46	.70	-1.41	.73	.67	70.1	68.7	I22
7	450	100	.27	.22	1.68	3.01	2.27	4.15	.53	.66	67.5	69.0	I7
14	451	100	.22	.22	1.16	.84	1.28	1.16	.63	.66	64.9	69.5	I14
6	452	100	.17	.22	.83	-.85	.78	-.90	.68	.65	76.6	69.6	I6
26	452	100	.17	.22	.71	-1.66	.99	.02	.70	.65	76.6	69.6	I26
12	454	100	.07	.23	1.02	-.17	1.18	.77	.64	.64	68.8	70.0	I12
16	454	100	.07	.23	.63	-2.22	.55	-2.12	.73	.64	84.4	70.0	I16
1	455	100	.02	.23	1.21	1.10	1.81	2.72	.55	.64	58.4	70.1	I1
11	455	100	.02	.23	1.16	.88	1.04	.23	.62	.64	68.8	70.1	I11
25	455	100	.02	.23	.80	-1.05	.70	-1.27	.69	.64	72.7	70.1	I25
13	456	100	-.04	.23	1.16	.85	1.03	.22	.61	.63	74.0	70.2	I13
18	456	100	-.04	.23	1.30	1.51	1.18	.76	.60	.63	74.0	70.2	I18
5	457	100	-.09	.23	.79	-1.17	.84	-.58	.66	.63	74.0	70.8	I5
15	458	100	-.14	.23	.64	-2.15	.58	-1.81	.70	.62	75.3	71.0	I15
2	462	100	-.36	.24	.86	-.73	.80	-.67	.63	.60	74.0	71.7	I2
9	462	100	-.36	.24	1.12	-.69	.91	-.22	.60	.60	72.7	71.7	I9
20	462	100	-.36	.24	.97	-.11	.85	-.48	.61	.60	71.4	71.7	I20
8	463	100	-.42	.24	1.04	.26	.81	-.61	.62	.59	76.6	71.9	I8
4	466	100	-.59	.24	.97	-.13	.82	-.52	.60	.57	77.9	72.2	I4
3	473	100	-1.03	.26	.88	-.70	1.67	1.59	.53	.52	75.3	73.3	I3
21	478	100	-1.38	.27	.77	-1.38	.62	-.83	.54	.47	88.3	74.8	I21
MEAN	454.8	100.0	.00	.23	1.00	-.1	1.04	.1			72.2	70.1	
P. SD	9.1	.0	.49	.01	.25	1.3	.41	1.5			6.7	2.0	

Source: Processed Primary Data (2022)



Figure 1. Wright Map

The test results on Wisntep by testing the item measure and wright map were obtained for a total count. The results demonstrated that all items reached 100. It means that no data were lost in the analysis because the respondents were 100 in total. Regarding the analysis of the items selected by the respondents, the results were described in Table 4 and Figure 1. Specifically, the entire item scores displayed <1.0 logit. It was proven that the entrepreneurial competency instrument was considered essential for the development of the business of MSME actors to deal with in the post-pandemic era. The item of the instrument was considered to be the most priority regarding the entrepreneurial competencies of MSME actors.

As an example, the instrument I21 (maintaining relationships with business partners) required the MSME actors to have solid and loyal business partners among suppliers, agents, distributors, wholesalers, small traders, financial institutions, and policymakers to recover stronger and develop faster. On the other

hand, at the personal level, there were respondents (034PA) viewing items I10 and I17 as representing business opportunity competencies and organizational competencies in the post-pandemic period.

First, Fit Order Items (Column)

Analysis of fit order items was a test utilized to notice the suitability of the data with the research model. The results of the fit order item (column) measurements can be shown in the following Table 5.

The test adopted item (column) fit in order with the criteria that instrument items were declared valid if the MNSQ OUTFIT value was in the range $0.5 < MNSQ < 1.5$ (Sumintono, 2016). Hence, three instrument items were found to be unsuitable. They were I7, I1 and I10. The test employed item (column) fit in order with the criteria that instrument items were declared valid if the OUTFIT Z-STANDARD (ZSTD) value was in the range $-2 < ZSTD < + 2$ (Sumintono, 2016).

Table 5. Fit Order Output Item (Column) Results

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S. E.	INFIT		OUTFIT		PTMEASUR-AL		EXACT OBS%	MATCH EXP%	Item	
					MNSQ	ZSTD	MNSQ	ZSTD	CORR.	EXP.				
7	450	100	.27	.22	1.68	3.01	2.27	4.15	A	.53	.66	67.5	69.0	I7
1	455	100	.02	.23	1.21	1.10	1.81	2.72	B	.55	.64	58.4	70.1	I1
10	434	100	.97	.20	1.54	2.41	1.80	3.33	C	.59	.71	67.5	64.8	I10
3	473	100	-1.03	.26	.88	-.70	1.67	1.59	D	.53	.52	75.3	73.3	I3
27	446	100	.46	.22	1.17	.90	1.31	1.35	E	.63	.68	57.1	68.3	I27
18	456	100	-.04	.23	1.30	1.51	1.18	.76	F	.60	.63	74.0	70.2	I18
14	451	100	.22	.22	1.16	.84	1.28	1.16	G	.63	.66	64.9	69.5	I14
12	454	100	.07	.23	1.02	.17	1.18	.77	H	.64	.64	68.8	70.0	I12
19	446	100	.46	.22	1.18	.94	1.11	.57	I	.64	.68	62.3	68.3	I19
11	455	100	.02	.23	1.16	.88	1.04	.23	J	.62	.64	68.8	70.1	I11
13	456	100	-.04	.23	1.16	.85	1.03	.22	K	.61	.63	74.0	70.2	I13
9	462	100	-.36	.24	1.12	.69	.91	-.22	L	.60	.60	72.7	71.7	I9
8	463	100	-.42	.24	1.04	.26	.81	-.61	M	.62	.59	76.6	71.9	I8
26	452	100	.17	.22	.71	-1.66	.99	-.02	N	.70	.65	76.6	69.6	I26
4	466	100	-.59	.24	.97	-.13	.82	-.52	m	.60	.57	77.9	72.2	I4
20	462	100	-.36	.24	.97	-.11	.85	-.48	l	.61	.60	71.4	71.7	I20
17	443	100	.59	.21	.92	-.34	.86	-.59	k	.71	.69	75.3	67.5	I17
24	444	100	.55	.21	.91	-.40	.85	-.67	j	.70	.68	75.3	67.7	I24
2	462	100	-.36	.24	.86	-.73	.80	-.67	i	.63	.60	74.0	71.7	I2
5	457	100	-.09	.23	.79	-1.17	.84	-.58	h	.66	.63	74.0	70.8	I5
6	452	100	.17	.22	.83	-.85	.78	-.90	g	.68	.65	76.6	69.6	I6
23	447	100	.41	.22	.83	-.85	.81	-.86	f	.70	.67	68.8	68.5	I23
25	455	100	.02	.23	.80	-1.05	.70	-1.27	e	.69	.64	72.7	70.1	I25
21	478	100	-1.38	.27	.77	-1.38	.62	-.83	d	.54	.47	88.3	74.8	I21
22	448	100	.36	.22	.73	-1.46	.70	-1.41	c	.73	.67	70.1	68.7	I22
15	458	100	-.14	.23	.64	-2.15	.58	-1.81	b	.70	.62	75.3	71.0	I15
16	454	100	.07	.23	.63	-2.22	.55	-2.12	a	.73	.64	84.4	70.0	I16
MEAN	454.8	100.0	.00	.23	1.00	-.1	1.04	.1				72.2	70.1	
P. SD	9.1	.0	.49	.01	.25	1.3	.41	1.5				6.7	2.0	

Source: Processed Primary Data (2022)

As a result, 4 unsuitable instrument items were found, namely items I7, I1, I10, and I16. The test adopted item (column) fits in order with valid criteria if $0.4 < PtMean Cor < 0.85$ the value of Point Measure Correlation (Pt Mean Corr) with valid criteria if $0.4 < PtMean Cor < 0.85$ (Sumintono, 2016). With this in mind, there are no items that do not match these criteria. Focusing on these 3 validity criteria, it was assumed that the 27 items of entrepreneurial competency instrument in the post-covid-19 era can be used (fit) to measure the variable being measured (entrepreneurship competence) although several items are not included in the OUFIT MNSQ and OUFIT Z-STANDARD criteria (ZSTD).

Second, Testing Items: Dimensionality

This test analysis was carried out to portray the construct validity of the item of the instrument for measuring the entrepreneurial competencies of MSME actors in the Post-Covid-19 pandemic. The results can be viewed in the following Table 6.

The test adopted dimensionality items in Winstep. It utilized the criteria that the instrument construct could measure all respondents if the Raw Variance Explained by Measures value was above 40% for data type Likert's (Sumintono, 2016). Then, it was found that the value was indicated by Raw Variance Explained by measures of 35.7%. Given these facts, the entrepreneurial competency instru-

Table 6. Output Results of Testing Items: Dimensionality

Table of STANDARDIZED RESIDUAL variance in Eigenvalue units = Item information units			
	Eigenvalue	Observed	Expected
Total raw variance in observations	= 41.9893	100.0%	100.0%
Raw variance explained by measures	= 14.9893	35.7%	36.4%
Raw variance explained by persons	= 8.1147	19.3%	19.7%
Raw Variance explained by items	= 6.8746	16.4%	16.7%
Raw unexplained variance (total)	= 27.0000	64.3%	100.0%
Unexplned variance in 1st contrast	= 3.0126	7.2%	11.2%
Unexplned variance in 2nd contrast	= 2.7767	6.6%	10.3%
Unexplned variance in 3rd contrast	= 1.9508	4.6%	7.2%

Source: Processed Primary Data (2022)

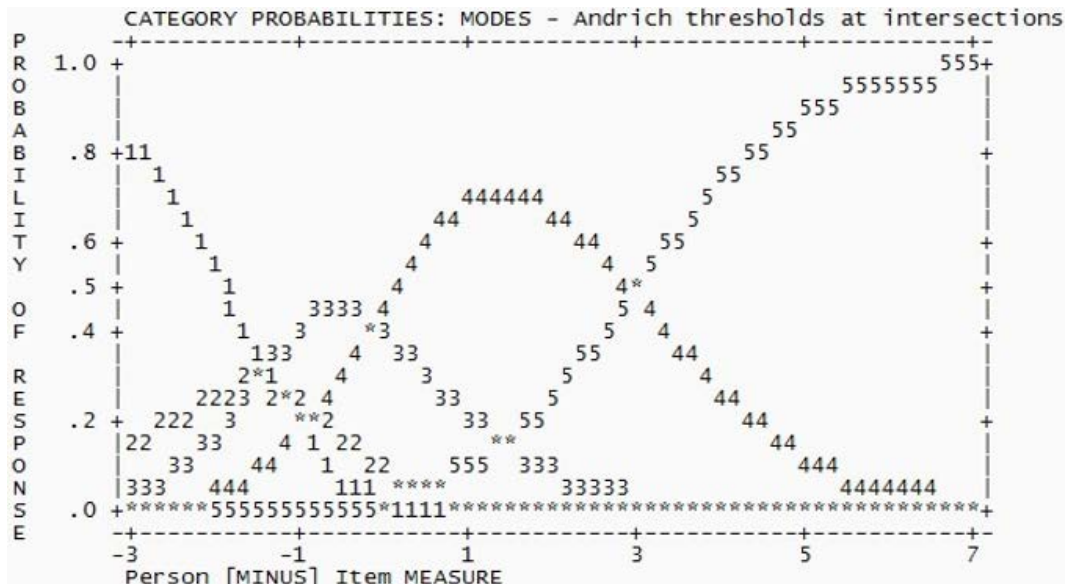


Figure 2. Rating Test Results (Partial-Credit) Scale

ments for MSME actors in the Post-Covid-19 pandemic lacked construct validity. In other words, they were unable to measure a range of variables or measure all respondents.

Third, Test the rating (partial-credit) scale

Rating scale testing was carried out to discover and notice the ability of respondents to answer choices depicted through a curve pattern. The results of the rating scale calculation

analysis can be viewed as follows Figure 2.

The test results on Winstep using the rating (partial-credit) scale as displayed in Figure 3.2 revealed that each rating (1, 2, 3, 4, 5) had a separate peak. The data demonstrated that the probability of each rating was different from the respondents. In other words, the entrepreneurial competency instrument was able to differentiate its scale by MSME actors as respondents.

Table 7. Person Classes DIF Test Results by Gender

DIF class/group specification is: DIF=\$S4w1

Person CLASSES	SUMMARY DIF CHI-SQUARED	D. F.	PROB.	BETWEEN-CLASS/GROUP UNWTD MNSQ	ZSTD	Item Number	Name
2	.0000	1	1.0000	.0049	-1.29	1	I1
2	.0993	1	.7527	.1005	-.66	2	I2
2	.2552	1	.6134	.2594	-.30	3	I3
2	.0320	1	.8581	.0315	-.98	4	I4
2	2.4240	1	.1195	2.5318	1.24	5	I5
2	3.1715	1	.0749	3.3479	1.52	6	I6
2	.5245	1	.4689	.5358	.07	7	I7
2	1.8421	1	.1747	1.9109	.98	8	I8
2	.0993	1	.7527	.1005	-.66	9	I9
2	.4420	1	.5062	.4526	-.02	10	I10
2	.3041	1	.5813	.3105	-.21	11	I11
2	.0060	1	.9382	.0076	-1.23	12	I12
2	1.5039	1	.2201	1.5560	.81	13	I13
2	1.7958	1	.1802	1.8634	.96	14	I14
2	1.0600	1	.3032	1.0884	.53	15	I15
2	.3198	1	.5717	.3270	-.19	16	I16
2	.3437	1	.5577	.3516	-.15	17	I17
2	.0502	1	.8228	.0513	-.86	18	I18
2	1.5389	1	.2148	1.5925	.83	19	I19
2	.0364	1	.8486	.0372	-.94	20	I20
2	2.0998	1	.1473	2.2029	1.11	21	I21
2	.0000	1	1.0000	.0021	-1.38	22	I22
2	.0374	1	.8466	.0369	-.94	23	I23
2	.0804	1	.7768	.0823	-.73	24	I24
2	.0000	1	1.0000	.0049	-1.29	25	I25
2	.0042	1	.9484	.0079	-1.23	26	I26
2	.0151	1	.9020	.0155	-1.12	27	I27

Source: Processed Primary Data (2022)

Fourth, Differential Item Functional (DIF) Test.

Items that can cause a discriminatory test or in favor of certain groups can be observed from assorted aspects, such as gender, ethnicity, culture, region, and others (Osterlind, 1983). To illustrate, the tests were performed to identify fair, unfair, or biased items of an instrument on particular groups of respondents. Specifically, the group of respondents in this study was classified on gender and business scale.

From the data in Table 7, it can be viewed whether or not there were DIF items. If the probability value was <0.05, there was a significant difference between men and women. As a result, it can be explained that there were no biased items from respondents with gender classification. This means that MSME actors as respondents answered the same items. It means that there were no different competencies required and owned by both male and female MSME actors.

From the data in Table 8, it can be noticed whether or not there were DIF items. If the probability value was <0.05, there was a significant difference between the Start-Up and Scale-Up business scales. Thus, it implies

that there were no biased items from respondents with business scale classifications. This means that MSME actors (both Start-Up and Scale-Up business scale respondents) answered the same items (items). In other words, there was no different competency required and owned by both MSME actors (both Start-Up and Scale-Up business scales).

The grouping of respondents was divided into two groups, including the male group (36%), the female group (64%), the start-up group (33%), and the scale-up group (67%). Testing research instruments is essential to conduct (Brinkman, 2009). In this case, this test aims at obtaining a valid instrument (Ghazali, 2016). With this in mind, valid research instruments are a reflection of credible research results (Zohrabi, 2013). Further, a valid instrument means that the tool indicates the ability to measure what is being scrutinized (Rahmawati, 2019). The validity of a research instrument shows miscellaneous terms, such as content, construct, predictive, and statistical validity (Baghaei, 2014). This study examined entrepreneurial competency instruments aimed at SMEs with the Rasch model through Winstep.

Table 8. Person Classes DIF Test Results Based on Business Scale

Person CLASSES	SUMMARY DIF CHI-SQUARED	D. F.	PROB.	BETWEEN-CLASS/GROUP UNWTD MNSQ	ZSTD	Item Number	Name
2	1.1580	1	.2819	1.2084	.61	1	I1
2	.1157	1	.7338	.1222	-.60	2	I2
2	2.3125	1	.1283	2.6160	1.27	3	I3
2	.2277	1	.6332	.2346	-.34	4	I4
2	.8109	1	.3678	.8437	.35	5	I5
2	1.9898	1	.1584	2.1312	1.08	6	I6
2	.3357	1	.5623	.3461	-.16	7	I7
2	1.8782	1	.1705	2.0270	1.03	8	I8
2	2.1563	1	.1420	2.3437	1.17	9	I9
2	.5087	1	.4757	.5258	.06	10	I10
2	.2826	1	.5950	.2916	-.24	11	I11
2	2.2060	1	.1375	2.3419	1.17	12	I12
2	.4253	1	.5143	.4378	-.04	13	I13
2	2.6940	1	.1007	2.8854	1.37	14	I14
2	.1108	1	.7392	.1139	-.62	15	I15
2	.4624	1	.4965	.4779	.01	16	I16
2	.6399	1	.4238	.6630	.20	17	I17
2	.2107	1	.6462	.2168	-.38	18	I18
2	.3023	1	.5825	.3122	-.21	19	I19
2	1.9004	1	.1680	2.0258	1.03	20	I20
2	.1079	1	.7426	.1110	-.63	21	I21
2	3.1991	1	.0737	3.4556	1.56	22	I22
2	.0148	1	.9032	.0213	-1.06	23	I23
2	.0300	1	.8626	.0359	-.95	24	I24
2	.0000	1	1.0000	.0005	-1.48	25	I25
2	.1271	1	.7214	.1331	-.57	26	I26
2	1.1281	1	.2882	1.1771	.59	27	I27

Source: Processed Primary Data (2022)

The instruments are proven to produce 27 recommended instruments. Based on the track record of previous research results, it is proven that the Rasch model can analyze the validity of the instrument from several aspects (Abdaziz et al., 2014). In addition, it helps to address the measurement of items properly (Wu & Adams, 2007). The validity analysis using the Rasch Model can be assumed to be better because of its consistency (Jusoh, 2018). Moreover, Othman (2014) states that the implementation of the Rasch model in testing research instruments can produce validity with various criteria (Othman, 2014). The existence of the Rasch model can be utilized as an alternative to instrument testing (Zile-Tamsen, 2017).

A good research instrument should be both valid and reliable (Mohajan, 2017). In particular, reliability is consistency (Ghazali, 2016). It means that if the instrument is used elsewhere, it will produce relatively the same findings. The use of the Rasch model as seen in this study is capable of demonstrating three reliable aspects, namely person, Cronbach's alpha, and item/item reliability (Van Buuren & Wijnmalen, 2015). The results of the study prove that the adopted entrepreneurial competency instrument indicates good person, Cronbach alpha, and item reliability. The personal reliability coefficient obtained a value of 0.88 and an item of 0.76 showed good and good enough. This means that the entrepreneurial competency instrument has one of the characteristics of a good instrument, namely having a good reliability value (Mohajan, 2017).

All of the entrepreneurial competency instruments distributed to MSME actors in Tasikmalaya City received a positive response. In this case, the 27 statements MSME actors considered that the dimensions of entrepreneurial competence were very essential to have and underlie in the post-pandemic period. One of the instruments was considered to be the most essential related to entrepreneurial competencies dealing with post-pandemic business competition, namely "maintaining relationships with business partners". This motto

is required by the MSME actors to develop their businesses in the post-pandemic era. The supporting capacity of partners in the business circle can become the foundation to survive in difficult situations in the post-pandemic period. Practically speaking, working together and being committed to organizing the business rhythm plays an indispensable role to reach the desired business goals in the post-pandemic period.

From personal level measurements, two respondents viewed business opportunity competence and organizational competence as not their priorities. As an illustration, the MSME sector suffered from a setback in business income during the pandemic. The view of MSMEs seeking business opportunities is not easy. Most MSMEs prioritize personal abilities rather than employing other people. Therefore, it burdens the operational costs of the business. These concrete strategies and steps are perceived by MSME actors as a realistic path that must be carried out to ensure the continuity of their business.

The instrument for measuring the dimensions of entrepreneurial competence is stated to be less construct validity. As a result, the entrepreneurial competency instrument is unable to measure the range of all respondents. It can be claimed that all statements have a positive purpose. The statements were given to respondents aimed at measuring the views of MSME actors regarding the priority scale of entrepreneurial competency dimensions to face the post-pandemic business competition. The results of the Differential Item Functional (DIF) test discovered that each statement given to respondents was not biased and non-discriminatory in both the gender group and the business scale group.

CONCLUSION

This scrutiny determines 27 instrument items from seven dimensions of entrepreneurial competencies for MSME actors in Tasikmalaya City while dealing with the post-pandemic situation. It was tested using

the Rasch model. As a result, they are recommended for use in empirical investigation. The test covers six aspects, namely they covered (1) summary statistics; (2) item measures and wright maps; (3) item (column) fit order; (4) item test (dimensionality); (5) rating (partial-credit) scale test; (6) differential item functional (DIF) test, and probability value.

These investigative results involving the Rasch model analysis reported that most MSME actors recognize that all entrepreneurial competencies are very indispensable. They are considered necessary when dealing with changes in the business climate in the post-pandemic period. There is an instrument item essential for MSME actors to fulfill, namely item (item I21) representing relational competence with a statement (maintaining relationships with business partners).

Basically, in organizing a business, the relationship or partner network is a very important component for the existence of the business in the pre- during, and post-pandemic era. It is presumed that MSME actors build a network of business partners to prevent business failure and minimize the risk of bankruptcy as a result of COVID-19. MSME actors can collaborate with various partners, including policymakers (government), suppliers, agents, distributors, wholesalers, small traders, and customers.

At least with the foundation of business cooperation with partners, MSME actors in Tasikmalaya City, have started to enhance by starting to schedule bazaars and taking part in exhibitions organized by the local governments. Apart from it, MSME actors have started to become aware and move to adapt immediately by promoting their goods and services through digital platforms with the growth of the "Less Physical Contact Economy" paradigm as a result of the pandemic.

At the individual level, there are respondents with a number (034PA) who consider item number (I10 sees problems as business opportunities) and (I17 coordinating various tasks in business) are not important. The respondent is categorized as a woman and has

a Start-Up business scale. One of the MSME actors views conceptual competence as building business opportunities from problems that are not very important to be needed in the post-pandemic era, and judging from the scale of his business the respondent does not need coordination within his business organization, which is part of organizational competence, because his business does not employ employees due to the impact of the pandemic, so that their businesses are run by those closest to them. The limitations of this study cover the absence of involving digital capabilities in measuring entrepreneurial competence. Therefore, future researchers can employ digital competence to measure entrepreneurial competence.

REFERENCES

- Abdaziz, A., Jusoh, M. S., & Amlus, H. (2014). Construct Validity: A Rasch Measurement Model Approaches. *Journal of Applied Science and Agriculture*, 9(September), 7–12.
- Al Mamun, Abdullah, Muniady, Rajennd A/L, Hery, Mohd Asrul Hery, Noorshella, (2018) "Effect of economic vulnerability on entrepreneurial competencies among Malaysian micro-entrepreneurs", *Asia Pacific Journal of Innovation and Entrepreneurship*, <https://doi.org/10.1108/APJIE-03-2018-0013>
- Baghaei, P. (2014). The Rasch Model as a Construct Validation Tool. *Rasch Measurement Transactions*, 22(1).
- Brinkman, W.-P. (2009). *Design of a Questionnaire Instrument*. Handbook of Mobile Technology Research Methods, December, 31–57.
- Catriana, Elsa. (2020). *Terpukul Corona, Ini 5 Keluhan Para Pelaku UMKM*, retrieved from <https://money.kompas.com/read/2020/03/27/190000026/terpukul-corona-ini-5-keluhan-para-pelaku-umkm>.
- Ghazali, N. H. M. (2016). A Reliability and Validity of an Instrument to Evaluate the School-Based Assessment System: A Pilot Study. *International Journal of Evaluation and Research in Education (IJERE)*, 5(2), 148–157.
- Jusoh. (2018). Construct Validity for Measuring

- Entrepreneurial Readiness Among Malaysian Higher Education Students: A Stochastic Measurement Model Approach. *In MATEC Web of Conferences* 150, (Vol. 150, pp. 1–4).
- Dahiya, Kapil., Ali Potia, Resil Das, Denny Praseco, (2020). *Survey: Indonesian consumer sentiment during the coronavirus crisis*, McKinsey & Company Survey, retrieved from <https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/survey-indonesian-consumer-sentiment-during-the-coronavirus-crisis>.
- Kijkasiwat, P., Wellalage, N. H., & Locke, S. (2021). The impact of symbiotic relations on the performance of micro, small and medium enterprises in a small-town context: The perspective of risk and return. *Research in International Business and Finance*, 56 (January), 101388. <https://doi.org/10.1016/j.ribaf.2021.101388>
- Liedholm, C.E. and Mead, D.C. (2013), *Small Enterprises and Economic Development: The Dynamics of Micro and Small Enterprises*, Routledge Studies in Development Economics, Routledge, Abingdon.
- Man, T. W., & Lau, T. (2000). Entrepreneurial competencies of SME owner/managers in the Hong Kong services sector: A qualitative analysis. *Journal of Enterprising Culture*, 8(3), 235–254
- Man, T. W., Lau, T., & Chan, K. F. (2002). The competitiveness of small and medium enterprises: A conceptualization with a focus on entrepreneurial competencies. *Journal of Business Venturing*, 17(2), 123–142.
- Man, T. W. Y., Lau, T., & Snape, E. (2008). Entrepreneurial Competencies and the Performance of Small and Medium Enterprises: An Investigation Through a Framework of Competitiveness. *Journal of Small Business & Entrepreneurship*, 21(3), 257-276. doi:10.1080/08276331.2008.10593424.
- Mohajan, H. K. (2017). Two Criteria for Good Measurements in Research: Validity and Reliability. *Annals of Spiru Haret University*, 17(3), 1–32.
- Othman, N. B. (2014). Assessing Construct Validity and Reliability Of Competitiveness Scale Using Rasch Model Approach. *The 2014 WEI International Academic Conference Proceedings*, 113–120.
- Osterlind, S. J. (1983). *Test item bias*. Beverly Hills, CA: Sage Publication Inc.
- Rahmawati, E. (2019). Developing instruments of teacher's perception of critical thinking in elementary school. *Journal of Education and Learning (EduLearn)*, 13(4), 559–566. <https://doi.org/10.11591/edulearn.v13i4.13232>
- Ratten, V. (2016), “Female entrepreneurship and the role of customer knowledge development, innovation outcome expectations and culture on intentions to start informal business ventures”, *International Journal of Entrepreneurship and Small Business*, Vol. 27 Nos 2/3, pp. 262-272.
- Setiawan, B., Panduwangi, M., & Sumintono, B. (2018). A Rasch analysis of the community's preference for different attributes of Islamic banks in Indonesia. *International Journal of Social Economics*, 45(12), 1647–1662. <https://doi.org/10.1108/IJSE-07-2017-0294>
- Sumintono, B. (2014). *Model Rasch untuk Penelitian Sosial Kuantitatif*. Makalah Kuliah Umum Di Jurusan Statistika, ITS Surabaya, 21 November 2014. <https://doi.org/10.1002/rcm.1134>
- Sumintono, B. (2016). *Aplikasi Pemodelan Rasch pada Asesmen Pendidikan: Implementasi Penilaian Formatif (Assessment For Learning)*. Makalah Dipresentasikan Dalam Kuliah Umum Pada Jurusan Statistika, Institut Teknologi Sepuluh November, Surabaya, 17 Maret 2016., March, 1–19. http://eprints.um.edu.my/15876/1/ITS_rasch_model_asesment_for_learning.pdf
- Undang Undang Republik Indonesia Nomor 20 Tahun 2008 Tentang Usaha Mikro, Kecil dan Menengah.
- Plumeyer, A., Kottemann, P., Böger, D., & Decker, R. (2019). Measuring brand image: a systematic review, practical guidance, and

- future research directions. *Review of Managerial Science*, 13(2), 227–265. <https://doi.org/10.1007/s11846-017-0251-2>
- van Buuren, S., & Wijnmalen, D. J. D. (2015). Measuring Psychosocial Impact of CBRN Incidents by the Rasch Model. *Journal of Applied Measurement*, 16(3), 242–250
- Wu, M., & Adams, R. (2007). *Applying The Rasch Model To Psycho-Social Measurement A Practical Approach*. Educational Measurement Solutions.
- Zainol, Noor Raihani, and Al Mamun, Abdullah, (2018) “Entrepreneurial competency, competitive advantage and performance of informal women micro-entrepreneurs in Kelantan, Malaysia”, *Journal of Enterprising Communities: People and Places in the Global Economy*, <https://doi.org/10.1108/JEC-11-2017-0090>
- Zile-Tamsen, C. Van. (2017). Using Rasch Analysis to Inform Rating Scale. *Research in Higher Education*. <https://doi.org/10.1007/s11162-017-9448-0>
- Zohrabi, M. (2013). Mixed Method Research: Instruments, Validity, Reliability, and Reporting Findings. *Theory and Practice in Language Studies*, 3(2), 254–262. <https://doi.org/10.4304/tpls.3.2.254-262>