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Development of Academic Resilience Instrument for Junior High School Students : A Rasch Model Analysis

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Abstract: This study aims to develop and test the validity and reliability of an academic resilience instrument tailored to the context of Junior High School (SMP) students. The research was conducted using a quantitative method with a cross-sectional design, involving data collection through a 51-item questionnaire. The subjects of this study were 84 junior high school students aged 12-16 from the Yogyakarta region. Data analysis was carried out using the Rasch Model method with Winstep version 3.73. The analysis results identified 47 items that met the criteria, with a Cronbach's alpha value of 0.93, which falls into the good category. The person reliability value of 0.92 is considered excellent, while the item reliability value of 0.96 is categorized as outstanding. The analysis results indicate that the developed academic resilience instrument possesses good psychometric characteristics, including high validity and reliability. This instrument can serve as an effective tool for educators and counselors to identify student needs, design appropriate intervention programs, and enhance the quality of guidance and counseling at the junior high school level.

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Introduction

In an increasingly complex and dynamic educational era, academic resilience can be a key factor influencing students' performance and well-being at the Junior High School (SMP) level (Afiffah, 2023; Faturrohmah & Sagita, 2022; Irawan et al., 2022; Ramadanti & Sofah, 2022; Wahidah, 2019). Academic resilience reflects students' ability to face, overcome, and adapt to the academic challenges they encounter at school (Cassidy, 2016; Martin & Marsh, 2006; Morales, 2008; Tudor & Spray, 2017). This is crucial because the learning process is not always smooth, and the ability to bounce back after facing failure or difficulty becomes a key determinant of academic success.

Resilience encompasses an individual's ability to recover from challenges, overcome failures, and manage stress effectively across various life situations. It provides the strength needed to grow and navigate daily life. The concept initially emerged in academia, referred to as academic resilience. According to Martin and Marsh (2006), academic resilience describes students' abilities to cope with setbacks and pressures in an educational context. Morales (2008) further defines it as the process by which individuals achieve academic success despite obstacles that might cause others with similar backgrounds to fail. This aligns with Cassidy (2016) perspective that emphasizes enhancing educational success even in adversity. In conclusion, academic resilience refers to an individual's capacity to adapt and recover from stress and negative emotional experiences within the academic process. This ability empowers individuals to achieve academic success that surpasses expectations, even after

encountering challenging events or situations. Additionally, it aids in personal development, helping individuals reach their full potential and become a better version of themselves.

Students exhibiting high academic resilience possess the capability to navigate difficult situations, adapt effectively to the pressures of learning, and recover from setbacks. Finn and Rock (1997) characterize these students as hardworking individuals who are less likely to skip classes and generally encounter fewer problems in their studies. Additionally, Wolin and Wolin (2010) identify other traits associated with academic resilience, including insight, independence, creativity, a sense of humor, and initiative. High academic resilience reflects strong adaptability, self-confidence, and the ability to transform challenges into opportunities for growth (Dewinda et al., 2024; Hendriani, 2018; Irawan et al., 2022). In the secondary education context, students with high academic resilience are invaluable assets; they not only overcome challenges but also gain positive insights from their experiences. Their resilience can inspire their peers, encouraging others to cultivate similar skills and contributing positively to the overall learning environment.

On the other hand, students with low academic resilience are more prone to experiencing stress and often exhibit lower academic performance (Ramadanti & Sofah, 2022). These students tend to view academic difficulties as heavy burdens, which can lead to feelings of frustration and despair when confronted with challenges (Triningtyas & Saputra, 2021). It's important to understand that low academic resilience does not signify weakness or lack of intelligence; rather, it usually relates to difficulties in managing stress and developing effective coping strategies. Academic resilience highlights students' strengths in overcoming learning obstacles through positive cognitive, emotional, and affective responses. By fostering academic resilience, students can maximize their potential and achieve satisfactory results, even when faced with academic hurdles. Therefore, providing support and guidance to students with low academic resilience is essential to help them develop effective coping strategies and build their resilience skills.

Several researchers have developed instruments to measure academic resilience. Kumalasari et al., (2020) adapted The Academic Resilience Scale (ARS-30) into an Indonesian version and produced an instrument that can be used to measure the academic resilience of university students. Hardiansyah et al. (2020) developed an academic resilience measurement tool based on four aspects: perseverance, motivation to solve problems, intelligence in facing difficulties, and self-control, producing 27 items with a Cronbach's alpha value of 0.784. Afriyeni & Rahayuningsih (2020) developed a measurement tool focusing on academic resilience and its relationship with online learning satisfaction among university students during the COVID-19 pandemic, with 41 items and a Cronbach's alpha value of 0.971. Lianawati & Puspitasari (2023) developed an academic resilience scale for junior and senior high school studentsbased on Bernard’s (2004) theory with six components: social skills, empathy, problem-solving, self-efficacy, self-awareness, and aspiration goals. It is interesting to see how researchers approach the measurement of academic resilience using different concepts and theories.

However, it is clear that the instrument developed in this study differs from the research conducted by Kumalasari et al. (2020) and Afriyeni & Rahayuningsih (2020) in terms of focus and specific context, while the differences with Hardiansyah et al. (2020) and Lianawati & Puspitasari (2023) lie in the academic resilience concepts used. The instrument developed in this study is based on Cassidy’s academic resilience theory, which includes three aspects: Perseverance, Reflecting and Adaptive Help-seeking, and Negative Affect and Emotional Response. Notably, Cassidy's theory was specifically developed to measure academic resilience in the school context (Kumalasari et al., 2020), making it highly relevant

for measuring the academic resilience of students in the formal education setting. Therefore, this instrument is expected to provide a comprehensive picture of students' ability to face academic challenges, including how they persevere, seek help adaptively, and manage negative emotional responses during the learning process.

The development of a valid and reliable instrument to measure academic resilience is crucial for understanding the level of resilience among students and helping them achieve optimal development. Such an instrument can be a valuable tool for educators and counselors to support the holistic development of students. It is important to note that each educational environment has its own unique context, and academic resilience can be influenced by various factors, such as the school environment, social support, and individual student characteristics (Coronado-Hijón, 2017; Hartuti & Mangunsong, 2009; Rojas Flórez, 2015). Therefore, the developed instrument should be sensitive to these contexts and capable of measuring the dimensions of academic resilience comprehensively. The validity and reliability of the instrument will be tested in this study using the Rasch model approach, which is widely used in educational research and has been proven effective in validating and refining measurement instruments (Asrijanty, 2014; Sumintono & Widhiarso, 2015).

This study aims to develop and test the validity and reliability of an academic resilience instrument specifically for junior high school students. It is hoped that with a valid and reliable instrument, educators, especially school counselors, will better understand students' needs and design appropriate programs or interventions to support them. Additionally, this research is expected to contribute to the development of educational policies that are more responsive to academic resilience issues and raise awareness of the importance of psychological aspects in the learning process at the junior high school level.

Research Method

This study uses a quantitative method following the standard stages of data collection, analysis, and interpretation, as outlined by Creswell & Creswell (2017). The research design is cross-sectional, with data collected through a 51-item questionnaire. Each item in the questionnaire uses a four-point Likert scale, ranging from 1 (strongly disagree) to 4 (strongly agree). Data collection was conducted using an online survey with students aged 12-16 at a junior high school (SMP) in Yogyakarta City. The study's respondents consisted of 84 students, distributed as follows:.

Table 1. Respondent Overview

No	Class	Gender		Total
		Male	Female	
1.	7D	10	16	26
2.	8B	15	15	30
3.	9A	13	15	28
	Total			**84**

The academic resilience instrument developed in this study is based on the academic resilience theory derived from Cassidy's (2016) work, which describes academic resilience as an individual's ability to enhance their success in education, even in difficult situations. According to Cassidy (2016), there are three aspects used to measure the level of academic resilience in students: Perseverance, Reflecting and Adaptive Help-seeking, and Negative Affect and Emotional Response. 1) Perseverance refers to the students' determination to face challenges, reflecting their ability to work hard and not give up easily. 2) Reflecting and Adaptive Help-seeking refers to the cognitive responses of students when encountering academic difficulties. This aspect is characterized by an individual's ability to reflect on their

strengths and weaknesses, seek appropriate help and support when needed, and monitor their efforts and progress. 3) Negative Affect and Emotional Response partain to students' emotional reactions when dealing with academic difficulties, with an emphasis on avoiding negative emotional responses.

In this study, the Rasch model was used for data analysis, conducted using the Winstep 3.73 software. The first step in the analysis is to assess the unidimensionality of the instrument. This is done by examining the Raw Variance Prepared by Measures and Unexplained Variance values, which are obtained from Output Table 23 in the Winstep application. Next, the analysis focuses on the individual items to determine the difficulty level and appropriateness of each item, which is analyzed using Output Table 13. This analysis helps assess whether participants understand the scale options from 1 to 4. The Rating Scale Diagnostic, based on the study by Ramdani, et al., (Nadhirah et al., 2022)), is then conducted to evaluate participants' understanding of how to respond to the instrument on a 1 to 4 scale. This diagnostic is analyzed using Output Table 3.2. Finally, the analysis focuses on the instrument itself to assess the participants' abilities and fit, as well as perform item analysis. This is done using Output Table 3.1. Overall, this rigorous data analysis technique ensures that the research findings are accurate, reliable, and informative.

Results and Discussion

Unidimensionality Analysis

In this study, the instrument was analyzed to identify the attributes or dimensions it measures. This analysis was conducted using the Winstep 3.73 software. The analysis focused on the raw variance explained by measure and unexplained variance in the 1st to 5th contrast to determine the unidimensionality of the instrument. The results of this analysis can be used to assess whether the instrument measures one attribute or multiple attributes. Menurut Boone et al., (2014) and Boone & Staver (2020), an instrument can be considered unidimensional if the raw variance explained by measures is ≥ 20%, with the following general estimation criteria: 1) Fair (20-40%); 2) Good (40-60%); and 3) Very Good (> 60%). Additionally, the unexplained variance in the 1st to 5th residuals must each be less than 15% for each of the first five residuals. Based on the processing in Winstep, Table 1 presents the results of the unidimensionality analysis, confirming that the instrument measures a single attribute with a very high level of unidimensionality. This analysis is crucial to ensure that the instrument is appropriate for measuring the intended construct and that the results obtained are valid and reliable.

Table 2. Results of Unidimensionality Analysis

No	Description	Value 1	Value 2	Value 3	Value 4
1	Total raw variance in observations	87.8	100.0%		100.0%
2	Raw variance explained by measures	36.8	41.9%		41.9%
3	Raw variance explained by persons	11.2	12.8%		12.8%
4	Raw Variance explained by items	25.6	29.1%		29.1%
5	Raw unexplained variance (total)	51.0	58.1%	100.0%	58.1%
6	Unexplained variance in 1st contrast	7.9	9.0%	15.5%	
7	Unexplained variance in 2an contrast	3.6	4.1%	7.1%	
8	Unexplained variance in 3rd contrast	3.2	3.7%	6.3%	
9	Unexplained variance in 4th contrast	2.7	3.1%	5.3%	
10	Unexplained variance in 5th contrast	2.5	2.9%	4.9%	

The results shown in Table 2 indicate that the variance explained by measures is 41.90%, which means it falls into the "good" category. Meanwhile, the unexplained variance

in the 1st to 5th residuals are as follows: 1) Unexplained variance in 1st contrast 9.00%; 2) Unexplained variance in 2nd contrast 4.10%; 3) Unexplained variance in 3rd contrast 3.70%; 4) Unexplained variance in 4th contrast 3.10%; dan 5) Unexplained variance in 5th contrast 4.90%.

Item Analysis

The aspects of the instrument's items were analyzed to determine the difficulty level, item fit, and item bias. This analysis was conducted using Winstep 3.73 software with the help of Output Table 13: Item Measure Order. Table 2 presents the results of the analysis, showing the difficulty level (item measure) and the item fit of each item in the instrument. The item measure indicates the difficulty level of each item, with higher values indicating greater difficulty. The item fit measures how well each item fits the Rasch model, with values between 0.5 and 1.5 indicating good fit. In addition, item bias was examined to ensure that the instrument is not biased toward any particular group or demographic. This aspect is crucial to ensure that the instrument is appropriate for measuring the intended construct and that the results obtained are valid and reliable. The item analysis processed by Winstep provides valuable insights into the performance of each item and helps identify any issues that need to be addressed to improve the overall quality of the instrument.

1) Item Difficulty Level.

The analysis in Table 3 shows a standard deviation (SD) value of 0.97. Combined with the average logit value, this value helps categorize the difficulty level of the items into four categories. Items with a difficulty level greater than the standard deviation can be classified as "very difficult," those with difficulty levels between 0.0 logit and 1 SD can be classified as "difficult," those with difficulty levels between 0.0 logit and -1 SD can be classified as "easy," and those with difficulty levels less than -1 SD can be classified as "very easy." Therefore, the boundary values for each category are as follows: 1) Very Difficult (>0,97); 2) Difficult (0,0 - 0,97); 3) Easy (0,0 -(-0,97)); and 4) Very Easy (< (-0.97)). This categorization helps provide a clear understanding of the difficulty level of each item in the instrument and can assist in interpreting the results. Overall, this analysis provides valuable insights into the performance of the instrument and helps ensure that the results obtained are reliable and valid.

Table 3. Item Difficulty Level Categories

Category	Item Numbers	Total
Very Difficult	42, 43, 41, 27 dan 50	5
Difficult	23, 3, 28, 17, 11, 20, 16, 51, 31, 32, 21, 44, 10, 8, dan 6	15
Easy	49, 40, 35, 38, 19, 29, 18, 4, 7, 45, 48, 9, 13, 34, 37, 39, 14, 22, 25, 15, 33, 23, 30, 5, 12, dan 26	26
Very Easy	36, 2, 47, 1, dan 46	5
Total		**51**

Based on the analysis results in Table 3 regarding the item difficulty levels, the difficulty of the academic resilience instrument items can be categorized as follows: 1) Very Difficult: This category includes five items, which are item numbers 42, 43, 41, 27, and 50. 2) Difficult: This category includes sixteen items, which are item numbers 23, 3, 28, 17, 11, 20, 16, 51, 31, 32, 21, 44, 10, 8, and 6. 3) Easy: This category includes twenty-six items, which are item numbers 49, 40, 35, 38, 19, 29, 18, 4, 7, 45, 48, 9, 13, 34, 37, 39, 14, 22, 25, 15, 33, 23, 30, 5, 12, and 26. 4) Very Easy : This category includes five items, which are item numbers 36, 2, 47, 1, and 46.

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2) Item Fit Level

The level of item fit interprets whether the item functions normally to measure academic resilience, ensuring there is no misconception among individuals regarding the items assessed. This analysis is based on data processing using Winstep in Table 10, the item fit order. According to Table 10, the item fit can be examined using the columns OUTFIT MNSQ, OUTFIT ZSTD, and POINT MEASURE CORRELATION. The criteria for assessing item fit or misfit are as follows: OUTFIT MNSQ values range from 0.5 to 1.4, with values closer to 1 indicating better fit. OUTFIT ZSTD values range from -2.0 to +1.9, with values closer to 0 indicating better fit. POINT MEASURE CORRELATION values range from 0.4 to 0.8. If an item meets any of these three criteria, it can be considered fit. However, if an item fails to meet all three criteria, it can be concluded that the item is a misfit and needs to be revised or replaced (Sumintono & Widhiarso, 2015). The results of the item fit level can be seen in Table 4.

Based on Table 4, the results for the item fit assessment are as follows: 1). Criterion 1 (0.5 < MNSQ < 1.5): Twelve items were identified as misfit or not meeting the criteria. These items are: item numbers 47, 46, 43, 42, 51, 27, 10, 36, 9, 12, 26, and 2 (highlighted in green). 2). Criterion 2 (-0.2 < ZSTD < +2.0): Twenty items were identified as misfit or not meeting the criteria. These items are: item numbers 47, 46, 43, 42, 51, 27, 10, 38, 24, 8, 39, 15, 14, 4, 22, 36, 9, 12, 26, and 2 (highlighted in blue). 3). Criterion 3 (0.4 < Point Measure Correlation < 0.85): Ten items were identified as misfit or not meeting the criteria. These items are: item numbers 47, 46, 51, 27, 10, 24, 49, 50, 30, and 41 (highlighted in gray). Finally, the items that did not meet all three criteria are items 47, 51, 27, and 10 (highlighted in red). Therefore, four items were discarded from the academic resilience scale.

Table 4. Item Fit Order

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
47	274	84	-1.14	.20	2.99	8.0	3.21	8.3	A .05	.44	48.8	66.7	RA47
46	281	84	-1.43	.20	2.60	7.3	2.88	7.4	B .12	.42	51.2	64.8	RA46
43	130	84	3.11	.19	2.37	6.2	2.09	4.8	C .59	.59	63.1	63.1	RA43
42	129	84	3.15	.19	2.23	5.6	2.02	4.5	D .60	.59	61.9	63.9	RA42
51	224	84	.56	.17	1.79	4.3	2.03	5.3	E .22	.49	42.9	54.9	RA51
27	180	84	1.69	.16	1.62	4.1	1.84	5.2	F -.04	.54	45.2	50.4	RA27
10	232	84	.33	.17	1.26	1.6	1.56	3.1	G .07	.48	51.2	57.3	RA10
38	246	84	-.11	.18	1.47	2.5	1.50	2.6	H .50	.47	59.5	63.5	RA38
24	212	84	.88	.16	1.19	1.3	1.40	2.5	I .32	.50	53.6	50.6	RA24
8	237	84	.18	.18	1.33	1.9	1.37	2.1	J .58	.48	53.6	59.4	RA8
1	281	84	-1.43	.20	.91	-.5	1.33	1.9	K .41	.42	75.0	64.8	RA1
49	243	84	-.01	.18	1.11	.7	1.23	1.3	L .31	.48	64.3	62.2	RA49
35	246	84	-.11	.18	1.15	.9	1.18	1.0	M .45	.47	64.3	63.5	RA35
50	208	84	.99	.16	1.04	.3	1.15	1.1	N .38	.50	48.8	49.5	RA50
20	220	84	.67	.17	1.04	.3	1.08	.6	O .48	.49	52.4	52.2	RA20
6	242	84	.02	.18	1.03	.2	1.05	.4	P .51	.48	60.7	61.9	RA6
40	244	84	-.05	.18	1.05	.4	1.05	.3	Q .44	.48	54.8	62.8	RA40
11	219	84	.70	.17	1.00	.0	1.05	.4	R .55	.49	59.5	52.2	RA11
31	226	84	.50	.17	.99	.0	1.03	.2	S .52	.49	64.3	55.5	RA31
17	218	84	.72	.16	.91	-.6	.99	.0	T .63	.50	59.5	52.1	RA17
32	228	84	.44	.17	.92	-.5	.96	-.2	U .59	.49	66.7	56.0	RA32
48	258	84	-.53	.19	.79	-1.2	.96	-.2	V .46	.46	78.6	66.7	RA48
23	264	84	-.75	.19	.90	-.5	.93	-.3	W .51	.45	77.4	67.3	RA23
21	229	84	.41	.17	.82	-1.2	.91	-.5	X .55	.49	69.0	56.2	RA21
16	224	84	.56	.17	.86	-.9	.91	-.6	Y .61	.49	59.5	54.9	RA16
34	260	84	-.60	.19	.79	-1.2	.90	-.5	Z .45	.46	73.8	66.9	RA34
30	264	84	-.75	.19	.83	-1.0	.90	-.5	y .32	.45	77.4	67.3	RA30
44	229	84	.41	.17	.90	-.6	.90	-.6	x .56	.49	61.9	56.2	RA44
28	216	84	.78	.16	.76	-1.8	.88	-.8	w .60	.50	70.2	51.5	RA28
29	248	84	-.18	.18	.86	-.8	.88	-.7	v .54	.47	75.0	64.3	RA29
41	171	84	1.91	.16	.74	-2.2	.87	-1.0	u .35	.55	71.4	50.0	RA41
7	251	84	-.28	.19	.86	-.8	.84	-.9	t .57	.47	64.3	65.0	RA7
45	254	84	-.39	.19	.78	-1.3	.84	-.9	s .54	.47	82.1	65.7	RA45
18	249	84	-.21	.18	.79	-1.3	.83	-1.0	r .50	.47	67.9	64.5	RA18
13	260	84	-.60	.19	.76	-1.4	.77	-1.3	q .58	.46	73.8	66.9	RA13
3	215	84	.80	.16	.71	-2.2	.77	-1.7	p .57	.50	67.9	51.5	RA3
15	263	84	-.72	.19	.76	-1.4	.72	-1.7	o .60	.46	71.4	67.2	RA15
19	247	84	-.15	.18	.74	-1.6	.74	-1.6	n .58	.47	71.4	63.8	RA19
33	263	84	-.72	.19	.73	-1.6	.69	-1.9	m .66	.46	72.6	67.2	RA33
37	260	84	-.60	.19	.72	-1.7	.71	-1.8	l .54	.46	76.2	66.9	RA37
25	261	84	-.64	.19	.69	-1.9	.70	-1.9	k .58	.46	76.2	67.1	RA25
39	260	84	-.60	.19	.60	-2.6	.59	-2.7	j .65	.46	77.4	66.9	RA39
5	266	84	-.83	.20	.59	-2.7	.59	-2.7	i .60	.45	81.0	67.5	RA5
14	261	84	-.64	.19	.55	-3.0	.56	-2.9	h .57	.46	75.0	67.1	RA14
4	250	84	-.25	.19	.54	-3.1	.55	-3.1	g .66	.47	70.2	64.8	RA4
22	261	84	-.64	.19	.52	-3.2	.52	-3.3	f .64	.46	79.8	67.1	RA22
36	271	84	-1.02	.20	.48	-3.8	.48	-3.7	e .64	.44	82.1	67.2	RA36
9	260	84	-.60	.19	.41	-4.3	.46	-3.8	d .63	.46	82.1	66.9	RA9
12	266	84	-.83	.20	.44	-4.1	.46	-3.9	c .64	.45	83.3	67.5	RA12
26	268	84	-.91	.20	.41	-4.4	.41	-4.4	b .71	.45	83.3	67.5	RA26
2	272	84	-1.06	.20	.41	-4.5	.40	-4.5	a .69	.44	88.1	67.0	RA2
MEAN	240.0	84.0	.00	.18	.99	-.4	1.05	-.1			67.5	61.6	
S.D.	32.4	.0	.97	.01	.54	2.8	.57	2.8			11.2	6.1	

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Analysis of Rating Scale Diagnosis

The rating scale analysis is an important aspect of the research, as it helps determine whether participants understand the differences between answer alternatives. This analysis was conducted using Winstep 3.73 software, with assistance from Output Table 3.2. The analysis focuses on the academic resilience variables 1, 2, 3, and 4, assessing whether the observed average values and Andrich thresholds increase in accordance with the participants' understanding. Table 4 presents the results of the analysis, showing the differences in answers as understood by the participants. The observed average values and Andrich thresholds increase in line with the participants' understanding, indicating that the instrument is suitable for measuring the intended construct and that the results obtained are both valid and reliable. This analysis is crucial to ensure that participants understand the differences between the answer choices, and that the results accurately reflect their level of academic resilience.

Table 5. Rating Scale Diagnosis Analysis Results

Category Score	Observed COUNT	%	Obsvd Avrge	Sample Expect	Infit Mnsq	Outfit Mnsq	Andrich Threshold	Category Measure
1	266	6	-1.15	-1.45	1.37	1.78	NONE	(-3.16)
2	882	21	-.20	-.08	.85	.86	-1.90	-1.27
3	2333	54	.83	.84	.76	.73	-.58	1.00
4	803	19	2.20	2.13	1.03	1.02	2.48	(3.62)

Instrument Analysis.

In this aspect, the analysis was conducted using the Winstep 3.73 application with Output Table 3.1 Summary Statistic. This analysis will present two tables: Table 6 Summary Person and Table 7 Summary Item, as follows.

Table 6. Summary Person

	Total Score	Count	Measure	Model Error	Infit MNSQ	Infit ZSTD	Outfit MNSQ	Outfit ZSTD
MEAN	145.7	51.0	0.75	0.24	1.07	-0.5	1.05	-0.5
S.D.	16.9	0.0	1.01	0.03	0.94	3.7	0.93	3.7
MAX.	195.0	51.0	4.34	0.39	4.91	9.9	4.88	9.9
MIN.	198.0	51.0	-1.09	0.21	0.25	-5.2	0.23	-5.3
REAL	RMSE 0.28	TRUE SD	0.96	SEPARATION 3.39	PERSON RELIABILITY 0.92			
MODEL	RMSE 0.24	TRUE SD	0.98	SEPARATION 4.12	PERSON RELIABILITY 0.94			
S.E. OF	PERSON MEAN 0.11							

Person RAW SCORE-TO-MEASURE CORRELATION = 0,99

CORNBACH ALPHA (KR-20) Person RAW SCORE "TEST" RELIABILITY = 0,93

Table7. Summary Item

	Total Score	Count	Measure	Model Error	Infit MNSQ	Infit ZSTD	Outfit MNSQ	Outfit ZSTD
MEAN	240.0	84.0	0.00	0.18	0.99	-0.4	1.05	-0.1
S.D.	32.4	0.0	0.97	0.01	0.54	2.8	0.57	2.8
MAX.	281.0	84.0	3.15	0.20	2.99	8.0	3.21	8.3
MIN.	129.0	84.0	-1.43	0.16	0.41	-4.5	0.40	-4.5
REAL	RMSE 0.20	TRUE SD	0.95	SEPARATION 4.73	PERSON RELIABILITY 0.96			
MODEL	RMSE 0.18	TRUE SD	0.95	SEPARATION 5.19	PERSON RELIABILITY 0.96			
S.E. OF	PERSON MEAN 0.14							

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Table 6 presents the results of the instrument analysis to determine the level of ability and fit of the participants, as well as the item analysis. The person-measure column shows the average score of all participants on each item of the academic resilience instrument. The results indicate that the participants' abilities are higher than the difficulty level of the items, as evidenced by the average person measure being higher than the average item difficulty. This means that the participants were able to answer the questions with ease, and the instrument is suitable for measuring their academic resilience level. The instrument analysis and participants' ability also help identify any issues or areas that need improvement, which can be addressed to enhance the overall quality of the instrument.

Reliability is a crucial aspect of any instrument used in research, as it helps ensure that the results obtained are consistent and accurate. The Cronbach Alpha reliability coefficient is one way to assess the reliability of an instrument and is classified into four categories: excellent (0.80 to 1.00), good (0.70 to 0.80), acceptable (0.60 to 0.70), and poor (0.00 to 0.60) (Boone et al., 2014; Sumintono & Widhiarso, 2015). In this study, the Cronbach Alpha value, which indicates the interaction between persons and items overall, is 0.93, which falls into the excellent category. This indicates that the instrument is reliable and consistent in measuring the intended construct. Additionally, the person reliability value of 0.92 also falls into the excellent category, indicating that the respondents' answers are consistent and dependable. The item reliability value of 0.96 is considered exceptional and indicates the high quality of the items on the instrument. Overall, these results provide evidence that the instrument used in this study is reliable, valid, and appropriate for measuring the participants' academic resilience level.

In addition to the reliability values, other data that can be seen in Tables 6 and 7 include the INFIT MNSQ and OUTFIT MNSQ values. INFIT MNSQ and OUTFIT MNSQ are measures of the fit between participants' abilities and the difficulty level of the items on the instrument. Generally, a value of 1 is considered ideal because it indicates a good fit between the participants' abilities and the difficulty of the items. In Table 6, the average INFIT MNSQ and OUTFIT MNSQ values for the summary person are 1.07 and 1.05, respectively. In Table 7, the average INFIT MNSQ and OUTFIT MNSQ values for the summary item are 0.99 and 1.05, respectively. These results indicate that the instrument has a good fit between the participants' abilities and the difficulty of the items, as the values are close to the ideal value of 1. Overall, the analysis of the INFIT MNSQ and OUTFIT MNSQ values provides valuable insights into the instrument's performance and helps ensure that the results obtained are accurate, reliable, and informative.

In addition to the INFIT MNSQ and OUTFIT MNSQ values, Tables 6 and 7 also present the INFIT ZSTD and OUTFIT ZSTD values. INFIT ZSTD and OUTFIT ZSTD are standard measures of the fit between participants' abilities and the difficulty level of the items on the instrument. Generally, a value of 0 is considered ideal because it indicates a perfect fit between the participants' abilities and the difficulty of the items. In Table 6, the INFIT ZSTD and OUTFIT ZSTD values for the summary person are -0.5 and -0.5, respectively. In Table 7, the INFIT ZSTD and OUTFIT ZSTD values for the summary item are -0.4 and -0.1, respectively. These results suggest that the quality of both the person and the items is good, as the values are close to the ideal value of 0. Overall, the analysis of the INFIT ZSTD and OUTFIT ZSTD values provides further evidence that the instrument is appropriate for measuring what it is intended to measure.

The final analysis of the instrument concerns the separation of persons and items. Person separation indicates how well the items of the academic resilience instrument are distributed across the range of ability levels. The higher the person separation, the better the

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instrument is considered, as it allows for the measurement of individuals with both high and low ability levels. On the other hand, item separation shows how widely the sample is distributed across the linear interval scale, with higher item separation indicating better measurement. This index is useful in identifying the significance of the construct being measured and helps ensure that the instrument is suitable for measuring the intended construct.

Based on Tables 6 and 7, the person separation value is 3.39, and the item separation value is 4.73. Higher separation values indicate better overall quality for both the person and the instrument. The separation values can be more accurately calculated using the formula: H = {(4 × separation) + 1} / 3. Using this formula, the person separation value of 4.85 is rounded to 5, and the item separation value of 6.64 is rounded to 7. Therefore, it can be concluded that this study has a diversity of abilities that can be categorized into 5 groups. Meanwhile, the difficulty levels of the items are divided into 7 groups, ranging from easy to very difficult.

Discussion

The study conducted by Cheng et al. (2011) explains that the results of undimensionality are useful in testing whether the items align with the underlying construct. The results of the undimensionality analysis indicate that the variance explained by measures is 41.90%, which falls into the "good" category. Meanwhile, the unexplained variance in the 1st to 5th contrasts, with values below 15%, indicates that the instrument is reliable in measuring every aspect of academic resilience. Muslihin et al. (2022) further explain that this result demonstrates the instrument's ability to accurately measure academic resilience. The study by Linacre (Yusuf et al., 2021) also states that when the unexplained variance is below 15%, the undimensionality test results guarantee the construct validity of the instrument, confirming that it measures what it is intended to measure.

In addition to measuring the difficulty level of individual items, the results of the instrument are also related to item analysis, which determines the suitability of the items within the instrument. As stated by (Suryani, 2018) items that are suitable show consistency with the expected outcomes, while items that are not suitable indicate misunderstandings among participants regarding the item. The item suitability analysis of the academic resilience instrument shows that 47 items meet the criteria and can be considered appropriate, while 4 items do not meet the criteria and are considered unsuitable. Therefore, out of 51 items, only 47 are deemed suitable.

Moreover, the Cronbach Alpha value for the academic resilience instrument, which represents the interaction between persons and items overall, is 0.93, indicating very good reliability. Additionally, the person reliability value of 0.92, which reflects the consistency of respondent answers, also falls within the very good category. The item reliability value of 0.96 indicates that the quality of the items in the instrument is exceptional. Based on these results, the construct of the academic resilience instrument is valid and reliable and can be used for purposes such as program development and needs assessment.

Based on the analysis results, 47 items meet the established criteria, with a Cronbach's alpha value of 0.93. This indicates that the instrument falls into the good category. Additionally, the measured person reliability value is 0.92, which also falls within the good category, while the item reliability recorded an impressive value of 0.96, which can be considered exceptional. These results confirm that the instrument developed to measure academic resilience has excellent psychometric characteristics, marked by high validity and reliability. This suggests that the instrument can be effectively used in both research and practice within the field of education.

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The implications of this research in the context of guidance and counseling are as follows. First, this instrument can be used as a tool for conducting needs assessment in schools or educational institutions. By understanding students' academic resilience levels in depth, counselors can identify areas where specific guidance and counseling support are needed. Second, a better understanding of students' academic resilience allows counselors to design more specific and effective counseling programs. In this way, counselors can develop interventions that are better suited to students' needs, enhancing their ability to overcome academic challenges, which in turn can improve their academic performance.

Conclusion

The conclusion drawn from this study is that the analysis resulted in 47 items that meet the criteria, with a Cronbach's alpha value of 0.93, which is considered excellent. The person reliability value of 0.92 falls into the excellent category, and the item reliability value of 0.96 is considered exceptional. The analysis indicates that the developed academic resilience instrument has good psychometric characteristics, including high validity and reliability. This instrument can serve as an effective tool for educators and counselors to identify students' needs, design appropriate intervention programs, and enhance the quality of guidance and counseling at the junior high school level.

Recommendation

Future research can focus on developing instruments that encompass broader and deeper aspects of academic resilience, thereby providing a more holistic understanding of students' academic resilience. Additionally, future studies could explore new dimensions of academic resilience that may not be covered in existing instruments. For example, research might focus on measuring academic resilience in specific contexts, such as during a pandemic or significant school transitions, and it will be important to assess the validity and reliability of the academic resilience instrument in different contexts, including various educational levels and cultures. Future studies could also explore the generalizability of this instrument across different student populations and educational settings.

In supporting the development of students' academic resilience, guidance and counseling teachers can use this instrument to assess their students' levels of academic resilience. Additionally, it is crucial for guidance and counseling teachers to undergo training focused on academic resilience in order to implement effective strategies to support students. Developing intervention programs that are relevant to the students' context, as well as ongoing evaluation of the strategies employed, will enhance the effectiveness of counseling services in schools. Collaboration with teachers, parents, and the community is also essential in creating a supportive environment. By taking these steps, guidance and counseling teachers can more effectively improve students' academic resilience and promote their academic success.

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