

VALIDITY AND RELIABILITY OF THE ECONOMICS LEARNING ANXIETY (ELA) INSTRUMENT AMONG SENIOR HIGH SCHOOL STUDENTS

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Abstrak

Penelitian ini bertujuan untuk mengembangkan dan melakukan evaluasi psikometrik awal terhadap instrumen ELA. Penelitian menggunakan pendekatan kuantitatif dengan desain survei *cross-sectional*. Data diperoleh dari 83 peserta didik kelas X SMAN 3 Tambun Selatan, Bekasi, Indonesia. Validitas item dianalisis menggunakan *corrected item-total correlation* (CITC), validitas konstruk diuji melalui *Exploratory Factor Analysis* (EFA), sedangkan reliabilitas diukur menggunakan koefisien *Cronbach's alpha*. Hasil penelitian menunjukkan bahwa 21 dari 37 item awal memenuhi kriteria validitas (CITC $\geq 0,30$) dan dipertahankan dalam instrumen final. Nilai *corrected item-total correlation* berkisar antara 0,377–0,615. Analisis faktor eksploratori memberikan bukti validitas konstruk dengan nilai *Kaiser-Meyer-Olkin* (KMO) sebesar 0,805 dan *Bartlett's Test of Sphericity* yang signifikan ($\chi^2 = 819$, $p < 0,001$). Faktor loading item berkisar antara 0,377–0,870. Uji reliabilitas menghasilkan nilai *Cronbach's alpha* sebesar 0,890 yang menunjukkan konsistensi internal yang sangat baik. Temuan ini memberikan bukti psikometrik awal yang mendukung validitas dan reliabilitas instrumen ELA untuk mengukur kecemasan belajar ekonomi pada peserta didik SMA. Namun demikian, penelitian lanjutan dengan melibatkan validasi ahli, jumlah sampel yang lebih besar, dan *Confirmatory Factor Analysis* masih diperlukan.

Abstract

This study aimed to develop and conduct a preliminary psychometric evaluation of the Economics Learning Anxiety (ELA) instrument. A quantitative approach with a cross-sectional survey design was employed. Data were collected from 83 tenth-grade students at SMAN 3 Tambun Selatan, Bekasi, Indonesia. Item validity was evaluated using *corrected item-total correlation* (CITC), construct validity was examined through *Exploratory Factor Analysis* (EFA), and reliability was assessed using *Cronbach's alpha* coefficient. The results showed that 21 of the initial 37 items met the validity criterion (CITC ≥ 0.30) and were retained in the final instrument. The *corrected item-total correlation* coefficients ranged from 0.377 to 0.615. *Exploratory Factor Analysis* provided evidence of construct validity, with a *Kaiser-Meyer-Olkin* (KMO) value of 0.805 and a significant *Bartlett's Test of Sphericity* ($\chi^2 = 819$, $p < .001$). The retained items demonstrated factor loadings ranging from 0.377 to 0.870. Reliability analysis yielded a *Cronbach's alpha* coefficient of 0.890, indicating excellent internal consistency. These findings provide preliminary evidence supporting the validity and reliability of the Economics Learning Anxiety (ELA) instrument for assessing economics learning anxiety among senior high school students. Nevertheless, further validation involving expert judgment, larger samples, and *confirmatory factor analysis* is recommended.

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INTRODUCTION

Economics at the senior high school level is complex, encompassing theoretical concepts, curves, and mathematical calculations (Saputra & Bahrudin, 2024). This complexity of the subject matter demands critical thinking, analysis, and problem-solving skills within an economic context. These thinking processes are already at a higher-order level, requiring advanced economic learning and evaluation. This situation can potentially lead to psychological distress, stress, and boredom among students if it is not balanced with adequate cognitive and emotional preparedness (Rustam & Tentama, 2020).

Economic learning pressures can lead to learning anxiety among students. Learning anxiety can be defined as a negative emotional state that arises from learning demands, time constraints, instructional methods, and academic evaluation pressures (França & Dias, 2021; Phanchamlong et al., 2022). This condition is characterized by excessive worry, negative thoughts about failure, feelings of unpreparedness, and heightened tension when facing academic challenges (Casali et al., 2022; Podlessek et al., 2021). Furthermore, learning anxiety can be observed through physiological, cognitive, and emotional responses that disrupt concentration, self-confidence, and the learning process (Bülbül & Odacı, 2023; Durak & Karagoz, 2021; Kameubun et al., 2023; Malakcioglu, 2022; Teixeira et al., 2021).

Learning anxiety in economics is part of the academic anxiety experienced by students as a result of the complex demands of learning and evaluation. Academic anxiety can be defined as a negative emotional state that influences the learning process and negatively impacts students' academic performance (Caviola et al., 2022; Guzmán et al., 2021). Furthermore, academic anxiety is a multidimensional construct encompassing cognitive, emotional, physiological, and behavioral aspects. These aspects manifest as fear of failure, excessive worry about achievement, negative thoughts, and avoidance of academic tasks (Abbasi & Ghosh, 2020; Bülbül & Odacı, 2023; Fatima et al., 2021). Therefore, learning anxiety in economics not only affects students' emotional states but also undermines the effectiveness of the learning process.

Economics learning anxiety differs from general anxiety and broader forms of academic anxiety because it is associated with the specific demands of economics as a discipline. General anxiety tends to manifest as feelings of worry, tension, and discomfort across a wide range of situations (Pretorius & Padmanabhanunni, 2023), whereas learning anxiety emerges as a response to specific academic demands and learning contexts (Zhang et al., 2021). In economics learning, students are required to interpret economic issues, evaluate alternative solutions, analyze graphical and numerical information, and make reasoned decisions based on economic principles. These learning demands require not only conceptual understanding but also higher-order thinking skills. Consequently, anxiety experienced during economics learning may possess unique characteristics that distinguish it from other forms of learning anxiety and warrant separate conceptualization and measurement.

Learning anxiety arises in specific academic situations and is not limited to any single subject area. Previous studies have developed and validated anxiety instruments in various educational contexts. For example, mathematics anxiety instruments have been designed to measure students' anxiety related to mathematical reasoning and problem-solving activities (Batashvili et al., 2022; Primi et al., 2020). Similarly, statistics anxiety instruments have been developed to assess anxiety arising from statistical learning and data analysis tasks (Durak & Karagoz, 2021; Lavidas et al., 2021). Other studies have focused on language learning anxiety, online learning anxiety, and examination anxiety (Dikmen, 2022; Khalaf & Omara, 2022; Ritzhaupt et al., 2022). These instruments have demonstrated satisfactory psychometric properties and have contributed significantly to the understanding of learning-related anxiety in specific educational domains.

Despite these developments, no study has specifically developed and psychometrically evaluated an instrument designed to measure economics learning anxiety among senior high school students. Consequently, empirical evidence regarding the assessment of economics learning anxiety remains limited. This gap highlights the need for a dedicated ELA instrument that can provide more accurate assessment and support future educational interventions in economics education. The present study contributes to the literature by developing a subject-specific instrument that captures the cognitive, affective, physiological, and behavioral dimensions of economics learning anxiety.

The contextual and multidimensional nature of learning anxiety requires measurement instruments that accurately capture the construct. Existing anxiety instruments have limitations because they primarily assess general academic anxiety or anxiety associated with specific subjects such as mathematics, statistics, and language learning (Suryawati et al., 2020; Zhang et al., 2021). Consequently, these instruments may not adequately reflect the distinctive characteristics of anxiety experienced during economics learning. Learning anxiety instruments also require rigorous validity and reliability testing to ensure accurate and consistent measurement (Bergqvist et al., 2020; Piccolo et al., 2020). Instruments that meet validity and reliability criteria are essential for accurately identifying students' learning anxiety and providing appropriate educational support (Guzmán et al., 2021).

Furthermore, in many schools, including SMAN 3 Tambun Selatan, the identification of students' learning anxiety is generally based on classroom observations and academic performance rather than standardized anxiety assessment instruments. As a result, information regarding the level and dimensions of economics learning anxiety may not be systematically documented. The absence of a dedicated and psychometrically tested instrument may limit teachers' ability to identify students who require academic and emotional support during economics learning. This condition further highlights the need for a valid and reliable instrument specifically designed to assess economics learning anxiety among senior high school students.

Given the absence of a dedicated instrument for assessing economics learning anxiety and the limited use of standardized anxiety assessment tools in schools, the development of a psychometrically sound instrument is needed. Such an instrument can assist teachers and researchers in identifying students who experience anxiety during economics learning and provide a basis for appropriate educational interventions. Therefore, this study aims to develop and conduct a preliminary psychometric evaluation of the ELA instrument among senior high school students. Specifically, the study seeks to examine the item validity, construct validity, and reliability of the instrument and to identify items that adequately represent the construct of economics learning anxiety.

METHOD

Research Design

This study employed a quantitative approach with a cross-sectional survey design, in which data were collected at a single point in time using a self-administered questionnaire (Cohen et al., 2018). The cross-sectional design was considered appropriate because the study aimed to develop and conduct a preliminary psychometric evaluation of an instrument designed to measure economics learning anxiety among senior high school students. The ELA instrument was developed through a systematic process based on a review of the literature concerning academic anxiety, learning anxiety, and subject-specific anxiety. Four theoretical dimensions were identified, namely cognitive, affective, physiological, and behavioral aspects. These dimensions were subsequently operationalized into indicators and questionnaire items intended to capture students' experiences of anxiety during economics learning activities. This process ensured that each item reflected the theoretical construct of economics learning anxiety (Arip et al., 2022; Singh, 2020).

Participants and Sampling Procedure

The participants consisted of 83 tenth-grade students enrolled at SMAN 3 Tambun Selatan, Bekasi, West Java, Indonesia. A non-probability purposive sampling technique was employed to select participants who met the criteria relevant to the study objectives. Specifically, the participants were students who had experience in economics learning and were therefore considered capable of providing information regarding economics learning anxiety.

Tenth-grade students were selected because they were in the initial stage of studying economics at the senior high school level and were adapting to new academic demands, learning environments, and economics-related concepts. This transition period may increase students' vulnerability to learning anxiety, making them an appropriate population for the preliminary evaluation of the Economics Learning Anxiety (ELA) instrument. Data were collected through the administration of the ELA questionnaire. A total of 83 completed questionnaires were obtained and included in the analysis.

Instrument Development

The ELA instrument was developed based on a review of the literature concerning academic anxiety, learning anxiety, and subject-specific anxiety. The development process began with the identification of theoretical dimensions that were considered relevant to economics learning anxiety among senior high school students. Drawing on previous studies, economics learning anxiety was conceptualized as a multidimensional construct consisting of cognitive, affective, physiological, and behavioral dimensions.

Each dimension was operationalized into several indicators representing students' experiences of anxiety during economics learning activities. The cognitive dimension reflects students' thoughts, concerns, and perceptions related to economics learning. The affective dimension refers to emotional responses such as fear, nervousness, and discomfort. The physiological dimension represents physical reactions associated with anxiety, whereas the behavioral dimension reflects avoidance tendencies and other observable behaviors that may arise during economics learning. The indicators and item distribution used in developing the ELA instrument are presented in Table 1.

Table 1. Indicators of Economics Learning Anxiety

No.	Aspects	Indicators	Item
1.	Cognitive	Negative thoughts about one's own abilities	1-3
		Fear of failure in learning	4-6
		Difficulty concentrating as a result of worry	7-10
2.	Affective	Feelings of fear or tension during studying or examinations	11-13
		Feelings of shame and low self-confidence	14-16
		Unexplained feelings of anxiety	17-19
3.	Physiological	Physiological reactions associated with anxiety (e.g., sweating, trembling, heart palpitations)	20-22
		Physical difficulties experienced during learning	23-25
		Feelings of fatigue and physical tension	26-28
4.	Behavior	Avoidance of learning activities	29-31
		Low engagement in learning	32-34

No.	Aspects	Indicators	Item
		Decreased motivation and learning quality	35-37

Source: Bülbül & Odacı (2023); Durak & Karagoz, (2021); Kameubun et al., (2023); Malakcioglu, (2022); Teixeira et al., (2021).

Based on the indicators presented in Table 1, an initial pool of 37 questionnaire items was developed. The instrument consisted of 10 items representing the cognitive dimension, 9 items representing the affective dimension, 9 items representing the physiological dimension, and 9 items representing the behavioral dimension. Each item was designed to reflect students' experiences and responses during economics learning activities. The instrument employed a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Higher scores indicated higher levels of economics learning anxiety.

Due to time and resource limitations, the instrument did not undergo formal expert validation before data collection. Therefore, the present study focused on a preliminary psychometric evaluation based on empirical evidence obtained from students' responses. The instrument was subsequently administered to the participants and evaluated through item validity, construct validity, and reliability analyses.

Data Analysis

The validity of the ELA instrument was evaluated through item validity and construct validity analyses using Jamovi software. Item validity was assessed using Corrected Item–Total Correlation (CITC), which measures the extent to which each item is consistent with the overall scale score. According to Boateng et al. (2018), items with CITC values of 0.30 or higher demonstrate acceptable discrimination and can be retained for further analysis.

Construct validity was examined through Exploratory Factor Analysis (EFA), which is recommended during the early stages of instrument development to identify the underlying factor structure of an instrument (Watkins, 2018). Prior to factor extraction, the Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity were evaluated to determine the suitability of the data for factor analysis. Hair et al. (2019) suggest that KMO values greater than 0.60 and significant Bartlett's Test results ($p < .05$) indicate that the data are appropriate for factor analysis. Items that met the established validity criteria were retained in the final version of the instrument.

The reliability of the instrument was assessed using Cronbach's alpha coefficient to evaluate the internal consistency of the retained items. Cronbach's alpha is one of the most widely used indicators of scale reliability in educational and psychological research. According to Taber (2018), a Cronbach's alpha coefficient of 0.70 or higher indicates acceptable reliability, whereas higher values reflect stronger internal consistency among the items. Therefore, the reliability analysis was conducted to determine the extent to which the retained items consistently measured the construct of economics learning anxiety.

RESULTS AND DISCUSSION

Results

Participant

A total of 83 tenth-grade students from SMAN 3 Tambun Selatan participated in the preliminary psychometric evaluation of the Economics Learning Anxiety (ELA) instrument. The distribution of participants by gender is presented in Table 2.

Table 2. Distribution of Participants by Gender

Gender	Frequency (n)	Percentage (%)
Male	30	36.1
Female	53	63.9
Total	83	100

As shown in Table 2, female students accounted for the majority of the sample, representing 63.9% ($n = 53$) of the participants, while male students comprised 36.1% ($n = 30$). All participants were enrolled in Grade 10 and had experience in economics learning activities, making them suitable respondents for evaluating the psychometric properties of the ELA instrument.

Item Validity Analysis

Item validity was evaluated using Corrected Item–Total Correlation (CITC) analysis. CITC was employed to examine the extent to which each item was correlated with the overall instrument score. Following the recommendation of Boateng et al. (2018), items with CITC values of 0.30 or higher were considered acceptable and retained for further psychometric evaluation. The initial version of the ELA instrument consisted of 37 items distributed across four theoretical dimensions: cognitive, affective, physiological, and behavioral anxiety. The CITC analysis revealed that 21 items met the minimum validity criterion, whereas 16 items failed to achieve the recommended threshold and were

therefore excluded from subsequent analyses. The retained items demonstrated CITC values ranging from 0.302 to 0.572, indicating acceptable discrimination and consistency with the overall scale.

As presented in Table 3, several items exhibited low or negative CITC values, suggesting weak relationships with the total scale score. These items were removed because they did not contribute adequately to the measurement of economics learning anxiety. The elimination of such items was intended to improve the psychometric quality of the instrument and ensure that only items demonstrating satisfactory item-level validity were retained for construct validity and reliability analyses.

Tabel 3. Results of Item Validity Analysis

Item	Item-rest Correlation	Decisions
1	-0.292	Removed
2	-0.298	Removed
3	-0.234	Removed
4	-0.429	Removed
5	0.447	Retained
6	0.176	Removed
7	0.370	Retained
8	0.134	Removed
9	0.210	Removed
10	0.267	Removed
11	0.388	Retained
12	0.346	Retained
13	0.372	Retained
14	-0.456	Removed
15	0.369	Retained
16	0.302	Retained
17	-0.481	Removed
18	0.369	Retained
19	0.572	Retained
20	-0.416	Removed
21	0.342	Retained
22	0.493	Retained
23	-0.190	Removed
24	0.431	Retained
25	0.541	Retained
26	-0.354	Removed
27	0.433	Retained
28	0.386	Retained
29	0.513	Retained
30	0.553	Retained
31	-0.493	Removed
32	0.456	Retained
33	0.306	Retained
34	0.219	Removed
35	-0.396	Removed
36	0.457	Retained
37	0.398	Retained

Source: Data processed by the researchers (2026)

The results indicate that more than half of the initial item pool satisfied the established validity criterion. The retained items represented all theoretical dimensions of economics learning anxiety, suggesting that the instrument maintained adequate conceptual coverage despite the reduction in the number of items. These retained items were subsequently subjected to Exploratory Factor Analysis (EFA) and reliability testing to further evaluate the psychometric properties of the instrument.

Construct Validity Analysis

Construct validity was examined using Exploratory Factor Analysis (EFA) on the 21 items retained from the item validity analysis. EFA was conducted to identify the underlying factor structure of the ELA instrument and to determine whether the retained items adequately represented the construct being measured. Prior to factor extraction, the

suitability of the data for factor analysis was evaluated using the Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy and Bartlett’s Test of Sphericity. The results of these analyses are presented in Table 4.

Table 4. KMO and Bartlett’s Test Results

Statistic	Value
KMO Measure of Sampling Adequacy	0.805
Bartlett’s Test χ^2	819
Degrees of Freedom (df)	210
Significance (p)	< .001

Source: Data processed by the researchers (2026)

As presented in Table 4, the overall KMO value was 0.805, indicating that the sample was adequate for factor analysis. Furthermore, Bartlett’s Test of Sphericity was statistically significant ($\chi^2 = 819$, $df = 210$, $p < .001$), indicating that the retained items were sufficiently correlated and shared common variance. These findings suggest that the data met the assumptions required for exploratory factor analysis and were appropriate for examining the underlying factor structure of the instrument.

Following the assessment of data suitability, factor extraction was performed to identify the latent dimensions underlying the retained items. The results of the factor extraction based on eigenvalues are presented in Table 5.

Table 5. Initial Eigenvalues of Extracted Factors

Factor	Eigenvalue
1	6.091
2	2.147
3	0.954

Source: Data processed by the researchers (2026)

The factor extraction results supported a three-factor solution. The first factor produced an eigenvalue of 6.091, followed by the second factor with an eigenvalue of 2.147 and the third factor with an eigenvalue of 0.954. Although the third factor exhibited an eigenvalue slightly below the conventional threshold of 1.00, it was retained because the factor structure was determined based on parallel analysis and yielded an interpretable grouping of items. The extracted factors indicate that economics learning anxiety is represented by multiple underlying dimensions rather than a single homogeneous construct.

To further examine the contribution of each item to the extracted factors, factor loadings were analyzed. The factor loading matrix of the retained items is presented in Table 6.

Table 6. Factor Loadings of Retained Items

Item	Factor		
	1	2	3
5	0.463		
7		0.409	
11			0.439
12	0.870		
13	0.456		
15	0.564		
16	0.809		
18			0.525
19		0.677	
21	0.569		
22	0.463		
24			0.688
25		0.730	
27			0.450
28	0.585		
29			0.743
30		0.842	
32		0.645	
33	0.460		
36		0.600	
37			0.490

Source: Data processed by the researchers (2026)

Table 6 shows that the factor loadings of the retained items ranged from 0.409 to 0.870. The highest factor loading was observed for item 12 (0.870), indicating a strong relationship with its underlying factor. Conversely, the lowest acceptable loading was observed for item 7 (0.409), which still exceeded the minimum recommended threshold of 0.40. Overall, all retained items demonstrated acceptable to strong factor loadings and were therefore maintained in the final version of the instrument.

Overall, the results of the exploratory factor analysis provide preliminary evidence supporting the construct validity of the ELA instrument. The retained items demonstrated adequate correlations with the extracted factors and formed a coherent latent structure. These findings indicate that the instrument adequately represents the construct of economics learning anxiety and is suitable for further reliability evaluation.

Reliability Analysis

Following the assessment of construct validity, the internal consistency reliability of the Economics Learning Anxiety (ELA) instrument was evaluated using Cronbach's alpha coefficient. Reliability analysis was conducted on the 21 items retained after the item validity and construct validity analyses. The results of the reliability analysis are presented in Table 7.

Table 7. Reliability Statistic

Statistic	Value
Cronbach's Alpha	0.890
Number of Items	21

Source: Data processed by the researchers (2026)

As presented in Table 7, the ELA instrument produced a Cronbach's alpha coefficient of 0.890. This value exceeds the commonly recommended threshold of 0.70, indicating a high level of internal consistency among the retained items. The findings suggest that the items consistently measure the same underlying construct and provide stable measurement results. The high reliability coefficient also indicates that the item selection process contributed positively to the psychometric quality of the instrument. After removing items that did not meet the validity criteria, the remaining 21 items demonstrated strong internal consistency and satisfactory coherence in measuring economics learning anxiety. Therefore, the ELA instrument can be considered a reliable instrument for assessing economics learning anxiety among senior high school students.

Discussion

Item Validity of the Economics Learning Anxiety Instrument

The item validity analysis resulted in the retention of 21 items from the initial pool of 37 items. Sixteen items were removed because they did not meet the minimum corrected item-total correlation (CITC) criterion. This finding indicates that not all theoretically developed items functioned adequately in the empirical context. Although the initial items were constructed based on the cognitive, affective, physiological, and behavioral dimensions of economics learning anxiety, some items demonstrated weak relationships with the overall instrument score and therefore did not contribute sufficiently to the measurement of the construct.

The elimination of items is a common and necessary process in instrument development because it improves measurement precision and reduces the potential for measurement error (Boateng et al., 2018). Items with low CITC values may indicate ambiguity in wording, overlap with other items, or inconsistent interpretation among respondents. Consequently, retaining only items that demonstrate acceptable item discrimination enhances the psychometric quality of the instrument.

Despite the reduction in the number of items, the retained items continued to represent the theoretical dimensions underlying economics learning anxiety. This finding supports Achievement Emotion Theory, which suggests that anxiety experienced during learning involves interconnected cognitive, emotional, physiological, and behavioral responses (Pekrun et al., 2007). Similar findings have been reported in studies of subject-specific anxiety instruments, which emphasize that a multidimensional approach provides a more comprehensive understanding of students' anxiety experiences in particular learning contexts (Durak & Karagoz, 2021; Megreya et al., 2021).

Construct Validity of the Economics Learning Anxiety Instrument

The construct validity analysis provided additional evidence supporting the psychometric quality of the ELA instrument. The KMO value of 0.805 and the significant Bartlett's Test of Sphericity indicated that the retained items were suitable for exploratory factor analysis. These findings suggest that sufficient correlations existed among the items and that the instrument possessed an underlying latent structure appropriate for construct validation (Hair et al., 2019; Watkins, 2018).

The exploratory factor analysis supported a three-factor solution, indicating that economics learning anxiety is a multidimensional construct. Interestingly, the instrument was originally developed based on four theoretical dimensions,

namely cognitive, affective, physiological, and behavioral anxiety. However, the empirical findings yielded three factors rather than four. This result suggests that some theoretically distinct dimensions may overlap in students' actual experiences of economics learning anxiety. In educational settings, cognitive concerns, emotional reactions, physiological symptoms, and behavioral responses frequently occur simultaneously, making it possible for several dimensions to merge empirically into broader latent factors. Similar findings have been reported in studies of learning-related anxiety, where theoretically distinct dimensions were found to be closely interconnected in practice (Durak & Karagoz, 2021; Megreya et al., 2021).

The emergence of a three-factor structure does not necessarily contradict the underlying theoretical framework. Instead, it demonstrates the importance of empirical validation during instrument development. Exploratory factor analysis is intended to identify the latent structure that best represents the observed data, and the resulting factor structure may differ from the initial theoretical assumptions (Brown, 2015; Watkins, 2018). The findings indicate that economics learning anxiety is not experienced as a set of completely independent dimensions but rather as interconnected psychological responses that collectively influence students' learning experiences. Therefore, the factor structure obtained in this study provides preliminary evidence supporting the construct validity of the ELA instrument while also highlighting the need for further validation using larger and more diverse samples through confirmatory factor analysis (Brown, 2015; Hair et al., 2019).

Reliability of the Economics Learning Anxiety Instrument

The reliability analysis demonstrated that the final 21-item ELA instrument possesses high internal consistency, as indicated by a Cronbach's alpha coefficient of 0.890. This value exceeds the commonly accepted threshold of 0.70 and suggests that the retained items consistently measure the same underlying construct. According to Tavakol & Dennick (2011), high Cronbach's alpha values indicate strong relationships among items and provide evidence that the instrument produces stable and consistent measurements.

The strong reliability coefficient may also be attributed to the item refinement process conducted during the validity analysis. The removal of items with weak item-total correlations likely improved the coherence of the instrument and strengthened the relationships among the retained items. Similar findings have been reported in the development of subject-specific anxiety instruments, where psychometrically refined items tend to demonstrate higher reliability coefficients (Piccolo et al., 2020; Primi et al., 2020).

These findings indicate that the ELA instrument can provide consistent measurements of economics learning anxiety and may therefore be useful for both educational research and classroom-based assessment. The high level of internal consistency suggests that the retained items function cohesively in measuring economics learning anxiety among senior high school students.

Implication

The development of a valid and reliable instrument for measuring economics learning anxiety has important implications for educational practice. Previous studies have shown that academic anxiety is associated with lower self-efficacy, reduced participation in learning activities, and poorer academic performance (Rozgonjuk et al., 2020). In the context of economics education, anxiety may interfere with students' ability to analyze economic problems, evaluate alternative solutions, and apply abstract economic concepts in real-world situations.

The ELA instrument may therefore serve as a diagnostic tool that enables teachers to identify students who experience anxiety during economics learning. Early identification may facilitate the implementation of appropriate instructional strategies and psychological support aimed at reducing learning anxiety and improving students' engagement in economics education. Furthermore, the instrument may assist researchers in examining the relationships between economics learning anxiety, motivation, academic achievement, and other educational variables.

Limitations

Several limitations should be acknowledged when interpreting the findings of this study. First, the instrument was evaluated using a relatively small sample of 83 students drawn from a single senior high school. This limitation may restrict the generalizability of the findings to broader student populations. Second, the present study relied on exploratory factor analysis as an initial stage of construct validation. Consequently, the factor structure identified in this study should be interpreted as preliminary and requires further confirmation through confirmatory factor analysis (CFA) using larger and more diverse samples (Brown, 2015).

Another limitation concerns the reduction of items from the initial pool of 37 items to the final set of 21 items. Although this process improved the psychometric quality of the instrument, it may also have reduced the representation of certain theoretical indicators originally proposed in the conceptual framework. Therefore, future studies should examine whether additional item refinement can improve the balance between theoretical coverage and psychometric performance.

Future research is recommended to evaluate the ELA instrument across different schools, educational levels, and geographical regions. Additional validation studies involving larger samples and advanced psychometric techniques will contribute to strengthening the robustness and generalizability of the instrument (Bergqvist et al., 2020).

CONCLUSION

This study developed and conducted a preliminary psychometric evaluation of the Economics Learning Anxiety (ELA) instrument among senior high school students. The findings indicated that 21 of the initial 37 items met the established item validity criteria and were retained in the final version of the instrument. Furthermore, the exploratory factor analysis supported a three-factor structure, providing preliminary evidence of construct validity. The reliability analysis yielded a Cronbach's alpha coefficient of 0.890, indicating high internal consistency among the retained items.

Taken together, these findings suggest that the ELA instrument demonstrates promising initial psychometric properties for assessing economics learning anxiety among senior high school students. However, the findings should be interpreted as preliminary rather than definitive evidence of instrument validity. The psychometric evaluation was conducted using a relatively small sample drawn from a single school, and the factor structure has not yet been confirmed through confirmatory factor analysis (CFA).

Despite these limitations, the ELA instrument provides an initial framework for identifying students' anxiety in economics learning and may serve as a useful tool for educational research and classroom-based assessment. Future studies are recommended to examine the instrument using larger and more diverse samples, conduct confirmatory factor analysis, and further evaluate the stability and generalizability of the instrument across different educational contexts.

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DECLARATION OF GENERATIVE AI

The author uses artificial intelligence (AI) technology to a limited extent as an aid for language editing and manuscript refinement. All AI-generated output has been reviewed and verified by the author. The author bears full responsibility for the content, accuracy, originality, and integrity of the article.

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