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MULTIDIMENSIONAL CONSTRUCTION OF A CHILD-FRIENDLY LEARNING ENVIRONMENT (CIFEQ) AT THE SECONDARY SCHOOL LEVEL

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ABSTRACT
The implementation of child-friendly education requires valid and reliable instruments capable of assessing the extent to which learning environments support children's rights, participation, safety, inclusion, and well-being. This study aimed to develop and validate the Child-Friendly Learning Environment Questionnaire (CIFEQ) for Indonesian secondary schools using a CFA approach. The study employed a research and development design involving construct identification, item generation, expert review, pilot testing, and psychometric evaluation. Data were collected from 800 junior secondary school students from SMPN Jabodetabek. Content validity was examined using Aiken's V, while construct validity was assessed through Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). Results supported a seven-factor structure comprising Quality Learning, Student Participation, Teacher Support, Student Cohesiveness, Inclusivity and Equality, Safety and Comfort, and Protection. The final instrument consisted of 44 items with satisfactory factor loadings (>0.30). CFA demonstrated excellent model fit (RMSEA = 0,035, SRMR = 0,044, CFI = 0,916, NNFI = 0,908, dan IFII = 0,917). Reliability analysis indicated high internal consistency (Cronbach's α = 0.92). These findings provide strong evidence that the CIFEQ is a psychometrically sound instrument for measuring child-friendly learning environments in Indonesian schools and supporting educational evaluation and policy development.

Keywords: *scaffolding; collaborative writing; zone of proximal development; language classroom; qualitative study*

INTRODUCTION
High-quality education extends beyond academic achievement and encompasses the fulfilment of children's rights through learning environments that are safe, inclusive, participatory, and supportive of students' holistic development. The concept of a child-friendly learning environment originates from the Child-Friendly Schools (CFS) framework developed by UNICEF, which emphasizes that schools should protect children from violence, discrimination, abuse, and other harmful practices while providing opportunities for meaningful participation in learning processes and decision-making that affect their lives (Wright et al., 2009). A growing body of research has demonstrated that positive learning environments contribute significantly to academic achievement, student engagement, psychological well-being, and social-emotional development (Fisher et al., 2018; Fraser et al., 1996). Consequently, the assessment of child-friendly learning environments has become

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an essential component of educational quality evaluation, as it provides empirical evidence regarding the extent to which schools implement child-centered educational principles.

Despite the increasing global and national emphasis on child-friendly schools, the measurement of child-friendly learning environments remains limited. Previous studies have primarily focused on evaluating child-friendly school policies and general school climate rather than comprehensively examining students' lived learning experiences (Liestyasari et al., 2023). In Indonesia, the Learning Environment Survey (*Survei Lingkungan Belajar*—SULINJAR), implemented as part of the National Assessment Program, measures broad aspects of the educational environment but does not specifically capture key dimensions of child-friendly learning, such as student participation, child protection, inclusivity, safety, and emotional well-being. Internationally, research findings have revealed inconsistencies regarding the dimensional structure of child-friendly school environments. For example, Çobanoğlu et al. (2018) identified six dimensions of child-friendly schools in Türkiye (Çobanoğlu, 2018; Cobanoglu & Sevim, 2019), whereas Xiao et al. (2023) reported a four-dimensional structure within the Chinese educational context (Xiao et al., 2023). These variations suggest that child-friendly learning environments represent a multidimensional and context-dependent construct that requires empirical validation across different sociocultural settings.

One promising approach to addressing these limitations is the development of a specialized instrument designed to assess child-friendly learning environments from the students' perspective. As the primary beneficiaries of educational services, students are uniquely positioned to provide valid insights into the extent to which child-friendly principles are implemented in daily classroom practices. Developing a valid and reliable measurement instrument would enable schools and policymakers to obtain more accurate information regarding the quality of child-friendly learning implementation. The present study contributes to the literature by developing the Child-Friendly Learning Environment Questionnaire (CIFEQ), which integrates the UNICEF Child-Friendly Schools framework, the Child-Friendly School Scale (CFSS), the Child-Friendly School Environment Questionnaire (CFSEQ), and Fraser's learning environment theory into a comprehensive multidimensional model tailored to the Indonesian educational context. Furthermore, this study employs Confirmatory Factor Analysis (CFA) to examine construct validity and verify the hypothesized factor structure, thereby providing stronger empirical evidence for instrument validation.

Over the past decade, research on learning environments and child-friendly schools has expanded considerably. Fraser (2012) highlighted the critical role of classroom learning environments in shaping student outcomes and engagement (Fraser et al., 2006; Margianti et al., 2002). Fisher et al. (2018) found that students' perceptions of school safety were positively associated with psychological well-being and academic engagement. Liestyasari et al. (2023) reported that the implementation of child-friendly schools in Indonesia continues to face challenges related to student participation, protection, and school culture. In China, Xiao et al. (2023) developed and validated the Child-Friendly School Environment Questionnaire (CFSEQ), identifying four dimensions: environmental friendliness, teaching friendliness, peer friendliness, and children's participation. More recently, Pettersen et al.

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Volume 2 , July 2026

(2024) demonstrated that socially and emotionally supportive classroom environments significantly influence students' situational engagement (Bjerga Pettersen et al., 2024). Collectively, these findings indicate that child-friendly learning environments constitute a complex and multidimensional construct that requires comprehensive and psychometrically validated measurement instruments.

The present study is particularly important given the Indonesian government's ongoing efforts to expand the implementation of Child-Friendly Schools across all educational levels. Although tens of thousands of schools have officially received Child-Friendly School status, only a relatively small proportion have fully met the established standards (Bappenas RI, 2024). This discrepancy highlights the need for a robust evaluation instrument capable of accurately assessing the implementation of child-friendly learning practices. Unlike previous studies that focused primarily on program evaluation or instrument development in other cultural contexts, this study develops an instrument specifically designed to measure Indonesian students' perceptions of child-friendly learning environments across seven dimensions: Quality Learning, Student Participation, Teacher Support, Student Cohesiveness, Inclusivity and Equality, Safety and Comfort, and Protection. Therefore, this research is expected to contribute both theoretically to the development of child-friendly learning environment models and practically to educational quality evaluation and policy implementation in Indonesia.

Accordingly, this study aims to develop and validate the Child-Friendly Learning Environment Questionnaire (CIFEQ) as an instrument for measuring child-friendly learning environments in Indonesian junior secondary schools. The study was conducted among students from public junior secondary schools in Jakarta, Bogor, Depok, and Tangerang, representing diverse urban educational settings. The unit of analysis consisted of students' perceptions of their learning environments. Specifically, the study sought to examine the factor structure of the CIFEQ through Confirmatory Factor Analysis (CFA) and to evaluate its validity and reliability as a psychometrically sound instrument for assessing child-friendly learning environments in the Indonesian educational context.

METODE

Design Research

This study employed a research and development (R&D) design to develop and validate the Child-Friendly Learning Environment Questionnaire (CIFEQ) as an instrument for measuring child-friendly learning environments in Indonesian junior secondary schools. The instrument development process followed a systematic psychometric approach consisting of construct identification, item generation, expert review, pilot testing, large-scale field testing, and statistical validation. This design was selected to ensure that the resulting instrument possessed strong theoretical foundations, empirical validity, and measurement reliability. The study focused on capturing students' perceptions of learning environments that reflect the principles of child-friendly education, including safety, participation, inclusivity, support, and protection.

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Population and Sample

The study was conducted in public junior secondary schools located in Jakarta, Bogor, Depok, and Tangerang, Indonesia. These regions were selected because they represent diverse urban educational contexts and sociocultural backgrounds. The target population consisted of Grade VII and Grade VIII students enrolled in public junior secondary schools. Instrument validation was carried out in two stages. The first stage involved a pilot study with 280 students to examine the preliminary psychometric properties of the instrument and identify potential weaknesses in item functioning. The second stage involved a large-scale field test with 800 students drawn from eight public junior secondary schools across the four regions. A purposive sampling technique was employed to ensure that participants represented diverse educational environments and possessed characteristics relevant to the objectives of the study.

Research Procedure

The development of the CIFEQ began with an extensive review of literature related to child-friendly schools, child-friendly learning, classroom learning environments, children's rights, and educational quality. Based on the conceptual synthesis, seven dimensions of child-friendly learning environments were identified: Quality Learning, Student Participation, Teacher Support, Student Cohesiveness, Inclusivity and Equality, Safety and Comfort, and Protection. These dimensions were operationalized into indicators and translated into an initial pool of 60 items. The preliminary instrument was designed using a four-point Likert response format ranging from 1 (Strongly Disagree) to 4 (Strongly Agree) (Robinson, 2024; Van Laerhoven et al., 2004). The four-category format was intentionally adopted to reduce neutral responses and encourage respondents to provide clear judgments regarding their learning experiences.

Content validation was conducted through expert review involving specialists in child protection, educational psychology, child development, social welfare, language studies, and educational measurement. Experts evaluated the relevance, clarity, and representativeness of each item with respect to the intended construct. Subsequently, eleven panellists reviewed the instrument to assess item appropriateness and alignment with the conceptual framework. Items that did not meet the required content validity standards were revised or removed before empirical testing. The content validation process ensured that the instrument adequately represented the multidimensional characteristics of child-friendly learning environments and was appropriate for use in the Indonesian educational context.

Data Collection

Data collection was carried out through direct administration of the questionnaire in participating schools after obtaining approval from school authorities, teachers, parents, and students. Prior to data collection, respondents were informed about the purpose of the study and assured that their responses would remain confidential and be used solely for research purposes. The pilot test data were used to examine the dimensional structure of the instrument, whereas the field-test data were used for confirmatory validation and

eISSN 3124-9396
Volume 2 , July 2026

psychometric evaluation. All questionnaires were screened for completeness and accuracy before being entered into the statistical analysis process.

Data Analysis

Data analysis was conducted in several consecutive stages to ensure the validity and reliability of the instrument. Content validity was evaluated using Aiken's V coefficient ≥0,75 (Aiken, 1985; Ilyana et al., 2025; Retnawati, 2016). The dimensional structure of the instrument was initially explored through Exploratory Factor Analysis (EFA) using JASP software to determine factor adequacy and identify the underlying construct structure. The suitability of the data for factor analysis was assessed through the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's Test of Sphericity (Hair, 2009; Husain & Aziz, 2022). Following EFA, Confirmatory Factor Analysis (CFA) was performed using LISREL to verify the hypothesized seven-factor model and evaluate construct validity. Model fit was assessed using multiple goodness-of-fit indices, including the Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), Non-Normed Fit Index (NNFI/TLI), and Goodness-of-Fit Index (GFI) (Barattucci & Zuffo, 2012; Hair Jr et al., 2019; Umar & Nisa, 2020). Items with inadequate factor loadings were removed or revised to improve model fit and construct representation.

RESULTS AND DISCUSSION

Research Results

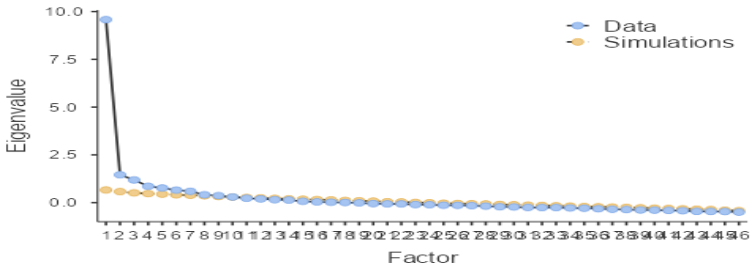
Exploratory Factor Analysis

The Exploratory Factor Analysis (EFA) stage, as a test of sample adequacy requirements, obtained a KMO-MSA value of 0.920. Kaiser's Criterion analysis and scree plot were conducted to determine the most optimal number of factors. Based on the Kaiser's Criterion table, the eigenvalue value obtained >1 is a number of 9 factors, this indicates that the CIFEQ instrument has many dimensions or is multidimensional, and is in line with the number of dimensions developed, namely 7 dimensions.

Table 1: Kaiser's Criterion – Eigenvalue > 1

Factor	SS Loadings	% of Variance	Cumulative %
1	3.029	6.59	6.59
2	2.710	5.89	12.48
3	2.067	4.49	16.97
4	1.830	3.98	20.95
5	1.805	3.92	24.87
6	1.723	3.75	28.62
7	1.606	3.49	32.11
8	1.518	3.30	35.41
9	1.207	2.62	38.03
10	0.840	1.83	39.86

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Graph 1: Scree plot

The scree plot and parallel analysis graphs above show that the eigenvalues of the empirical data are above the simulated eigenvalues up to the 6th factor, while from the 7th factor onwards, the eigenvalues of the data begin to approach or fall below the simulated line. This finding indicates that the construct measured by the instrument is multidimensional, with 7 main dimensions collectively explaining the latent structure of the data.

Confirmatory Factor Analysis

The CFA was conducted on 46 retained items, which resulted from a systematic item screening process applied to the original 55-item instrument administered during the pilot study. Nine items were eliminated based on the findings of the preliminary validity and item performance analyses.

Tabel 2: Factor loadings

Factor	Indicator	Std. Estimate	Factor	Indicator	Std. Estimate
QL	B1	0.554	IE	B25	0.572
	B2	0.609		B26	0.531
	B3	0.531		B27	0.579
	B4	0.431		B28	0.666
	B5	0.268		B29	0.466
	B6	0.345		B30	0.540
	B7	0.471		B31	0.424
	B8	0.372		B32	0.544
	B9	0.518	SPC	B33	0.529
SP	B10	0.496		B34	0.618
	B11	0.540		B35	0.649
	B12	0.465		B36	0.579
	B13	0.413		B37	0.573
	B14	0.422		B38	0.288
	B15	0.537		B39	0.386
TS	B16	0.690	PR	B40	0.441
	B17	0.620		B41	0.690
	B18	0.638		B42	0.738
	B19	0.694		B43	0.689
	B20	0.660		B44	0.594
SC	B21	0.462		B45	0.469
	B22	0.725		B46	0.534
	B23	0.748			
	B24	0.614			

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Table 3 : Fit indices

Index	Value
Root mean square error of approximation (RMSEA)	0.052
Standardized root mean square residual (SRMR)	0.055
Comparative Fit Index (CFI)	0.801
Tucker-Lewis Index (TLI)	0.787
Bentler-Bonett Non-normed Fit Index (NNFI)	0.787
Bentler-Bonett Normed Fit Index (NFI)	0.727
Parsimony Normed Fit Index (PNFI)	0.680
Bollen's Relative Fit Index (RFI)	0.709
Bollen's Incremental Fit Index (IFI)	0.802
Relative Noncentrality Index (RNI)	0.801

Based on the results presented in table, of the 46 retained items, three items did not meet the recommended standardized factor loading (SFL) criterion of 0.40 for item validity assessment. Nevertheless, the overall evaluation of model fit indicated that the proposed CFA model demonstrated a satisfactory fit to the empirical data, as evidenced by an RMSEA value of 0.052 and an SRMR value of 0.055. These values fall within the acceptable threshold, suggesting that the measurement model adequately represents the underlying factor structure of the instrument.

To achieve model fit indices that met the recommended criteria, model modifications were performed by eliminating items with low standardized factor loadings (SFL) and addressing indicators associated with high residual correlations. These modifications were undertaken to improve the overall model fit while maintaining the theoretical integrity of the underlying construct.

Table 4: Factor loadings

Factor	Indicator	Std. Estimate	Factor	Indicator	Std. Estimate
QL	B1	0.521	IE	B25	0.587
	B2	0.556		B26	0.505
	B3	0.504		B27	0.579
	B4	0.403		B28	0.667
	B5	0.490		B29	0.475
	B6	0.527		B30	0.547
	B7	0.455		B31	0.417
	B8	0.442		B32	0.526
	B9	0.395	SPC	B33	0.564
SP	B10	0.416		B34	0.613
	B11	0.441		B35	0.568
	B12	0.521		B36	0.505

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	B13	0.677		B37	0.555
	B14	0.617		B38	0.389
	B15	0.638		B39	0.478
TS	B16	0.696	PR	B40	0.592
	B17	0.665		B41	0.609
	B18	0.419		B42	0.528
	B19	0.647		B43	0.596
	B20	0.692		B44	0.504
SC	B21	0.613		B45	0.563
	B22	0.521		B46	0.587
	B23	0.556			
	B24	0.504			

Table 4 shows an increase in the standardized factor loading values following three rounds of model modifications based on the modification indices. In addition, the goodness-of-fit indices improved substantially and met the recommended criteria for an acceptable model fit, as presented RMSEA 0,0351≤0,08, SRMR 0,0441≤0,08, NNFI 0,908≥0,90, CFI 0,916≥0,90, IFI 0,917≥ 0,90.

As shown in Table 4, all goodness-of-fit indices met the recommended threshold values, indicating an acceptable level of model fit. These results provide evidence that the indicators are valid measures of their respective latent dimensions and adequately represent the underlying constructs of the CIFEQ model.
Reliability Instrument.

Tabel 4: Reliability

Dimensi	Omega	Croanbach
QL	0.628	0.688
SP	0.554	0.634
TS	0.786	0.794
SC	0.640	0.721
IE	0.759	0.758
SFC	0.679	0.719
PR	0.687	0.787
	0.907	0.922

Instrument reliability was evaluated using McDonald's Omega (ω) and Cronbach's Alpha (α). McDonald's Omega is considered more appropriate for multidimensional measurement models because it directly accounts for the contribution of latent factors, whereas Cronbach's Alpha assumes that all items contribute equally to the construct being measured (tau-equivalence).

Discussion

The findings of this study provide empirical support for the seven-factor structure of the Child-Friendly Learning Environment Questionnaire (CIFEQ). The CFA results demonstrated that the proposed measurement model achieved a good level of fit with the

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Volume 2 , July 2026

empirical data, as indicated by RMSEA = 0.038, SRMR = 0.042, CFI = 0.911, IFI = 0.912, and GFI = 0.986. These values satisfy the recommended criteria for model fit, suggesting that the hypothesized dimensions adequately represent the latent construct of a child-friendly learning environment. According to Hu and Bentler (1999), RMSEA values below 0.06 and SRMR values below 0.08 indicate a close-fitting model, whereas CFI values above 0.90 indicate acceptable model fit. Therefore, the present findings suggest that the theoretical framework underlying the CIFEQ is empirically supported (Hu & Bentler, 1999).

The excellent KMO value (0.920) further confirms the adequacy of the sample for factor analysis. Kaiser (1974) classified KMO values above 0.90 as "Marvelous," indicating that the correlations among variables are sufficiently strong to produce reliable factor solutions. The consistently high MSA values observed across all indicators further support the appropriateness of the dataset and strengthen confidence in the stability of the identified factor structure (Kaiser, 1974).

The factor loading analysis revealed that all retained indicators significantly contributed to their respective latent constructs. Although three items exhibited standardized factor loadings below the recommended threshold of 0.40, the majority of indicators demonstrated moderate to strong loadings ranging from 0.403 to 0.696. According to Hair et al. (2022), factor loadings above 0.40 are generally considered acceptable in instrument development studies, particularly when supported by theoretical justification. Moreover, the statistical significance of all factor loadings ($p < .001$) indicates that each item contributes meaningfully to measuring its intended construct (Hair, 2009; Hair Jr et al., 2019).

Among the seven dimensions, Teacher Support demonstrated the strongest factor loadings and the highest reliability coefficients. This finding highlights the pivotal role of teachers in establishing a child-friendly learning environment. From a humanistic perspective, Rogers (1969) argued that positive teacher–student relationships are fundamental to creating meaningful learning experiences and promoting students' personal growth. Similarly, the UNICEF Child-Friendly Schools framework emphasizes that supportive teacher practices contribute significantly to students' emotional well-being, engagement, and academic success (UNICEF, 2009). The present findings therefore reinforce the importance of teacher support as a core component of child-friendly learning environments (Wright et al., 2009).

The dimensions of Inclusivity, Safety and Comfort, and Protection also exhibited satisfactory factor loadings and reliability estimates. These findings indicate that a child-friendly learning environment encompasses not only academic aspects but also the fulfilment of children's rights to safety, participation, protection, and equitable treatment. This result is consistent with the rights-based educational perspective promoted by UNICEF (2009) and UNESCO (2015) which emphasizes that educational quality should be evaluated not only through academic achievement but also through the extent to which schools provide inclusive, safe, and protective learning environments for all students (Akther, 2020; Unterhalter, 2017).

The reliability analysis further confirmed the psychometric quality of the instrument. The overall McDonald's Omega coefficient ($\omega = 0.907$) and Cronbach's Alpha coefficient (α

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= 0.922) indicate excellent internal consistency. According to Nunnally and Bernstein (1994), reliability coefficients exceeding 0.90 demonstrate very high consistency and are suitable for educational assessment and research purposes. These findings suggest that the CIFEQ consistently measures the construct of child-friendly learning environments across its seven dimensions and can produce stable and dependable scores (Considine et al., 2005).

Nevertheless, some dimensions, particularly Student Participation ($\omega = 0.554$; $\alpha = 0.634$), demonstrated lower reliability coefficients compared with the other dimensions. This result may reflect the complex and context-dependent nature of student participation, which can vary according to classroom climate, instructional practices, and individual student characteristics. Similar findings have been reported in educational measurement studies, where behavioral and participatory constructs tend to exhibit greater variability than constructs related to environmental support and teacher behavior (Fredricks et al., 2004).

Overall, the findings provide strong evidence supporting the construct validity and reliability of the CIFEQ. The seven-dimensional model successfully captures essential components of child-friendly learning environments, including quality learning, student participation, teacher support, student cohesiveness, inclusivity, safety and comfort, and protection. These findings support the use of the CIFEQ as a comprehensive instrument for assessing child-friendly learning environments and evaluating the implementation of child-friendly education policies in schools.

CONCLUSION

The present study aimed to validate the construct of the Child-Friendly Learning Environment Questionnaire (CIFEQ) using Confirmatory Factor Analysis (CFA). The findings provide substantial evidence supporting the adequacy of the proposed seven-factor measurement model, comprising Quality Learning, Student Participation, Teacher Support, Student Cohesiveness, Inclusivity, Safety and Comfort, and Protection.

The CFA results demonstrated that the model achieved a satisfactory level of fit with the empirical data, as indicated by RMSEA = 0.035, SRMR = 0.042, CFI = 0.916, IFI = 0.917, and GFI = 0.986. These indices confirm that the hypothesized factor structure adequately represents the underlying construct of a child-friendly learning environment. Furthermore, the KMO value of 0.920 indicated excellent sampling adequacy, supporting the suitability of the data for factor analysis.

The factor loading analysis revealed that most indicators demonstrated acceptable to strong loadings on their respective factors, confirming the convergent validity of the instrument. Although three items exhibited standardized factor loadings below the recommended threshold of 0.40, the overall factor structure remained stable and theoretically meaningful. Reliability analysis further demonstrated that the instrument possessed satisfactory internal consistency, with an overall McDonald's Omega coefficient of 0.907 and a Cronbach's Alpha coefficient of 0.922.

Overall, the findings suggest that the CIFEQ is a valid and reliable instrument for assessing child-friendly learning environments in educational settings. The validated seven-dimensional framework provides a comprehensive measure of learning environments that support children's academic, social, emotional, and protective needs. Therefore, the

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Volume 2 , July 2026

instrument may serve as a useful tool for researchers, educators, and policymakers in evaluating and improving the implementation of child-friendly learning practices in schools.

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