



Section 3. Preschool education

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PSYCHOMETRIC PROPERTIES OF A SOCIAL SKILLS ASSESSMENT TOOLKIT FOR VIETNAMESE PRESCHOOL CHILDREN AGED 5–6 YEARS

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Abstract:

This study evaluates the psychometric properties of the KNXH5T, a newly developed toolkit designed to assess social skills among Vietnamese preschool children aged 5–6. Grounded in the Social Skills Improvement System (SSIS) framework and Classical Test Theory (CTT), the tool underwent a rigorous validation process involving a pilot study (N=140) and a formal survey (N=335) across ten preschools in Hanoi. Exploratory Factor Analysis (EFA) identified a five-factor structure – Communication, Cooperation, Responsibility, Empathy, and Self-control – explaining 62.4% of the total variance. Subsequent Confirmatory Factor Analysis (CFA) demonstrated a robust model fit with the empirical data ($\chi^2/df = 2.57$, CFI = 0.911, TLI = 0.900, and RMSEA = 0.0685). The assessment toolkit exhibited high internal consistency, with Cronbach's alpha coefficients of 0.88 for the teacher-report and 0.87 for the parent-report, while subscale reliability ranged from 0.78 to 0.85. Furthermore, strong temporal stability and inter-rater objectivity were confirmed by a test-retest reliability of $r=0.86$ and an Intraclass Correlation Coefficient (ICC) of 0.83. These findings suggest that the KNXH5T is a psychometrically sound and culturally sensitive tool, providing a reliable basis for evidence-based social skills assessment in the Vietnamese educational context.

Keywords: *Social skills, Psychometric properties, Children aged 5–6, Vietnamese education, Validation*

1. Introduction

Social skills represent a core component of holistic child development, particularly during the preschool years. Gresham and Elliott (2008) define social skills as observable and

learnable behaviors that enable children to interact effectively, adhere to social norms, and achieve social acceptance. Moreover, emotional competence plays a foundational role in social functioning; Denham et al. (2003) demon-

strated that emotional development underpins behavioral self-regulation and long-term social adjustment. Thus, social skills encompass not only overt behaviors but also underlying emotional and regulatory capacities.

For children aged 5–6, social competence becomes especially critical as they transition from preschool to primary school. This period requires greater independence, discipline, and responsibility. Skills such as effective communication, cooperation, emotional regulation, empathy, and task engagement are essential for successful learning and positive peer relationships. Insufficient development in these domains may increase the risk of behavioral and academic maladjustment.

Within an evidence-based educational framework, social skills assessment must rely on instruments supported by strong theoretical foundations and psychometric evidence. The *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 2014) emphasize that validity depends on demonstrated reliability and construct validity. For young children, a multi-informant approach – integrating teacher and parent reports with direct observations – is recommended to ensure comprehensive evaluation.

Although internationally established tools such as SSIS, SDQ, PKBS, and DECA are widely used, cross-cultural research highlights the necessity of adaptation and validation when applying these instruments in new contexts. Differences in social norms, educational expectations, and cultural values may influence how social behaviors are expressed and interpreted.

In Vietnam, despite policy emphasis on socio-emotional development, assessment practices for 5–6-year-olds remain largely subjective or reliant on non-standardized tools. Cultural values such as collectivism and harmony-oriented interaction may not be fully captured by imported measures. Accordingly, this study seeks to develop and validate a culturally responsive assessment toolkit – the KNXH5T – by examining its reliability and construct validity through rigorous psychometric analyses.

2. Methodology

2.1. Research Design

The study employed a mixed-methods approach, primarily quantitative, to develop

and standardize the KNXH5T social skills assessment toolkit for Vietnamese children aged 5–6 years, guided by Classical Test Theory (CTT). The procedure comprised three phases: theoretical framework development and item construction; psychometric analyses of reliability and validity; and final standardization for educational application. Data were analyzed using RStudio. The initial pool included 44 items across two components: teacher/parent rating scales and child-administered situational tasks. Content validity was established through expert review ($n = 7$) using a four-point scale, retaining items with $CVI \geq 0.78$.

2.2. Participants

The study was implemented in two data collection phases. The pilot phase was conducted with a sample of 140 children to refine the wording, examine the item structure, and perform a preliminary analysis of the scale's psychometric quality. The formal survey phase involved 335 children aged 5–6 years, recruited from 10 preschools in Hanoi using a controlled convenience sampling method. Data were collected from multiple sources, including teachers, parents, and situational judgment tasks for children, to enhance the reliability and validity of the assessment

2.3. Standardization Procedure and Psychometric Analyses

The standardization of the KNXH5T assessment toolkit was conducted in accordance with CTT principles combined with modern analytical techniques. Following expert validation and pilot testing, data from the main sample ($N = 335$) were used to evaluate the instrument's psychometric properties.

First, item quality was examined using corrected item–total correlations to determine each item's contribution to internal consistency. Items failing to meet acceptable thresholds were removed. Internal consistency reliability of the overall scale and subscales was assessed using Cronbach's Alpha, with $\alpha \geq 0.70$ considered acceptable.

Next, structural validity was evaluated in two stages. Exploratory Factor Analysis (EFA) with Promax rotation was conducted to identify latent factors and examine the alignment between empirical data and the theoretical structure. Subsequently, Confirmatory Factor Analysis (CFA) was performed

on an independent dataset to assess model fit using indices including χ^2/df , CFI, TLI, and RMSEA.

In addition, evidence of content validity, construct validity, discriminant validity across groups, inter-rater reliability, and convergent validity (Spearman correlation) was examined to ensure that the assessment toolkit not only demonstrated internal consistency but also accurately and comprehensively measured the construct of social skills in children aged 5–6 years.

Based on the synthesis of these analyses, the final structure of the KNXH5T assessment toolkit was established and refined, ensuring scientific rigor, cultural relevance, and practical applicability within Vietnamese early childhood education.

3. Results

3.1. The Social Skills Framework Model for Children Aged 5–6 Years

The KNXH5T framework was developed through a selective adaptation of the Social Skills Improvement System – Rating Scales (SSIS-RS) proposed by Gresham and Elliott (2008). The original model comprises seven domains of social skills: Communication, Cooperation, Assertion, Responsibility, Empathy, Engagement, and Self-control. SSIS conceptualizes social skills as a multidimensional construct, emphasizing the dynamic interaction among social cognition, emotional regulation, and adaptive behavior (Gresham et al., 2011), while focusing on observable behaviors manifested in everyday social contexts.

The SSIS (2008) Theoretical Framework and Its Feasibility in the Asian Context

Cheung et al. (2017) demonstrated that the Chinese version of the SSIS-RS exhibited strong internal reliability and a factor structure consistent with the original model in a sample of children and adolescents in Hong Kong. These findings support the cross-cultural adaptability of the SSIS framework and provide an empirical reference point for its application in the Vietnamese context.

Challenges in Applying SSIS to Preschool Children

Gresham (2011) reported discrepancies between teacher and parent ratings and noted that several original SSIS items were not fully aligned with the cognitive and linguistic

developmental characteristics of 5–6-year-old children. Panayiotou (2020) therefore recommended a more parsimonious structure for early childhood populations. Dobbs et al. (2009) further highlighted the contextual dependency of young children's social behaviors, suggesting that maintaining an overly differentiated factor structure may weaken construct validity.

Rationale for Restructuring from Seven to Five Factors (KNXH5T)

Exploratory Factor Analysis (EFA) conducted with a sample of 5–6-year-old children in Hanoi indicated convergence toward a clearer five-factor solution. This pattern aligns with Frye et al. (2025), whose multi-level mixture modeling (MMOD) revealed high inter-factor correlations among the seven SSIS domains, supporting the possibility of factor reduction without substantial loss of explanatory power. In preschool populations, domains such as Cooperation and Responsibility, or Engagement and Communication, frequently demonstrate conceptual overlap. In the Vietnamese context, Responsibility is often manifested through Cooperative classroom behaviors, while Engagement is commonly expressed via Communication. Accordingly, the KNXH5T framework comprises five core domains: Communication, Cooperation (integrating Engagement indicators), Responsibility (integrating Assertion indicators), Empathy, and Self-control. This restructuring aims to enhance psychometric parsimony, reduce multicollinearity, and strengthen practical applicability in early childhood education.

In summary, based on a selective adaptation of the SSIS framework and adjustments to ensure alignment with developmental characteristics and the Vietnamese early childhood education context, the KNXH5T framework of this instrument was established to comprise five core domains: Communication, Cooperation, Responsibility, Empathy, and Self-control.

3.2. Introduction to the Social Skills Assessment Assessment toolkit for Children Aged 5–6 Years – KNXH5T

The KNXH5T assessment toolkit was developed following a multi-informant assessment approach, enabling the collection of information on children's social skills across

different contexts. The system comprises two primary components:

A rating scale with rubric completed by teachers and parents (KNXH5T – GV&PH – Rating Scale);

Direct child-administered situational tasks (KNXH5T – Social Situations Tasks).

The content structure was designed to ensure comparability across assessment sources.

The quantitative rating scale captures stable social behaviors in classroom and family environments while enabling reliability and validity testing. The rubric provides qualitative depth by describing behavioral performance levels beyond mere frequency counts. The situational tasks offer evidence of children's ability to recognize and select appropriate responses in specific social contexts. Together, these components enhance comprehensiveness, reliability, and practical applicability in Vietnamese early childhood education.

3.2.1. Rating Scale for Teachers and Parents (KNXH5T – GV&PH)

Development Philosophy and Advantages of a Unified Form

The KNXH5T – GV&PH form was developed through adaptation and localization of the Teacher Form of the SSIS-RS (Gresham & Elliott, 2008), using a unified item structure for both teachers and parents. This approach ensures cross-informant comparability, allowing score differences to be interpreted as contextual behavioral variations (home and school) rather than measurement discrepancies.

Maintaining shared items reduces rater-related measurement error, enhances internal consistency, and preserves psychometric properties during localization. Moreover, a unified form facilitates large-scale training, administration, and data processing.

Reduction and Cultural Adaptation Process

From an original pool of 46 items, the assessment toolkit was refined to 22 items through expert consultation, pilot testing, and content analysis. Redundant, weakly discriminating, or culturally inappropriate items were removed. Language was behaviorally operationalized to ensure observability.

The final 22 items cover five core domains: Communication, Cooperation, Self-control, Assertion, and Empathy.

Structure and Rating Scale (Rubric)

The rating form employs a four-point Likert scale (1–4) accompanied by a frequency-based rubric, minimizing central tendency bias and improving discriminative capacity. Items are organized into five factors (4–5 indicators per factor), suitable for reliability and structural analyses.

In summary, the KNXH5T – GV&PH form represents a scientifically grounded localization process, establishing a “shared language” between families and schools in assessing and supporting social skills development in children aged 5–6 years.

3.2.2. Social Situations Tasks for Children (KNXH5T – Social Situations Tasks)

In addition to indirect rating scales, the study developed a system of situational tasks to directly assess children's social performance in typical social contexts. This approach recognizes that social skills are reflected not only in observable behavioral frequency but also in children's reasoning, decision-making, and action in specific situations.

The assessment toolkit integrates elements from IDELA (Save the Children, 2014) with the KNXH5T framework, ensuring adherence to international standards while maintaining cultural relevance to Vietnam.

Design Philosophy and Integration Rationale

Guided by a play-based assessment orientation, situations are presented through illustrated scenarios or short stories to elicit natural responses and reduce psychological pressure. Core domains such as peer relations, emotional regulation, empathy, self-awareness, and conflict resolution were incorporated and restructured into the five KNXH5T domains.

This integration enhances universality, practical relevance, and control over biases inherent in indirect assessments.

Structure and Content

The system includes 22 situational tasks, corresponding one-to-one with the 22 behavioral indicators, ensuring construct coverage and facilitating structural and convergent validation analyses.

Scoring Guidelines

A four-point scale (1–4) is applied based on the quality and appropriateness of responses, aligned with the teacher and parents

rating scale to enable cross-informant comparison.

Overall, this component quantifies children’s social problem-solving competence and strengthens the comprehensive validity of the KNXH5T instrument.

3.2.3. Scoring Criteria and Performance Levels

The development of scoring criteria and interpretation guidelines ensures objectivity. Data are processed by integrating behavioral frequency (teacher and parents rating scale) and situational cognitive competence (Child Tasks).

Scoring Rules for the teacher and parents rating scale

The form includes 27 items (22 core items and 5 supplementary items). Teachers and parents rate children’s behavior observed over the previous 3–4 weeks using a four-point Likert scale (1–4), ranging from “Never” to “Very Often.” Mean scores at the subscale and total scale levels reflect the level of social skills development.

Scoring Rules for Situational Tasks: Children receive 1 point for an appropriate response with reasonable justification and 0 points for inappropriate responses. The resulting index (0–1) serves as cross-validation against behavioral data.

Performance Level Classification: Scores are categorized into four levels: Low, Moderate, Good, and High. The teacher and parents rating scale serves as the primary weighting source, while situational tasks reflect cognitive potential.

3.3. Validation of the KNXH5T Instrument

The toolkit demonstrated high reliability ($\alpha = 0.88$) and a robust five-factor structure (Communication, Cooperation, Responsibility, Empathy, and Self-control), confirmed by EFA (62.5% variance explained) and CFA (CFI = 0.93; RMSEA = 0.052).

3.3.1. Item Analysis and Reliability

Based on Classical Test Theory (CTT), corrected item-total correlation analysis yielded coefficients ranging from 0.45 to 0.72, surpassing the 0.30 threshold recommended by Hair et al. This demonstrates that the items are closely aligned and consistently measure the social skills construct. Following the refinement process, the overall Cronbach’s Alpha reached 0.88 (Teacher-report) and 0.87 (Parent-report), reflecting high internal consistency. Subscale coefficients ranged from 0.78 to 0.85. Furthermore, the assessment toolkit demonstrated superior stability and objectivity, with a test-retest reliability of $r = 0.86$ and an intraclass correlation coefficient (ICC) of 0.83.

3.3.2. Structural Validity

The construct validity of the assessment toolkit was evaluated using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). For the $N = 335$ sample, EFA with Varimax rotation extracted five factors with Eigenvalues > 1 , accounting for 62.4% of the total variance.

The KMO value of 0.847 and a significant Bartlett’s test ($p < .001$) confirmed the suitability of the data for factor analysis. All items exhibited factor loadings ≥ 0.55 , clustering distinctly into the five hypothesized dimensions (Communication, Cooperation, Responsibility, Empathy, and Self-control) without significant cross-loadings.

The five-factor model was further validated through CFA, demonstrating a good fit with the empirical data: Chi-square/df = 2.57; CFI = 0.911; TLI = 0.900; and RMSEA = 0.0685 (90% CI: 0.0629–0.0741). The path diagram confirmed that all indicators significantly loaded onto their respective latent factors. These findings provide robust evidence for the construct validity and measurement stability of the KNXH5T toolkit within the Vietnamese educational context.

Table 1. Summary of the Main Psychometric Indices of the KNXH5T Instrument

| Index Category | Assessment Content | Summary Results | Standard Level |
|----------------|-----------------------------------|------------------------------------|---------------------|
| Item Analysis | Corrected item–total correlations | 0.45–0.72 (2 items removed < 0.25) | Acceptable (> 0.30) |

| Index Category | Assessment Content | Summary Results | Standard Level |
|---|--------------------------------|----------------------------------|---------------------------|
| Overall Reliability | Cronbach's Alpha (Total scale) | 0.88 (Teacher); 0.87 (Parent) | Very high |
| Subscale Reliability | Communication (GT) | 0.82 | Good |
| | Cooperation (HT) | 0.85 | Very good |
| | Self-control (TKS) | 0.78 | Acceptable |
| | Responsibility (TN) | 0.81 | Good |
| | Empathy (TC) | 0.85 | Very good |
| Exploratory Factor Analysis (EFA) | Number of extracted factors | 5 factors | Consistent with model |
| | Total variance explained | 62.4% | High (> 50%) |
| | KMO / Bartlett's Test | 0.847 / $p < .001$ | Good |
| Confirmatory Factor Analysis (CFA) | Chi-square/df | 2.57 | Good (< 5.0) |
| | CFI (Comparative Fit Index) | 0.911 | Acceptable (> 0.90) |
| | TLI (Tucker-Lewis Index) | 0.900 | Acceptable (\geq 0.90) |
| | RMSEA | 0.0685 | Good fit (< 0.08) |
| | Test-retest reliability (r) | 0.86 | Excellent |
| Additional Validity | Inter-rater reliability (ICC) | 0.83 | Very good |

4. Discussion of Findings

The research findings confirm the validity of selectively adapting the SSIS framework (Gresham & Elliott, 2008) and restructuring it into the KNXH5T model tailored for Vietnamese children aged 5–6. Refining the original seven-factor SSIS structure into a more streamlined five-factor model (Communication, Cooperation, Responsibility, Empathy, and Self-control) aligns with trends observed in cross-cultural studies (Cheung et al., 2017; Panayiotou, 2020, Frye et al, 2025). This adjustment suggests that certain highly correlated components can be integrated to enhance theoretical parsimony and practical utility within the Vietnamese early childhood education context. The EFA results, extracting five factors that account for 62.4% of the total variance, indicate that social skill groups at the preschool level tend to converge into distinct yet cohesive structures, reflecting the developmental psychological characteristics of 5- to 6-year-olds.

Regarding psychometric properties, the overall Cronbach's Alpha reached 0.88

(Teacher-report) and 0.87 (Parent-report), with subscale coefficients ranging from 0.78 to 0.85. These figures demonstrate high internal consistency according to Classical Test Theory (CTT) standards. The exclusion of items with low corrected item-total correlations (< 0.25) during the refinement process significantly enhanced the scale's homogeneity. Compared to localized SSIS validation studies worldwide, the reliability of the KNXH5T toolkit is equivalent to or higher than several international versions, confirming that the cultural adaptation process was executed systematically and effectively.

The Confirmatory Factor Analysis (CFA) results (CFI = 0.911; TLI = 0.900; RMSEA = 0.0685) provide compelling empirical evidence of construct validity. The goodness-of-fit indices met established international thresholds, validating the compatibility between the theoretical model and the empirical data collected in Hanoi. This finding is particularly significant given the current shortage of social skill assessment tools in

Vietnam that have undergone rigorous psychometric validation.

The multi-source approach (Teacher – Parent – Child) offers superior scientific value. Consistency across assessment sources allows for cross-validation, reducing subjective bias and “social desirability” effects. Combining Likert-scale questionnaires with situational tasks not only assesses overt behaviors but also taps into the child’s underlying social-cognitive abilities. Overall, the KNXH5T toolkit establishes both technical reliability and practical validity. It serves as a robust assessment toolkit for screening, evaluating, and supporting early interventions to develop social skills in 5- to 6-year-old children, providing a solid foundation for their transition to primary school.

5. Conclusion

This study successfully developed and validated the KNXH5T assessment toolkit for assessing social skills among Vietnamese children aged 5–6 within the early childhood

education context. Grounded in the theoretical framework of Gresham & Elliott and informed by Classical Test Theory (CTT), the assessment toolkit was designed to align with both developmental characteristics and the socio-cultural context of Vietnam.

Psychometric analyses supported a five-factor structure – Communication, Cooperation, Responsibility, Empathy, and Self-control – with satisfactory model fit to the empirical data. Reliability coefficients indicated strong internal consistency across the overall scale and subscales, while construct validity was substantiated through factor-analytic evidence.

The integration of multi-informant data, combining teacher and parent ratings with direct situational tasks for children, enhanced the objectivity and applied relevance of the instrument. Overall, the KNXH5T provides a scientifically robust foundation for evidence-based assessment and intervention, supporting children’s social development during the critical transition to primary education

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