Psychometric development of an independence scale for students with mild intellectual disabilities

Andi Prabowo[1], Edi Istiyono[2], and Farida Agus Setiawati[3]

[1,2,3]Sekolah Pascasarjana Universitas Negeri Yogyakarta, Kampus Karangmalang, Yogyakarta
Corresponding Author: andiprabowo.2024@student.uny.ac.id

Abstract

Measuring the independence of students with mild intellectual disabilities requires a well-validated and culturally appropriate instrument as a foundation for designing effective educational interventions. However, in Indonesia, such tools remain limited. This study aimed to develop a non-cognitive Independence Scale for students with mild intellectual disabilities and to evaluate its psychometric properties, including validity, reliability, item difficulty, and discrimination. A 30-item Likert-scale instrument, rated by teachers, was constructed to measure three domains: Personal, Social, and Academic Independence. The scale was pilot tested on 100 students with mild intellectual disabilities at SLB Negeri Manggar. Quantitative analyses using R Studio included tests of item validity (corrected item–total correlations), internal consistency (Cronbach's a), item discrimination (upper–lower group method), item difficulty indices, and normality of total scores (Shapiro–Wilk and Kolmogorov–Smirnov tests). All 30 items demonstrated acceptable validity ($r \geq 0.39$) and high internal consistency (Cronbach's $a = 0.919$). Item discrimination indices were satisfactory ($D \geq 0.30$). Seventeen items (57%) were categorized as "Easy" ($p > 0.70$), while the rest showed moderate difficulty levels, and no items were too difficult ($p < 0.30$). The total scores were normally distributed ($p > 0.05$). Overall, the Independence Scale exhibited strong psychometric properties, indicating its suitability for assessing the independence of students. Future revisions are recommended to refine items that were identified as Easy to enhance discrimination among higher-performing students.

Keywords: Student Independence; Mild Intellectual Disability; Psychometric Validity; Reliability; Adaptive Behavior

INTRODUCTION

Independence is defined as an individual's ability to carry out daily activities, make decisions, and complete tasks without excessive reliance on others (Santrock, 2011). For students with mild intellectual disabilities, independence represents a fundamental adaptive capacity necessary for optimizing daily functioning. This independence encompasses personal aspects (self-care), social aspects (interaction and social responsibility), and academic aspects (preparation for learning and following instructions). In the context of special education, teachers play a crucial role in facilitating the development of independence. However, to ensure that interventions are properly targeted and effective, teachers require a systematic and reliable means of assessing student independence.

jpipfip@uny.ac.id

Recent research emphasizes that measuring independence effectively requires instruments that are both culturally sensitive and appropriate for the target population. Although internationally standardized tools such as the Vineland Adaptive Behavior Scales (VABS) and the Adaptive Behavior Assessment System (ABAS-II) are widely used, their applicability may be limited in local educational settings where language, cultural norms, and school practices differ (Kummeling et al., 2023). Teacher-rated scales have demonstrated reliability in capturing students' adaptive behaviors, especially when items are operationally defined and linked to observable outcomes. The heterogeneity in adaptive skills across individuals underscores the need for instruments capable of capturing subtle differences in ability levels. Furthermore, cognitive and developmental factors have been shown to influence independence: for example, variations in attentional resources directly correlate with performance in daily living activities García-Pintor et al. (2024), and adaptive behavior profiles can vary depending on developmental dynamics and intensity of support (Adrien et al., 2025). These findings affirm that independence-focused interventions should address not only practical functional skills but also underlying cognitive and developmental mechanisms.

In Indonesia, the availability of psychometrically robust instruments specifically measuring personal, social, and academic independence in students with mild intellectual disabilities remains limited. Previous studies suggest that existing tools may suffer from cultural bias, limited contextual relevance, or insufficient sensitivity to detect subtle but meaningful differences in adaptive skills (Yusuf & Nurihsan, 2018). This limitation is critical because independence can be heavily influenced by social and environmental factors, including community context and family support (Ghalib, 2024). Developing a locally relevant instrument allows educators to gather more precise data on students' independence levels, enabling tailored instructional planning and targeted interventions (Creswell & Poth, 2018).

Empirical evidence also supports the use of non-cognitive, informant-report scales for measuring functional independence when teacher ratings are systematically collected and analyzed (Arbiatin & Mulabbiyah, 2020). Careful item-level psychometric evaluation including analyses of item validity, reliability, discrimination, and difficulty is essential to create instruments that are both accurate and actionable (Andaru et al., 2022; Saleh et al., 2024). Recent efforts in instrument development highlight the need for tools that are comprehensive and sensitive to individual differences. For instance, Carbajal et al. (2024) designed a new test battery to evaluate adaptive behavior, integrating cognitive, social, and practical indicators within a cohesive assessment framework. Similarly, Kildahl et al., (2025) demonstrated the importance of instrument stability by showing that the Aberrant Behavior Checklist maintained a consistent factor structure over time; this underscores the link between behavioral problems and daily living skills. Drijver et al. (2025) reported the development of a diagnostic instrument focused on capturing small variations in adaptive abilities, thereby supporting more precisely targeted learning programs.

The need for multidimensional assessment tools is further reinforced by recent validation studies. Zorzi et al. (2023) found that the Adult Independence Living Measurement Scale (AILMS) could accurately differentiate independence profiles across personal, social, and instrumental domains, demonstrating the value of examining distinct dimensions of independence. Overly standardized international instruments may not fully capture the nuanced behaviors of students with mild intellectual disabilities in everyday school activities, particularly in social interactions and classroom routines (Esteras et al., 2024; Losada-Puente & Baña, 2022b). The importance of social domain assessment is emphasized by research on pragmatic skills, which are strongly related to adaptive functioning and interpersonal interactions Hernández-Hernández et al. (2025) and by findings that functional social maturity is a significant predictor of achieving independence (Sajewicz-Radtke & Radtke, 2024). Therefore, a locally developed, psychometrically validated tool focusing on three key dimensions of independence personal, social, and academic is necessary to fill this practical and scientific gap. Such an instrument would align with actual classroom practices, enhance teacher acceptability, and strengthen the

data foundation for intervention planning (Yusuf & Nurihsan, 2018). Moreover, attention to internal factors related to independence is growing: Scior et al. (2023) recently validated a well-being scale for individuals with intellectual disabilities, highlighting that psychological well-being is an important aspect of adaptive functioning. Likewise, Davison et al (2023) showed that self-reported mental well-being measures are reliable in adolescents with intellectual disabilities, indicating that affective and self-perception components should be considered when assessing adaptive function.

In sum, this research is novel in that it involves the development and comprehensive psychometric testing of an independence assessment instrument specifically tailored for students with mild intellectual disabilities in Indonesia. By combining rigorous statistical validation with considerations of practical relevance, the resulting instrument provides educators with a robust tool for assessing student independence and for informing individualized educational strategies (DeVellis, 2017).

METHODS

This study employed an instrumental research design, instrument development research, focusing on the construction, pilot testing, and psychometric evaluation of a new measurement instrument (Meng et al., 2018) . This design is well-suited for developing valid and reliable tools intended for educational practice (DeVellis, 2017). Rigorous quantitative analyses of psychometric properties (e.g. validity and reliability testing) were conducted to ensure that the instrument produces accurate and interpretable data (Yusuf & Nurihsan, 2018).

Participants

The research sample comprised 100 students with mild intellectual disabilities recruited from several special schools across Belitung Island, representing the instrument's target population. Participants were selected using a purposive sampling technique to ensure they were representative and informative for the study's objectives (Andaru et al., 2022). In addition, special education teachers who taught and observed these students daily served as informants (raters). These teacher-raters provided informed consent and rated each student's level of independence, a method demonstrated to yield reliable data on adaptive behavior when raters possess extensive experience with the students (Losada-Puente & Baña, 2022a).

Instrument Development

The instrument, named the *Independence Measurement Instrument for Students with Mild Intellectual Disabilities*, is a non-cognitive, informant-report scale consisting of 30 items. These items are organized into three dimensions: Personal Independence (Items R01–R10), Social Independence (Items R11–R20), and Academic Independence (Items R21–R30). Responses were collected using a 4-point Likert scale (Rating Scale Model): 1 = Strongly Inappropriate, 2 = Inappropriate, 3 = Appropriate, 4 = Strongly Appropriate. The total theoretical score ranges from 30 to 120.

Data Analysis Procedures

Quantitative data were analyzed using R Studio to examine the instrument's psychometric quality. The analysis began with testing the normality assumption using the Shapiro–Wilk and Kolmogorov–Smirnov tests on total scores, a prerequisite for subsequent parametric analyses. (Creswell & Creswell, 2023). Item validity was then assessed through the Corrected Item–Total Correlation (rit), where items with a value of rit ≥ 0.30 were considered valid contributors to the measured construct (Marianti et al. 2023). Internal consistency reliability was evaluated using Cronbach's Alpha ($α$), with $α ≥ 0.70$ deemed acceptable and $α ≥ 0.90$ indicating excellent reliability (Saleh et al. 2024). Finally, item quality was examined through two indices: the Discrimination Index (D), where items with D ≥ 0.30 were considered to effectively distinguish between high- and low-ability respondents (Garvin & Ebel, 1991), and the Item Difficulty Index

(p), where items with moderate difficulty ($0.30 \leq p \leq 0.70$) were preferred to avoid ceiling or floor effects (Downing & Haladyna, 2006). This multi-step analytical procedure ensured a robust assessment of the instrument's validity, reliability, and overall quality.

RESULTS AND DISCUSSION

Results

This study focuses on examining the psychometric properties of the Independence Measurement Instrument for Students with Mild Intellectual Disabilities, including internal reliability and item-level analyses (difficulty index and discrimination index). All analyses were conducted using the integrated R Studio environment.

Item – Level Descriptive Analysis

This analysis examines the 30 statement items (R01 to R30) included in the Independence Measurement Instrument for Students with Mild Intellectual Disabilities. The measurement was carried out using a 4-point Likert Scale completed by raters (Special Education Teachers) for a sample of 100 students.

Psychometric evaluation must begin with item-level descriptive analysis to examine data distribution and ensure readiness before proceeding to inferential testing (Creswell & Creswell, 2023). In this study, descriptive analysis served to map the response distribution of 100 raters across the 30 items using a 4-point Likert scale (1 = Never to 4 = Always). According to Losada-Puente & Baña (2022a), early examination of item distribution is essential in instrument validation studies, particularly for scales assessing adaptive behavior constructs. This step helps researchers identify potential response biases such as tendencies toward extreme ratings—that may affect subsequent reliability and validity results.

These items were designed to represent three distinct domains of independence. The instrument was developed based on a theoretical framework that classifies the independence of students with mild intellectual disabilities into three primary dimensions: personal, social, and academic.

Table 1. Item-level descriptive analysis results

Item	Mean	SD	Skewness	Kurtosis
R01	3.08	0.94	-0.74	-0.43
R02	2.80	1.02	-0.23	-1.17
R03	3.08	0.73	-0.27	-0.68
R04	3.07	0.79	-0.36	-0.74
R05	1.98	1.01	0.73	-0.63
R06	3.05	0.73	-0.23	-0.68
R07	1.85	1.05	0.87	-0.61
R08	2.24	1.08	0.13	-1.40
R09	2.25	1.01	0.19	-1.14
R10	1.89	0.76	0.32	-0.86
R11	2.97	0.67	-0.16	-0.27
R12	2.81	0.91	-0.27	-0.81
R13	1.97	0.96	0.60	-0.71
R14	1.81	0.99	0.87	-0.51
R15	3.00	0.68	-0.38	0.24
R16	3.13	0.73	-0.35	-0.63
R17	2.87	1.05	-0.31	-1.25
R18	3.13	0.97	-0.78	-0.54
R19	3.20	0.99	-1.07	0.01
R20	3.15	0.74	-0.39	-0.67
R21	2.39	1.05	0.11	-1.22
R22	2.12	0.94	0.50	-0.63
R23	3.15	0.74	-0.39	-0.67
R24	2.93	0.98	-0.38	-1.04
R25	2.00	1.03	0.70	-0.71
R26	1.91	1.11	0.83	-0.78
R27	1.92	1.13	0.83	-0.81
R28	3.15	0.74	-0.39	-0.67
R29	2.88	1.06	-0.32	-1.27
R30	3.13	0.95	-0.82	-0.37

The mean scores of most items were above 2.80, indicating that respondents generally agreed with the statements in the instrument (scale 1 – 4). However, a group of items (R05, R07, R10, R14, R25, R26, R27) showed mean values below 2.00, suggesting that respondents tended to disagree or assign lower scores to these items. The predominantly negative skewness values (e.g., R19: –1.07) further confirm the tendency of respondents to provide high scores.

Item Validity and Reliability

The validation process adopted a classical psychometric approach, in which item validity and internal reliability must meet strict statistical criteria (Creswell & Creswell, 2023). Internal reliability was assessed using Cronbach's Alpha (α) to evaluate the extent to which the items consistently measure the same construct (Kummeling et al., 2023). Meanwhile, item validity was examined through the analysis of corrected item–total correlations, where an item is considered valid if it shows a positive and significant correlation with the total instrument score, demonstrating its contribution to the overall measurement (Losada-Puente & Baña, 2022a).

Table 2. Corrected item–total correlation (rit) results for each item

Item	R01	R02	R03	R04	R05	R06	R07	R08	R09	R10
R_{it} (r.drop)	0.46	0.57	0.55	0.44	0.51	0.53	0.49	0.43	0.54	0.48
Item	R11	R12	R13	R14	R15	R16	R17	R18	R19	R20
R_{it} (r.drop)	0.45	0.57	0.50	0.56	0.45	0.50	0.55	0.50	0.40	0.59
Item	R21	R22	R23	R24	R25	R26	R27	R28	R29	R30
R_{it} (r.drop)	0.54	0.39	0.53	0.62	0.53	0.53	0.47	0.54	0.56	0.47

Based on the analysis results, all 30 items (R01 to R30) are declared valid, as all corrected item–total correlation (rit) values exceed the minimum threshold of 0.30. Reliability Conclusion the Cronbach's Alpha value of 0.919 is classified as Very High (criterion α ≥ 0.90). This indicates that the instrument demonstrates excellent internal consistency and is highly reliable for measuring the intended construct.

Table 3. Alpha if item deleted

Item	R01	R02	R03	R04	R05	R06	R07	R08	R09	R10
Alpha if Item Deleted	0.917	0.916	0.916	0.918	0.917	0.917	0.917	0.918	0.916	0.917
Item	R11	R12	R13	R14	R15	R16	R17	R18	R19	R20
Alpha if Item Deleted	0.918	0.916	0.917	0.916	0.918	0.917	0.916	0.917	0.918	0.916
Item	R21	R22	R23	R24	R25	R26	R27	R28	R29	R30
Alpha if Item Deleted	0.916	0.918	0.917	0.915	0.916	0.916	0.918	0.917	0.916	0.917

All "Alpha if Item Deleted" values are lower than the total Cronbach's Alpha (0.919). This indicates that none of the items should be removed, as eliminating any item would reduce the overall reliability of the instrument.

Item Analysis

The item quality analysis focused on the Item Difficulty Index to identify items that best differentiated respondents' abilities. Item difficulty was based on the proportion of high-category responses (scores 3 and 4). Beyond validity and reliability, instruments must also be evaluated through item difficulty analysis (Losada-Puente & Baña, 2022a). For non-cognitive measures, the p-value shows how easily respondents endorse an item, with values between 0.30 and 0.70 considered most effective (Creswell & Creswell, 2023). This analysis helps prevent ceiling effects, as reflected in the following distribution tables.

Table 4. Item discrimination index (d) results

Item	Difficulty Index (p)	Category
R01	0.77	Easy
R02	0.70	Moderate
R03	0.77	Easy
R04	0.46	Moderate
R05	0.49	Moderate
R06	0.56	Moderate
R07	0.74	Easy
R08	0.70	Moderate
R09	0.49	Moderate
R10	0.74	Easy
R11	0.70	Moderate
R12	0.49	Moderate
R13	0.45	Easy
R14	0.75	Moderate
R17	0.60	Easy
R22	0.73	Moderate
R23	0.73	Easy
R30	0.78	Easy

Conclusion on Item Discrimination: Using the criterion D ≥ 0.30 (categorized as Good), all 30 items demonstrate very strong discrimination power. This indicates that the instrument effectively distinguishes between respondents with high overall scores and those with low scores. The item difficulty index (p-value) was calculated by dividing the mean score of each item by the maximum possible score (4).
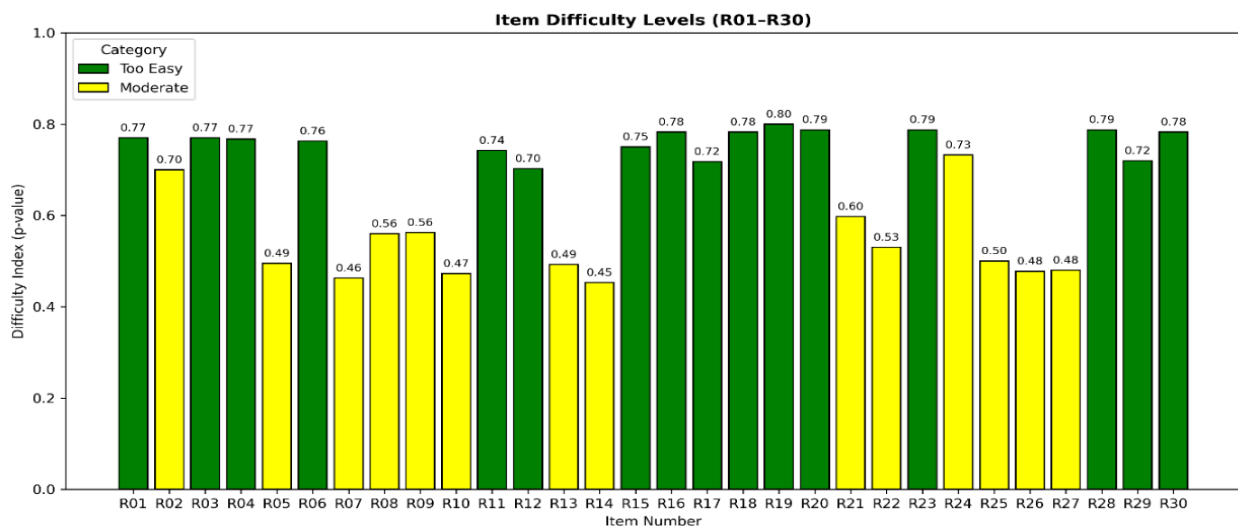

Figure 1. Item difficulty analysis (p-value)

Conclusion on Item Difficulty: A total of 17 items are categorized as Easy (p > 0.70), while 13 items fall into the Moderate category ($0.30 \leq p \leq 0.70$). No items are classified as Too Difficult. The high number of Easy items indicates the presence of positive response bias, meaning respondents tend to choose high/agree responses.

Normality Test of Total Scores

The normality test of the instrument's total scores is an inferential statistical procedure used to determine whether the obtained data originate from a population with a normal distribution. Normality is a prerequisite assumption that must be met before conducting parametric statistical analyses underlying item validity and reliability testing.

Assessing the normality of total scores is essential to validate the use of parametric statistics such as correlation and Cronbach's Alpha, which are employed to evaluate reliability and validity. A normally distributed dataset ensures that the statistical inferences drawn from the

sample accurately represent characteristics of the target population (Losada-Puente & Baña, 2022a).

Normality of the total scores was assessed by comparing the p-value with a significance level of 0.05 using two distinct methods. The Shapiro-Wilk test yielded a statistic (W) of 0.976 with a *p*-value of 0.064. Similarly, the Kolmogorov-Smirnov test resulted in a statistic (D) of 0.056 with a *p*-value of 0.912. Since the p-values from both tests exceed the alpha level of 0.05, it can be concluded that the total scores follow a normal distribution. This finding satisfies the essential assumption required for the application of further parametric statistical procedures.

Discussion

This section interprets the psychometric findings and discusses their implications for assessing independence in students with mild intellectual disabilities. The discussion addresses the instrument's validity, reliability, item characteristics, and overall suitability for use in special education settings.

The results indicate that the Independence Measurement Instrument for Students with Mild Intellectual Disabilities possesses robust psychometric properties. The instrument demonstrated excellent internal consistency, with a Cronbach's alpha of 0.919, substantially exceeding the commonly accepted minimum threshold of 0.70 for reliability. As noted by Kummeling et al. (2023) , achieving high internal reliability in adaptive behavior assessments is critical to ensure that teacher ratings are stable and minimally affected by measurement error. This is especially important when evaluating students with mild intellectual disabilities, whose adaptive behaviors might fluctuate due to contextual or instructional factors. The high α obtained suggests that teachers were consistent in their ratings across the various items, reinforcing confidence that the scale reliably measures a cohesive construct of "student independence."

In addition to reliability, the item validity analysis confirmed that all 30 items are valid measures of the construct. Every item's corrected item–total correlation was well above 0.30, indicating strong discriminatory power. This outcome aligns with the observations of Belcher et al. (2023) , who found that teacher-rated adaptive behavior scales tend to exhibit high item validity when behavioral indicators are clearly operationalized and contextually relevant. In our study, the complete set of items showing significant item-total correlations suggests that each independence behavior assessed contributes meaningfully to differentiating students' overall independence levels. Together, the very high reliability and universal item validity support the conclusion that the instrument is psychometrically sound and appropriate for the target student population (Losada-Puente & Baña, 2022a).

Although the instrument proved to be both valid and reliable, the item analysis results highlight an important pattern: 17 out of 30 items (57%) were categorized as "Easy," with p-values greater than 0.70. This finding has several implications in the context of assessing students with mild intellectual disabilities:

Mastery of Foundational Adaptive Skills: The prevalence of easy items suggests that many students in the sample have already mastered the basic independence skills represented by those items (Matson & Matson, 2011). Behaviors such as handling routine self-care tasks, following simple instructions, or organizing personal belongings were rated as frequently demonstrated by most students. This could indicate that the special education programs in the participating schools are effective in teaching fundamental adaptive skills so effective that these basic skills no longer differentiate among students. In practical terms, if most students can perform these tasks with little difficulty, the items might be tapping into skills that are below the current ability level of the group (ceiling reached). This is encouraging from an educational standpoint, as it reflects success in building foundational independence, but it poses a challenge for measurement sensitivity.

Potential for a Ceiling Effect: A high proportion of "Easy" items raises the risk of a ceiling effect in the scale (Embretson & Reise, 2013). When many items are very easy for respondents to agree with, high total scores become clustered, and the instrument may have limited ability to

discriminate among students at the upper end of the independence range (Creswell & Creswell, 2023). In our results, the skewness data and difficulty indices suggest that a significant number of students scored near the top on many items. This ceiling effect means that the instrument might not be very sensitive to improvements in independence for higher-performing students; as students progress, their scores might hit a maximum and fail to reflect incremental gains (Reeve et al., 2007). This limitation could reduce the usefulness of the scale for long-term progress monitoring or for identifying exceptional strengths, since the room for growth on these items is minimal. Future revisions of the instrument should consider introducing more challenging items that capture advanced independence skills (e.g., problem-solving novel tasks, self-initiation of complex activities, or transferring skills to unfamiliar situations) to extend the upper range of measurement.

Overall Feasibility of the Instrument: Despite the above considerations, the instrument remains highly feasible and valuable for use in special education practice. The confirmation of normality in total scores indicates that the scale can produce a distribution suitable for parametric analyses and meaningful interpretation across a classroom or program (Tassé et al., 2016). The combination of strong internal consistency, thorough item validity, and informative item-level analysis means that educators and researchers can trust the instrument to provide a reliable snapshot of a student's independence. Importantly, the scale is straightforward to administer: it leverages teacher observations that occur naturally, avoiding the need for lengthy testing sessions with the students. The 30-item format is relatively brief, which encourages regular use (for example, as part of an initial assessment or periodic progress evaluations). In providing a standardized, empirically validated measure, this instrument enables educators to obtain objective data on student independence that can inform Individualized Education Program (IEP) goals and instructional planning. The fact that all items were retained and contribute positively implies that the full spectrum of personal, social, and academic independence skills is covered without redundancy. This comprehensive coverage ensures that teachers and support teams can identify specific domains where a student is excelling or needs further support.

CONCLUSION

Based on the psychometric evaluation results, the developed Independence Scale demonstrated strong reliability and validity. With a Cronbach's alpha of 0.919, the instrument showed excellent internal consistency and produced stable scores when used by teachers to assess the independence of students with mild intellectual disabilities. All items were valid, with corrected item–total correlations above 0.30, indicating that each effectively differentiated levels of personal, social, and academic independence. Overall, the scale proved to be an appropriate, standardized, and data-driven tool for use in special education settings. However, the item difficulty analysis revealed that most items were categorized as easy, suggesting the need for revision to enhance the instrument's discriminative power among higher-performing students.

Moving forward, it is recommended that this instrument be used for early assessments to establish baseline independence profiles that can guide the development of Individualized Education Plans (IEPs). The results can support teachers in setting more precise goals and targeted interventions. Further refinement should focus on revising overly easy items, establishing external validity through correlations with other adaptive behavior measures (e.g., VABS or ABAS-II), and applying advanced psychometric analyses such as Confirmatory Factor Analysis (CFA) or Item Response Theory (IRT). These steps will strengthen the scale's precision and applicability, ensuring it serves as both a diagnostic and evaluative tool for monitoring progress and enhancing adaptive outcomes among students with mild intellectual disabilities.

ACKNOWLEDGEMENT

REFERENCES

Adrien, J.-L., Courcy, A., Haelewyck, M.-C., & Seron, X. (2025). Profile and development of adaptive behavior in adults with autism and intellectual disability. *Frontiers in Psychiatry*, *16*. https://doi.org/10.3389/fpsyt.2025.1166214

Andaru, M., Sari, M. A., & Handayani, T. (2022). Uji normalitas data menggunakan metode empirical distribution function dengan memanfaatkan MATLAB dan Minitab 19. *Jurnal Inovasi Pendidikan Dan Pengajaran*, *4*(2), 1–10. https://doi.org/10.30998/semnasristek.v7i1.6238

Arbiatin, E., & Mulabbiyah, I. (2020). Analisis kelayakan butir soal tes penilaian akhir semester mata pelajaran Matematika kelas VI di SDN 19 Ampenan tahun pelajaran 2019/2020. *El-Midad: Jurnal PGMI*, *12*(2), 146–171. https://doi.org/10.20414/elmidad.v12i2.2627

Belcher, T., Sparkman-Key, N., Augustine, B., & Borden, N. (2023). ePortfolio: Advancing Human Services Education through Technology. *International Journal of EPortfolio*, *13*(1), 69–82.

Creswell, John W & Creswell, J. D. (2023). *RESEARCH DESIGN Qualitative, Quantitative, and Mixed Methods Approaches Sixth Edition* (Sixth Edit). SAGE Publications, Inc.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative Inquiry & Research Design: Choosing Among Five Approaches*. SAGE Publications Inc. file:///C:/Users/L13 Yoga/AppData/Local/Mendeley Ltd./Mendeley Desktop/Downloaded/Creswell, Poth - 2018 - Qualitative Inquiry & Research Design Choosing Among Five Approaches.pdf

Davison, M. L., Weiss, D. J., DeWeese, J. N., Ersan, O., Biancarosa, G., & Kennedy, P. C. (2023). A Diagnostic Tree Model for Adaptive Assessment of Complex Cognitive Processes Using Multidimensional Response Options. *Journal of Educational and Behavioral Statistics*, *48*(6), 914–941. https://doi.org/10.3102/10769986231158301

DeVellis, R. F. (2017). *Scale development: Theory and applications (4th ed.)*. SAGE Publications.

Downing, S. M., & Haladyna, T. M. (2006). *Handbook of Test Development*. Lawrence Erlbaum Associates, Publishers. http://www.ebookstore.tandf.co.uk

Drijver, H. E., Didden, R., & Schuengel, C. (2025). Reliability and Validity of the Diagnostic Instrument on Adaptive Behaviour. *Journal of Applied Research in Intellectual Disabilities*, *38*(6). https://doi.org/10.1111/jar.70150

Embretson, S. E., & Reise, S. P. (2013). Item response theory for psychologists. *Item Response Theory for Psychologists*, 1–371. https://doi.org/10.4324/9781410605269

Esteras, G., Carbajal, A. B., Chávez-Ventura, G., & Zegarra-López, A. (2024). Challenges in adaptive behavior assessment for intellectual disabilities: A Latin American perspective. *International Journal of Developmental Disabilities*, *70*(1), 23–35.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*, *5*(1), 1. https://doi.org/10.11648/j.ajtas.20160501.11

García-Pintor, B., Guàrdia-Olmos, J., & Sánchez-Busqués, S. (2024). Attentional resources and independence in basic and instrumental activities of daily living in individuals with mild intellectual disability. *Healthcare*, *12*(2). https://doi.org/10.3390/healthcare12020126

Garvin, A. D., & Ebel, R. L. (1991). Essentials of Educational Measurement. In *Educational Researcher* (5th ed.). prentice-Hall, Inc, Englevrcod Clifh, NJ.

https://doi.org/10.2307/1175572

Ghalib, M. E. (2024). The level of daily life skills among individuals with mild intellectual disabilities and its relation to demographic variables in Central Sudan – Gezira State. *Migration Letters*, *21*(S1), 512–528.

Hernández-Hernández, S., García-Gómez, A., & López-Ruiz, V. (2025). Assessing pragmatic skills in people with intellectual disability: A systematic review. *Behavioral Sciences*, *15*(1). https://doi.org/10.3390/bs15010012

Kildahl, A. N., Hellerud, J. M. A., Halvorsen, M. B., & Helverschou, S. B. (2025). The Aberrant Behavior Checklist in a clinical sample of autistic individuals with intellectual disabilities and co-occurring mental health problems: Psychometric properties, factor structure, and longitudinal measurement invariance. *Journal of Autism and Developmental Disorders*. https://doi.org/10.1007/s10803-024-06697-5

Kummeling, J., Vermeulen-Kalk, K., Souverein, V., van Dongen, L. C. M., Oomens, W., Janzing, J. G. E., Pop-Purceleanu, M., Kleefstra, T., & Egger, J. I. M. (2023). Measuring Adaptive Behavior in Patients With Mendelian Neurodevelopmental Disorders. Comparison of Abas-3 and Dutch Vineland Scales. *Clinical Neuropsychiatry*, *20*(5), 453–461. https://doi.org/10.36131/cnfioritieditore20230507

Kummeling, J., de Vaan, M., & van Rijn, R. (2023). Measuring adaptive behavior in patients with Mendelian neurodevelopmental disorders: Comparison of ABAS-3 and Dutch Vineland Scales. *Journal of Neurodevelopmental Disorders*, *15*(1). https://doi.org/10.1186/s11689-023-09459-2

Losada-Puente, L., & Baña, M. T. (2022a). Assessment of Adaptive Behavior in People with Autism Spectrum Disorders through the ICAP. *Behavioral Sciences*, *12*(9). https://doi.org/10.3390/bs12090333

Losada-Puente, L., & Baña, M. T. (2022b). Predicting adaptive behaviors in individuals on the autism spectrum as assessed by teachers and parents: An analysis based on ABAS-3. *Journal of Clinical Medicine*, *11*(24). https://doi.org/10.3390/jcm11247607

Marianti, S., Rufaida, A., Hasanah, N., & Nuryanti, S. (2023). Comparing item-total correlation and item-theta correlation in test item selection: A simulation and empirical study. *Jurnal Penelitian Dan Evaluasi Pendidikan*, *27*(2), 133–145. https://doi.org/10.21831/pep.v27i2.61477

Matson, J., & Matson, M. (2011). Research in Developmental Disabilities. *Research in Developmental Disabilities*, *32*(4), CO2. https://doi.org/10.1016/S0891-4222(11)00176-4

Meng, M., Peter, D., Mattner, F., Igel, C., & Kugler, C. (2018). Development and psychometric pilot-testing of a questionnaire for the evaluation of satisfaction with continuing education in infection control nurses. *Nurse Education in Practice*, *31*(April), 77–82. https://doi.org/10.1016/j.nepr.2018.05.003

Reeve, B. B., Hays, R. D., Bjorner, J. B., Cook, K. F., Crane, P. K., Teresi, J. A., Thissen, D., Revicki, D. A., Weiss, D. J., Hambleton, R. K., Liu, H., Gershon, R., Reise, S. P., Lai, J. S., & Cella, D. (2007). Psychometric evaluation and calibration of health-related quality of life item banks: Plans for the Patient-Reported Outcomes Measurement Information System (PROMIS). *Medical Care*, *45*(5 SUPPL. 1), 22–31. https://doi.org/10.1097/01.mlr.0000250483.85507.04

Sajewicz-Radtke, U., & Radtke, B. (2024). The Functional Social Maturity Scale (FSMS): Development and application. *Psychiatria Polska*, *58*(Online First). https://doi.org/10.12740/PP/OnlineFirst/144

Saleh, N., Gamal, O., Eldosoky, M. A. A., & Shaaban, A. R. (2024). An integrative approach to medical laboratory equipment risk management. *Scientific Reports*, *14*(1). https://doi.org/10.1038/s41598-024-54334-z

Santrock, J. W. (2011). *Perkembangan masa hidup (13th ed., Vol. 2)*. Erlangga.

Scior, K., Patel, M., Goldsmith-Sumner, A., Hayden, N., Lee, J. Y., Lunsky, Y., Osborne, M., Richardson, L., Stewart-Brown, S., & Hastings, R. P. (2023). Development and initial

psychometric properties of the Warwick–Edinburgh Mental Wellbeing Scale – Intellectual Disability version. *Journal of Intellectual Disability Research*, *67*(9), 893–900. https://doi.org/10.1111/jir.13039

Tassé, M. J., Schalock, R. L., Thissen, D., Balboni, G., Bersani, H. H., Borthwick-Duffy, S. A., Spreat, S., Widaman, K. F., Zhang, D., & Navas, P. (2016). Development and standardization of the diagnostic adaptive behavior scale: Application of item response theory to the assessment of adaptive behavior. *American Journal on Intellectual and Developmental Disabilities*, *121*(2), 79–94. https://doi.org/10.1352/1944-7558-121.2.79

Yusuf, A. M., & Nurihsan, J. (2018). Validitas dan reliabilitas: Sebuah tinjauan komprehensif. *Jurnal Penelitian Dan Evaluasi Pendidikan Indonesia*, *8*(1), 1–15.

Zorzi, S., Dalmonego, C., De Vreese, L. P., & Gomiero, T. (2023). Adult Independence Living Measurement Scale: Psychometric validation of a scale to estimate personal skills for independent living in people with intellectual and developmental disabilities. *Journal of Intellectual Disability Research*, *67*(6), 560–572. https://doi.org/10.1111/jir.13028

This page is initially left blank