

Development and Validation of a Student Self-Management Scale Among Filipino Grade 10 Students

Desarrollo y validación de una escala de autogestión del estudiantado en estudiantes filipinos de grado 10

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Abstract:

Student self-management is widely recognized as a key factor in fostering resilience, adaptability, and holistic student development; however, validated instruments for secondary-level learners remain limited, particularly in developing-country contexts. This study developed and validated the Student Self-Management Scale (SSMS) to assess self-regulation, stress resilience, and goal orientation among secondary school students. Following systematic item generation, expert validation, and pilot testing, data were collected from 346 Filipino secondary students, refining 113 initial items to 27 indicators. Psychometric analyses included internal consistency reliability, exploratory and confirmatory factor analyses, and concurrent validity testing using mathematics achievement. The SSMS demonstrated excellent overall internal consistency ($\alpha = .94$). Exploratory factor analysis supported a three-component structure; however, confirmatory factor analysis indicated only partial and provisional model fit. The goal orientation dimension was represented by a single item, limiting its psychometric robustness. Concurrent validity with mathematics achievement was weak and should be interpreted cautiously, potentially reflecting both construct

Resumen:

La autogestión del estudiantado es ampliamente reconocida como un factor clave para fomentar la resiliencia, la adaptabilidad y el desarrollo integral; sin embargo, los instrumentos validados para estudiantes de nivel secundario siguen siendo limitados, especialmente en contextos de países en desarrollo. Este estudio desarrolló y validó la Escala de Autogestión del Estudiantado (SSMS) para evaluar la autorregulación, la resiliencia al estrés y la orientación a metas en estudiantes de educación secundaria. Tras un proceso de generación sistemática de ítems, la validación por expertos y la aplicación de pruebas piloto, se recopiló datos de 346 estudiantes filipinos, refinando 113 ítems iniciales a 27 indicadores. Los análisis psicométricos incluyeron consistencia interna, análisis factorial exploratorio y confirmatorio, y validez concurrente mediante el rendimiento en matemáticas. La SSMS mostró excelente consistencia interna global ($\alpha = .94$). El análisis factorial exploratorio apoyó una estructura de tres componentes; sin embargo, el análisis factorial confirmatorio indicó un ajuste del modelo parcial y de carácter provisional. La dimensión de orientación a metas estuvo representada por un solo ítem, lo que limita su solidez psicométrica. La validez concurrente

distinctiveness and limitations in the selected external criterion. Overall, the SSMS represents a preliminary but contextually grounded instrument, with further refinement needed to strengthen its structural validity and applicability in diverse educational settings.

Keywords: educational measurement, factor analysis, motivation, self-determination theory, well-being

con el rendimiento en matemáticas fue débil y debe interpretarse con cautela, ya que podría reflejar tanto la distintividad del constructo como limitaciones del criterio externo utilizado. En conjunto, la SSMS constituye un instrumento preliminar y contextualizado que requiere mayor refinamiento para fortalecer su validez estructural y su aplicabilidad en diversos contextos educativos.

Palabras clave: medición educativa, análisis factorial, motivación, teoría de la autodeterminación, bienestar.

1. Introduction

Rapid transformations in contemporary education have intensified the need for student self-management as a foundational competency for lifelong learning, adaptability, and holistic development. Within the broader framework of social-emotional learning (SEL), self-management is commonly defined as the capacity to regulate emotions, cognitions, and behaviors in ways that support goal attainment and adaptive functioning across academic and social contexts (Lawson et al., 2019; Pham, 2024). However, despite its prominence, the construct is often used interchangeably with related concepts such as self-regulation and other socio-emotional competencies, resulting in conceptual ambiguity (Gagne et al., 2021; Lozano-Peña et al., 2021). Self-management is also closely related to broader constructs such as executive functions and non-cognitive skills. Executive functions refer to underlying cognitive processes such as working memory, inhibitory control, and cognitive flexibility, whereas non-cognitive skills encompass a wider range of socio-emotional attributes including motivation, persistence, and interpersonal competencies. In contrast, self-management is conceptualized in this study as the observable and context-dependent enactment of these underlying capacities, reflecting how students translate internal regulatory processes into goal-directed behaviors in complex learning environments characterized by uncertainty,

autonomy, and heightened cognitive and emotional demands (Skinner-Nikhol, 2025; Ruffini et al., 2023).

The COVID-19 pandemic further accentuated the centrality of self-management skills, particularly as students transitioned to digital, modular, and hybrid learning modalities (Ruiz-Ramírez et al., 2021; Blanchard et al., 2024). Under these conditions, learners were required to independently manage time, sustain motivation, cope with stress, and regulate engagement with limited external supervision (Bashir et al., 2021; Sato et al., 2024). Empirical evidence consistently demonstrates that students with strong self-management capacities exhibit higher academic achievement, improved mental health outcomes, and more positive social integration, whereas deficits are associated with disengagement, elevated stress, and increased vulnerability to emotional and behavioral difficulties (Al-Abyadh & Abdel Azeem, 2022; Smith et al., 2022; Zhang et al., 2024). These findings underscore the need for a conceptually robust and empirically grounded understanding of self-management as a multidimensional construct.

Despite growing consensus on its importance, the availability of valid and culturally responsive measurement instruments remains limited, particularly for secondary-level learners in

non-Western and developing-country contexts (Pham, 2023; Arbués et al., 2025). Many existing scales are either embedded within broader SEL frameworks or developed in educational systems that differ substantially in pedagogical structures, technological access, and socio-cultural expectations (Hayashi et al., 2022). Consequently, these instruments may not adequately capture the contextualized and integrative nature of self-management as enacted in diverse learning environments, thereby constraining educators' and policymakers' ability to generate accurate assessments and design evidence-based interventions tailored to local needs (Camp-Spivey et al., 2021; Noordman et al., 2024).

While a number of instruments have been developed to assess self-management, self-regulation, and related socio-emotional competencies, these measures often focus on discrete dimensions—such as metacognitive strategies, motivation, or academic self-regulation—rather than conceptualizing self-management as a unified, multidimensional construct (Kanayama et al., 2024; Lourenço et al., 2025). Many are embedded within broader theoretical frameworks and lack specificity as standalone tools for comprehensive assessment (Roscoe & Craig, 2022; Zhang, 2024). Moreover, these instruments are predominantly validated in Western educational contexts and may not fully capture the integration of behavioral, emotional, and goal-directed processes required in resource-constrained and rapidly evolving learning environments (Fuchs & Fuchs, 2025; Jian et al., 2025). As a result, their applicability to secondary-level learners in developing-country contexts, particularly under modular and post-pandemic conditions, remains limited.

In the Philippine educational context, the rapid shift to modular and remote learning exposed persistent challenges related to sustaining student motivation, managing academic workloads, and supporting psychological well-being, especially among learners from socioeconomically disadvantaged backgrounds (Codilla, 2025). Although global SEL research has expanded considerably, locally validated instruments capable of capturing student self-management

within these contextual realities remain scarce (Durneva & LeRouge, 2026). Addressing this gap is critical for monitoring student resilience, informing instructional practices, and mitigating digital inequities that continue to shape learning experiences.

In response to these limitations, the present study advances a conceptualization of student self-management as a multidimensional construct comprising three interrelated domains: self-regulation and control, stress resilience, and goal orientation (Martínez-López et al., 2024; Barakou et al., 2023). These dimensions reflect the integration of regulatory processes, adaptive coping mechanisms, and motivational goal-directed behaviors. Conceptually, this structure also represents the consolidation of initially identified domains—impulse control, stress management, self-discipline and motivation, goal setting, and organizational skills—into a more parsimonious and theoretically coherent three-factor model (Wang et al., 2025). Specifically, impulse control and organizational skills align with self-regulation and control (Van & Raz, 2023); stress management corresponds to stress resilience (Peyer et al., 2022); and self-discipline, motivation, and goal setting converge under goal orientation (Avcı & Durak, 2022). This framework provides a conceptual basis for anticipating the dimensional structure of the construct and guiding its empirical validation.

Guided by this conceptual model, the present study aimed to develop and validate a Student Self-Management Scale (SSMS) for secondary school learners in the Philippines. The scale was grounded in established SEL theory and enriched through qualitative insights from student experiences. A rigorous psychometric validation process, including content validation, exploratory factor analysis, and confirmatory factor analysis, was employed to evaluate the scale's reliability and structural validity.

Beyond its function as a measurement instrument, the SSMS contributes to the refinement of theoretical and empirical work in SEL by offering a more clearly delineated and contextually grounded conceptualization of self-management. By providing a reliable and culturally responsive

assessment tool, this study supports broader educational efforts aimed at promoting student well-being, inclusive pedagogy, and digital adaptability. Ultimately, it responds to the urgent

need to equip learners with the competencies required to thrive academically, emotionally, and socially in increasingly complex and evolving educational environments.

2. Materials and methods

2.1. Research Design

This study adopted a scale development and validation research design guided by established psychometric frameworks and methodological standards (Boateng et al., 2018; Kyriazos & Stalikas, 2018). The design followed a sequential, multi-phase approach intended to maximize construct clarity, measurement precision, and empirical rigor. Specifically, the process comprised (a) theoretical and empirical item generation, (b) expert-based content validation, (c) iterative pilot testing, (d) exploratory factor analysis (EFA) to identify latent dimensions, (e) confirmatory factor analysis (CFA) to examine the proposed model structure, and (f) assessment of internal consistency and criterion-related validity.

Each phase informed subsequent stages, allowing for systematic refinement of the instrument. Independent samples were used for EFA and CFA to reduce capitalization on chance and to strengthen construct validation. This design aligns with best-practice recommendations for developing culturally responsive and psychometrically robust educational instruments.

2.2. Participants

Participants were recruited through purposive sampling from selected public secondary

schools in Nueva Vizcaya, Philippines. The target population comprised Filipino Grade 10 students enrolled in the regular secondary school curriculum during the data collection period. Exclusion criteria included incomplete questionnaire responses and withdrawal of consent.

A total of 346 students participated across three distinct pilot phases: Pilot Test 1 ($n = 100$), Pilot Test 2 ($n = 100$), and Pilot Test 3 ($n = 146$). Each pilot phase involved a unique group of respondents to preserve sample independence across analyses. The cumulative sample size met recommended participant-to-item ratios of 5–10 respondents per item for factor analytic procedures, ensuring sufficient statistical power and stability of factor solutions (Mundfrom et al., 2005). The demographic characteristics of the participants are presented in Table 1.

2.3. Instrument Development

The Student Self-Management Scale (SSMS) was developed through both deductive and inductive item-generation strategies. Deductively, items were derived from established theoretical models of social-emotional learning, self-regulation, and resilience (Nelson et al., 2007; Dusenbury et al., 2019; Zimmerman, 2023). Inductively, semi-structured interviews were conducted with secondary students to capture context-specific

Table 1. Demographic Characteristics of the Participants ($n = 346$)
Source: Own elaboration. (2025)

Variable	n	%	Mean	SD	Min	Max
Age	346	100	15.84	0.63	15	17
Sex	Male	167	48.30	—	—	—
	Female	179	51.70	—	—	—
General Mathematics Grade	346	100	86.72	6.87	75	98

behaviors and challenges related to managing academic workload, emotional stress, time constraints, and goal pursuit in modular and classroom-based learning environments.

An initial pool of 113 items was generated and mapped onto five conceptual domains: impulse control, stress management, self-discipline and motivation, goal setting, and organizational skills. All items were phrased as self-referential statements and responses were recorded using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Item wording was reviewed for age appropriateness, linguistic clarity, and cultural relevance prior to expert validation.

2.4. Content Validity

Content validity was examined through the application of the Content Validity Index (CVI) approach (Polit & Beck, 2006). Five experts in educational psychology, psychometrics, and secondary education independently evaluated each item in terms of relevance and clarity using a four-point ordinal scale. Item-level CVI (I-CVI) values were derived by determining the proportion of experts who rated an item as either quite relevant (3) or highly relevant (4).

I-CVI values were interpreted using established criteria: values of 0.79 and above were considered acceptable, values between 0.70 and 0.79 indicated the need for revision, and values below 0.70 warranted item elimination (Rodrigues et al., 2017). Items falling below the acceptable threshold were revised or removed based on expert consensus.

Scale-level content validity (S-CVI) was computed as the mean of the I-CVI values across retained items, with values of 0.80 or higher considered indicative of acceptable content validity (Rodrigues et al., 2017).

2.5. Pilot Testing and Exploratory Factor Analysis

Pilot testing was conducted in two sequential phases to examine the dimensionality of the instrument and iteratively refine the item pool.

The underlying factor structure was examined using Exploratory Factor Analysis (EFA) through principal component analysis (PCA) with varimax rotation to enhance interpretability and achieve a simpler factor structure. PCA was employed as an initial data reduction technique to identify the underlying structure of the item pool. Factor retention was guided by multiple criteria, including eigenvalues greater than 1, inspection of the scree plot, the proportion of variance explained, and the interpretability of the resulting factor structure. These criteria were applied consistently across pilot phases to ensure that the retained factor solution was both statistically adequate and conceptually meaningful. Items were retained based on factor loadings of at least 0.50, communalities exceeding 0.30, and the absence of substantial cross-loadings.

Pilot Test 1 ($n = 100$) was undertaken to examine preliminary dimensionality, assess the suitability of the data for factor extraction, and conduct an initial factor extraction to guide item reduction. Preliminary screening procedures included checks for missing values, univariate normality, and outliers. The adequacy of the correlation matrix was evaluated using the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett’s Test of Sphericity. Based on these procedures, criteria were applied to identify and remove weak or redundant items, leading to refinement of the item pool.

Pilot Test 2 ($n = 100$) involved a second round of EFA using the refined item set to further examine and stabilize the factor structure. Item retention decisions were guided by both statistical indicators and theoretical coherence, ensuring that retained items meaningfully represented their respective constructs. Consistent with the recommendations of Williams et al. (2010), redundant or weak items were removed, resulting in a parsimonious set of items representing a smaller number of interpretable factors.

2.6. Confirmatory Factor Analysis and Reliability Testing

Confirmatory factor analysis was conducted using data from Pilot Test 3 ($n = 146$) to evaluate the fit of the two-factor measurement model with

an additional indicator identified through EFA. CFA was performed using JASP software with maximum likelihood estimation. Model adequacy was examined through a combination of absolute and incremental fit indicators, including the chi-square to degrees-of-freedom ratio (χ^2/df), the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA), in accordance with established psychometric guidelines (Mulaik et al., 1989).

Internal consistency reliability was evaluated for the overall scale and individual subscales using Cronbach's alpha. Alpha coefficients of 0.70 or higher were interpreted as acceptable, values above 0.80 as good, and values above 0.90 as excellent (Cronbach, 1951; Hajjar, 2018).

2.7. Criterion-Related Validity

Criterion-related validity was examined through concurrent validation by correlating SSMS scores with students' General Mathematics grades obtained from school records. The relationship between variables was analyzed using Pearson correlation analysis to determine both the

magnitude and direction of the association. Effect sizes were interpreted in accordance with Cohen's guidelines, as summarized by Rosenthal (1996), to facilitate interpretation of statistical results alongside their practical implications.

2.8. Ethical Considerations

Ethical approval for the study was granted by the Division Office of Nueva Vizcaya prior to data collection. Authorization was obtained from the principals of participating schools, and coordination with teachers was undertaken to minimize disruption to instructional activities. Informed consent was obtained from all student participants, together with parental or guardian assent, in accordance with ethical guidelines for research involving minors.

Participation was entirely voluntary, and students were informed of their right to discontinue participation at any point without consequence. Confidentiality and anonymity were maintained through the use of coded identifiers, and all research data were stored securely and used solely for scholarly purposes.

3. Results

3.1. Item Generation and Content Validation

The initial pool of 113 items was developed through an integrative process that combined evidence from prior literature on student self-management, self-regulation, and resilience with qualitative data derived from student interviews. This dual approach ensured both theoretical grounding and contextual relevance of the items. The generated items were organized into five theoretically informed domains: impulse control, stress management, self-discipline and motivation, goal setting, and organizational skills. Collectively, these domains reflect core behavioral, emotional, and cognitive components of student self-management as articulated in contemporary social-emotional learning and self-regulatory frameworks.

To establish content validity, the item pool underwent expert evaluation using the Content Validity Index (CVI) procedure. Five subject-matter experts independently assessed each item in terms of relevance, clarity, and representativeness of the construct. Scale-level CVI (S-CVI) values met or exceeded the recommended threshold of .80 across all domains, indicating excellent agreement among experts and strong content representativeness. Items that did not meet the minimum item-level CVI criteria were removed or revised. As a result of this process, 92 items were retained for empirical testing. Tables 2 and 3 present the distribution of items across domains and the content validity outcomes, confirming the conceptual adequacy of the refined item pool.

Table 2. Generated Items from Literature and Student Responses
Source: Own elaboration. (2025)

Domain	No. of Items	Example Item
Impulse Control	19	"I control my emotions very well, even when I am angry."
Stress Management	22	"I am confident about my ability to handle my personal problems."
Self-Discipline & Motivation	21	"I prefer material that really challenges me, so I can learn new things."
Goal Setting	23	"I set short-term goals to help me achieve my long-term goals."
Organizational Skills	28	"I prepare a 'to do' list daily."
Total	113	

Table 3. Content Validity Index (CVI) and Item Retention
Source: Own elaboration. (2025)

Domain	Initial Items	Retained Items	S-CVI	Interpretation
Impulse Control	19	17	0.88	Excellent
Stress Management	22	16	0.8	Excellent
Self-Discipline & Motivation	21	15	0.8	Excellent
Goal Setting	23	22	0.98	Excellent
Organizational Skills	28	22	0.9	Excellent
Total	113	92	—	—

3.2. Factorability of Data

Prior to conducting exploratory factor analysis, preliminary tests were performed to determine the suitability of the dataset for factor extraction. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy yielded a value of .767, exceeding the commonly accepted minimum threshold of .60 for factor analysis. Bartlett's Test of Sphericity was statistically significant, $\chi^2 = 9804.097$, $p < .001$, indicating that the correlation matrix was not an identity matrix and that sufficient inter-item correlations were present.

Taken together, these results confirmed that the dataset met the statistical assumptions required for exploratory factor analysis and justified proceeding with factor extraction procedures. The results of these preliminary tests are summarized in Table 4.

Table 4. Suitability of Data for Factor Analysis (Pilot 1)
Source: Own elaboration. (2025)

Test	Value
Kaiser-Meyer-Olkin (KMO)	0.767
Bartlett's Test of Sphericity	$\chi^2 = 9804.097$, $p < .001$

3.3. Exploratory Factor Analysis

Exploratory factor analysis (EFA) was conducted in two iterative phases to refine the instrument and identify its latent structure. In Pilot Test 1 ($n = 100$), the 92-item pool was subjected to principal component analysis with varimax rotation to enhance interpretability and achieve a simple component structure. Item retention decisions were guided by multiple criteria, including component loadings of at least .50, adequate communalities, and the absence of substantial cross-loadings.

Component retention was further supported by eigenvalues greater than 1 and inspection of the scree plot. The initial extraction indicated a three-component solution, with eigenvalues exceeding the recommended threshold and a clear inflection point observed after the third component in the scree plot. The three retained components had eigenvalues of 26.03, 4.63, and 3.30, respectively, and together accounted for 36.92% of the total variance. Component 1 explained 28.30% of the variance, followed by Component 2 (5.03%) and Component 3 (3.59%). Although additional components also exhibited eigenvalues greater than 1, their incremental

contributions to total variance were minimal and they failed to produce stable or interpretable item groupings. This pattern suggests that these additional components likely reflect item-specific variance rather than substantively distinct latent constructs. Accordingly, the three-component solution was retained as it achieved an optimal balance between statistical adequacy, parsimony, and theoretical interpretability.

This initial analysis resulted in the removal of weak or redundant items and yielded a reduced set of 42 items. Table 5 summarizes the eigenvalues and the proportion of variance explained by each retained component in Pilot Test 1.

Table 5. Eigenvalues and Variance Explained by Retained Components (Pilot Test 1)
Source: Own elaboration. (2025)

Component	Eigenvalue	% of Variance	Cumulative %
1	26.03	28.30	28.30
2	4.63	5.03	33.33
3	3.3	3.59	36.92

Pilot Test 2 (n = 100) involved a second round of EFA using the refined item set. Further item elimination was based on statistical indicators and theoretical coherence, ensuring that retained items meaningfully represented their respective constructs.

This process resulted in a parsimonious 27-item solution comprising two primary components and one additional exploratory indicator: (a) Self-Regulation and Control, which integrated impulse control, self-discipline, and organizational behaviors; (b) Stress Resilience, reflecting students' capacity to manage and cope with academic and personal stressors; and (c) Goal Orientation, represented by a single item capturing students' forward-looking academic motivation. Given that this construct is represented by a single item, it does not constitute a fully developed subscale. Accordingly, it is interpreted as an exploratory indicator rather than a consolidated dimension, and no internal consistency estimate was computed. This finding suggests the need for further item development to more fully capture this construct in future research.

Notably, the emergence of a three-component structure indicates a potential reconceptualization of the initially proposed five-domain framework. The convergence of impulse control, self-discipline, and organizational behaviors into a single Self-Regulation and Control component suggests that these constructs may not function as discrete dimensions in this population, but rather as interdependent manifestations of a broader regulatory capacity. This pattern indicates that the distinction between these domains is less pronounced among secondary learners, with these aspects of self-management tending to co-occur as an integrated pattern of regulatory behavior. Thus, the observed structure reflects not only statistical parsimony but also a context-sensitive organization of the construct.

A summary of the EFA stages and outcomes is presented in Table 6.

Table 6. Eigenvalues and Variance Explained by Retained Components (Pilot Test 1)
Source: Own elaboration. (2025)

Stage	n	Items Tested	Items Retained	Components Extracted
Pilot 1	100	92	42	3
Pilot 2	100	42	27	3

3.4. Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was conducted using an independent sample (n = 146) to evaluate the adequacy of the two-factor measurement model with an additional indicator identified through EFA. Model fit was assessed using multiple indices to capture both absolute and incremental fit. The chi-square to degrees of freedom ratio ($\chi^2/df = 2.70$) indicated an acceptable level of relative fit. However, incremental fit indices, including the Comparative Fit Index (CFI = .72), Normed Fit Index (NFI = .62), and Relative Fit Index (RFI = .59), fell below commonly recommended cutoffs. Additionally, the Root Mean Square Error of Approximation (RMSEA = .11) suggested poor absolute model fit.

These findings indicate partial empirical support for the proposed measurement structure and

suggest the need for further item refinement, particularly for underrepresented dimensions. Table 7 presents the CFA fit indices and corresponding interpretations.

Table 7. Confirmatory Factor Analysis (Pilot 3, n=146)
Source: Own elaboration (2025)

Fit Index	Value	Interpretation
χ^2/df	2.70	Acceptable
Comparative Fit Index (CFI)	0.721	Below acceptable
Normed Fit Index (NFI)	0.624	Below acceptable
Relative Fit Index (RFI)	0.591	Below acceptable
RMSEA	0.108	Poor fit

3.5. Reliability and Criterion-Related Validity

Internal consistency reliability analyses demonstrated excellent overall reliability for the 27-item Student Self-Management Scale ($\alpha = .94$). The Self-Regulation and Control component exhibited very high internal consistency ($\alpha = .94$), indicating strong coherence among items measuring disciplined learning behaviors. The Stress Resilience component showed moderate reliability ($\alpha = .63$), likely attributable to the limited number of items retained.

Reliability estimation for the Goal Orientation indicator was not computed due to its single-item structure. As such, this construct is treated as an exploratory indicator rather than a fully developed subscale. Detailed reliability coefficients are presented in Table 8.

Criterion-related validity was examined by correlating SSMS scores with students' General Mathematics grades. The analysis revealed a very weak and non-significant association ($r = .03$, $p = .70$), indicating that self-management, as operationalized by the SSMS, does not directly predict subject-specific academic performance. These results suggest that student self-management represents a broader, transferable competency distinct from domain-specific achievement. The concurrent validity findings are summarized in Table 9.

Table 9. Concurrent Validity Test
Source: Own elaboration (2025)

Variable Pair	n	r	p
Self-Management Scale $\times$ General Mathematics Grades	146	0.032	0.697

Table 8. Reliability and Criterion Validity of the Student Self-Management Scale
Source: Own elaboration. (2025)

Scale Component	No. of Items	Cronbach's α	Reliability Level	Proposed Label
1	24	0.935	Very High	Self-Regulation and Control
2	2	0.633	Moderate	Stress Resilience
—	1	—	Not computed	Goal Orientation (exploratory indicator)
Overall	27	0.942	Very High	—

4. Discussion

4.1. Factor Structure and Psychometric Characteristics

The Student Self-Management Scale (SSMS) yielded a theoretically grounded and empirically interpretable, yet preliminary, structure consisting of two primary components and one additional exploratory indicator, reflecting key dimensions of student self-management in contemporary

educational contexts. The most prominent and relatively robust component, Self-Regulation and Control, integrated behavioral indicators related to impulse regulation, sustained attention, disciplined study practices, and organizational skills. The high internal consistency of this component underscores its central role within social-emotional learning (SEL) frameworks, which consistently identify self-regulation as a

foundational mechanism supporting academic persistence, adaptive functioning, and lifelong learning competence (Lawson et al., 2019; Zimmerman, 2023). The convergence of multiple theoretically related domains into this component suggests that, among secondary learners, behavioral regulation and organizational control operate as interrelated aspects of a broader regulatory capacity rather than as discrete skill domains, consistent with integrative models of self-regulated learning (Zimmerman, 2023; Panadero, 2017).

The Stress Resilience component demonstrated moderate internal consistency, reflecting students' perceived ability to manage academic stressors, emotional demands, and recovery from setbacks. Although the reliability coefficient falls below conventional thresholds for strong internal consistency, this outcome is likely influenced by the limited number of retained items and the inherently multidimensional nature of resilience. Existing literature emphasizes that resilience encompasses emotional, cognitive, and contextual processes that may not be fully captured through a small set of indicators (Pham, 2024; Ungar, 2018). As such, the present findings should be interpreted as preliminary, indicating the presence of a meaningful but underdeveloped component that requires further elaboration.

In contrast, Goal Orientation was represented by a single retained item and is therefore treated as an exploratory indicator rather than a fully developed component. This limitation constrains both reliability estimation and conceptual coverage, indicating that the construct is insufficiently operationalized within the current instrument. Given the established importance of goal orientation in supporting academic engagement, self-directed learning, and persistence (Claro & Loeb, 2019; Pintrich, 2000), its limited representation highlights a critical area for future scale development. Additional items are needed to capture both short-term goal-setting processes and longer-term motivational orientations.

To further situate these findings within the broader literature, it is important to consider how the present structure compares with existing self-management and self-regulation instruments.

While the development of such instruments is well established in the international literature, the present study contributes to this body of work through its contextualization, integrative framework, and target population. Existing instruments have typically been developed in Western contexts and often emphasize specific dimensions such as academic self-regulation, metacognitive strategies, or motivational constructs in isolation (Zimmerman, 2023; Duckworth & Yeager, 2015; OECD, 2019).

On the other hand, the SSMS adopts a more integrative approach by combining behavioral regulation, stress resilience, and goal-oriented processes within a single framework. The resulting structure, characterized by a dominant self-regulation and control component alongside more limited but conceptually meaningful dimensions, suggests that self-management may be experienced as a more integrated and less differentiated construct among secondary learners in this context, particularly in environments requiring adaptive functioning under constrained conditions (Gagne et al., 2021; Lozano-Peña et al., 2021).

Furthermore, the inclusion of qualitative input from Filipino students during item generation enhances the contextual relevance of the instrument, particularly in modular and post-pandemic learning environments where students navigate increased autonomy and external constraints. The SSMS is therefore specifically positioned to address a gap in validated tools for secondary-level learners in developing country contexts, where cultural and contextual factors significantly shape the manifestation of self-management behaviors (Hayashi et al., 2022; Noordman et al., 2024; Durneva & LeRouge, 2026).

In light of these considerations, the contribution of the SSMS lies not in the novelty of scale development per se, but in its context-sensitive design, empirically derived structure, and its potential application as a diagnostic and developmental tool within underrepresented educational settings. However, these structural interpretations should be considered tentative in light of the inadequate model fit observed in

the confirmatory analysis, as discussed in the following section, which limits the strength of conclusions that can be drawn regarding the scale's dimensional validity.

4.2. Model Fit and Refinement Needs

Confirmatory factor analysis (CFA) provided only partial empirical support for the proposed measurement structure, with several fit indices indicating inadequate model fit. Although the chi-square to degrees of freedom ratio suggested acceptable relative fit, the incremental indices (CFI, NFI, and RFI) fell substantially below recommended thresholds, and the RMSEA value exceeded acceptable limits. These results indicate that the hypothesized structure does not fully account for the relationships among observed variables and that the structural validity of the scale remains provisional. Accordingly, the current model should not be interpreted as a finalized representation of the construct but rather as an initial approximation that may not adequately represent the underlying dimensionality of student self-management.

The observed poor model fit may be attributed to several interrelated factors. First, the strong dominance of the Self-Regulation and Control component suggests that the scale may reflect a more unidimensional or hierarchical structure than currently specified, potentially obscuring distinctions among related constructs. Second, the limited number of items within the Stress Resilience component may restrict its ability to adequately represent the multidimensional nature of resilience. Third, the inclusion of Goal Orientation as a single-item exploratory indicator constrains its contribution to the model and limits the adequacy of its structural representation (Kline, 2013; Brown, 2015).

Collectively, these findings suggest that, while the SSMS demonstrates promising internal consistency and conceptual coherence, its current structural configuration requires further refinement. The model should therefore be interpreted with caution, particularly with respect to dimensional interpretation and construct separation. Consistent with established scale development frameworks (Boateng et

al., 2018), future research should prioritize expanding underrepresented dimensions (especially Goal Orientation) and re-evaluating the measurement model using larger and more diverse samples. Additionally, testing alternative model specifications, such as higher-order or bifactor models, may provide a more accurate representation of the underlying construct (Reise, 2012).

4.3. Distinctiveness from Academic Performance

The absence of a significant association between SSMS scores and General Mathematics grades supports the conceptualization of self-management as a non-cognitive, transferable competency instead of a direct predictor of subject-specific academic achievement. This finding aligns with existing literature indicating that self-management skills primarily influence learning persistence, emotional regulation, and overall well-being, rather than isolated academic outcomes measured through grades (Bashir et al., 2021; Claro & Loeb, 2019; Zhang et al., 2024).

However, this result warrants cautious interpretation considering theoretical expectations and methodological considerations. Given established links between self-regulation and academic performance, a modest positive relationship might have been anticipated (Zimmerman, 2023). The absence of such a relationship may reflect contextual and measurement-related factors rather than a complete lack of association. Academic grades are influenced by a range of external factors, including instructional practices, assessment formats, and contextual constraints, which may attenuate their relationship with self-management competencies (Brookhart, 2013; Guskey, 2015).

Furthermore, the possibility of restricted variability in grade distributions should be considered. If students' grades cluster within a narrow range, the resulting restriction of range may attenuate the observed correlation with SSMS scores (Cohen et al., 2013). This may be particularly relevant in contexts where grading practices limit differentiation among students.

These considerations suggest that the null correlation should not be interpreted as definitive evidence of independence between self-management and academic outcomes, but rather as an indication that the selected criterion may not fully align with the construct being measured. Future validation efforts should incorporate alternative external measures more directly related to self-regulated behavior, such as study habits, task persistence, time management, or indicators of student well-being, to provide a more comprehensive assessment of concurrent validity (Duckworth & Yeager, 2015; OECD, 2019).

In educational contexts shaped by pandemic-related disruptions, modular learning systems, and digital inequities, this distinction becomes particularly salient. Students may demonstrate

strong self-management capacities even when external constraints limit their academic performance. As such, the SSMS should not be interpreted as a proxy for academic achievement but rather as a diagnostic and developmental tool for identifying students' regulatory strengths and areas requiring support (Gagne et al., 2021; Lozano-Peña et al., 2021).

Recognizing self-management as a core competency supports more equitable and inclusive educational practices, particularly in resource-constrained and post-crisis learning environments. By focusing on students' capacity for regulation, resilience, and adaptive functioning, educators and practitioners can better design interventions that promote long-term learning success beyond traditional academic metrics (Codilla, 2025).

5. Conclusions

This study provides initial empirical evidence supporting the reliability and partial structural validity of the Student Self-Management Scale (SSMS) for secondary school learners in the Philippines. The findings affirm the multidimensional nature of student self-management, with self-regulation and stress resilience emerging as relatively strong components. While the proposed measurement structure demonstrated only partial and provisional empirical support, limitations in the measurement of goal orientation highlight important areas for further development.

The weak association between SSMS scores and mathematics achievement should be interpreted with caution and may reflect both the distinctiveness of self-management as a non-cognitive construct and limitations in the selected external criterion, emphasizing its relevance beyond traditional academic indicators.

Importantly, the development of the SSMS addresses the need for contextually grounded

assessment tools that reflect the sociocultural and educational realities of Filipino students. In the Philippine setting, where learners navigate diverse learning conditions, increasing demands for independent learning, and the ongoing impact of post-pandemic educational transitions, self-management has become a critical competency. The SSMS offers educators and school leaders a practical instrument for identifying students' strengths and areas for support, informing targeted interventions, and guiding the implementation of socio-emotional learning programs.

Overall, the SSMS represents a preliminary but promising, contextually grounded instrument for assessing student self-management and informing educational research, practice, and policy, particularly in post-pandemic and digitally mediated learning environments. However, further validation, particularly through improved item representation, alternative model specifications, and the use of more construct-aligned external criteria, is necessary to strengthen its structural validity and generalizability.

6. Recommendations

Drawing on the results of this study, several directions are suggested for future research, educational practice, and policy. First, future research should prioritize further refinement of the Student Self-Management Scale (SSMS), particularly by expanding the Goal Orientation and Stress Resilience dimensions through the development of additional items. Increasing item representation in these subscales is necessary to improve internal consistency, factorial stability, and overall model fit. Subsequent validation efforts should involve larger and more heterogeneous samples drawn from varied regions and educational settings to improve the generalizability of the instrument.

Second, researchers are encouraged to conduct longitudinal and predictive validity studies to assess the extent to which student self-management, as measured by the SSMS, predicts long-term academic engagement, psychological well-being, persistence, and school adjustment. Testing measurement invariance across gender, socioeconomic status, and learning modalities (e.g., face-to-face, modular, and online learning) is also recommended to ensure fairness and applicability across subgroups.

Third, educational practitioners may consider utilizing the SSMS as a formative diagnostic tool to identify students who require targeted support in self-regulation and stress resilience. The results can inform the design of school-based interventions, guidance programs, and classroom strategies that explicitly develop self-management competencies, particularly in contexts characterized by high academic demands and limited external support. However, such applications should be undertaken with consideration of the current limitations in the scale's structural validity.

Finally, policymakers and school administrators may consider integrating student self-management assessment into broader social-emotional learning (SEL) and mental health initiatives. Embedding context-sensitive instruments such as the SSMS into monitoring and evaluation frameworks can support data-driven decision-making, promote inclusive pedagogy, and strengthen resilience-focused educational policies, especially in post-pandemic and resource-constrained settings. Continued validation and refinement of the instrument are recommended prior to large-scale implementation.

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