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Perceived Pedagogical, Social, and Cognitive Supports Scale (PPSCSS): A Pilot Study

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ABSTRACT

The development and initial validation of the Perceived Pedagogical, Social, and Cognitive Supports Scale (PPSCSS), which measures multidimensional institutional supports, which predict student engagement and persistence in higher education, is the focus of this pilot study. The achievement of students is influenced not just by personal skills but also by a comprehensible pedagogy, interpersonal communication, and responsiveness of the institution, especially in the environment of multilingual and diverse academic classes. Although much literature on student retention has been conducted, there are still a number of tools that determine these support areas in one comprehensive measure. A contextually based scale and a preliminary psychometric analysis were the aim of the research. The pilot survey was carried out with a purposive sample of 331 undergraduate and postgraduate students in the institutions of higher learning. The self-developed PPSCSS involved 15 items, which assessed four dimensions of pedagogical support, social support, language support, and learning-style support on a five-point Likert scale. The descriptive statistics, internal consistency reliability (Cronbach alpha and McDonald omega), and univariate factor analysis (principal axis factoring with Varimax rotation) were used to analyze the data. Findings showed adequate reliability of the overall scale (a =.819; o=.918), with subscales in excess of suggested levels. Adequacy in sampling was verified (KMO = .854; p Bertlett =.001). The results of the exploratory

factor analysis indicated that there is a three-factor model consisting of the following: Peer/Classmate Support, Teacher Support, and Institutional/Interactional Support that described 55.22 percent of the total variance. Results indicate that the perception of the pedagogical and social supports was rather robust, but the language-relevant supports were perceived to be weak. It is possible that the PPSCSS is a promising diagnostic instrument in the measurement of multidimensional student supports because of good reliability and construct validity. As the scale is further endorsed on a large scale, it can be used to inform institutional policies that can be used to promote inclusive, equitable, and supportive learning and teaching environments in higher education.

1. Introduction

1.1 Background of the Study

The engagement, retention, and academic achievements of higher education revolve upon student support systems. The recent empirical studies suggest that the use of academic and social supports in the form of structure and leading to better outcomes has been observed to considerably influence persistence, psychological, as well as performance outcomes, especially in the context of diverse and multilingual learning (Richardson et al., 2012; Martin and Bolliger, 2018). Modern colleges and universities are paying more attention to the fact that persistence is not only an individual quality but rather an institutional process, which is determined by instructional design, peer networks, and institutional practices (Tinto, 2017; Moore III et al., 2008).

The academic and social integration theories give a sound theoretical foundation to the persistence of students. The integration model that was firstly developed by Vincent Tinto highlights the importance of academic involvement and social membership as having a simultaneous effect on continuation. New developments of this model emphasize faculty interaction that is structured and collaborative learning as predictors of long-term enrollment (Tinto, 2025; Lakhal et al., 2020; Loes et al., 2024). Likewise, institutional accountability in retention has also become the focus of modern academic literature, supporting the statements of Manty Yorke with new evidence that institutional climate and active support facilities have direct impact on the rate of completion (OECD, 2022).

1.2 Conceptual Framework

In the current research, the conceptualization of student support is presented in the form of a multidimensional construct, including the domain of pedagogical, social, and cognitive support. Pedagogical support describes instruction clarity, formative feedback and instructional responsiveness (Hornstein et al., 2025). These social support areas consist of peer collaboration and faculty encouragement making belonging and engagement stronger (Kozan and Richardson, 2014). Cognitive support is further broken down into language support, which deals with the linguistic scaffold in multilingual environments (Farrukh et al., 2025), learning-style support, which is differentiated instructional practice which can meet diverse needs of learners (Martin et al., 2022).

2. Literature Review

2.1 Theoretical Foundations

Integration theory among students, which is a theory, assumes that academic involvement and social identification in the institutional settings determine persistence in higher education. Empirical extensions of this framework, such as organized interaction between the faculty, peer work, and institutional climate, indicate that these factors are important predictors of student retention and performance (Tinto, 1975; Zepke & Leach 2010; Lakhal et al., 2020; Guzzardo et al., 2021). In line with this view, as suggested by D. Randy Garrison and others, the Community of Inquiry framework is in conceptualizing learning as a crossroads between teaching presence, social presence, and cognitive presence. Modern confirmations ensure that harmonious communication between these areas increases profound learning and contentment in blended and conventional environments (Garrison et al., 2010; Kozan and Richardson, 2014; Martin et al., 2022).

2.2 Review of Existing Scales

A number of measures measure elements of student learning and adaptation. Learning and Study Strategies Inventory is mainly used to assess motivation and self-regulated learning strategies but has little to assess institutional and peer-supported learning (Weinstein et al., 2011; Credé and Phillips2011). Student Adaptation to College Questionnaire assesses both academic and social adaptation, but does not adequately represent cognitive scaffolding mechanisms (Crede and Niehorster, 2012). The emphasis of the Social Support Inventories is more on emotional and interpersonal dimensions (Malecki and Demary,

2002), whereas the Community of Inquiry Instrument is more concerned with presence constructs without the complete coverage of institutional language and learning-style accommodations.

2.3 Identified Gaps

The most current reviews point at: Western-favors constructs of validation, not enough focus on multilingual scaffolding, or broken measures of support constructs (OECD, 2022). There are not many scales that combine pedagogical, social, and cognitive reinforcements into one system.

2.4. Rationality of PPSCSS Development.

The PPSCSS was created in order to fill these gaps and provide a multidimensional, context-specific measure, which combines instructional clarity, peer interaction, language scaffolding, and differentiated learning support, in order to reconcile the contemporary theory of retention with the practice of inclusive institutions.

3. Objectives of the Study

The present pilot study was undertaken with four primary objectives. First, to develop the Perceived Pedagogical, Social, and Cognitive Supports Scale (PPSCSS) as a multidimensional instrument tailored to higher education contexts. Second, to examine the internal consistency reliability of the overall scale and its proposed subdomains. Third, to explore the underlying factor structure of the instrument using exploratory factor analysis (EFA). Fourth, to evaluate sampling adequacy and overall model fit to determine the suitability of the instrument for large-scale validation.

4. Methodology

4.1 Research Design

The pilot research design adopted was quantitative, cross-sectional in order to test the initial psychometric properties of the PPSCSS (Creswell and Creswell, 2018).

4.2 Participants

A total of 331 students who were registered in undergraduate and postgraduate programs took part in the study. The age of the participants was between 18 and 27 years and different academic disciplines were represented. The sampling method employed was purposive in order to make sure that people of varied levels of education were represented.

4.3 Instrument Development

A theory-based procedure was used in developing the PPSCSS. Objects were created in accordance with predetermined patterns of student support and institutional involvement. The pretest tool had 15 questions to respond to on a five-point Likert scale with strongly disagree to strongly agree. The scale was used to measure four domains; Pedagogical Support (PS), Social Support (SS), Language Support (LS), and Learning-Style Support (LSS). Facade and content validity were attained using expert review. Specifications of the instrument are recorded in pilot.

4.4 Procedure

The data collection was done in a mix- mode such as administration in classroom settings and secure distribution online. Data collection was done with the ethical approval of the participants and an informed consent was also obtained.

4.5 Data Analysis Plan

Data analysis involved descriptive data, Cronbach alpha, McDonald omega, KMO and Bartlett test, exploratory factor analysis, and model fit index testing.

Table 1, Descriptive Statistics of PPSCSS Subscales (N = 331)

Subscale	Mean	SD	Median	Range	Skewness	Kurtosis
Pedagogical Support (PS)	18.63	3.26	19	10–25	0.005	−0.458
Social Support (SS)	15.27	2.34	15	8–20	0.048	−0.257
Learning-Style Support (LSS)	14.96	2.55	15	8–20	−0.136	−0.290
Language Support (LS)	7.78	1.33	8	4–10	−0.729	0.861
Overall Support (OS)	56.65	8.01	56	35–75	0.110	−0.009

Explanation

The descriptive statistics indicate that students perceived relatively stronger pedagogical and social supports compared to language-related support. Pedagogical Support recorded the highest mean score (M = 18.63), suggesting that instructional clarity and teacher engagement were positively evaluated. Language Support had the lowest mean (M = 7.78), highlighting comparatively limited linguistic scaffolding. Skewness and kurtosis values fall within acceptable psychometric limits, supporting data suitability for factor analysis.

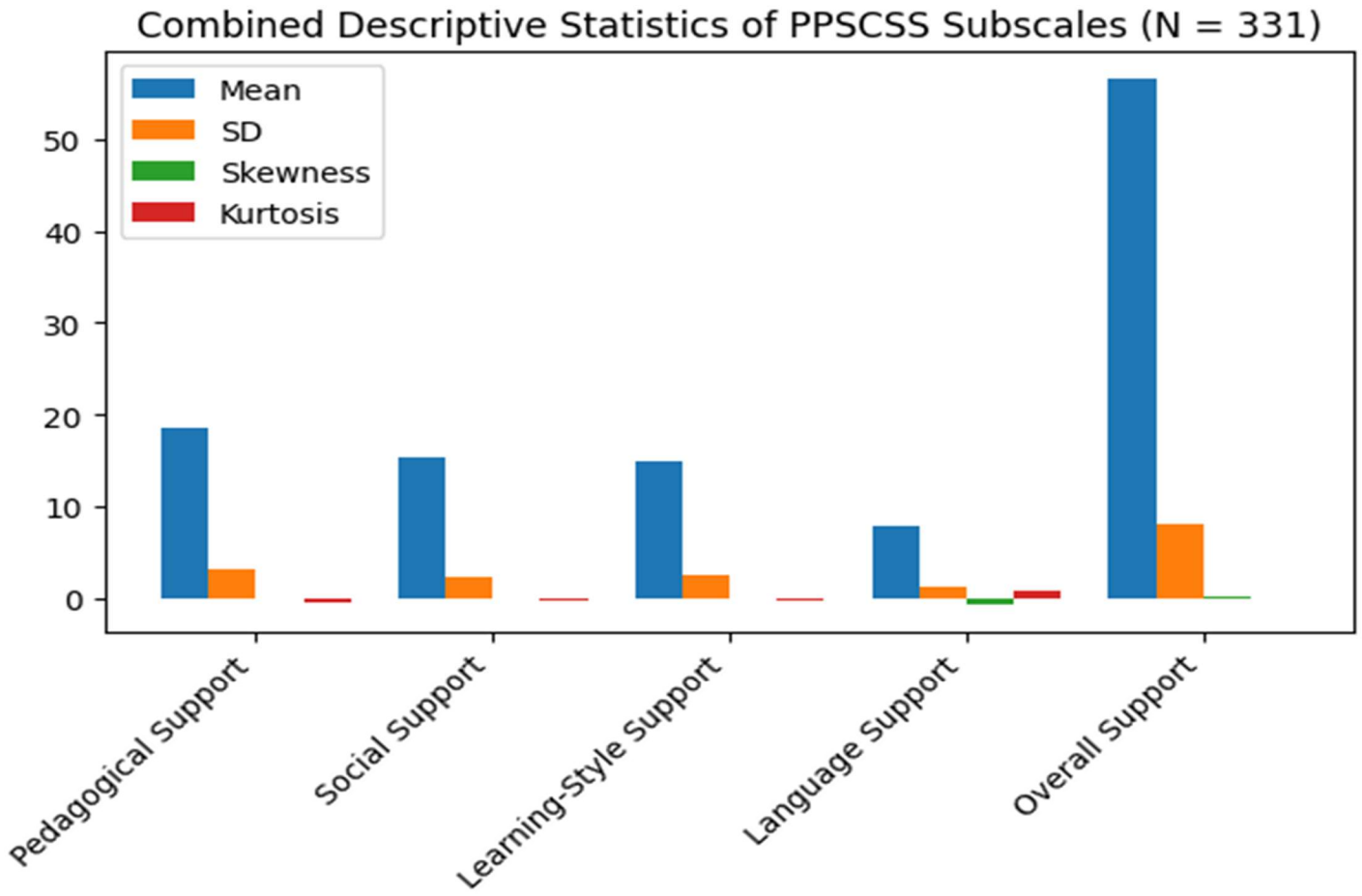


Table 2, Reliability Estimates of PPSCSS

Scale	Cronbach's α	McDonald's ω
PPSCSS (Total)	0.819	0.918

Subscale Reliability

Subscale	α (if dropped)	ω (if dropped)
Pedagogical Support	0.733	0.897
Social Support	0.781	0.911
Learning-Style Support	0.762	0.898
Language Support	0.829	0.929

Explanation

The overall scale demonstrated strong internal consistency (α = .819; ω = .918), exceeding recommended reliability thresholds. Subscale reliabilities ranged from .73 to .83, confirming acceptable internal coherence. Deletion diagnostics indicated no improvement in reliability if any subscale were removed, demonstrating structural stability.

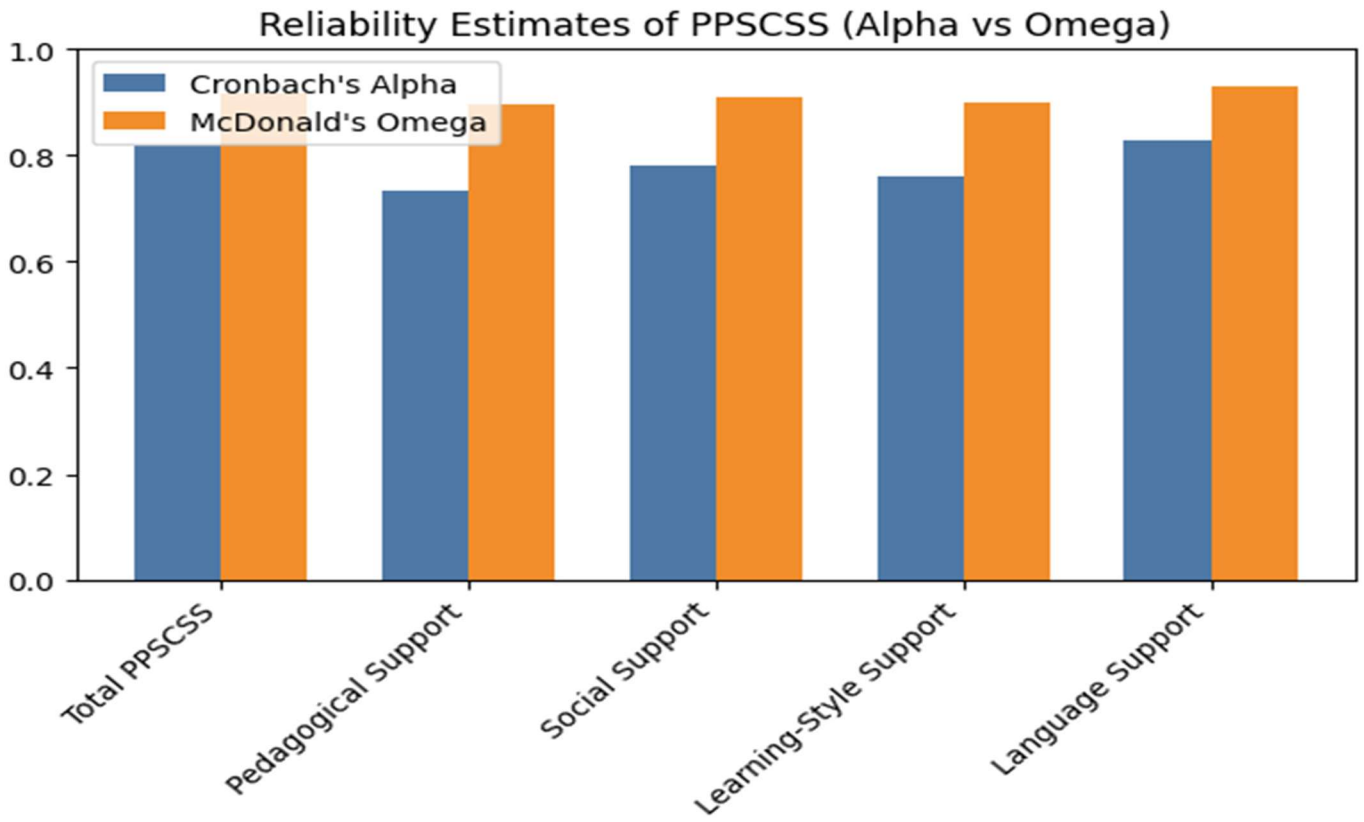


Table 3, Sampling Adequacy and Model Fit Indicators

Test	Value
KMO	0.854
Bartlett's Test	$\chi^2(105) = 1811, p < .001$
RMSEA	0.045
TLI	0.958
χ^2/df	< 3

Explanation

The KMO value (.854) indicates meritorious sampling adequacy. Bartlett's test was significant, confirming sufficient inter-item correlations for factor analysis. Model fit indices demonstrate strong adequacy (RMSEA < .05; TLI > .95), supporting the robustness of the extracted factor structure.

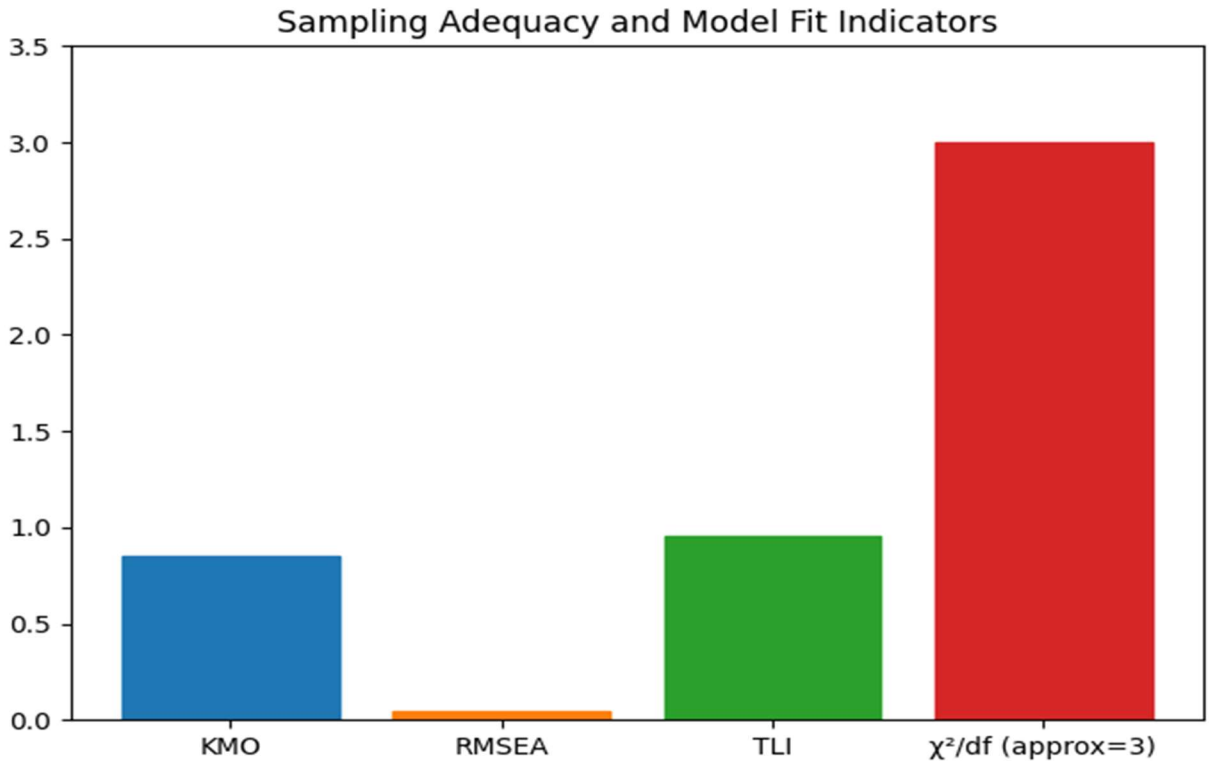


Table 4, Total Variance Explained (EFA)

Component	Eigenvalue	% Variance	Cumulative %
1	5.460	36.40%	36.40%
2	1.660	11.06%	47.47%
3	1.164	7.76%	55.22%

Explanation

Three components had eigenvalues greater than one, supporting retention. Together, they explained 55.22% of total variance, which is considered satisfactory in social science scale development. After rotation, variance was more evenly distributed, improving interpretability.

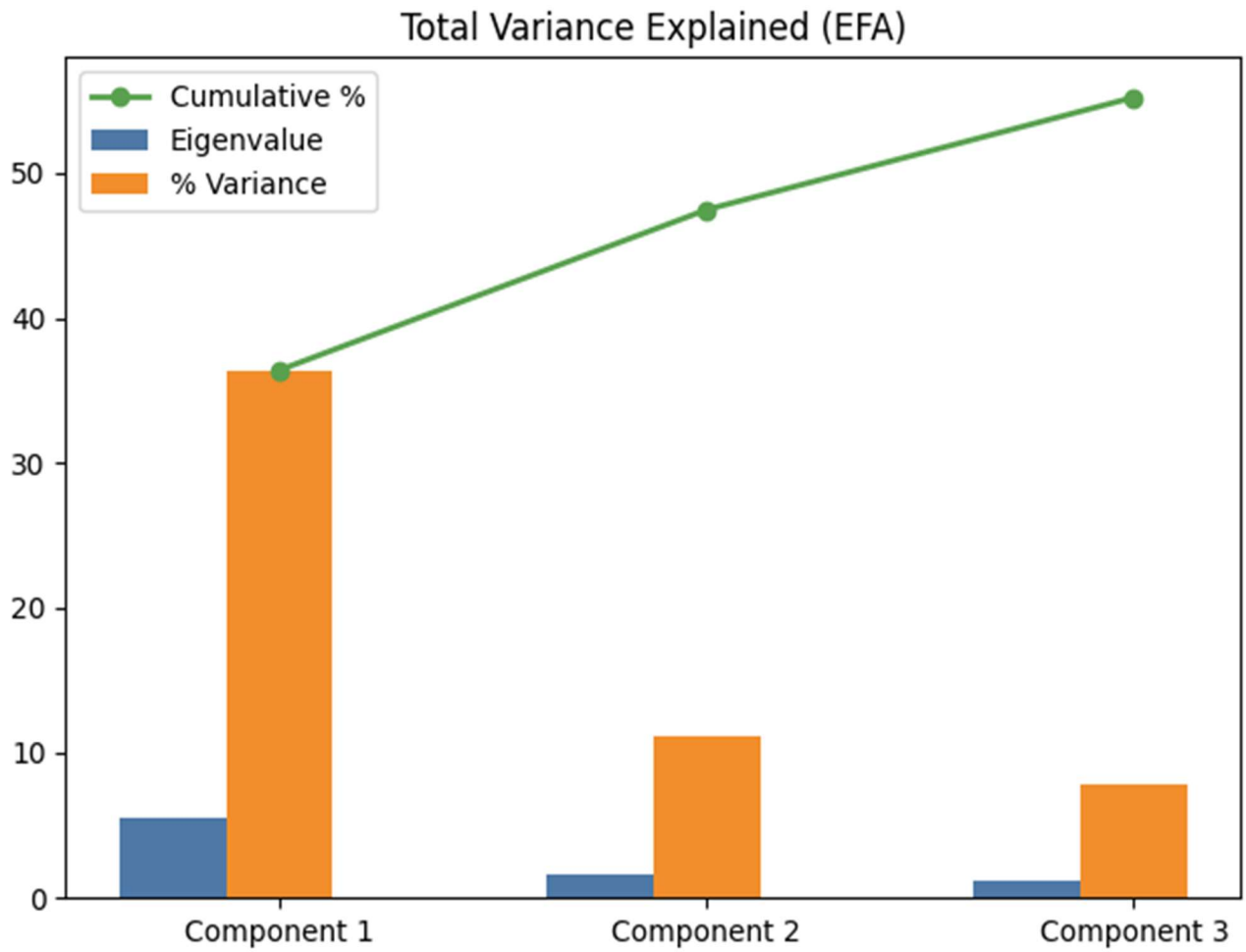
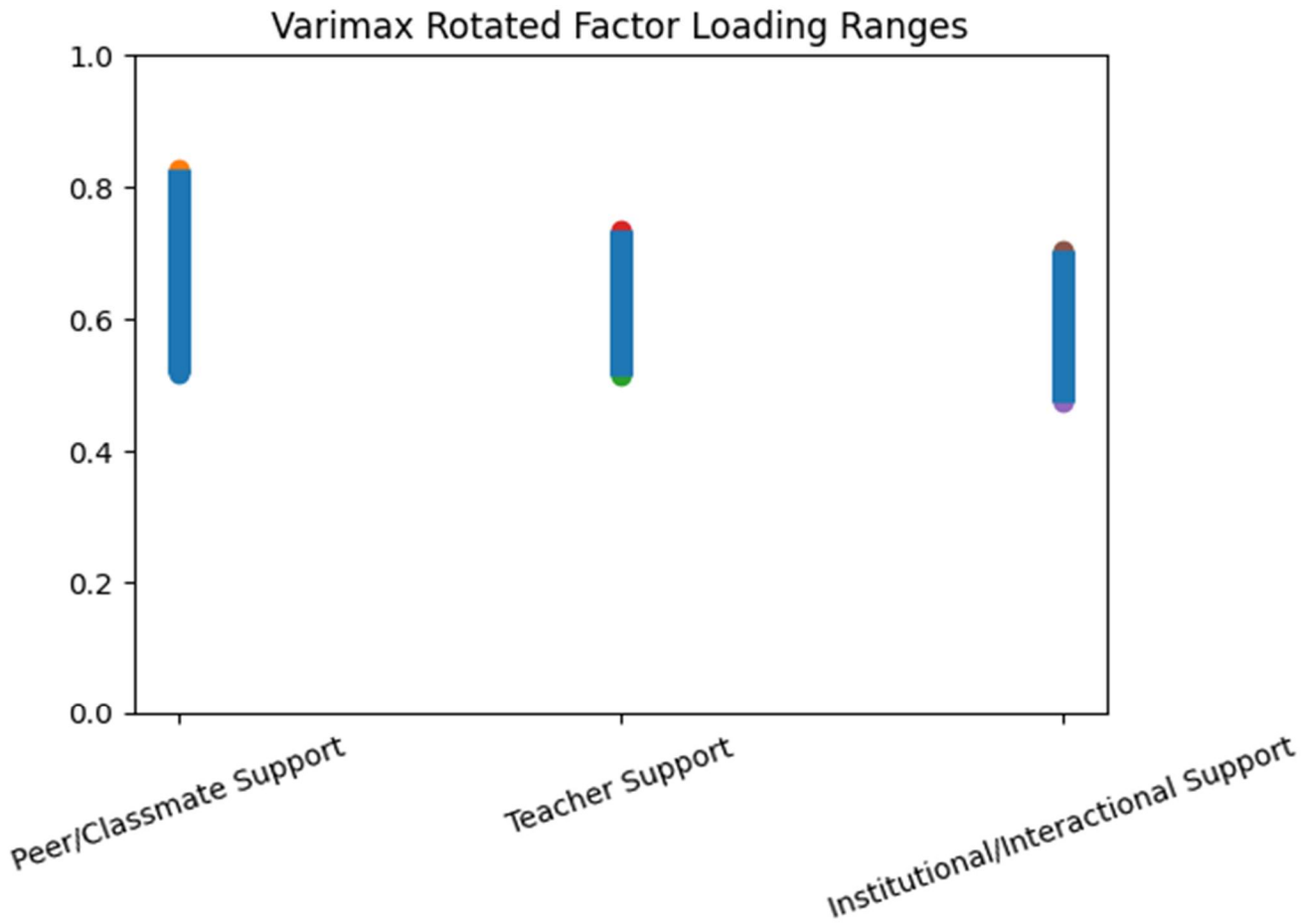


Table 5, Factor Structure (Varimax Rotated Loadings)

Factor	Interpretation	Loading Range
Factor 1	Peer/Classmate Support	.518 – .828
Factor 2	Teacher Support	.513 – .737
Factor 3	Institutional/Interactional Support	.473 – .706

Explanation

All items loaded significantly above the .40 threshold. Factor 1 captured peer encouragement and collaboration. Factor 2 represented teacher emotional and academic support. Factor 3 integrated institutional engagement and language-related support. The absence of problematic cross-loadings indicates strong construct validity.



5. Results

5.1 Descriptive Statistics

The descriptive statistics showed moderate to high perceived support in domains. The highest mean (M = 18.63, SD = 3.26) was Pedagogical Support, the next one was Social Support (M = 15.27, SD = 2.34), and Learning-Style Support (M = 14.96, SD = 2.55). The lowest mean was observed in the Language Support (M = 7.78, SD = 1.33). The skewness was between 0.729 and 0.110 and kurtosis between 0.458 and 0.861, which are within reasonable limits to perform multivariate analysis (West et al., 1995; Cain et al., 2017; Kim, 2013).

5.2 Reliability Analysis

The total PPSCSS presented a good internal consistency (Cronbach a =.819; McDonald a =.918), which is better than the standards used to create a new scale (Dunn et al., 2021; Taber, 2018; Kalkbrenner, 2024). Subscale reliability coefficients were between.73 and.83 which represents acceptable domain stability. The item-total correlations were moderate to high, and this ensured the coherence feature of item contribution towards the latent construct (Boateng et al., 2018; Taber, 2018; Pituch and Stevens, 2016; Worthington and Whittaker, 2006).

5.3 Factorability Testing

The KMO value was sampled as adequate; that is, meritorious (.854) (Hutcheson and Sofroniou, 1999; Kaiser, 1974). The test of sphericity carried out by Bartlett was significant (kh2(105) = 1811, p <.001), which means that there were enough inter-items correlations to extract factors (Williams et al., 2010; Yong and Pearce, 2013; Costello and Osborne, 2005; Field, 2018).

The exploratory factor analyses are used to analyze data with multiple variables and to verify the validity of the results. Table 4 Exploratory Factor Analysis The data that has many variables are analyzed with the help of Exploratory Factor analysis and the validity of the results is checked.

Principal axis factoring with Varimax rotation was used in the Exploratory Factor Analysis to maximize the interpretability (Fabrigar and Wegener, 2012; Costello and Osborne, 2005; Watkins, 2018). Three factors that had eigenvalues exceeding 1 were obtained, which accounted 55.22% of the overall variance. The elbowed scree plot indicated the presence of the three-factor solution, with the third component (Watkins, 2018; Costello and Osborne, 2005).

5.4 Rotated Component Matrix

The loadings of the factors were between 0.473 and 0.828 which is more than what is acceptable (Hair et al., 2019; Stevens, 2002; Watkins, 2018). Low cross-loadings were experienced. Factor 1 was denoted as Peer/Classmate Support, Factor 2 Teacher Support and Factor 3 Institutional/Interactional Support depending on the conceptual coherence and loading pattern.

5.5 Structural Representation

The path diagram depicted three correlated latent constructs, which had complementary relationships between pedagogical, social, and institutional supports. There were positive correlations among the factors, which implied the correspondence of the theories to the models of integrated student engagement (Kahu, 2013; Maluenda-Albornoz et al., 2023; Bond and Bedenlier, 2019).

6. Discussion

6.1 Interpretation of Findings

The results give empirical evidence to the multidimensional concept of perceived institutional support. The appearance of Peer/Classmate Support and Teacher Support as independent but correlated items is consistent with the integration model by Vincent Tinto that highlights that academic persistence is influenced by the integration of academics and social integration. According to recent research, organized faculty contact and collaborative efforts of peers greatly contribute to higher-education engagement and retention (Umbach and Wawrzynski, 2005; Loes et al., 2017; Loes and An, 2021; Carini et al., 2006). The role of the organizational climate and communicative practices in the formation of the student experience is also emphasized by the fact that the role of the Institutional/Interactional Support is identified (OECD, 2022). Nevertheless, the relative low scores in the category of Language Support represent the possible gap between linguistic scaffolding, especially when it comes to multilingual systems like Indian higher education (Gao and Lin, 2021; Dafouz and Smit, 2022; Pham et al., 2026).

6.2 Theoretical Contributions

The research drives to the next level of support framework by combining pedagogical, social, and cognitive domains into one valid framework. Also in opposition to current fragmented action, the PPSCSS provides a description of interconnected institutional action that in aggregate has an impact on

persistence. This is a holistic strategy that expands the modern framework of student engagement by making institution responsibility and interpersonal interaction operational (Kozan and Richardson, 2014). Moreover, contextual validation in Indian higher education will help to diversify the literature on scale development culturally, meeting the need to develop a non-Western validation context (Chan and Luk, 2021; Wen et al., 2025).

6.3 Practical Implications

In policy terms, organized systems of faculty-student interactions and formal peer mentoring programs should be introduced in the institutions to enhance integration pathways (Pavlovic and Jeno, 2024; Colvin and Ashman, 2010; Tinoco-Giraldo et al., 20202). Inclusive pedagogical practices and multimodal teaching ought to be introduced into curriculum reform in order to take into consideration various learning preferences (Espada-Chavarria et al., 2023; Vásquez et al., 2025). As well, some specific conducted remedial language programs and communication-skills workshops are necessary to manage linguistic differences and promote academic equity (Morita, 2000; Le Pichon and Sweet, 2025). These strategies combined may develop inclusive supportive learning ecosystems.

7. Limitations

A number of weaknesses must be realized in the application of the findings of this pilot study. To start with, purposive sampling can reduce the degree of generalizability of the findings. In spite of the adequate sample size (N = 331) to conduct an exploratory factor analysis, non-probability sampling limits the representativeness of the population and can result in selection bias. Modern methodological thought focuses on the fact that the use of probability-based sampling improves the external validity and cross-institutional generalizability (Bornstein et al., 2013; Bethlehem, 2010; Groves and Lyberg, 2010). The future research is therefore supposed to use stratified or multi-stage sampling with different institutional types.

Second, self-report measures were used in the study, which is vulnerable to social desirability bias and common method variance. Because of perceived expectations or response tendencies, participants can overestimate institutional support. Recent studies emphasize that self-reports in the education industry can exaggerate the connection between constructs when it is gathered by a single entity (Podsakoff et al., 2012; Miller, 2011). Validity could be enhanced by including multi-informant data or behavioral indicators or objective academic results.

Third, the sample was selected in a single state in India thus restricting the regional generalizability. Indian higher education is quite differentiated in terms of language policies, facilities, and pedagogical culture (Marginson, 2016; Tilak, 2015; Varghese, 2015). There is the need to have wider geographic sampling in order to determine cross-regional robustness.

Lastly, the research used Exploratory Factor Analysis and did not do Confirmatory Factor Analysis (CFA). Although EFA can be used in pilot validation, CFA is required in order to test factorial invariance and model fit rigorously (Schreiber, 2021; Marsh et al., 2020). Future studies are therefore advised to use structural equation modeling to ensure the consistency of the PPSCSS factor structure.

8. Future Research Directions

To evaluate the stability and goodness-of-fit of the three factor structure identified in this pilot study Confirmatory Factor Analysis (CFA) should be a priority in future research. CFA supports the intensive testing of latent constructs and rival models, and hence reinforces construct validity (DiStefano and Hess, 2005; Donnoli et al., 2024). Also, gender, academic level, and institutional type measurement invariance testing should be conducted to ascertain whether the PPSCSS is running on equal terms in subgroups and to be fair and comparable (Putnick and Bornstein, 2016; Leitgöb et al., 2023; Joshanloo, 2022).

The predictive validity also should be investigated further. The viability of the use of PPSCSS scores would be determined by analyzing the results to determine whether they have significant predictive power of academic performance, retention, engagement, and well-being (Credé et al., 2017; Richardson et al., 2012; Khatri et al., 2024). Institutional questions need to be evaluated in longitudinal studies of validation since the perceptions of support can change over the course of academic experience (Lazarides et al., 2017; Saqr et al., 2023; Chen et al., 2024). Lastly, cross-cultural validation of varied regions in India and other abroad scenarios would enhance generalizability and add to the research in global higher education (Steenkamp and Baumgartner, 1998; Gómez-López et al., 2026).

9. Conclusion

The current pilot test gives initial indication of the psychometric robustness of the PPSCSS. The scale had good internal consistency (a = .819; o =.918), satisfactory sampling adequacy (KMO =.854), and three factors which were held constant and accounted 55.22 percent of the variance. The indicators are

consistent with the modern-day requirements of instrument validity in the early stage (Boateng et al., 2018; Dunn et al., 2014).

Despite the need to confirm the results with the help of confirmatory testing, the existing results indicate that the PPSCSS is a valid and theoretically consistent instrument to measure the pedagogical, social, and institutional support in higher education. It has a multidimensional framework which provides institutional leaders with practical aspects of improving involvement and equity. The scale will be valuable to the current research on measuring education and student persistence by operationalizing integrated support systems in a culturally contextualized framework (Kozan and Richardson, 2014; Credé et al., 2010).

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