

Validation of the Student Engagement Scale among Pakistani University Students: A Confirmatory Factor Analysis

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Abstract

In higher education research, student engagement is a crucial concept. However, when applied to other populations, engagement tools created in one educational and cultural setting could need further psychometric testing. The current study looked at the factorial validity of the Student Engagement Scale among Pakistani university students, which was created by Nazamud-din, Zaini, and Jamil (2020). Three aspects of student engagement are measured by the original 27-item test: behavioral, affective, and cognitive engagement. Convenience sampling was used to gather data from 100 students at two universities in Faisalabad, Pakistan, using a quantitative study methodology. LISREL 8.80 was used to do confirmatory factor analysis (CFA) in order to assess the proposed three factor measurement structure. Seven behavioral, five affective, and six cognitive engagement items made up the final 18-item measure after items with factor loadings below the designated cutoff were eliminated. Factor loadings for the items that were kept ranged from 0.52 to 0.83. Cronbach's alpha was used to measure internal consistency; the coefficients for behavioral engagement, affective engagement, and cognitive engagement were 0.79, 0.78, and 0.76, respectively. The results offer preliminary psychometric support for the Student Engagement Scale's factorial structure and internal consistency among university students in Pakistan. For study in the context of Pakistani higher education, the finished scale might be a helpful indicator of student engagement.

Keywords: confirmatory factor analysis, behavioral engagement, affective engagement, cognitive engagement, higher education, Pakistan

I. Introduction

In higher education research, student engagement has emerged as a key concept because of its recognized role in understanding students' learning experiences and educational outcomes. Although the concept has received considerable scholarly attention, no single universally accepted definition exists. According to Schaufeli et al. (2002), engagement is a good, satisfying and work related state of mind that is marked by enthusiasm, dedication and full involvement. In an educational context, this reflects students' energetic involvement, commitment and deep concentration in their academic activities. A recent mini review by Wang (2025) identified Three recurrent ideas of student engagement: as students' connection with learning material through mastery and feedback, as a state of active participation occurring both inside and outside the classroom and as a psychological experience in which satisfies students' demands for belonging, skill and autonomy. Within higher education, engagement is regarded as an important indicator of educational quality and

student experience because it reflects not only students' participation in academic activities but also the extent of their involvement in learning (Trolan, 2023).

1.2 Dimensions of Student Engagement

Engagement is commonly discussed as a diverse structure rather than as a single type of involvement. Amerstorfer and Freiin von Münster-Kistner (2021) describe academic engagement as involving students' cognitive, affective and social involvement in learning activities, including deep mental and emotional engagement with learning materials and interaction with peers and teachers. Nazamud-din et al. (2020), drawing on the three-dimensional conceptualization proposed by Pérez et al. (2018), examined student engagement through these same three dimensions in an ESL higher education classroom.

Behavioral engagement concerns students' observable involvement in academic activities. In the conceptualization used by Nazamud-din et al. (2020), includes students' academic and multitask activities carried out in and outside the classroom. Attending lectures, doing projects, engaging in class discussions, asking questions and sharing learning with peers were among the behaviors that the authors looked at.

Cognitive engagement concerns students' mental involvement in learning. Nazamud-din et al. (2020) describe this dimension in relation to pupils' self regulated learning abilities and motivational objectives. Forming new understandings from information, applying what is taught to other elements of life, assessing viewpoints given in class, analyzing one's own opinions and thinking about course material outside of the classroom were all covered in their questionnaire.

Affective engagement concerns students' feelings, attitudes, interests and values in relation to their learning experiences. In Nazamud-din et al. (2020), affective engagement was examined through students' feelings about their learning, course activities, classmates, and their experiences in the classroom. Their items included feeling excited about classroom activities, feeling that course work is worthwhile, feeling that interaction with classmates helps understanding and being fascinated by course content.

These three dimensions are related but represent different aspects of students' engagement with learning. In their study of undergraduate students in a Malaysian ESL course, Nazamud-din et al. (2020) found significant positive relationships among cognitive, affective and behavioral engagement. This three dimensional structure is therefore directly relevant to the Student Engagement Scale examined in the present study.

1.3 Importance of Student Engagement

Research has examined student engagement in relation to several academic and psychological outcomes in higher education. Wong et al. (2024) conducted a systematic review and meta-analysis examining the association between academic success, subjective well-being and student participation. Their findings showed positive associations between student engagement and both academic achievement and subjective well-being across the studies included in the review.

Student engagement has also been examined in relation to university students' persistence and dropout. The association between academic engagement and dropout intention among undergraduate university students was examined by Álvarez-Pérez et al. (2024). and found that students who reported an intention to drop out had lower levels of academic engagement than students who did not report such an intention. López-Angulo et al. (2024) likewise examined cognitive and motivational variables in relation to university dropout and found disparities between students who dropped out and those who stayed enrolled in terms of involvement, independent motivation, and academic satisfaction.

University students' motivation, involvement, and academic achievement have all been studied. Acosta-Gonzaga (2023) found connections between students' motivation, academic engagement and academic success and investigated the relationship between university students' performance and academic engagement and self esteem..

When combined, these studies offer empirical proof that student engagement is associated with academic success, motivation, dropout-related outcomes, personal well-being and academic performance.

1.4 Measurement of Student Engagement

Different instruments have been developed to measure student engagement, reflecting differences in how engagement has been conceptualized and measured. The NSSE is an established survey instrument used to examine students' participation in educationally purposeful activities and their experiences at their institution (National Survey of Student Engagement, 2020).

The Utrecht Work participation Scale for Students (UWES-S) is an additional tool that evaluates student participation through the aspects of focus, commitment, and absorption (Schaufeli, 2003). Carmona-Halty et al. (2019) subsequently examined the nine-item student version, the UWES-9S, among Chilean undergraduate university students and evaluated its factorial validity, reliability and measurement invariance.

The University Student Engagement Inventory was developed by Maroco et al. (2016) to assess university students' engagement through behavioral, cognitive and emotional dimensions. Subsequent research has examined the psychometric properties and transcultural validity of the USEI in different student populations (Sinval et al., 2021; Assunção et al., 2020).

To gauge student interest in higher education, Zhoc et al. (2019) created the Higher Education Student Engagement Scale (HESES). Academic engagement, cognitive engagement, social engagement with peers, social engagement with teachers, and affective involvement are the five dimensions of the scale.

More recently, Laranjeira and Teixeira (2025) examined the Engagement in Higher Education Scale (EiHES), which was developed to assess engagement in higher education across six dimensions, including online engagement. Their study also examined relationships between engagement, achievement and well-being.

These instruments demonstrate that student engagement has been operationalized through different dimensions and measurement approaches. Among the instruments discussed above, the Student Engagement Scale developed by Nazamud-din et al. (2020) measures cognitive, affective and behavioral engagement. The development and characteristics of this instrument are discussed in the following section because it is the scale examined in the present study.

1.5 Student Engagement Scale and Need for Validation

Nazamud-din, Zaini, and Jamil (2020) developed a Student Engagement Scale to examine affective, behavioral and cognitive engagement among undergraduate students in Malaysia. The questionnaire was developed by adapting items from previously established instruments, including the NSSE, the Engaged Learning Index (Schreiner & Louis, 2011), and the engagement measure reported by Alvarez-Bell and Wirtz (2017), and was theoretically informed by the three-dimensional conceptualization proposed by Pérez et al. (2018).

However, the original study did not use confirmatory factor analysis (CFA) to test whether the proposed three dimensional structure was supported by the data. This leaves the factorial structure of the instrument open to further examination, particularly when the scale is applied to students in a different educational and cultural context.

Previous research demonstrates the use of CFA and related psychometric procedures to evaluate student engagement instruments across different populations. Assunção et al. (2020) examined the University Student Engagement Inventory (USEI) across nine countries and regions and found evidence supporting its three factor structure while also identifying differences in measurement invariance across national and regional groups. Carmona-Halty et al. (2019) used CFA to examine the UWES-9S among Chilean undergraduates and found support for its three factor structure. Similarly, Sinval et al. (2021) examined the factorial structure of the USEI among university students, while Zhoc et al. (2019) used CFA to validate the five factor structure of the Higher Education Student Engagement Scale (HESES). Laranjeira and Teixeira (2025) further used exploratory and confirmatory factor analyses to examine the six-dimensional structure of the Engagement in Higher Education Scale (EiHES). These studies illustrate the importance

of examining the factorial structure and psychometric properties of engagement instruments when they are applied to different populations and educational contexts.

Research in Pakistan has also examined student engagement from different perspectives. Panhwar and Bell (2023) investigated student engagement in large ESL classes at a Pakistani university, while Siddiqi et al. (2022) developed and tested a different student engagement scale specifically for students in Pakistani higher education. These studies provide evidence that student engagement has been examined within the Pakistani context; however, neither evaluated the factorial validity of the Student Engagement Scale developed by Nazamud-din et al. (2020).

Therefore, a specific psychometric gap remains concerning the factorial validity of the Nazamud-din et al. (2020) Student Engagement Scale among Pakistani university students. The original instrument was developed and examined in a Malaysian ESL higher education context without CFA, while existing Pakistani studies have examined engagement using different research approaches or a different measurement instrument. The present study addresses this gap by using CFA to determine whether the hypothesized three factor structure of the Student Engagement Scale is supported among Pakistani university students.

Research Objectives

1. To examine the factorial structure of the Student Engagement Scale developed by Nazamud-din et al. (2020) among Pakistani university students.
2. To examine the factor loadings of the items on their respective cognitive, affective and behavioral engagement dimensions.
3. To assess the internal consistency of three dimensions of Student Engagement Scale among Pakistani university students.

2. Methodology

2.1 Research Design

The factorial validity of the Student Engagement Scale created by Nazamud-din et al. (2020) was investigated in this study using a quantitative research approach. The three factor structure of the scale cognitive, affective and behavioral engagement was tested for support among Pakistani university students using confirmatory factor analysis (CFA).

2.2 Participants and Sampling

The study included 100 university students recruited from two universities in Faisalabad, Pakistan. Participants were selected using convenience sampling.

Table I

University	Sample
Govt. College University Faisalabad	56
University of Agriculture Faisalabad	44
Total	100

2.3 Research Instrument

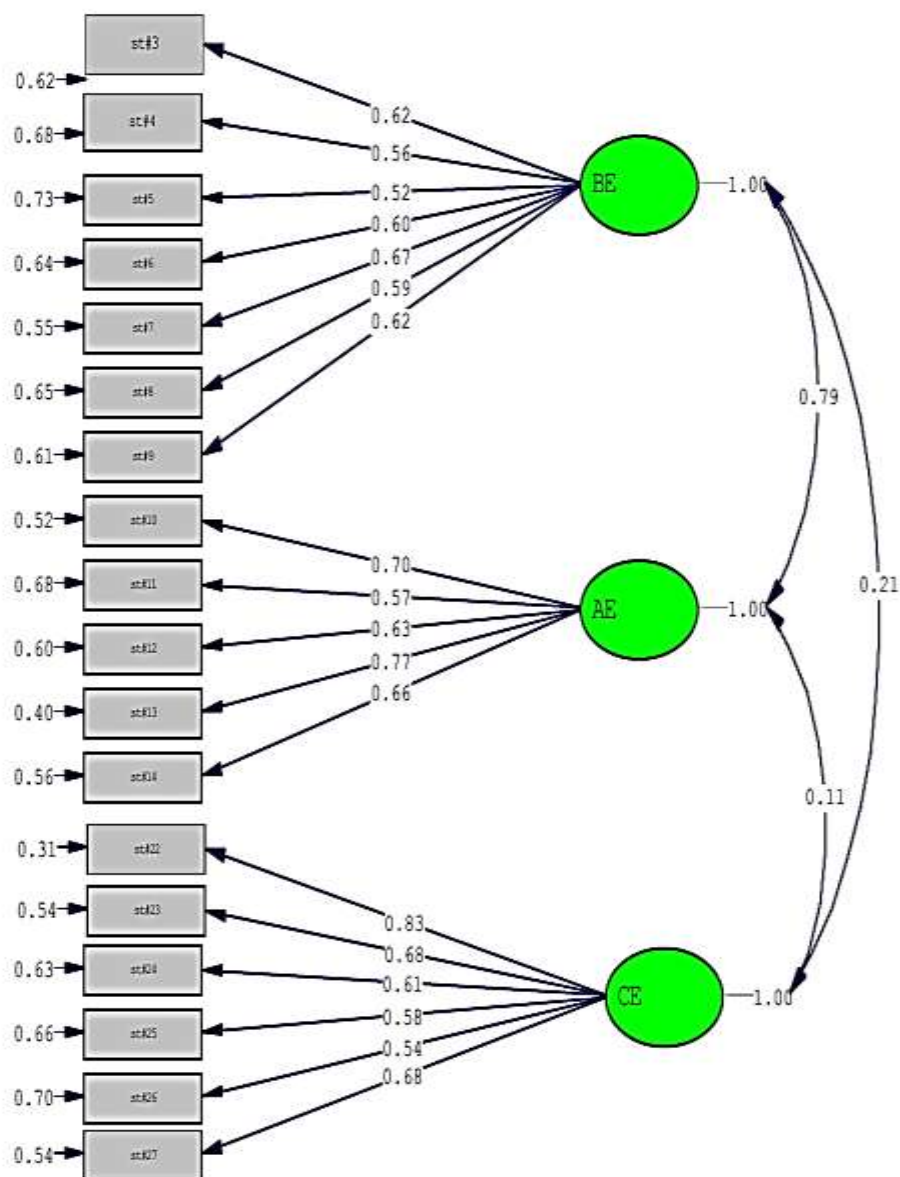
The researcher employed a standardized tool to measure student Engagement. This tool was originally developed by Nazamud-din, Zaini, and Jamil (2020) to assess engagement among undergraduate students in higher education settings. The instrument comprises 27 items encompassing three dimensions of student engagement: Behavioral Engagement (BE), Cognitive Engagement (CE) and Affective Engagement (AE). The standardized questionnaire consists of items on a 5-point Likert-type scale ranging from strongly disagree to strongly agree.

The representation of the subscales, their scope, serial number, no of items After CFA, example items and reliability are discussed in Table 2.

Table 3

Description of Subscales, their scope, Number of Items, Sr# in final scale Example Items and Reliability of scale

Subscale	Scope	No of items	After CFA	Sr# in Final Scale	α
Behavioral Engagement	An environment where students could express learning oriented behavior would increase engagement.	9	7 (Item # 1 and 2 removed)	1 to 7	0.79
Affective Engagement	Students' positive feelings influence their competency on skills like higher order, group and self directed learning.	9	5 (Item # 15,16,17 and 18 removed)	8 to 12	0.78
Cognitive Engagement	Cognitive engagement could be represented by four strategies namely, rehearsal, elaboration, organization and critical thinking strategies	9	6 (Item # 19,20 and 21 removed)	13 to 18	0.76

Factor Analysis:

Chi-Square=174.72, df=132, P-value=0.00756, RMSEA=0.057

Table 4

Factor Loading of Finalized Student Engagement Scale

Sr.no.	Statements No.	BE	AE	CE
1	St#1	0.62	----	----
2	St#2	0.56	----	----
3	St#3	0.52	----	----
4	St#4	0.60	----	----
5	St#5	0.67	----	----
6	St#6	0.59	----	----
7	St#7	0.62	----	----
8	St#8	----	0.70	----
9	St#9	----	0.57	----
10	St #10	----	0.63	----
11	St#11	----	0.77	----
12	St#12	----	0.66	----
13	St#13	----	----	0.83
14	St#14	----	----	0.68
15	St#15	----	----	0.61
16	St#16	----	----	0.58
17	St#17	----	----	0.54
18	St#18	----	----	0.68

The table 4 presents the factor values of statements from the Student Engagement Scale across three components: Behavioral Engagement consists of 9 items out of which 2 items was eliminated as their values are less than the acceptable threshold of 0.4. Affective Engagement includes 9 items out of which 4 items was eliminated as their values are less than the acceptable minimum criterion of 0.4, Cognitive Engagement also comprises 9 items out of which 2 items was eliminated as their values are less than the acceptable cutoff of 0.4. Except for the eliminated item, all other items have values greater than 0.4, indicating their validity and appropriateness for inclusion in the model.

2.4 Data Analysis

LISREL version 8.80 was used to evaluate the gathered data. CFA was used to evaluate the hypothesized three-factor structure of the Student Engagement Scale developed by Nazamud-din et al. (2020). The analysis examined the factor loadings of the observed items on their respective latent factors and evaluated the adequacy of the proposed measurement model.

The initial CFA model was specified using the original 27 items and three latent dimensions: behavioral, affective and cognitive engagement. Following the CFA, items that did not meet the specified factor loading criterion were removed, resulting in the final 18 item model. The internal consistency of the retained subscales was assessed using Cronbach's alpha.

3. Conclusion

Using confirmatory factor analysis, the current study investigated the factorial validity of the Student Engagement Scale created by Nazamud-din et al. (2020) among Pakistani university students. Three aspects of student participation were represented by the original instrument's 27 items: behavioral, affective and cognitive engagement. After nine items were eliminated and an 18 item scale was finalized, the CFA findings confirmed the three dimensional structure.

Overall, the results offer initial proof that university students' behavioral, affective and cognitive engagement can be assessed with the help of the Student Engagement Scale in the setting of Pakistani higher education. The results also show how important it is to look at an existing instrument's factorial structure when applying it to a population that is unlike the setting in which it was created. All three aspects of student participation are included in the finalized 18 item scale, which offers a more condensed form of the test. Examining the stability and universality of the measuring framework might benefit from more study using bigger and more varied samples of Pakistani university students.

REFERENCES

- Acosta-Gonzaga, E. (2023). The effects of self-esteem and academic engagement on university students' performance. *Behavioral Sciences*, 13(4), 348.
- Alvarez-Bell, R. M., & Wirtz, D. (2017). Identifying keys to success in innovative teaching: Student engagement and instructional practices as predictors of student learning in a course using a team-based learning approach. *Teaching & Learning Inquiry*, 5(2).
- Álvarez-Pérez, P. R., López-Aguilar, D., González-Morales, M. O., & Peña-Vázquez, R. (2024). Academic engagement and dropout intention in undergraduate university students. *Journal of College Student Retention: Research, Theory & Practice*, 26(1), 108-125.
- Amerstorfer, C. M., & Freiin von Münster-Kistner, C. (2021). Student perceptions of academic engagement and student-teacher relationships in problem-based learning. *Frontiers in psychology*, 12, 713057.
- Carmona-Halty, M. A., Schaufeli, W. B., & Salanova, M. (2019). The Utrecht Work Engagement Scale for Students (UWES-9S): Factorial validity, reliability, and measurement invariance in a Chilean sample of undergraduate university students. *Frontiers in psychology*, 10, 1017..
- Laranjeira, M., & Teixeira, M. O. (2025). Relationships between engagement, achievement and well-being: validation of the engagement in higher education scale. *Studies in Higher Education*, 50(4), 756-770.
- López-Angulo, Y., Cobo-Rendón, R., Sáez-Delgado, F., Mella-Norambuena, J., Pérez-Villalobos, M. V., & Díaz-Mujica, A. (2024, November). Cognitive motivational variables and dropout intention as precursors of university dropout. In *Frontiers in Education* (Vol. 9, p. 1416183). Frontiers Media SA..
- Maroco, J., Maroco, A. L., Campos, J. A. D. B., & Fredricks, J. A. (2016). University student's engagement: development of the University Student Engagement Inventory (USEI). *Psicologia: Reflexão e Crítica*, 29(1), 21.
- Assunção, H., Lin, S. W., Sit, P. S., Cheung, K. C., Harju-Luukkainen, H., Smith, T., ... & Marôco, J. (2020). University student engagement inventory (USEI): transcultural validity evidence across four continents. *Frontiers in psychology*, 10, 2796.
- National Survey of Student Engagement. (2020). *NSSE 2020 survey instrument*. Indiana University Center for Postsecondary Research
- Nazamud-din, A., Zaini, M. H., & Jamil, N. M. (2020). The relationship of affective, behavioral and cognitive engagements in ESL higher learning classroom. *English Language Teaching and Linguistics Studies*, 2(4), 48-64.
- Panhwar, A. H., & Bell, M. J. (2023). Enhancing student engagement in large ESL classes at a Pakistani university. *Educational Action Research*, 31(5), 964-980.
- Pérez, M., Ayerdi, V., & Arroyo, Z. (2018). Students Engagement and Learning through the Development of Didactic Models for Mechanical Engineering. *Universal Journal of Educational Research*, 6(10), 2300-2309.
- Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness studies*, 3(1), 71-92.
- Schaufeli, W. B. (2003). UWES—Utrecht work engagement scale: test manual. (No Title).

- Schreiner, L. A., & Louis, M. C. (2011). The engaged learning index: Implications for faculty development. *Journal on Excellence in College Teaching*, 22(1).
- Siddiqi, A. F., Shabbir, M. S., Abbas, M., Mahmood, A., & Salman, R. (2022). Developing and testing student engagement scale for higher educational students. *Journal of Applied Research in Higher Education*, 14(1), 424-439.
- Sinval, J., Casanova, J. R., Marôco, J., & Almeida, L. S. (2021). University student engagement inventory (USEI): Psychometric properties. *Current Psychology*, 40(4), 1608-1620.
- Torres Castro, U. E. (2024). Toward a unified framework: the intellectual lineage of student engagement in higher education (1999–2024). *Cogent Education*, 11(1), 2369002.
- Trolian, T. L. (2023). Student engagement in higher education: Conceptualizations, measurement, and research. In *Higher Education: Handbook of Theory and Research: Volume 39* (pp. 1-60). Cham: Springer Nature Switzerland.
- Wang, Q. (2025). Re-discover student engagement from the perspective of definition and influencing factors. *Frontiers in psychology*, 15, 1428668.
- Wong, Z. Y., Liem, G. A. D., Chan, M., & Datu, J. A. D. (2024). Student engagement and its association with academic achievement and subjective well-being: A systematic review and meta-analysis. *Journal of educational psychology*, 116(1), 48.
- Zhoc, K. C., Webster, B. J., King, R. B., Li, J. C., & Chung, T. S. (2019). Higher education student engagement scale (HESES): Development and psychometric evidence. *Research in higher education*, 60(2), 219-244.

Student Engagement Scale

1. Behavioral Engagement						
Sr#	Statements	SDA	DA	N	A	SA
1	I reach the classroom before the lecture starts.					
2	I identify key information from reading assignments, videos and power point lecturer slides..					
3	I always complete the task given by the teacher in class.					
4	I regularly participate in class discussions in most of my classes.					
5	I often discuss with my friends what I am learning in class.					
6	I ask questions to teachers during class if I do not understand.					
7	I take advantage of available learning resources other then what my teacher has provided.					
2. Affective engagement						
8	I feel energized by the ideas that I am learning in most of my classes.					
9	I feel that the course is challenging but hard work can help me to succeed.					
10	I feel that interactions with my classmates can help me to understand better.					

11	I feel excited about the activities that we experience in a classroom.					
12	I realize that I have learned something that changes the way I understand a concept.					

3. Cognitive Engagement

13	I examine the weakness of my own views on an issue.					
14	I find myself thinking about what I am learning in class even when I am not class.					
15	I evaluate the opinion discussed in the classroom.					
16	I examine the strength of my own views on an issue.					
17	I memorize important course notes after the class.					
18	I summarize what I have learned in class.					