



Received: 07/August/2025

IJRAW: 2025; 4(9):245-248

Accepted: 18/September/2025

Construction and Validation of Classroom Environment and Self-Efficacy Scales for Higher Secondary Students in English

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Abstract

The study reports the systematic development and validation of two instruments designed to assess Higher Secondary School students' perceptions of classroom environment in English and their academic self-efficacy in learning English. Both tools were constructed through extensive literature review, expert validation, pilot testing, and item analysis using the upper-lower 27% method and t-test for item discrimination. The finalized Classroom Environment Scale and Self-Efficacy Scale each consisted of 30 items with five-point Likert-type responses and demonstrated high reliability, with Spearman-Brown corrected coefficients of 0.85 and 0.86, respectively. Evidence of content and construct validity indicates that the scales are appropriate for use in studies involving Higher Secondary students' classroom experiences and academic self-beliefs in English.

Keywords: Self-Efficacy scale, Classroom Environment scale, higher secondary students.

1. Introduction

English learning at the Higher Secondary level plays a vital role in students' academic and professional development. Achievement in English is influenced not only by intellectual ability but also by the psychosocial climate of the classroom and students' beliefs about their own capabilities. A supportive classroom environment encourages participation, interaction, confidence, and meaningful engagement in language learning. At the same time, students' self-efficacy beliefs determine the effort they invest, their persistence in challenging tasks, and their ability to overcome academic difficulties.

Although several standardized tools are available internationally to measure classroom environment and self-efficacy, few instruments are specifically designed for the Indian Higher Secondary context, particularly with reference to English learning. Differences in curriculum, teaching practices, classroom culture, and evaluation systems necessitate the development of context-specific measures.

Therefore, the present study aimed to construct and validate two instruments: a Classroom Environment Scale to assess students' perceptions of the English classroom climate, and a Self-Efficacy Scale to measure their academic self-beliefs in learning English. These instruments were developed to support a broader normative survey examining the relationship between classroom environment, self-efficacy, and achievement in English among Higher Secondary students.

2. Method

a) Design and Participants

The tool development followed a descriptive, normative survey design. For pilot testing and item analysis, a sample of 100 Higher Secondary School students was randomly selected from different schools in the Kozhikode district, Kerala. For the main study, stratified random sampling was used to select 720 second-year Higher Secondary students from 12 schools, ensuring representation by gender, locale (rural/urban), type of management (Government, Aided, Unaided), and stream (Science, Commerce, Humanities).

b) Tools Used in the Study

This investigation utilized three measurement tools:

- Classroom Environment Scale and
- Self-Efficacy Scale, both developed by Nisha T N K & Dr. K. Saileela (2025), and
- English achievement scores from public examinations.

c) Classroom Environment Scale

The Classroom Environment Scale was developed to assess students' perceptions of the English classroom climate with reference to support, interaction, discipline, participation, and learning atmosphere. Items were generated after an extensive review of related literature, research reports, books, and existing standardized classroom environment instruments. The initial pool consisted of 38 statements, framed as both positive and negative items, each with five response options:

Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. Positive items, were scored from 5 to 1, while negative items were reverse-scored from 1 to 5.

d) Self-Efficacy Scale

The Self-Efficacy Scale was constructed to measure students' academic self-efficacy in learning English, including confidence in understanding lessons, task completion, overcoming difficulties, self-regulation, motivation, and goal achievement. Items were derived from an extensive review of theoretical and empirical literature on academic self-efficacy, previous theses, journals, books, and standardized scales. The preliminary form contained 40 statements (reported as 42 in the item-analysis table), comprising both positive and negative items with the same five response options and scoring pattern as the Classroom Environment Scale.

e) Content Validation

For both instruments, the preliminary item pools were submitted to a panel of experts in Education and Educational Psychology. Experts evaluated each item for clarity, relevance, age appropriateness, and coverage of intended dimensions (e.g., teacher support, peer interaction, discipline, participation, and learning atmosphere for classroom environment; confidence, persistence, motivation, emotional control, and self-regulated learning for self-efficacy). Based on expert feedback, ambiguous or overlapping items were revised or removed, thereby establishing content validity through expert judgment.

f) Pilot Study and Item Analysis

For each scale, a pilot administration was conducted on 100 Higher Secondary students. Responses were scored according to the specified key, and total scores were arranged in ascending order. The upper 27% (high group) and lower 27% (low group) of scorers were identified, and item analysis was carried out using the t-test for independent means to determine each item's discriminating power.

An item's t-value was computed based on the difference between the mean scores of the high and low groups for that item, divided by the standard error of the difference. Items with t-values greater than 2.00 were considered statistically significant and retained; those with t-values less than 2.00 were rejected.

- In the Classroom Environment Scale, items 4, 8, 12, 16, 20, 23, 26, and 29 were rejected, and 30 items were retained for the final scale.
- In the Self-Efficacy Scale, items 4, 7, 11, 14, 18, 21, 25, 28, 32, 35, 39, and 42 were rejected, leaving 30 items in the final form.

g) Final Forms of the Tools

The final Classroom Environment Scale comprises 30 items covering teacher support, peer interaction, discipline, participation, motivation, collaboration, and overall learning atmosphere, with a balanced mix of favourable and unfavourable statements.

Scoring Pattern:

- **Positive Items (22 Items):** Items 1, 2, 3, 5, 6, 7, 9, 10, 12, 13, 14, 16, 17, 18, 20, 21, 23, 25, 27, 28, 29, 30
Scored as: Strongly Agree (5), Agree (4), Neutral (3), Disagree (2), Strongly Disagree (1)
- **Negative Items (8 Items):** Items 4, 8, 11, 15, 19, 22, 24, 26

- **Reverse Scored:** Strongly Agree (1), Agree (2), Neutral (3), Disagree (4), Strongly Disagree (5)

This systematic arrangement ensures balanced measurement of classroom perceptions while minimizing response bias among Higher Secondary students.

The final Self-Efficacy Scale contains 30 items spanning dimensions such as confidence in understanding lessons, persistence in difficult tasks, self-regulation, motivation, adaptability, examination confidence, and goal attainment. Items are systematically arranged to balance positive and negative wording, which helps reduce response bias and improve measurement accuracy.

Scoring Pattern:

- **Negative Items (5 Items):** Items 5, 10, 15, 31, 33
Reverse scored: Strongly Agree (1), Agree (2), Neutral (3), Disagree (4), Strongly Disagree (5)
- **Positive Items (25 Items):** All remaining 25 items
Scored as: Strongly Agree (5), Agree (4), Neutral (3), Disagree (2), Strongly Disagree (1)

h) Evidence of Validity

Construct validity was supported by aligning the dimensions of each scale with established theoretical frameworks in the classroom environment and self-efficacy, and by retaining only items with significant discriminating power ($t > 2.00$) in the item analysis. The careful selection of theoretically grounded dimensions (student engagement, teacher behaviour, interaction patterns, motivational climate for classroom environment; confidence, persistence, motivation, and self-regulated learning for self-efficacy) strengthens the internal structure of both instruments. The high reliability coefficients further support the internal consistency aspect of construct validity.

i) Reliability Estimation

Reliability of both scales was established using the split-half method followed by the Spearman–Brown prophecy formula. The 30 items in each tool were divided into two halves (odd–even). Scores on the two halves were correlated using Pearson's Product-Moment correlation coefficient, and the resulting split-half reliability was corrected using the Spearman–Brown formula to estimate full-scale reliability.

- **Classroom Environment Scale:** split-half reliability $r = 0.75$; Spearman–Brown corrected reliability = 0.85
- **Self-Efficacy Scale:** split-half reliability $r = 0.76$; Spearman–Brown corrected reliability = 0.86.

These coefficients indicate high internal consistency and justify the use of both scales in the main study.

Classroom Environment Scale

(5-Point Likert Scale: 1 = Strongly Disagree | 2 = Disagree | 3 = Neutral | 4 = Agree | 5 = Strongly Agree)

1. My teacher encourages me to ask and answer questions in the classroom.
2. The classroom atmosphere makes me feel comfortable expressing my thoughts.
3. Students in my class cooperate and help each other in learning.
4. I often feel uncomfortable speaking in my classroom.
5. Group activities are regularly conducted to make learning interesting.

6. The teacher uses real-life examples to make lessons more meaningful.
7. Learning materials and resources are easily available in the classroom.
8. The classroom environment does not support my learning.
9. My teacher positively maintains discipline.
10. I receive useful feedback that helps me improve.
11. The classroom seating arrangement supports discussion and interaction.
12. I hesitate to participate in classroom discussions.
13. My teacher treats all students fairly and without bias.
14. The classroom environment motivates me to participate actively.
15. I feel free to share my doubts without hesitation.
16. There is lack of cooperation among students in my class.
17. The teacher gives equal importance to activity-based learning and textbook learning.
18. The classroom environment helps me develop confidence in learning.
19. I feel that my teacher values my ideas and contributions.
20. The teacher rarely encourages creative thinking.
21. My teacher provides opportunities for collaborative learning.
22. There is mutual respect between the teacher and the students.
23. I feel that classroom activities are a waste of time.
24. The classroom environment encourages me to think critically.
25. I feel comfortable using English during classroom discussions.
26. My teacher does not give individual attention when needed.
27. The teacher encourages innovative ideas in the classroom.
28. The learning environment helps reduce my exam-related stress.
29. I do not feel motivated in my classroom environment.
30. I am encouraged to participate in role plays, projects, and other activities.
31. The classroom promotes healthy competition among students.
32. My teacher is approachable whenever I need help.
33. The classroom has a friendly and supportive learning climate.
34. The teacher motivates us to learn beyond the textbook.
35. Peer discussions are encouraged in the classroom.
36. My classroom helps me develop positive study habits.
37. I enjoy being part of my classroom learning environment.
38. The classroom setting supports my overall academic achievement.

3. Results

The construction and validation procedures yielded two psychometrically sound instruments suitable for use among Higher Secondary students studying English. The final Classroom Environment Scale and Self-Efficacy Scale each consists of 30 Likert-type items with established content validity, satisfactory item discrimination, and high reliability. Interpretation guidelines were also developed: for example, score ranges on the Self-Efficacy Scale classify students into very high, high, moderate, low, and very low self-efficacy, facilitating meaningful educational decisions and interventions.

4. Discussion

The results indicate that the systematic process of item generation, expert validation, pilot testing, item analysis, and reliability estimation produced robust tools for assessing classroom environment and academic self-efficacy in English at the Higher Secondary level. The use of the upper-lower 27% method and a t-value criterion of 2.00 ensured that only items with adequate discriminative power were retained. High Spearman–Brown reliability coefficients (0.85 and 0.86) show that the scales yield consistent scores and can be confidently used in correlational and group-comparison studies.

These tools are particularly useful for examining how classroom climate and self-efficacy relate to achievement in English, and for identifying subgroups (e.g., by gender, locale, management type, stream) that may need targeted support. Because the scales are contextually grounded in the Indian Higher Secondary English classroom, they offer greater ecological validity than unadopted foreign instruments.

5. Conclusion

The present study successfully constructed and validated two research instruments: the Classroom Environment Scale and the Self-Efficacy Scale, specifically designed for Higher Secondary School students learning English. The tools were developed following systematic procedures of item construction, expert validation, pilot testing, and item analysis to ensure scientific rigor. The findings established that both instruments possess satisfactory content validity and construct validity, confirming that the items adequately represent the intended dimensions. Reliability analysis further indicated a high degree of internal consistency, demonstrating that the scales yield stable and dependable results.

These validated instruments provide reliable measures for assessing students' perceptions of the English classroom climate and their academic self-efficacy beliefs. They can be effectively used in educational research, diagnostic assessment, and intervention studies. Moreover, the scales may support teachers, school administrators, and researchers in identifying areas for improvement and implementing strategies to enhance classroom practices and strengthen students' confidence, thereby promoting better learning outcomes in English.

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