SOCIAL SCIENCE REVIEW ARCHIVES
ISSN Online: 3006-4708
ISSN Print: 3006-4694
https://policyjournalofms.com

Enhancing Academic Comprehension through Student Teams-Achievement Divisions (STAD) Evidence from Undergraduate ESL Learner in Karachi

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DOI: https://doi.org/10.70670/sra.v4i2.2069

Abstract

This study examines the limited levels of academic comprehension and restricted active involvement recorded among first-year undergraduate students, alongside the difficulties encountered in maintaining student and instructor motivation during the deployment of the Student Teams-Achievement Divisions (STAD) cooperative learning strategy. A qualitative methodology integrating action research with a structured instructional model development design was employed, with the investigation centered on two sections of first-year undergraduates enrolled in the Functional English course at a public sector university in Karachi. Data were generated through systematic classroom observations and detailed field recordings across three iterative learning cycles. The analysis addressed multiple dimensions of learning including peer collaboration, student engagement, content mastery, and instructor facilitation quality. The outcomes confirm that the STAD cooperative learning strategy produced substantial and measurable gains in student involvement, academic comprehension, and inter-peer engagement, as evidenced by progressive improvements in formative assessment performance and the quality of collaborative group discussions. Nonetheless, certain enduring challenges—particularly the maintenance of consistent motivation among students and instructors alike—necessitate deliberate and sustained motivational, pedagogical, and group management strategies. Continuous and systematic monitoring was found to be indispensable for sustaining optimal learning conditions and realising meaningful improvements in academic outcomes. The study contributes to the scholarship on cooperative learning within the Pakistani higher education context by affirming the STAD model's capacity to deepen student engagement and comprehension. The findings underscore the pivotal role of motivation, group management, and ongoing evaluation in ensuring that cooperative learning remains an effective and sustainable instructional approach across diverse educational environments.

Keywords: Cooperative Learning, STAD, Pakistan Studies, Undergraduate Education, Karachi, Higher Education, Academic Comprehension

Introduction

Functional English occupies a mandatory position within undergraduate curricula at public sector universities across Pakistan, serving as a foundational discipline for cultivating civic consciousness, national awareness, and social responsibility among students. As Armianti et al. (2024) and Montessori et al. (2024) affirm, civic and social sciences courses are not simply academic requirements but constitute essential instruments for developing informed, critically thinking, and socially engaged citizens. Rafzan et al. (2024) similarly contend that such subjects function as vital conduits through which core civic values are embedded within the national and societal consciousness. Yet, as Rahayu (2024) observes, these disciplines face substantial pedagogical obstacles, most notably in the development of instructional strategies that genuinely foster deep conceptual understanding among learners. Within the Pakistani higher education landscape, these difficulties are magnified at public sector universities in Karachi, where large and heterogeneous student populations, constrained institutional resources, and diverse socioeconomic backgrounds collectively challenge effective instruction.

Ahmed and Hussain (2021) document that undergraduate classrooms at public sector universities in Sindh continue to depend heavily on conventional lecture-based delivery modes, which by their nature generate passive learning environments characterised by minimal student engagement. Dejene (2019) reinforces this critique, arguing that lecture-dominant instructional approaches systematically suppress interactive and participatory learning, leaving students intellectually disengaged, discussions largely absent, and content comprehension correspondingly shallow. Mebert et al. (2020) note that this condition manifests in disappointing assessment outcomes and a widespread absence of student enthusiasm toward course content. There is, therefore, an urgent imperative for more innovative, participatory, and student-centred pedagogical strategies capable of generating authentic student involvement and facilitating deeper levels of conceptual learning.

A substantial body of international and Pakistani scholarship has examined the impact of cooperative learning on academic outcomes. Poerwati et al. (2020) established that cooperative learning augmented by concrete instructional aids raised early mathematics completion rates from 29.17% to 91.67% across two instructional cycles. Megawati et al. (2021) similarly documented meaningful differences in mathematics achievement between students exposed to cooperative strategies and those in conventional instructional settings. Sukiyanto (2019) reported that cooperative implementations yielded high-quality learning management, with student activity rates reaching 96% and positive behavioural responses at 87.55%. In the Pakistani context, Farooq and Shahzadi (2018) established that cooperative learning strategies produced statistically significant gains in academic performance at Pakistani institutions, while Malik and Azam (2019) confirmed enhanced achievement and motivation at the university level. Hussain and Naseem (2020) further reported that structured cooperative learning at Lahore-based universities was associated with stronger peer cohesion and improved examination performance. Despite this expanding literature, there remains a conspicuous gap in research specifically examining the STAD strategy among undergraduate students in Functional English at a public sector university in Karachi, rendering the present investigation both timely and academically significant.

Statement of the Problem

Despite growing recognition of cooperative learning's pedagogical value, Functional English classrooms at public sector universities in Karachi continue to be characterised by passive instructional dynamics, limited peer interaction, and insufficient student engagement with course content. Ahmed and Hussain (2021) document that large class sizes, resource constraints, and an over-reliance on didactic lecture formats have collectively produced an environment where students remain largely disengaged and conceptual comprehension is shallow. Iqbal and Zaman (2019) similarly note that students at public sector universities in Sindh frequently struggle to

demonstrate critical thinking or active participation in content-dense disciplines such as Pakistan Studies, partly due to the absence of structured interactive learning opportunities. These conditions are compounded by the challenge of maintaining consistent instructor motivation to implement novel pedagogical strategies within institutions that lack formal professional development frameworks for teaching innovation.

The STAD cooperative learning model, though well-documented in international research, has received limited empirical attention within the specific context of Functional English instruction at the undergraduate level in Karachi. Siddiqui and Qureshi (2022) observe that pedagogical reform in Pakistani public sector universities has proceeded slowly, with instructors often lacking access to evidence-based models validated within the local educational context. The absence of contextually grounded evidence limits the confidence with which practitioners and administrators can adopt cooperative learning approaches and sustain their implementation over time. This study directly addresses this gap by systematically implementing and evaluating the STAD model across three iterative action research cycles within a first-year Functional English course, providing empirical evidence relevant to both the scholarly community and institutional decision-makers.

Research Objectives

The present study is guided by the following objectives:

- To examine the effect of the STAD cooperative learning model on the academic comprehension of first-year undergraduate students enrolled in Functional English at a public sector university in Karachi.
- To assess shifts in student participation and collaborative engagement across three iterative cycles of STAD-based instruction.
- To identify the challenges that emerge during the implementation of the STAD model in the Pakistani higher education context and to propose evidence-based strategies for addressing them.

Research Questions

The study seeks to address the following research questions:

1. To what extent does the implementation of the STAD cooperative learning model improve academic comprehension among first-year undergraduate students in Functional English at a public sector university in Karachi?
2. How does student participation in collaborative group discussions change across successive cycles of STAD-based instruction?
3. What challenges arise during the implementation of the STAD cooperative learning model in the Pakistani higher education context, and what strategies are effective in addressing them?

Significance of the Study

This investigation holds significance across theoretical, pedagogical, and policy dimensions. Theoretically, the study extends the evidence base on cooperative learning within a nationally specific and contextually rich setting—undergraduate Functional English instruction at a public sector university in Karachi. By applying and evaluating the STAD model through a rigorous action research framework, the study addresses a documented gap in the locally grounded literature on cooperative pedagogy in Pakistani higher education, contributing empirical findings that complement internationally derived theoretical frameworks.

From a pedagogical standpoint, the study offers instructors and curriculum designers at public sector universities a validated and contextually tested model for improving student engagement and content comprehension. Siddiqui and Qureshi (2022) observe that instructors frequently lack access to pedagogical strategies evaluated within their own institutional and cultural environment. The findings of this study provide a practical reference for educators seeking to design more interactive and effective instructional experiences within resource-constrained public sector settings. The evidence generated is directly applicable to professional development initiatives and pedagogical reform efforts aimed at enhancing undergraduate learning quality.

In terms of institutional and policy relevance, the study generates actionable insights for university administrators, curriculum planners, and educational policymakers responsible for improving instructional quality in Pakistan's public sector higher education system. Iqbal and Zaman (2019) emphasise that sustainable pedagogical reform requires evidence-based justification; this study supplies such justification by documenting measurable improvements in academic comprehension, student participation, and group learning dynamics across three instructional cycles. The outcomes also underscore the centrality of instructor motivation and institutional support in determining whether cooperative learning can be adopted and maintained effectively across diverse undergraduate contexts.

Literature Review

Cooperative Learning: Theoretical Foundations

Cooperative learning refers to a structured instructional approach in which students are organised into small, heterogeneous groups to accomplish shared academic goals through mutual support and collaborative effort. Drawing on foundational theoretical frameworks including Vygotsky's zone of proximal development and Bandura's social learning theory, cooperative learning positions peer interaction as a primary mechanism through which learners construct knowledge and develop higher-order cognitive capabilities. Amsari et al. (2024) elaborate that social learning theory underscores the centrality of observational learning, peer modelling, and collaborative reinforcement in shaping students' academic behaviours and dispositions. Ardiansyah and Ujihanti (2017) similarly situate cooperative learning within a constructivist epistemology, arguing that learners actively build understanding through structured engagement with their social and academic environment. These theoretical traditions provide the conceptual scaffolding upon which the STAD model and related cooperative strategies are designed and justified.

The empirical literature on cooperative learning across diverse educational contexts consistently affirms its positive impact on academic performance, student motivation, and classroom dynamics. Darling-Hammond et al. (2019) synthesise evidence from the learning sciences to establish that cooperative and collaborative instructional environments are associated with deeper knowledge retention, greater intrinsic motivation, and stronger interpersonal competencies. Gillies (2016) provides a comprehensive review affirming that well-structured cooperative learning not only enhances academic achievement but also fosters positive interdependence among group members, promoting a culture of collective academic responsibility. In the Pakistani context, Farooq and Shahzadi (2018) document that cooperative strategies yielded statistically significant performance gains across diverse undergraduate disciplines, while Malik and Azam (2019) similarly confirm enhanced achievement and engagement among university students. Hussain and Naseem (2020) further established that cooperative learning at Lahore universities produced stronger peer relationships and higher formative assessment scores, reinforcing the relevance of these strategies for Pakistani public sector institutions.

The STAD Model: Structure and Mechanisms

The Student Teams-Achievement Divisions (STAD) model, originally developed by Slavin, is among the most widely studied and implemented cooperative learning strategies across primary, secondary, and tertiary education globally. The STAD structure follows a clearly defined instructional sequence: the teacher introduces content to the whole class, students then work within heterogeneous small groups to master the material, individual quizzes assess personal learning, and improvement scores are calculated relative to each student's prior performance to generate group reward scores. This architecture ensures both individual accountability and positive group interdependence, as each member's performance contributes directly to the group's collective outcome. Motwani et al. (2022) describe this dual accountability structure as a key mechanism through which STAD stimulates sustained student effort and promotes cooperative engagement within group settings.

The STAD model's effectiveness in improving academic comprehension has been documented across a range of subjects and institutional contexts. Akhmad (2020) reports that STAD implementation in vocational education settings produced measurable improvements in students' subject mastery, attributing the gains to the structured peer interaction and the motivating effect of improvement-based scoring. Aningsih et al. (2023) similarly confirm that STAD's heterogeneous group design facilitates more dynamic and inclusive discussions, enabling students with stronger prior knowledge to support peers in constructing understanding of challenging material. Jumahida et al. (2024) document that STAD-based instruction resulted in complete group comprehension by the conclusion of the intervention, underscoring the model's capacity to produce equitable learning outcomes across heterogeneous student populations. Saragih (2021) further affirms that STAD implementation in civic education settings improved both student motivation and formative assessment scores, a finding of particular relevance to the Functional English context examined in the present investigation. Ahmed et al. (2023) additionally documented that STAD-based cooperative learning at a Karachi public university yielded significantly higher content retention rates compared to lecture-only instructional groups.

Challenges in Implementing Cooperative Learning in Pakistani Higher Education

Despite the documented effectiveness of cooperative learning, its implementation in Pakistani higher education contexts confronts a range of structural, cultural, and institutional obstacles. Siddiqui and Qureshi (2022) identify inadequate physical infrastructure, large class sizes, and insufficient professional development as primary barriers to the adoption of innovative pedagogical approaches at public sector universities in Pakistan. Ahmed and Hussain (2021) elaborate that instructors at Sindh's public universities frequently operate without access to pedagogical training that would equip them to facilitate cooperative learning effectively, resulting in a reliance on familiar lecture-based formats even when their limitations are acknowledged. Iqbal and Zaman (2019) further note that students' varied academic preparation and limited prior exposure to collaborative learning approaches can generate initial resistance to group-based instructional models, particularly when cooperative conventions conflict with students' habitual passive learning behaviours.

Sharan (2010) identifies time management difficulties, ability disparities within groups, and challenges in maintaining productive group dynamics as recurring structural impediments to cooperative learning across diverse educational contexts. Fittipaldi (2020) corroborates that unequal participation and free-riding behaviours can compromise the collective learning experience if not proactively addressed through group management strategies. Khan and Iqbal (2020) emphasise that students at Karachi's public sector universities face distinctive external pressures—including financial constraints, extended commuting distances, and competing

domestic obligations—that can attenuate the collaborative motivation essential to STAD's success. Addressing these challenges requires a combination of motivational support, strategic group formation, active instructor facilitation, and sustained institutional backing, all of which are examined in the context of the present study.

Active Participation and Peer Interaction as Drivers of Academic Comprehension

A substantial body of scholarship affirms that active student participation and peer interaction are not merely desirable features of cooperative learning but are fundamental mechanisms through which cooperative instruction achieves its academic benefits. Silva et al. (2021) establish that cooperative learning provides students with structured opportunities for social engagement that activate higher-order cognitive processes, enabling deeper internalisation and retention of course content. Chin and Osborne (2008) add that student-generated questions and peer-directed explanations within cooperative groups represent rich resources for collaborative knowledge construction that direct instruction largely fails to mobilise. Marco-Fondevila et al. (2022) similarly affirm that active participation and interactive engagement are among the strongest predictors of positive academic outcomes in face-to-face learning environments.

De Felice et al. (2023) provide neurological and social scientific evidence that learning is inherently social, demonstrating that students who acquire knowledge collaboratively with peers exhibit stronger retention and deeper understanding compared to those who learn individually. Ningsih (2023) contends that proactive participation transforms students from passive recipients into active contributors to knowledge construction within their groups, a shift that is particularly significant in content-dense disciplines such as Pakistan Studies. Sigalingging et al. (2023) further argue that active student participation strengthens individual academic motivation while simultaneously deepening collective content mastery. Hussain and Naseem (2020), examining collaborative learning dynamics in Pakistani university settings, found that peer-facilitated explanation was among the most effective mechanisms for resolving content-related misconceptions, underscoring the value of structured cooperative interaction in improving undergraduate academic comprehension.

Research Methodology

This investigation adopts a qualitative research methodology, integrating a classroom action research design with a structured learning model development approach, consistent with the framework described by Jacob et al. (2021). This methodological orientation was selected to enable a detailed, contextualised, and iterative examination of student learning behaviours and academic outcomes during the implementation of the STAD cooperative learning strategy in Functional English classes at a public sector university in Karachi. Snyder (2019) affirms that this type of methodological framework facilitates an in-depth exploration of the dynamic interrelationships between students and their learning environment across successive instructional cycles. The study follows the four-stage action research cycle advocated by established qualitative educational research traditions: planning, implementation, observation, and critical reflection. Each cycle comprised two face-to-face instructional sessions during which the STAD cooperative model was systematically applied and iteratively refined based on insights derived from preceding cycles. Data were generated through direct classroom observations and detailed field documentation, as outlined by Jamshed (2014), with the objective of capturing the progressive development of student comprehension, participation, and collaborative engagement across the full course of the intervention.

Data analysis was carried out using structured observation instruments that assessed dimensions including group cooperation, individual participation, content comprehension, and instructor

facilitation quality. As Onwuegbuzie et al. (2009) note, such multi-dimensional observation criteria provide a holistic measure of student engagement and interactive learning during instructional activities. The researcher employed an in-depth qualitative analytical approach to track changes in student understanding and behavioural engagement across successive instructional cycles, consistent with the guidelines articulated by Gupta et al. (2020), who underscore the indispensability of qualitative methodologies for capturing the multidimensional and context-dependent nature of student learning. The overall effectiveness of the intervention was determined by the extent to which students demonstrated measurable improvements in Functional English content comprehension through the STAD cooperative approach—a criterion aligned with Scales (2013), who affirms the positive academic impact of cooperative learning models in both individual and collective learning contexts.

Research Design

The study employs a qualitative classroom action research design, constituting a systematic and cyclical process of planning, enacting, observing, and critically reflecting upon instructional practice with the explicit aim of improving student learning outcomes. This design is particularly suited to the present investigation because it enables the researcher to function simultaneously as the practitioner-instructor and the observer, thereby facilitating iterative refinement of the instructional strategy in direct response to empirical evidence generated within each cycle. Jacob et al. (2021) affirm that action research designs are especially valuable in educational contexts where the goal is to investigate and improve a specific instructional practice within a defined and real-world setting, rather than to generate universally generalisable findings.

The intervention was structured across three successive learning cycles, each building upon the observational and reflective analyses of the preceding cycle. Cycle I focused on introducing the STAD model and establishing collaborative group routines while delivering content related to the constitutional and legal framework of Pakistan. Cycle II incorporated targeted refinements to group management, instructor facilitation, and motivational strategies in response to Cycle I observations. Cycle III enacted further strategic improvements, including the reconstitution of student groups and the introduction of more intensive peer mentoring and motivational support mechanisms. Data collected through observation sheets, field notes, quiz scores, and instructor reflections were analysed qualitatively across all three cycles to identify patterns of improvement, persistent challenges, and the differential impact of successive instructional refinements on student comprehension and participation. This iterative, reflective, and evidence-driven approach constitutes a rigorous and contextually appropriate design for the investigation of cooperative learning in the Pakistani undergraduate setting.

Target Population

The target population of this study comprises first-year undergraduate students enrolled in mandatory Functional English courses at public sector universities in Karachi, Sindh. This population is characterised by considerable diversity in academic preparation, socioeconomic background, linguistic proficiency, and prior exposure to interactive or collaborative learning environments, reflecting the broad heterogeneity typical of undergraduate cohorts at public sector institutions in Sindh (Ahmed & Hussain, 2021). The selection of first-year undergraduates as the target population is pedagogically significant, as this cohort represents students at a critical transitional juncture who are adapting to university-level academic expectations while simultaneously forming their foundational learning habits and dispositions. Lim (2024) underscores that clearly defining the target population is essential for contextualizing research

findings and enabling meaningful interpretation and transferability of results to comparable educational settings.

The broader population from which participants were drawn encompasses all sections of first-year students registered in Functional English at the participating institution during the study period. Given the study's focus on a specific instructional context—namely, sections identified by the course instructor as exhibiting low academic engagement and limited content comprehension—the target population is both contextually specific and educationally representative of the challenges facing undergraduate Functional English instruction at public sector universities in Karachi. Siddiqui and Qureshi (2022) note that such populations are particularly relevant for pedagogical intervention research, as their academic profiles and institutional contexts align closely with the conditions under which the STAD model is most likely to produce observable and meaningful improvements in learning outcomes.

Sampling Technique

Participants were selected through purposive sampling, a non-probability sampling technique in which individuals or groups are deliberately chosen based on specific, predefined characteristics relevant to the research objectives. Crowe et al. (2015) emphasise that purposive sampling is a methodologically appropriate strategy for qualitative and action research designs, where the aim is to examine a particular phenomenon within a specific context rather than to achieve statistical representativeness. In the present study, purposive sampling was employed to identify two course sections of first-year undergraduates in Functional English where low academic engagement and limited content comprehension had been formally identified and documented by the course instructor prior to the commencement of the study.

The rationale for this sampling approach is directly tied to the study's objectives. As Lim (2024) articulates, purposive sampling ensures that participants possess the characteristics most likely to yield data relevant to the research questions, thereby maximizing the analytical richness and contextual depth of the investigation. The two selected sections were characterized by heterogeneity in academic preparation and background, a feature deliberately retained in the construction of cooperative learning groups to maximize the pedagogical benefits of peer interaction and reciprocal assistance. Siddiqui and Qureshi (2022) affirm that accounting for student diversity is critical when implementing participatory learning strategies in Pakistani higher education settings, where learners frequently arrive with widely divergent prior academic experiences and learning competencies.

Sample Size

The study involved 70 first-year undergraduate students (mean age 18–20 years) distributed across two sections of the mandatory Functional English course at a public sector university in Karachi. This sample size represents a deliberate expansion of the study's scope relative to comparable single-section interventions, enabling a more robust assessment of the STAD model's effectiveness across multiple classroom groups within the same institutional context. Lim (2024) affirms that providing explicit and transparent participant information, including age range, academic year, and educational backgrounds essential for contextualizing the research and enabling meaningful interpretation and comparison of findings across studies.

The 70 participating students were organized into 14 heterogeneous cooperative learning groups of five members each, constituted to reflect the academic diversity of the cohort. Group composition was deliberately balanced to distribute students with stronger and weaker prior academic performance across all teams, in accordance with the STAD model's foundational principle of heterogeneous grouping for mutual academic benefit. Khan and Iqbal (2020) note

that such deliberate heterogeneity is particularly valuable in the Karachi university context, where students' diverse socioeconomic and academic backgrounds can be harnessed as a pedagogical resource within well-structured cooperative frameworks. The sample's diversity spanning varied academic preparation, socioeconomic circumstances, and prior exposure to collaborative learning is treated as a strength of the study, as it enhances the contextual relevance and generalizability of findings to comparable undergraduate settings across public sector universities in Sindh and beyond.

Data Collection Tools

Data were gathered through a structured and multi-instrument approach designed to capture the breadth and depth of student learning experiences across all three instructional cycles. The primary data collection instruments employed in this study were as follows:

Structured observation sheets constituted the central data collection instrument. These sheets were developed to systematically assess three primary dimensions of learning during each instructional session: student group cooperation, active participation in collaborative discussions, and content comprehension as evaluated by the instructor. The observation instrument drew on criteria recommended by Onwuegbuzie et al. (2009) for holistic assessment of student engagement and interactive learning, and was piloted and refined prior to the commencement of Cycle I to ensure its suitability for the specific instructional context.

Detailed field notes were maintained by the researcher-instructor throughout each session, documenting qualitative observations regarding student behavior, group dynamics, instances of peer assistance, and the quality of content-related discussions. As Jamshed (2014) advises, field notes capture the contextual nuances and emergent dynamics of classroom interaction that structured observation sheets alone may not fully record.

Formative assessment instruments comprising short written quizzes administered at the conclusion of each instructional cycle provided quantifiable evidence of students' comprehension of the instructional content. Quiz items were aligned with the specific Functional English content covered in each cycle and were designed to assess understanding at both recall and application levels. Individual quiz scores were aggregated to generate class-level performance indicators for comparative analysis across cycles.

Reflective journals maintained by the instructor after each session served as an additional qualitative data source, documenting insights regarding instructional effectiveness, student motivation patterns, group dynamics challenges, and areas requiring adjustment in subsequent cycles. Scales (2013) affirms the value of reflective practitioner documentation in action research as a mechanism for generating evidence-based insights that drive iterative instructional improvement.

Data Analysis Tool

Data analysis was conducted using a combination of qualitative content analysis and descriptive quantitative methods, reflecting the mixed-evidence nature of the action research design. The primary analytical tool was qualitative content analysis of observation sheets, field notes, and instructor reflective journals, in which recurring themes related to student participation, group cooperation, comprehension levels, and implementation challenges were systematically identified, coded, and interpreted across all three instructional cycles. This approach aligns with the analytical framework recommended by Onwuegbuzie et al. (2009) for qualitative educational research, enabling the researcher to track progressive shifts in learning quality and identify patterns of challenge and improvement with precision and contextual depth.

Descriptive statistical analysis was applied to quantitative data generated from formative assessment scores and structured observation ratings. Quiz scores and participation percentages were compiled and compared across cycles to generate a clear empirical picture of the intervention's impact on academic comprehension and student engagement over time. Gupta et al. (2020) affirm that the integration of descriptive quantitative indicators within a predominantly qualitative action research framework strengthens the evidential basis of findings without compromising the depth of contextual interpretation that qualitative methods afford. Comparative tables were constructed to display pre- and post-cycle performance indicators across all three cycles, facilitating both intra-cycle and inter-cycle analysis of improvement trends. The convergence of qualitative and quantitative evidence across multiple data sources enhances the credibility, reliability, and contextual validity of the study's conclusions.

Findings of the Study

Findings of Cycle I

In Cycle I, instructional activities were centred on the constitutional and legal dimensions of Pakistan's national history, delivered through the STAD cooperative learning framework. The instructional sequence began with a whole-class presentation of core content by the instructor, followed by the formation of 14 heterogeneous groups. Each group was assigned a differentiated set of study materials for collaborative analysis and group-based presentation. Constructive feedback and content clarification were provided by the instructor following each group's presentation. Initial student responses were mixed: a segment of the cohort demonstrated enthusiastic engagement with the collaborative format, while others appeared reluctant or unfamiliar with cooperative learning conventions. Student involvement gradually increased over the course of the cycle, though a number of groups had not yet achieved a thorough mastery of the instructional material. The weekly quiz administered at the conclusion of Cycle I yielded an average score of 61%, indicating that students' comprehension of the content required further development through more targeted and refined instructional interventions.

Table 1. Comparison of Learning Outcomes before and After Cycle I

Evaluated Aspect	Before Cycle I	After Cycle I	Improvement
Quiz Score Percentage	52%	61%	**+9%**
Active Participation in Group Discussions	28% of students active	52% of students active	**+24% active students**
Material Comprehension (Instructor Evaluation)	5 out of 14 groups (36%)	8 out of 14 groups (57%)	**+3 groups (+21%)**

As shown in Table 1, measurable improvements were recorded across all three evaluated dimensions following the implementation of Cycle I. Quiz scores increased from 52% to 61%, reflecting a 9-percentage-point gain in students' initial grasp of the instructional content. Active participation in group discussions rose substantially from 28% to 52%, representing a 24-percentage-point improvement that indicates a meaningful shift in students' willingness to engage collaboratively with their peers. The number of groups demonstrating satisfactory content comprehension increased from 5 to 8 out of 14 groups. While these gains are encouraging and confirm a constructive early trajectory, they remain unevenly distributed across the cohort and highlight the need for continued instructional refinement. The strategy for Cycle II was therefore

designed to prioritise broader and more equitable student engagement and to consolidate content understanding across all groups.

Findings of Cycle II

In Cycle II, the thematic content was revisited with deliberately targeted refinements to the instructional sequence, informed by the reflective analysis of Cycle I outcomes and observational data. The STAD approach was implemented with greater procedural consistency and precision, yielding a noticeably more structured and academically focused classroom environment. Students began to demonstrate a more cooperative orientation toward supporting one another's content understanding, and inter-group interactions became increasingly substantive and animated. The instructor adopted a more proactive supervisory role in monitoring group progress and ensuring that all 14 groups remained aligned with the established learning objectives. These cumulative adjustments produced perceptible improvements in student engagement and academic performance. However, a number of groups continued to encounter difficulties in completing assigned tasks within the allotted instructional time, and a subset of students had not yet achieved full comprehension of the material, necessitating more targeted mentoring and individualized support strategies.

Table 2. Comparison of Learning Outcomes before and After Cycle II

Evaluated Aspect	Before Cycle II	After Cycle II	Increase
Formative Assessment Score Percentage	61%	74%	**+13% (21.3%)**
Active Participation in Group Discussions	52% of students active	69% of students active	**+17% active students**
Material Comprehension (Instructor Evaluation)	8 out of 14 groups (57%)	11 out of 14 groups (79%)	**+3 groups (+22%)**

Table 2 documents substantial improvements across all three outcome dimensions following the implementation of Cycle II. Formative assessment scores increased from 61% to 74%, representing a 13-percentage-point gain and a relative improvement of 21.3%, reflecting meaningful progress in students' mastery of the instructional content. Active participation in collaborative group discussions rose from 52% to 69%, a 17-percentage-point improvement that indicates considerably greater student investment in the cooperative learning process. The number of groups demonstrating satisfactory content comprehension increased from 8 to 11 out of 14 groups, representing an improvement of 22 percentage points. These results confirm that the strategic refinements introduced in Cycle II were effective in advancing the quality and reach of the teaching and learning process. Nevertheless, continued attention was directed toward the three groups yet to achieve satisfactory comprehension, underscoring the need for more targeted individualised support and differentiated instructional approaches in Cycle III.

Findings of Cycle III

In Cycle III, all recommendations derived from the reflective analyses of Cycles I and II were systematically enacted, with particular emphasis on enhancing motivational support mechanisms, strengthening content mastery through the reconstitution of more strategically balanced cooperative groups, and ensuring that peer interactions were purposeful, structured, and

comprehensively supported by instructor facilitation. The outcomes of Cycle III revealed a marked elevation in students' intrinsic interest in self-directed study, alongside greater seriousness and focus during group-based collaborative activities. Peer interactions improved substantially in both quality and frequency, supported by the instructor's increasingly engaged and differentiated facilitation across all 14 groups. Average quiz scores increased significantly relative to Cycle II, providing concrete and measurable evidence that students' comprehension of Functional English content had advanced meaningfully across the full duration of the intervention.

Table 3. Cycle III Results – Implementation of the STAD Cooperative Learning Model

No.	Aspect	Description of Progress
1.	Strategy Refinement	Recommendations from Cycles I and II were fully enacted: motivational interventions were intensified, group formations were reconstituted for enhanced balance, and structured peer interactions were further reinforced.
2.	Student Motivation	Students demonstrated measurably heightened interest in self-directed learning, attributed to targeted motivational support and improved inter-group cohesion.
3.	Group Dynamics	Reconstituted groups engaged in more purposeful collaborative discussions and achieved stronger collective comprehension of instructional content across all 14 groups.
4.	Peer Interaction	Markedly more substantive and energised peer interactions were observed across sessions, significantly facilitating mutual knowledge construction and content clarification among students.
5.	Instructor's Role	Instructors assumed a more proactive, differentiated, and facilitative role in guiding and supporting all group activities across both participating sections.
6.	Learning Outcomes	Average quiz scores rose to 85%, reflecting a substantial and sustained improvement in students' understanding of Functional English content relative to the pre-intervention baseline of 52%.
7.	Overall Learning Quality	The overall quality of the learning experience improved considerably across both sections, confirming the cumulative effectiveness of the iteratively refined STAD strategy.
8.	Recommendations for Future Cycles	Further systematic optimisation of the STAD model is warranted to guarantee full student participation and comprehensive content mastery across all groups and individual learners.

By the conclusion of Cycle III, all 14 groups achieved satisfactory to strong comprehension of the instructional content, and active participation rates reached 84% of the 70-student cohort—a substantial increase from the pre-intervention baseline of 28%. Average quiz scores rose to 85%,

representing a cumulative 33-percentage-point improvement from the initial 52% recorded at the commencement of Cycle I. These outcomes collectively confirm that the iteratively refined STAD strategy produced significant, sustained, and broadly distributed improvements in academic comprehension and student engagement throughout the full course of the intervention.

Discussion

Strengthening Active Student Participation Through STAD Cooperative Learning

The findings of this study provide robust empirical confirmation that the STAD cooperative learning model constitutes an effective strategy for stimulating and sustaining active student participation within Functional English classes at a public sector university in Karachi. Evidence presented in Table 2 demonstrates that student involvement in collaborative group discussions increased from 52% to 69% following the implementation of Cycle II, and reached 84% by the conclusion of Cycle III. Thomas and Martina (2022) affirm that the STAD model consistently fosters active student engagement during the instructional process by positioning learners as proactive contributors to discussion, opinion exchange, and collaborative knowledge construction rather than passive recipients of teacher-delivered content. Ningsih (2023) corroborates this perspective, noting that through STAD, students progressively evolve into more engaged participants who take ownership of their own and their peers' learning trajectories.

Darling-Hammond et al. (2019) similarly affirm that cooperative learning heightens student engagement precisely because it situates learners within heterogeneous, goal-oriented teams where collective success depends upon the active contribution of every member. Farooq and Shahzadi (2018), writing specifically within the Pakistani institutional context, corroborate these findings by establishing that students in cooperative learning environments demonstrated significantly greater academic engagement than those in conventional didactic settings. Khan and Iqbal (2020), examining engagement patterns at Karachi universities, similarly found that structured peer collaboration was among the most effective mechanisms for counteracting the passive learning tendencies endemic to large undergraduate classrooms. Hussain and Naseem (2020) further confirm that cooperative learning arrangements at Pakistani universities produced stronger peer accountability and higher formative performance, reinforcing the relevance of STAD-based strategies for the present context.

Motwani et al. (2022) assert that the cooperative learning model generates positive interdependence among group members, wherein each student develops a sense of accountability not only for their individual academic progress but also for the collective success of the group. This shared responsibility motivates students to seek clarification, contribute perspectives, and actively support their peers' content understanding. The increase in active participation documented across the three cycles of this study is therefore not merely a product of novelty or initial enthusiasm but reflects the structural incentives built into the STAD model that sustainably cultivate collaborative academic engagement among diverse undergraduate learners.

The Impact of the STAD Model on Enhancing Students' Content Understanding

The STAD cooperative learning model demonstrably enhanced students' comprehension of Functional English content across all three instructional cycles, as evidenced by the progressive and consistent improvement in formative assessment scores from an initial baseline of 52% to a final average of 85% by the conclusion of Cycle III. Akhmad (2020) explains that STAD contributes to improved academic outcomes by creating a structured environment in which peer interaction reinforces and deepens the understanding generated through initial whole-class instruction. Aningsih et al. (2023) similarly affirm that STAD's heterogeneous group design

enables more dynamic and inclusive peer discussions, allowing students with stronger prior knowledge to scaffold the understanding of peers encountering difficulties with the material.

The 17-percentage-point increase in active group discussion participation documented in Cycle II is directly linked to the improvement in content comprehension. Silva et al. (2021) establish that social interaction within cooperative learning environments sharpens cognitive capabilities and deepens conceptual understanding, as students engaged in explaining content to peers are compelled to organise, consolidate, and articulate their own knowledge more precisely. De Felice et al. (2023) similarly affirm that collaborative knowledge-building processes not only broaden individual understanding but expose students to diverse interpretive perspectives that enrich their grasp of complex material. Aida (2023) highlights that group-based interactions allow students to share information, clarify misconceptions, and collectively construct a more nuanced understanding than any individual learner could achieve independently. Ahmed et al. (2023) corroborate these dynamics in the Karachi university context, documenting that STAD-based instruction produced significantly higher content retention rates than lecture-only approaches among comparable undergraduate cohorts.

The achievement of 100% group comprehension across all 14 groups by the conclusion of Cycle III—rising from 36% at the commencement of Cycle I—constitutes the most compelling evidence of the STAD model's effectiveness in the present study. Jumahida et al. (2024) identify complete group comprehension as a defining indicator of STAD's capacity to create equitable and inclusive learning environments in which all students, regardless of their initial academic preparation, can attain satisfactory mastery of the instructional content. This outcome is fully consistent with the constructivist framework articulated by Ardiansyah and Ujihanti (2017), who foreground the indispensability of social interaction and collaborative knowledge construction in enabling deeper and more durable learning. Malik and Azam (2019) further document that students in Pakistani universities taught through cooperative strategies not only achieved higher scores but retained content more effectively over time, providing additional justification for the sustained adoption of STAD-based pedagogy in public sector higher education.

Challenges and Strategies in Implementing the STAD Cooperative Learning Model

Despite the significant positive gains documented across the three instructional cycles, the implementation of the STAD cooperative learning model was accompanied by a range of persistent and context-specific challenges. Sharan (2010) identifies time management difficulties, academic ability disparities among group members, and challenges in sustaining productive group dynamics as recurring structural impediments to cooperative learning across diverse educational contexts. Fittipaldi (2020) similarly notes that unequal participation and group management difficulties can attenuate the overall effectiveness of cooperative interventions if not proactively and consistently addressed. In the present study, these challenges were compounded by contextual factors specific to public sector universities in Karachi, including large class sizes, limited physical classroom space for simultaneous small-group activity, and students' diverse and sometimes competing external obligations (Siddiqui & Qureshi, 2022).

A particularly significant challenge encountered across all three cycles was the maintenance of consistent motivation and sustained commitment from both students and the instructor over the duration of the intervention. Dinca et al. (2023) emphasise that motivational consistency is fundamental to ensuring the fidelity and effectiveness of STAD implementation. Khan and Iqbal (2020) note that in Karachi's public sector university context, students' motivation is frequently attenuated by external pressures including financial constraints, extended commuting demands, and competing domestic obligations, all of which can disrupt the collaborative spirit and sustained engagement that STAD requires. Hussain and Naseem (2020) additionally document that

instructor motivation and pedagogical confidence are critical determinants of cooperative learning quality in Pakistani higher education settings, where institutional support for innovative pedagogy remains inconsistent.

Addressing these challenges required a layered set of strategic responses across successive cycles. Torsdottir et al. (2024) emphasise the consistent cultivation of student motivation as a foundational strategy for sustaining cooperative engagement over time. Zamiri and Esmaeili (2024) advocate for systematic monitoring and evaluation as critical mechanisms for the early identification of implementation obstacles, enabling the researcher-instructor to intervene promptly and appropriately. Caroline et al. (2023) further argue that contextually responsive and data-driven interventions are essential to ensuring the smooth and equitable progression of cooperative learning activities. Malik and Azam (2019) additionally recommend incorporating culturally relevant and locally contextualised content to sustain student interest in collaborative activities, a strategy that proved particularly effective within the Functional English instructional context of the present investigation. The cumulative implementation of these strategic responses across three iterative cycles was instrumental in overcoming initial resistance and progressively realising the full potential of the STAD model within the participating undergraduate cohort.

Conclusion

The findings of this investigation affirm that the systematic implementation of the STAD cooperative learning model across three iterative action research cycles produced substantial and measurable improvements in academic comprehension, active student participation, and collaborative engagement among 70 first-year undergraduate students enrolled in Functional English at a public sector university in Karachi. Formative assessment scores increased from a pre-intervention baseline of 52% to a final average of 85% by the conclusion of Cycle III, while active participation rates rose from 28% to 84% and complete group comprehension was achieved across all 14 cooperative learning groups. These outcomes provide robust empirical confirmation of the STAD model's capacity to transform passive, lecture-dependent instructional environments into dynamic, student-centred learning communities characterised by meaningful peer interaction and deeper content mastery.

The study also affirms the theoretical relevance of social learning theory and constructivism to cooperative learning in the Pakistani higher education context, demonstrating that structured peer interaction within heterogeneous groups constitutes a powerful mechanism for knowledge construction and academic competency development. The findings corroborate the positions of Farooq and Shahzadi (2018), Malik and Azam (2019), and Hussain and Naseem (2020), who collectively establish that cooperative learning strategies produce meaningful academic gains within Pakistani institutional settings. At the same time, the study highlights the critical importance of sustained motivational support, active instructor facilitation, strategic group management, and continuous reflective evaluation in ensuring the equitable and effective implementation of the STAD model across diverse undergraduate populations.

The scope of this study is necessarily bounded by its focus on two course sections within a single public sector university in Karachi, which limits the direct generalisability of findings to other institutional contexts. Future research is encouraged to encompass larger and more socioeconomically diverse samples across multiple public sector universities in Sindh and other provinces, and to integrate richer longitudinal designs to examine the durability of STAD-generated comprehension gains over time. Subsequent investigations might also explore the differential effects of varying group compositions, the influence of specific motivational strategies, and the role of institutional support structures in determining the scalability and sustainability of cooperative learning adoption within Pakistan's public sector higher education

system. Siddiqui and Qureshi (2022) underscore that sustained institutional commitment—including professional development for instructors and the provision of adequate pedagogical resources—is indispensable for ensuring that cooperative learning models achieve their full transformative potential in Pakistani higher education contexts.

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