

# THE IMPLEMENTATION OF COLLABORATIVE LEARNING IN TEACHING THEORETICAL SCIENCES: A CASE STUDY ON THE SUBJECT OF COMPARATIVE TYPOLOGY

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## Abstract

This article explores the effectiveness of collaborative learning over traditional teaching methods in enhancing student engagement and comprehension, particularly in theoretical subjects like Comparative Typology. Through an experimental design, typology seminars were conducted using both traditional and collaborative learning approaches, allowing for a comparative analysis of student outcomes, participation levels, and understanding of course material. Data from the experiment indicate that collaborative learning not only improves academic performance but also fosters a deeper grasp of complex concepts, encouraging critical thinking and peer interaction. These findings suggest that collaborative learning can be a valuable alternative to traditional methodologies in teaching theoretical sciences.

**Keywords:** Collaborative Learning, Comparative Typology, Language Education, Pedagogical Approaches, Student Engagement, Active Learning, Performance Evaluation, Educational Psychology, Peer Interaction, Curriculum Design, Critical Thinking, Social Constructivism, Linguistic Analysis, Teaching Methodologies, Higher-Order Thinking Skills.

## Introduction

Comparative typology is a branch of linguistics that analyzes languages to identify similarities and differences in their structures and functions (Haspelmath, 2010). As language learners increasingly require the ability to navigate and compare diverse linguistic systems, innovative pedagogical approaches such as collaborative learning have gained prominence in educational contexts (Johnson & Johnson, 2009). Collaborative learning emphasizes social interaction and teamwork, which can significantly enhance students' learning experiences (Mendo-Lázaro et al., 2022).

The need for this investigation arises from the growing recognition that traditional methods of teaching linguistic concepts may not effectively engage students or facilitate deep understanding. In an era where linguistic diversity is expanding due to globalization, educators must find effective strategies to equip students with the skills necessary for analyzing and appreciating different language structures. By implementing collaborative learning strategies in a seminar on comparative typology, this study aims to address this gap, providing insights into how group-based learning can enhance both comprehension and interpersonal skills.



This study aims to examine the effectiveness of collaborative learning in a seminar on comparative typology, focusing on students' engagement and understanding of key linguistic concepts. Through structured group activities, students analyzed differences in sentence structures, grammar, and cultural nuances between languages, promoting active learning and critical thinking.

### Methodology

This study employs a quasi-experimental design, comparing the effectiveness of collaborative learning with traditional teaching methods in a seminar focused on comparative typology. A control group (traditional seminar) and an experimental group (collaborative learning seminar) were established to assess differences in student engagement, understanding of key concepts, and overall academic performance.

Participants included 60 undergraduate students enrolled in a linguistics program at UzSWLU. They were divided into two groups: a control group consisting of 30 students taught through traditional methods and an experimental group of 30 students engaged in collaborative learning activities.

The materials used for this study included:

1. Seminar Plans: Detailed outlines for both the traditional and collaborative learning seminars, covering topics related to comparative typology, including definitions, key concepts, and examples.
2. Questionnaires: Pre- and post-seminar questionnaires designed to assess participants' prior knowledge and attitudes toward learning linguistics. These questionnaires included Likert-scale items, open-ended questions, and multiple-choice questions.
3. Activity Worksheets: Task sheets for collaborative learning activities, including real-life language comparison, group readings, matching activities, group discussions, and research presentations on linguistic typology.
4. Assessment Rubrics: Criteria for evaluating group presentations, individual contributions, and overall participation, based on clarity, relevance, and engagement.

The study consisted of the following steps:

1. Pre-Assessment: Both groups completed a pre-seminar questionnaire assessing their understanding of comparative typology and their attitudes toward collaborative learning.
2. Seminar Implementation:
  - Control Group: The traditional seminar involved lectures and individual tasks. Students completed a series of exercises, including true/false statements, gap-fill activities, and matching tasks, without opportunities for group interaction.
  - Experimental Group: The collaborative learning seminar incorporated structured group activities. Students worked in pairs and small groups to complete tasks, such as analyzing sentence structures and preparing presentations on various types of linguistic typology. The instructor facilitated discussions and provided guidance to ensure active participation.
3. Post-Assessment: After the seminars, both groups completed a post-seminar questionnaire to evaluate changes in their understanding and attitudes. Additionally, their performance on the tasks and presentations was assessed using the established rubrics.



Data collected from the questionnaires were analyzed using quantitative methods. Descriptive statistics, including means and standard deviations, were calculated for both pre- and post-assessment scores. A paired t-test was conducted to compare the mean scores of the control and experimental groups before and after the seminars. Qualitative data from open-ended questions were analyzed thematically, identifying key trends in student feedback regarding their experiences with collaborative learning versus traditional methods.

## Results

Data were collected from both the control group (traditional seminar) and the experimental group (collaborative learning seminar) through pre- and post-seminar questionnaires, as well as performance assessments on collaborative tasks. The results are organized into three main areas: quantitative findings from the questionnaires, qualitative insights from open-ended responses, and performance evaluations.

The pre-assessment questionnaires revealed no significant differences in participants' understanding of comparative typology between the two groups. The mean score for the control group was 45% (SD = 12.5), while the experimental group had a mean score of 44% (SD = 11.8), indicating a similar baseline knowledge of the subject.

After the seminars, the post-assessment questionnaires showed significant improvements in understanding and attitudes towards the subject for both groups. However, the experimental group demonstrated a markedly higher increase in their scores compared to the control group.

- Control Group: The mean score increased to 55% (SD = 10.2), indicating a gain of 10 percentage points.
- Experimental Group: The mean score increased to 78% (SD = 9.5), indicating a gain of 34 percentage points.

A paired t-test was conducted to compare the pre- and post-assessment scores within each group. The results indicated a statistically significant increase in scores for both groups ( $p < 0.01$ ). However, the difference in post-assessment scores between the groups was also significant ( $t(58) = 5.45$ ,  $p < 0.001$ ), with the experimental group outperforming the control group.

Responses to Likert-scale items regarding attitudes toward collaborative learning showed that the majority of students in the experimental group (80%) reported feeling more engaged and motivated during the seminar compared to only 45% in the control group. The mean score for the experimental group was 4.5 (SD = 0.8) on a scale from 1 to 5, while the control group scored a mean of 3.2 (SD = 1.0).

Qualitative analysis of open-ended responses from the post-assessment questionnaire revealed several themes regarding students' experiences:

1. Increased Engagement: Many students in the experimental group emphasized that collaborative learning made the material more interesting and relatable. Comments included, "Working with my classmates helped me understand the concepts better" and "I enjoyed discussing different languages and their structures with others."

2. Peer Support: Students noted the benefits of peer interactions, with one student stating, "I felt more comfortable asking questions when working in a group than in a lecture." This highlights the role of collaboration in fostering a supportive learning environment.

3. Understanding of Concepts: Participants expressed that the hands-on nature of the collaborative tasks deepened their understanding of comparative typology. For example, a student remarked, "Analyzing real-life examples made it easier to grasp the differences between languages."

Performance on collaborative tasks was assessed based on clarity, relevance, and engagement, using a rubric with a maximum score of 20 points. The average scores for the two groups were as follows:

- Control Group: Mean score of 12.5 (SD = 3.2)
- Experimental Group: Mean score of 18.0 (SD = 1.5)

Statistical analysis showed a significant difference in performance ( $t(58) = 7.68, p < 0.001$ ), indicating that students in the collaborative learning seminar were more effective in articulating their understanding of comparative typology.

Overall, the findings suggest that the implementation of collaborative learning strategies in the seminar on comparative typology significantly enhanced students' understanding, engagement, and performance compared to traditional teaching methods. These results support the hypothesis that collaborative learning fosters a deeper comprehension of linguistic concepts through active participation and peer interaction.

## Discussion

The findings of this study demonstrate that collaborative learning significantly enhances students' understanding and performance in the subject of comparative typology. The experimental group, which engaged in collaborative tasks, consistently outperformed the control group, confirming the hypothesis that collaborative learning fosters a deeper comprehension of complex linguistic concepts.

The results indicate that students in the experimental group exhibited higher engagement levels during the learning process. This aligns with existing literature suggesting that collaborative learning encourages active participation and critical thinking (Johnson & Johnson, 2009). As students worked together to identify and articulate the differences between languages, they not only shared knowledge but also developed essential skills such as problem-solving and communication. The presence of diverse perspectives during discussions likely contributed to a richer understanding of comparative typology, as supported by Vygotsky's (1978) social constructivist theory, which posits that social interaction plays a crucial role in cognitive development.

Peer interaction appeared to be a critical factor in the experimental group's success. Students engaged in dialogue, asked clarifying questions, and provided feedback to one another, which facilitated a deeper understanding of the material. This collaborative dynamic is supported by research indicating that students often learn more effectively when they can articulate their thoughts and reasoning to their peers (Webb, 2009). The group presentations also highlighted



the importance of collaboration, as students were able to combine their insights and create a more comprehensive understanding of the subject matter.

Conversely, the control group's reliance on traditional, instructor-led learning resulted in less engagement and a more passive learning experience. While students were able to complete the assigned tasks, their presentations lacked depth and interactivity. This observation reinforces critiques of traditional education methods, which often limit opportunities for student collaboration and may hinder the development of higher-order thinking skills (Freeman et al., 2014). The findings suggest that while traditional instruction can convey information, it may not adequately prepare students to critically analyze and apply knowledge in real-world contexts.

The positive outcomes associated with collaborative learning in this study have significant implications for curriculum design in language education. Educators should consider integrating more collaborative tasks into their syllabi to enhance student engagement and learning outcomes. The findings suggest that collaborative activities not only improve understanding of comparative typology but also equip students with vital skills that are applicable beyond the classroom, including teamwork, communication, and analytical thinking.

While the results of this study are promising, certain limitations must be acknowledged. The sample size was relatively small, and the study was conducted in a single academic setting, which may limit the generalizability of the findings. Future research should consider larger, more diverse populations to confirm the effectiveness of collaborative learning in various educational contexts. Additionally, longitudinal studies could provide insights into the long-term benefits of collaborative learning on student outcomes.

### Conclusion

In conclusion, this study supports the notion that collaborative learning is a powerful pedagogical approach that enhances understanding and engagement in comparative typology. The significant differences in performance between the collaborative and traditional learning groups underscore the need for educational practices that prioritize collaboration and active participation. As language education continues to evolve, it is essential for educators to embrace methodologies that foster a more interactive and inclusive learning environment.

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