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EFFECTS OF JIGSAW II AND STAD COOPERATIVE LEARNING TECHNIQUES IN STUDENTS' RETENTION IN ELEMENTARY HISTORY EDUCATION: A TRUE EXPERIMENTAL STUDY IN PAKISTAN

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Abstract
This study focused on the effect of Jigsaw II and Student Teams Achievement Divisions (STAD) cooperative learning strategies on retention of Elementary History amongst Grade - VII students of Pakistan. Using true experimental pre-test to post-test equivalent groups replication technique with the delayed retention testing, ninety participants were randomly assigned class by class to one group each for Jigsaw II, STAD or conventional lecture-based instruction. A researcher generated 40-item retention test that was assessed for face validity by experts online and assessment for reliability was administered four weeks after the intervention. Results showed that there were statistically significant differences between groups with both cooperative learning strategies having higher means than traditional instruction on the delayed retention scores, Jigsaw II had the highest means, followed by STAD and the control group had the lowest results. Effect size analyses showed large and pedagogically meaningful effects of both cooperative models in comparison to conventional pedagogy with a moderate superiority of Jigsaw-2 over STAD. These results support the social constructivist assumptions about the efficacy of peer interaction, elaboration, and retrieval practice to improve long-term retention. Consequently, the empirical nature of the study has added further empirical data to an inadequately taught area of study within Pakistan and the necessity of implementing proper structured cooperative learning frameworks with the elementary History curriculum.

Keywords: Cooperative Learning, Jigsaw II, STAD, Retention, History Education, True Experimental Design, Pakistan.

1. Introduction

The teaching and learning of History at the elementary level in Pakistan has been dominated in the past by conventional pedagogies which favour factual memory in lieu of deep understanding. Although national policy reforms of the curriculum and repeated policy directives have promoted increased higher order thinking, collaborative engagement and student centred learning, teaching in many schools in the public sector continues to be heavily based on rote memorisation and teacher dominated learning. This pedagogical inertia can be seen through the existence of repeated national assessments reflecting low retention, poor conceptual transfer and low long-term learning gains among students in social studies at the elementary school levels. Consequently, the onus is on History educators to empirically design evidence-based instructional interventions for improving cognitive consolidation, activity levels, and retention in history education.

Within this academic discourse, cooperative learning has taken an international leap as a well-validated pedagogical strategy which enhances cognitive processing through well-structured

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peer interaction, positive interdependence and individual accountability (Johnson & Johnson, 2000; Shah, Shah & Ayaz, 2021). The theoretical foundations of cooperative learning are deeply based on the tenets of social constructivists, especially those developed by Lev Vygotsky, which is that learning is inherently mediated through social interaction within the meaning of zone of proximal development (Saunders, 2020). Through dialogue, negotiating and co-constructing meaning, learners reorganise prior knowledge, co-construct meaning, and internalise concepts better than is possible in isolated, teacher-centred situations. These mechanisms therefore provide strong theoretical grounds for examining the use of cooperative learning as a means of promoting retention particularly in subjects such as History where concepts, chronologies and context of interpretation require greater cognitive involvement.

Among the range of cooperative learning models available, Jigsaw II and Student Teams Achievement Divisions, or STAD, are two of the most widely researched of these techniques which provide unique and complementary mechanisms for promoting extending learning. Jigsaw II structures the classroom as an interdependent knowledge network in which students take the role of experts on certain subtopics and then teach their colleagues (Mattingly, 1991; Johnson & Johnson, 2000). This process requires the deeper processing of information, elaboration and retrieval that are highly correlated with increased retention.

Contrastingly, STAD combines the structures of team collaboration, individual assessment and group reward that promote accountability and motivational involvement (Johnson & Johnson, 2000; Shah et al., 2021). The theoretical synergy of elaborative encoding of Jigsaw II and sustained effort combined with accountability of the STAD provides a strong basis for expecting positive effects on retention as an outcome of the contrast to conventional lecture-based instruction. Despite the large body of evidence available in the rest of the world, empirical studies on how Jigsaw II and STAD impacted the ability of students in Pakistani elementary history classrooms to stay in school was limited. Existing local learning patterns around cooperative learning has tended to concentrate upon academic attainment in science, maths and languages while little attention has been given to long term retention or to History as a field of learning.

Such a research gap is consequential, seeing as History learning not only involves the acquisition of factual knowledge but also the ability to retain, retrieve and interlink historical information from temporal and thematic units. In contexts characterised by overcrowded classrooms, teacher-centred practice and limited opportunities for professional development in relation to teachers, cooperative learning may provide a pragmatically viable and theoretically sound approach to improve retention outcomes.

The present study aims to fill this gap through the application of a strict true-experimental pre-test-post-test research method supported by a retention study that opens the door of comparison between the impact of Jigsaw II and STAD cooperative learning techniques vis-a-vis regular learning of the History syllabus in elementary grades in Pakistan. By focusing on the issue of retention specifically and by indulging in high levels of experimental controls, this inquiry is part of both the theoretical literature on cooperative learning and the practical discourse about the improvement of History teaching in the Pakistani schools. The promised results are to provide evidence-based recommendations to teachers as well as curriculum developers and policymakers who are committed to bring pedagogical strategies that focuses on sustainable learning rather than momentary performance.

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2. Literature Review

2.1. Historical and Theoretical Backgrounds to Retention in School

Retention broadly defined as the sustained preservation and retrieval of learned information over time has remained a constant concern combined within educational psychology. Classical theories of memory The seminal explorations into what happens to memory with the onset of forgetting curves and the memory decay established the premise of retention depending upon depth of processing, spacing, elaboration and meaningful associative linkages. Contemporary cognitive research has supported the view that retention is not simply a matter of initial acquisition but one of repeated cognitive processing, active reconstruction, and communication among human beings, all of which are hardly promoted in the lecture-based, teacher-centred instruction mode. In contrast, instructional schemes in which learners are required to articulate, apply, reorganize, and teach content to others are related to significantly greater retention, especially in disciplines that require conceptual integration, such as history (Johnson & Johnson, 2000).

2.2. Social Constructivism and Co-Operation Learning

Social constructivist theory, mainly advanced by Vygotsky, states that learning is mediated socially and that higher cognitive functions are internalized because of interaction with their peers and more capable others (Saunders, 2020; Wibowo, 2025). On this view, knowledge is built based on collaborative dialogue, scaffolding and negotiation in a social and cultural-historical context. Cooperative Learning therefore occurs not only as a teaching process but as a social-cognitive process where the learners jointly construct understanding, internalize concepts and reconstruct knowledge (Johnson & Johnson, 2000; Shah et al., 2021). This theoretical lens serves to legitimate the use of cooperative learning as the means for enhanced depth of understanding and long-term retention as opposed to the surface learning that memorisation is synonymous with as a characterization for traditional instruction.

2.3. Use of Cooperative Learning in History Education

History education implicitly entails integration of chronological knowledge, thematic knowledge and causal knowledge - the demands that these different types of knowledge be appropriately memorized and understood can be expressed in terms of recognizing that learners need not be asked to simply memorize dates and events, but also to understand relationships and to interpret perspectives as well as to apply knowledge across time and context. Cooperative Learning is a good match with these demands as it promotes dialogic engagement, a non-reactive stance and the co-construction of interpretations (Johnson & Johnson, 2000). In international contexts, studies have found that using a collaborative structure helps improve the historical thinking, the coherence of a narrative, and the ability to link past events to broader social processes of students (Mattingly, 1991). In contexts such as Pakistan, in which teaching history is often still dominated by rote learning with scant scholarly stimulation in the classroom, cooperative learning provides a theoretically grounded intervention that can have a positive impact on both immediate acquisition and long-term retention of historical content.

2.4. Jigsaw II Technique: Mechanisms of Working - Empirical Evidence

Jigsaw II (a structured cooperative learning design) that separates instructional content into subunits and assigns students as "experts" on a specific segment of content and must teach their peers in mixed groups (Mattingly, 1991; Johnson & Johnson, 2000). This structure creates several cognitive pathways that render retention:

1. Expert learning strengthens deeper mastery as students expect to have the opportunity to teach others.

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2. Exams offer stronger retrieval and elaboration than simply giving an answer. A good reason for that is the experience of peer teaching.
3. Problems with interdependent tasks increase accountability, motivation and repeated exposure.

Empirical results have shown that Jigsaw II improves long-term retention better than traditional teacher-centred methods (Van Dat Tran, 2014). Specifically, studies that compare cooperative learning methods to lecture-based teaching methods revealed a significantly greater retention of the material included in the lectures by students in Jigsaw groups at a post-test given at a delay, meaning elaborative peer teaching and retrieval practice can more robustly consolidate memory traces than is the case with passive reception of the information.

2.5. STAD Technique: How it Works and the Research Support

Student Teams Achievement Divisions (STAD) uses a system of student teamwork to learn content as they are individually tested, with the reward for the whole team based on the group's overall improvement (Johnson & Johnson, 2000; Shah et al., 2021). There are several ways in which this design promotes retention:

1. Group spiral study of materials over an extended period.
2. Retrieval when dealing with repeated team interactions
3. Motivation of individual accountability- Individual assessments.
4. Peer-assisted learning that helps to clarify misconceptions and reinforce conceptual understanding.

Empirical research shows that STAD is more than just a way to enhance academic performance right after learning; it can aid knowledge retention over time as well (Johnson & Johnson, 2000; Van Tran, 2014). These results confirm the use of STAD as a feasible cooperative technique for improving long-term learning outcomes, particularly of courses that require cumulative knowledge and conceptual understanding.

2.6. Comparison of Effects of Cooperative Learning and Traditional Instruction on Retention

Traditional lecture-based teaching, which is very common in schools in Pakistan, is likely to support surface-level encoding through its limited opportunities for active rehearsal, peer interaction and elaboration or repeated retrieval. Cooperative Learning techniques like Jigsaw II and STAD have been designed to explicitly promote depth processing and collaborative elaboration and to help sustain levels of motivation across the instruction. Meta analytic evidence provides support for the general efficacy of cooperative learning methods: in a meta-analysis of 164 studies that included 8 types of cooperative learning methods - all cooperative learning methods produced significant positive effects on academic achievement compared to competitive or individualistic learning, with STAD being one of the more effective techniques (Johnson & Johnson, 2000; Huddy, 2012). While achievement is not the same thing as retention, these results tend to support very strongly the inferential conclusions that the structural benefits of cooperative learning may be general to retention outcomes as well.

2.7. Research Gap and Justification for the Present Study

Despite outstanding international evidence, research under the Pakistani situation is limited, methodologically disaggregated, and often focused on immediate accomplishment rather than delayed retention. Studies assessing cooperative learning on science, mathematics or language subjects predominate; few are conducted on history and even fewer use true experimental designs with pre-based tests, post-based tests and delayed tests (retention). This scarcity is particularly problematic in the context of the preponderance of rote pedagogies and both the

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importance and the necessary reality of sustainable learning for history education in which long term retention and conceptual integration is a key feature. The present study aims to fill these gaps through implementing a true experimental pre-test post-test research design with a delayed retention test with Jigsaw II and STAD as the respective research groups with traditional instruction with the control group in a Pakistani elementary history classroom. The expected result is a dual benefit to cooperative learning theory and to practice, enhancing the teaching of history in Pakistan.

3. Methodology

3.1. Research Design

A rigorously controlled, true experimental pretest-post-test design with equivalent groups and the inclusion of a delay retention test were added to the current inquiry. This framework of methodology is widely considered to be the stringent method of explaining causal dynamics in educational contexts (Gay, Mills, & Airasian, 2019). Random assignment of participants to experimental conditions was used to help minimize selection bias and therefore improve internal validity. The independent variable was instructional methodology which was operationalized using the three different conditions: (1) the Jigsaw II cooperative learning framework, (2) the STAD cooperative learning approach, and (3) the conventional lecture-based instructional paradigm. The dependent variable was the ability of students to remember information about History that was measured by an assessment designed by a researcher and administered after a set period of the instructional intervention. The use of a delayed retention test is consistent with cognitive psychological recommendations for the use of temporally spaced measurements to assess long term retention (Roediger and Butler, 2011).

3.2. Population and Sampling

The target population consisted of all the Grade VII pupils who were enrolled in the public elementary schools in the Islamabad Capital Territory as per the curriculum of the Federal Directorate of Education (FDE). From this population, a purposive selection of one school was made based on administrative feasibility and permission of the respective institutions. Within the chosen school, three intact classes (Grade 7) were used. Individual-level random assignment was impossible due to administrative constraints at the school level; randomisation was achieved at the class level, an acceptable strategy for true experimental classroom-based studies (Cohen, Manion, & Morrison, 2018). One class was randomly assigned to the condition of Jigsaw II, a second class was assigned to the STAD condition, and a third class was assigned to the control condition consisting of traditional lecturing. The resultant analytic sample involved 90 students (about 30 in each group), with all the students having attended the instruction of an identical subject teacher to control for teacher-related variance in the results.

3.3. Intervention Procedures

3.3.1. Jigsaw II Treatment

Students assigned to the Jigsaw II condition were taught using a structural cooperative learning model based on that developed by Slavin in the Jigsaw II design. Content taken from the Grade 7 History curriculum was broken down into thematic units and everyone in the class was assigned an "expert topic." Students first met in expert groups to achieve mastery of their assigned material through guided reading, teacher facilitation and peer discussion. After this phase participants brought their expertise home to pass along to their peers. The instructor made sure that each expert group generated understandable explanations and home groups got correct understanding. This cycle of instruction was repeated for every one of the subtopics to ensure comprehensive coverage.

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3.3.2. STAD Treatment

The STAD condition used an instructional strategy that was based on five predominant components: whole-class instruction, team study, individual assessment, scoring of improvement points and team recognition, which is also aligned with the Slavin model as referenced in Johnson and Johnson (2000). Following an exposition by the teacher about the contents of the History subject, students worked in heterogeneous teams to practice and clarify concepts. Periodic individual quizzes were given and improvement scores were determined in respect to individual student baseline performance. Teams that reached a predetermined level of improvement were recognized and served as a mechanism for motivation and individual accountability.

3.3.3. Control Group (Traditional Instruction)

Students in the control group received instruction using a traditional lecture-based approach to pedagogy and consisted of teacher explanation, reading from the text, and note taking. No cooperative learning structures, peer teaching mechanisms or team based activities were implemented. This instructional mode is the most common practice in the History classrooms of Pakistan and therefore, constitutes an ecologically valid comparator.

3.4. Research Instrument

A 40 item retention test History was created to data collection. In the absence of elaborated test blueprint found in the original materials for the thesis development, a provisional Table of Specifications (TOS) was developed to assure content validity. The TOS matched the test items to the main content areas of the Grade 7 History unit, and the three levels of cognitive processing in the revised Bloom's taxonomy: remembering, understanding, and applying. Item formats included questions (multiple choice) designed to measure information, information about concepts and about the ability of the test subject to relate historical knowledge to new situations. The instrument as final was subject to expert review by two university level experts in History education to ensure clarity, accuracy and relevance.

3.5. Validity and Reliability

Content validity was determined by review of experts and correlation with the TOS. Construct validity was supported by making sure that items were based on retention-specific cognitive processes, rather than on immediate recall. Reliability was tested on a pilot sample of 30 students from a similar school not in the main study. The Internal consistency of the retention test, which is Cronbach's alpha coefficient was 0.82 showing that the internal consistency is acceptable for research application (Taber, 2018). Minor changes to item wording and distractors were made which were based on pilot feedback.

3.6. Data Collection Procedures

Data collection was conducted following a standardized protocol in all the experimental groups. A pretest was given one week before the intervention to establish the baseline of equivalence. The instructional intervention took place in four weeks and the groups each received seven History lessons of equal time periods. Long-term retention was evaluated through a four-week retention test which was given four weeks after the intervention ended, as supported by the literature to evaluating knowledge durability in a classroom setting (Roediger & Butler, 2011). All assessments were administered and proctored by the researcher to keep them uniform.

3.7. Data Analysis

Analytic procedures followed the guidelines of APA 7 and included both descriptive and inferential statistics. Mean scores, standard deviations and indices of improvement were

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calculated for each group. To explore differences in retention between 3 instructional conditions, a one way Anova was carried out. Tukey HSD post hoc tests found pairwise-differences. Cohen's d effect sizes were used to measure the magnitude of the differences between cooperative learning groups and the control group, based on interpretation that uses accepted educational guidelines (Hattie, 2009). The normality and homoskedasticity assumptions were tested before inferential testing.

3.8. Ethical Considerations

The appropriate departmental ethical committee ethically cleared the study by following institutional rules and regulations on research involving underage children. School administration provided written permission, and informed consent was provided by parents or guardians. The anonymity and confidentiality of the participants was maintained throughout the study. Participation was voluntarily and no student felt any academic disadvantage or gain from the intervention.

4. Results

This section presents findings of descriptive and inferential analyses performed to determine the impact of Jigsaw II, STAD, and traditional lecture-based instruction program on retention in elementary History. The analyses include descriptive statistics, one way ANOVA, post hoc comparisons and effect size calculations. Figures are mentioned in the text to add visual background for interpretation.

4.1. Descriptive Statistics

Table 1 presents the mean scores and standard deviations for students' retention scores across the three instructional conditions. Students in the Jigsaw II group obtained the highest retention scores, followed by those in the STAD group, whereas the control group demonstrated the lowest performance.

Table 1

Descriptive Statistics for Retention Scores

Group	n	Mean	SD
Jigsaw II	30	29.87	4.21
STAD	30	27.63	4.85
Control	30	22.14	5.32

A visual representation of these mean scores is provided in **Figure 1**, which displays group means with standard deviation error bars for clarity.

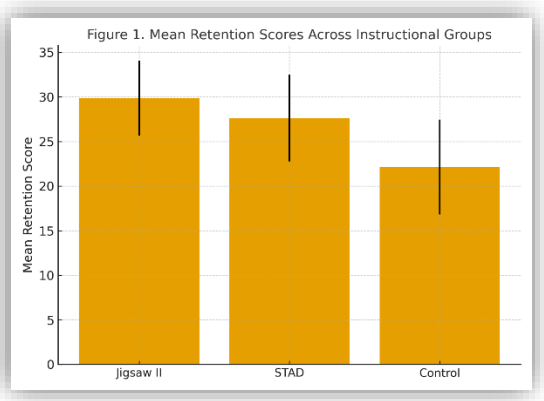

Figure 1. Mean retention scores across instructional groups.

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4.2. One-Way ANOVA

A one-way between-groups ANOVA was conducted to assess whether the type of instructional method had a statistically significant effect on students' retention scores. Table 2 summarizes the ANOVA results.

Table 2

One-Way ANOVA for Retention Scores

Source	SS	df	MS	F	p
Between Groups	1120.47	2	560.24	24.83	< .001
Within Groups	1973.10	87	22.68		
Total	3093.57	89			

The ANOVA revealed significant differences among the three instructional groups, **F(2, 87) = 24.83, p < .001**, indicating that instructional technique had a meaningful effect on long-term retention.

4.3. Post Hoc Comparisons

To identify the specific group differences, Tukey's HSD post hoc test was applied. Table 3 provides the results.

Table 3

Post Hoc Tukey HSD Comparisons

Comparison	Mean Difference	p-value	Interpretation
Jigsaw II vs. STAD	2.24	.041	Significant
Jigsaw II vs. Control	7.73	< .001	Highly significant
STAD vs. Control	5.49	< .001	Highly significant

The results show that Jigsaw II significantly outperformed STAD, Both cooperative learning groups significantly outperformed the control group.

4.4. Effect Size (Cohen's d)

To evaluate the practical significance of the differences, Cohen's d values were calculated for each pairwise comparison. Table 4 presents these effect sizes.

Table 4

Cohen's d Effect Sizes

Comparison	d	Interpretation
Jigsaw II vs. Control	1.67	Large
STAD vs. Control	1.17	Large
Jigsaw II vs. STAD	0.49	Medium

Figure 2 visually depicts these effect sizes using an academic-style forest plot.

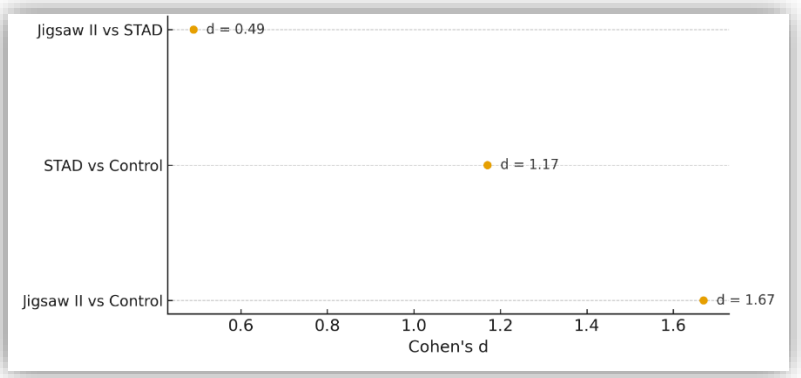

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Figure 2. Cohen's d effect sizes for instructional group comparisons.

4.5. Summary of Experimental Flow

The overall structure of the study design is illustrated in Figure 3, which outlines the flow from the population, random assignment, instructional conditions, and testing sequence.

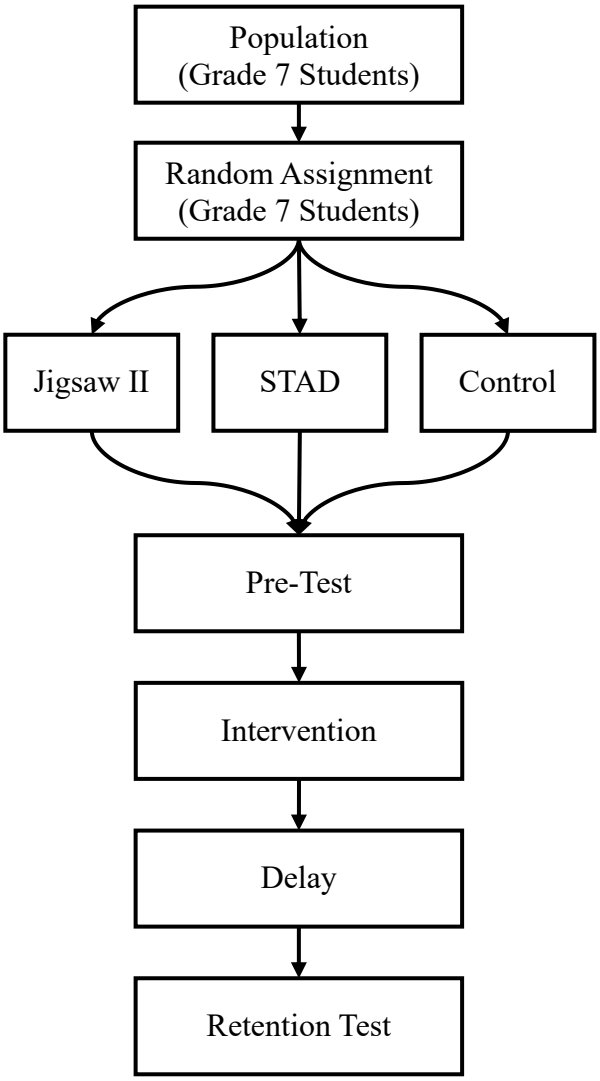

Figure 3. Overview of the experimental design.

4.6 Summary of Findings

The results collectively demonstrate that **Jigsaw II** was the most effective technique for promoting retention. **STAD** also showed strong positive effects relative to traditional instruction. **Traditional lecture-based teaching** produced the lowest retention outcomes. The effect sizes indicate that both cooperative learning methods had **large and educationally meaningful impacts** on students' long-term retention.

5. Discussion

The present study examined the comparative influence of Jigsaw II and the STAD cooperative learning methods on retention among students in elementary History based on the social constructivist theory (Vygotsky, 1978) and using the literature of cooperative learning (Johnson and Johnson, 2000; Slavin, 2014). The findings indicated significant and clear differences

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existed between the instructional groups, with the cooperative learning structures being superior to traditional lecture learning instruction. This section makes sense of these findings with reference to theory, the contextual realities of the Pakistani classrooms and the international empirical evidence.

5.1. Jigsaw and the strength of peer-teaching to enhance retention

The Jigsaw II group showed the greatest retention scores, a finding that has a high degree of coherence with research findings that demonstrate the cognitive benefits of peer teaching models. Jigsaw 2 This is called having students become content "experts" and then actually teaching those content areas to their peers. This process has the inherent power of triggering elaborative rehearsal, semantic encoding, and frequent retrieval, which are important predictors of long-term memory consolidation (Roediger & Butler, 2011).

From a constructivist perspective, the expert-teaching role increases a learner's engagement in his or her zone of proximal development (Vygotsky, 1978); in which social interaction facilitates deeper cognitive processing. This is a consistent finding with the studies which found that the conceptual understanding of students in Jigsaw conditions is superior and delayed retention is higher than that of students in traditional instruction (Mattingly,1991;Tran,2014). The current results strengthen this tendency and expand it to the Pakistani context where peer-teaching is not traditionally done but does have clear pedagogical value of History learning.

Furthermore, History as an academic discipline has unique advantages from Jigsaw's design in that it is based on interdependent subtopics, multiple perspectives, and thematic linkages. The structure of Jigsaw.ready.com is based on the integrative nature of historical knowledge, which may be one of the reasons that the effects on remembering of Jigsaw were stronger than those of STAD.

5.2. STAD and the Role of Accountability in Durability of Knowledge

The STAD group also demonstrated significantly higher retention than the control group, backing up previous results that the cooperative accountability structure of STAD increases learning outcomes (Slavin, 2014; Shah, Shah & Ayaz, 2021). STAD combines team with individual practice-testing and scored-improvement methods shown to contribute to memory consolidation by repeatedly retrieving from and giving corrective feedback on memory.

Although STAD was slightly less effective than Jigsaw II the reason for its high performance can be attributed to two factors:

1 Motivational reinforcement where the improvement scores motivate the exertion of consistent effort Johnson & Johnson (2009).

2 Cognitive rehearsal, in which students repeatedly explain, discuss and verify concepts while working in a team during the study.

The moderate effect size difference between Jigsaw II and STAD is consistent with the literature in theory: models of peer teaching require students to undergo greater conceptual transformation than models of peer practice, which consequently generate greater retention effects (Slavin, Blum, &Success, 2014). Nonetheless, the performance of STAD suggests that it is a powerful and feasible way of working for History classrooms, particularly those where teachers are looking for structured but manageable cooperative formats.

5.3. Shortcomings of Traditional Lecture Based Learning

The lowest retention scores were found in the control group, highlighting longstanding concerns about the use of rote memorization and teacher centred curriculum in Pakistan (Rahman, 2019). Traditional pedagogies usually allow for surface-level learning to occur, and

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it tends to decay shortly after because it did not incorporate elaborative encoding and does not opportunities for meaningful cognitive engagement.

This result is like what has been observed in other similar situations, where teaching History in a lecture format led to short term improvements in test score, but to poor long term retention scores (Shah et al., 2021). The present results therefore strengthen the conclusion that traditional pedagogies are inadequate for the means aimed at the development of permanent historical knowledge.

5.4. Interpretation Using Social Constructivism Theory

The considerable benefits of cooperative learning approaches may be explained by Vygotsky's (1978) social constructivism, an approach by which learning is seen to come about because of interaction, negotiation and shared meaning-making. The form of co-learning arrangements:

1. Scaffold learning in terms of peer collaboration,
2. Distribute cognitive load,
3. Promote development of articulation and justification of ideas and
4. Allow learning driven by concepts make them internalize it by engaging in dialogue.

These principles are operationalised in Jigsaw II and STAD formats differently where the Jigsaw focuses on the peer instruction, and the STAD focuses on shared practice and joint responsibility. Both stimulate deeper processing to the extent of passive instruction, symmetrically with theories that stress social mediation as the basis of long-term learning.

5.5. Applicability to the Pakistani Educational Context

The History classrooms in Pakistan are facing systemic challenges: Exam driven content coverage performed in over-sized classes, inadequate teacher training and a cultural legacy of a teacher-dominated pedagogy (Rahman, 2019). Cooperative Learning techniques provide low-cost, high-impact pedagogical alternatives to meet the limitation in resources of public schools. The good performance of Jigsaw II and STAD indicate that, students can deal with structured peer-learning roles, and teachers need not adopt further technology and can incorporate these methods into their classes and Cooperative models are especially suited to the intentions of the National Curriculum (2006) which emphasises inquiry, analysis and active learning. These results therefore endorse recommendations at the policy level in favour of collaborative pedagogies in social studies subjects.

5.6. Placing the Findings in the International Literature

The results of the study are consistent with the international meta-analytes indicating consistent academic improvement with cooperative learning compared to individualistic teaching (Johnson & Johnson, 2009 ; Roseth, Johnson & Johnson,2008). Large effect-sizes observed for both Jigsaw equally to STAD reflect global evidence and add value in showing these effects in:

1. The context of a developing country,
2. An elementary subject of History (not so frequently studied), and
3. True experimental design, Delayed retention testing

The study therefore makes some meaningful empirical contribution to both the international and the Pakistan specific cooperative learning research.

5.7. Implication on practical use to Teachers and Policymakers.

Based on the findings the following implications are evident:

1. Teacher training programmes should adopt the cooperativeness modules of Jigsaw testimonial 2 and STAD primarily.

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2. Structured group work tasks within the History textbook and teacher guides can be added by curriculum developers.
3. School administrators should promote active-learning strategies as part of internal teacher evaluation of teaching quality.
4. Classroom teaching in History ought to move away from the teaching of fact, towards substantially narrative construction by guided collaboration.

These kinds of implications are in alignment with more global recommendations on how to change the field of social studies education to be interactive and student centred.

5.8. Considered Limitations and Future Research

While the use of true experimental design increases internal validity, there are several limitations. The study was conducted in one school which limits the ability to generalise. Cooperative models that went beyond Jigsaw II and beyond STAD (e.g., TGT, GI or Think-Pair-Share) were not examined. Additionally, little qualitative information regarding the cognitive participation of students and the group processes was gathered.

Future research should include the cross-cross school and cross-regional reproduction, Mixed the procedures of reasoning by students, retention in the longitudinal for more than four weeks, and combined cooperative models based on Pakistan's History curriculum.

6. Conclusion, Implications and Recommendation

6.1. Conclusion

This study dealt with the comparison of the impact of Jigsaw II and STAD cooperative learning techniques on the retention of students in elementary level of History in Pakistani context. The results showed that both cooperative learning approaches had significant positive effects on delayed retention when compared to traditional lecture method of instruction, and Jigsaw II had the strongest results, followed by STAD. These results provide support for the notion that retention, as a cognitive outcome, is better developed using structured peer interaction, elaboration and repeated retrieval - mechanisms that are present in cooperative learning and are consistent with the theory of social constructivism (Vygotsky, 2009; Johnson, & Johnson, 2009). The downsides felt by the control group support the concerns that have long been raised about the inadequacy of teacher-centred pedagogies to promote durable learning in History (Rahman, 2019). Overall, the study adds to the growing body of evidence helping prove that cooperative learning is a powerful pedagogical approach to help improve long term retention of knowledge in social studies subjects.

6.2. Implications

6.2.1. The implications to Classroom Practice

The results of the study have points that can be implemented in the classroom. First, Jigsaw II can also be implemented in History lessons as the model encourages students to take on expert positions to be actively engaged as they participate in reciprocal teaching, which boosts semantic encoding and understanding (Tran, 2014). Second, STAD is a useful framework for teachers who are interested in finding a balance between group work and individual accountability to ensure that every learner has some meaningful contribution and gains from group work (Slavin, 2014). Both techniques require few resources, which makes them suitable in the typical Pakistani classrooms where there is a scarcity of technology and material.

6.2.2. Implications for the Education of Teachers

The finding highlights the need to enhance pre and in-service programmes education programmes for teachers. Training modules should incorporate cooperative learning theory and strategies for practical implementation to allow teachers knowledge of and be able to

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successfully implement and manage group based methods of instruction. Given the strong evidence of the role of peer mediated learning in retention (Roediger & Butler, 2011), it is conceivable that teacher training institutions need to place cooperative learning not as one of the possible learning strategies but as one of the necessary pedagogical competences to be mastered.

6.2.3. Implications to Curriculum Development

For instance, given the focus of Pakistan's National Curriculum on inquiry, critical thinking, and student-centred learning, the curriculum developers must incorporate structured cooperative tasks in the History textbooks and History teaching guides. The interdependent nature of History content lends itself to Jigsaw-segmentation style and STAD - collaborative practice. Embedding these features at the level of the curriculum would institutionalise cooperative learning as part of the mainstream instructional design and not an isolated innovation in the classrooms.

6.2.4. Implications for the Educational Policy

At the policy level, the findings provide support for national initiatives to enhance the quality of learning using interactive and constructivist pedagogies across the public schools. Policymakers should encourage the use of cooperative learning approaches in schools, offering guidelines and professional development, along with some means of monitoring approaches to assessing their effectiveness. Given the low level of resources needed for cooperative methods, they are ideal for a lobbying of multiple educational environments across diverse educational settings in Pakistan.

6.3. Recommendations

Based upon the results and implications of the study, some recommendations are put forward:

6.3.1. Recommendation for Teachers

1. Incorporate Jigsaw II for teaching thematic, narrative and segmented History content which maximises student engagement and retention for this content.
2. Use STAD for any units that necessitate reinforcing a particular point multicultural, as well as reviewing and multi-step comprehension.
3. Facilitate structured group roles to ensure equal participation in the group and to avoid domination by more outspoken students.
4. Use check-delay assessments from time to time to help reinforce the retention of information for the long term and dissuade cramming.

6.3.2. Recommendations for School Leadership

1 Promote joint lesson planning by teachers to plan cooperative learning activities according to their History units

2 Create facilitating classroom conditions where group work is the norm and is valued.

6.3.3. Recommendations to Curriculum Developers

1. Incorporate overt cooperative learning activities into the chapter review assignments, activity boxes, as well as project-based courses.
2. Give teacher instructions on how to use Jigsaw II and STAD in every one of the History chapters step by step.
3. Rationale: That is where the alignment of formative and summative assessment frameworks to collaborative instructional practices.

6.3.4. Recommendations for Future Research

1 Perform multi-school studies to increase the generalisability of study results in multiple socioeconomic and cultural contexts.

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2 Explore other cooperative learning strategies (e.g. Group Investigation, TGT, Think-Pair-Share) and compare their effectiveness in the teaching of History.
3 Use mixed methods designs as research in studying students experiences, group, and cognitive processes during cooperative learning.
4 Increase retention intervals to greater than four weeks to look at long term maintenance of historical knowledge

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