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EFFECT OF COOPERATIVE LEARNING ON READING COMPREHENSION IN CHILDREN WITH HEARING IMPAIRMENTS

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ABSTRACT:
The researchers set out on a quiet quest to see how reading—that hidden thread tying learning together—might blossom for kids with hearing impairments, where words often twist into shaky bridges instead of open gates. In a fifth-grade classroom in Taichung City, Taiwan, they watched two boys wrestle with texts, their struggles lighting a question: could cooperative learning or self-instruction carve a brighter path? With a hands-on design, they guided these kids through three stages—baseline days of plain reading, then a whirl of fifteen lessons each of teamwork and solo reflection, topped off with five rounds of the stronger approach. Using a trusted benchmark and a tailor-made test, they tracked growth not just in scores—up 9 and 10 points—but in the way stories started to hum, from basic facts to big ideas. Cooperative learning rolled in like a warm breeze, its shared buzz lifting understanding higher than self-instruction's soft nudge, though both kindled real strides. Those gains weren't mere marks; they were flickers of kids stepping past shadows, a hint that these rough, hopeful efforts might steady the bridge to literacy. From this, the researchers call for classrooms alive with group chatter and quiet coaching, dreaming of workshops and reading circles to carry the spark further, nudging future trails toward wider fields like science to see how far this light can stretch..

KEYWORDS: Cooperative Learning; Educational Strategy; Hearing Impairment Children; Reading Comprehension

INTRODUCTION

Reading comprehension weaves a quiet, yet mighty thread through learning, often slipping by unnoticed while still holding everything together. Seen from the careful lens of cognitive studies or amid the everyday bustle of a classroom, it becomes clear that making sense of words isn't just another academic challenge—it works like a key, opening doors to realms in science, history, and even flights of fancy for children. Educational psychology backs this up by showing that the knack for reading and interpreting language isn't simply a skill picked up along the way; rather, it lays the very groundwork upon which a student's entire intellectual journey is built. For children with hearing impairments, language can sometimes turn into a shaky bridge instead of an open door. Hearing loss often messes up the normal way children pick up language, leaving some awkward gaps in how they talk, listen, and mingle with others. Research generally paints a picture where these students end up trailing behind their peers when it comes to grasping written material [4, 5, 11]. One visit to a bustling fifth-grade classroom made the whole issue feel very real. Two kids didn't lack determination—they clashed with texts that others seemed to breeze through without a hitch. Their struggle wasn't just about reading words; they also found it tricky to grab key details, guess what might come next, or sift through a jumble of information to catch the real meaning. This scene sparked a burning question for the researchers: how can teachers boost their reading comprehension overall while sharpening skills like spotting facts, drawing inferences, and weighing comparisons? Hope comes alive when learners engage in working together or take matters into their own hands—there's a spark that lights up through these methods. Various studies, in many cases, have shown that such approaches not only improve academic performance but also help build social bonds among all types of learners, be they typically developing or those needing special support [1, 14]. Spurred by these findings, the researchers set up this study with two main aims: 1. whether cooperative learning beats self-instruction in boosting reading comprehension for children with hearing impairments, using a test crafted to match the lesson materials; and 2. to compare how these kids perform on the Chinese Reading Comprehension Test both before and after the implementation of these learning strategies. In the end, the investigation hopes to offer down-to-earth insights that might enrich the broader educational scene and give every student a fair shot at success.

LITERATURE REVIEW:

A. Cooperative Learning Studies

Imagine a classroom buzzing with energy as kids cluster around a table, voices mingling and stories emerging in a very natural way. Cooperative learning springs to life right there—something that many teachers have been drawn to for quite a while now. Back in 2003, Caposey and Heider caught this spark when elementary and middle schoolers lit up as they worked together with teachers and friends. They weren't simply memorizing words; they were really getting the stories, building vocabulary and understanding side by side [10]. In Taiwan around 2000, Wu LK noticed a similar trend. She observed group work lifting reading skills for kids of all stripes—some with learning disabilities, others without. In most cases, it even worked to turn those who felt on the outside into part of the circle, helping everyone feel included [1]. Yang KT, tinkering around in resource rooms back in 1993, saw the same shift. He found that teaming up gave struggling students a shot at shining academically [7]. Then, in a 1996 book, Huang and Lin laid out what turned out to be a kind of blueprint—a lifeline for classrooms filled with different kinds of learners [6]. Almost like a heartfelt nod, Slavin's 1995 work combed through lots of studies and revealed how kids flourish in groups, especially when reading turns into an adventure shared by all [14]. For these researchers, the real value wasn't merely in the numbers; it was a subtle hint that cooperative learning might even unlock new ways to tackle reading challenges for kids with hearing impairments. And, with a bit of determination, they rolled up their sleeves and put the idea to work, testing it out in real classrooms.

B. Reading Comprehension Challenges in Hearing-Impaired Children

Imagine a young child with hearing loss, perched at a desk, a book open before them. Their eyes trace the words, but the meaning slips away like mist on a windy day. For these kids, reading isn't just a task—it's a quiet battle, and the research lays bare why. Zhang BL devoted years to understanding this, digging into the puzzle in 1989 and again in 1994. She discovered that hearing impairments snarl language development from the very beginning, turning sentences and tales into a tougher climb than they are for hearing classmates [4, 5]. Qi BX carried this torch forward in 2000, focusing on hearing-impaired children in Taiwan as they wrestled with Chinese texts. Her findings hit hard: these kids lagged, grappling with meaning while others glided past [8]. Lin and Huang, peering back to 1997, found the root in shaky Mandarin skills—a wobbly stepping stone too many of these children couldn't steady [2]. Half a world away, Geers and Moog sat down with deaf teenagers in 1989, sifting through the reasons literacy felt like a distant shore. They traced it to early language gaps, left like footprints by hearing loss [11]. Holt's 1993 work with the Stanford Achievement Test cast the same shadow in numbers: hearing-impaired students trailed in reading comprehension, a divide that clung stubbornly over time [12]. To the researchers, these weren't cold figures on a page. They saw faces—kids in classrooms, eager but stuck, calling out for a hand up. That's where Lin and Qi's 1999 Chinese Reading Comprehension Test stepped in, a tool not just to measure the struggle but perhaps to start patching it [3].

C. Bridging the Gap

So, how do you sweep away the shadows that dim a child's path to reading? O'Connor and Jenkins stumbled onto a hint in 1993, their eyes fixed on classrooms where cooperative learning worked its quiet magic. They saw children with disabilities—once on the edges—drawn into the pulse of group work, their voices mingling with others. It wasn't just about belonging; it was about blossoming, especially in reading skills that had long seemed beyond their reach [13]. Alfassi found a similar thread in 1998, sitting with high schoolers in remedial classes. When these teens took turns guiding and learning from each other, the air shifted—reading transformed from a lonely trudge into a triumph they built together [9]. Even Xue and Wang, peering into 2023, tossed in a bold twist: virtual reality, lighting up language skills in ways that might just ripple into stronger reading down the line [15].

For the researchers, these weren't mere studies tucked into journals—they were flickers of possibility, glowing brighter with each page turned. Cooperative learning started to take shape in their minds not as a dry technique, but as a sturdy bridge—weathered, maybe, but solid enough to bear the weight of hearing-impaired children reaching for meaning in texts. Fueled by hope and a gut feeling honed over years of digging through research, they rolled up their sleeves. Could this be the spark, they wondered—the lift these kids had been quietly yearning for all along?

METHODOLOGY:

A. Research Design

The researchers chose a hands-on path to explore their question, settling on a single-subject approach with an Alternating Treatment Design (ATD) [6]. Picture it like a three-act plays, each stage revealing a new layer of understanding. In the first act—the baseline phase (A)—two fifth-graders with hearing impairments from a special education class in Taichung City, Taiwan, sat through four lessons with no special teaching tricks in 2019. They simply read their materials and took a test right after, setting the stage for what they could do on their own. Act two—the intervention phase—brought the action: fifteen lessons of cooperative learning (B) and fifteen of self-instruction (C), each followed by a test to see what stuck. Finally, in act three, the researchers picked the winner—whichever method shone brightest—and ran it solo for five more lessons, testing again to seal the deal. This three-part journey—baseline (A), comparison (B vs. C), and best-practice finale (B or C)—let them weigh the two

strategies side by side, as sketched out in Figure 1.

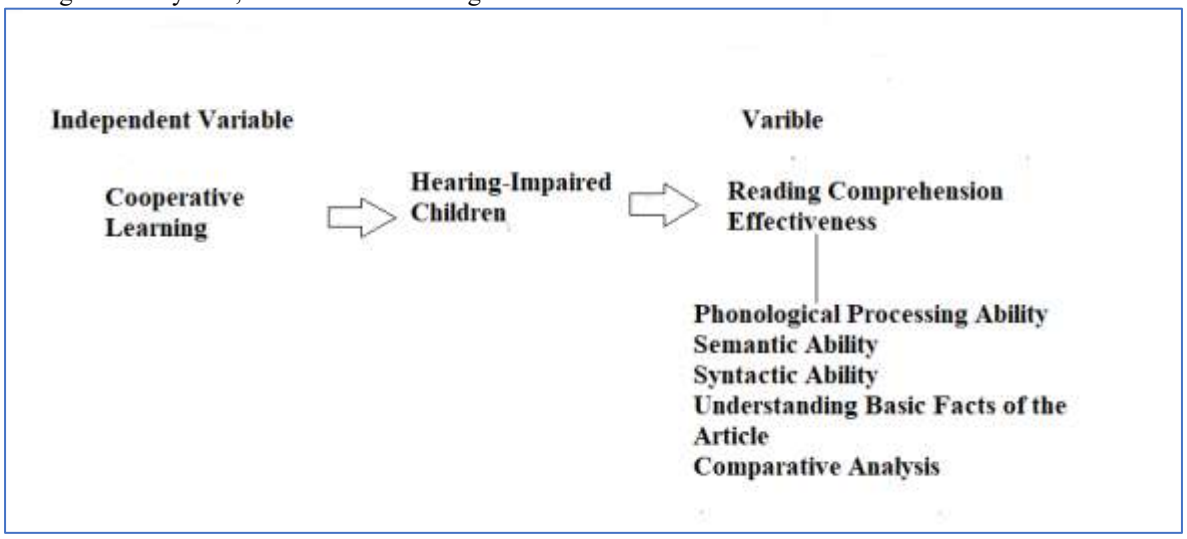

Figure 1: Research structure

The cooperative learning sessions had a heartbeat all their own, a steady pulse guiding the classroom's ebb and flow. Teachers kicked things off by passing out materials, then settled in for a ten-minute read-aloud—their voices breathing life into the pages. They wove in story structure analysis or semantic mapping, like a lantern swung low to light up the story's winding paths, helping the kids find their footing in the text. Next, the students gathered into familiar little crews, their chatter filling the air as they tackled worksheet questions together for fifteen minutes. After that, each child faced an eight-minute test alone, a quiet moment to show what they'd caught. A quick three-minute check of their progress scores followed—small victories tallied up—before the room brightened again with four minutes of group cheers, a nod to the teamwork that carried them through. Through these lively sessions, the researchers set out to explore how cooperative learning—and a dash of self-instruction—might lift reading comprehension for hearing-impaired children. They pegged teaching methods as the spark to watch, measuring its glow through test scores, hoping to see these young readers shine a little brighter.

Table 1. Participating Students Data

Item	Detail	Student A	Student B
Basic Information	Gender	Male	Male
	Age	11 years	11 years
	Hearing Impairment Level	Severe	Profound
	Hearing Loss (Unaided)	Left: 96 dB, Right: 96 dB	Left: 90 dB, Right: 90 dB
	Hearing Aid	ALEX FM Group Hearing Aid	Cochlear Implant
	Hearing Loss (Aided)	Left: 45 dB, Right: 45 dB	Approx. 35 dB
Academic Ability		Math: Upper-middle in regular class; Mandarin: Behind, especially in sentence construction; Social Studies & Science: Weaker than peers	Mandarin: Longer but unclear sentences; Math, Social Studies, Science: Weaker than pe
Communication Ability		Mild, introverted; Minimal talk with peers; Uses oral and sign language, often keywords only	Cheerful, outgoing; Initiates talk; Uses oral and sign language, short fluent sentences, soft tone
Mandarin Proficiency Test	Total Score	77	78
	Age Percentile Rank	82	83
	T-Score	58	59
Reading Comprehension Screening	Score	0.20 (Low, indicates difficulty)	0.25 (Low, indicates difficulty)

To really get to know these two young learners, the researchers pulled together a toolbox of assessments—

each one like a different lens to bring their world into focus. First, they sifted through the fifth-grade crowd with a pair of screening tools: the Mandarin Proficiency Test for Hearing-Impaired Students and the Screening Test for Reading Comprehension Difficulties. These weren't just checklists—they were the gatekeepers, helping the researchers spot the right two boys whose struggles and strengths fit the study's heart [2]. With their participants in hand, the real work began. They turned to two main measures: the Chinese Reading Comprehension Test [3], a steady benchmark trusted by many, and a homegrown Reading Comprehension Test they'd stitched together to match their lessons—like a tailor-made map for this journey. The scores from these tests—the Chinese Reading Comprehension Test totals and the percentage of right answers on their own creation—were the threads the researchers hoped would weave a story of growth. Beyond the numbers, they laid out the boys' lives in Table1 : their hearing levels, their quirks, their backgrounds—all the little pieces that made them more than data points. It was a way to step closer, to see these kids not just as subjects, but as young readers with dreams waiting to unfold.

RESULT

The researchers wanted to peek into the hearts and minds of two young readers, to see if their teaching ideas could spark something new. So, they brought out the Chinese Reading Comprehension Test [3], a familiar friend in their toolbox, and sat down with the boys—Student A and Student B—before and after the lessons. They counted every right answer like treasures pulled from a chest, piecing together the story of what changed. That story unfolded across tables and figures, a quiet tale of steps forward, one the researchers pored over with a mix of hope and wonder.

For Student A, the numbers whispered a small triumph. Table 2 laid it out plain: after the cooperative learning and self-instruction sessions, he'd climbed 9 points. It wasn't a shout from the rooftops, but it was enough—a gentle nudge that both approaches had lifted his reading a little higher. Digging deeper, the researchers flipped through Table2 and squinted at Figure 2, tracing his progress across the little skills that make reading sing. Every piece—semantics, main ideas, all of it—budded with growth. But semantics" and "extracting the main idea? Those bloomed brighter, like flowers catching extra sunlight. The group chatter and quiet self-coaching must've struck a chord, helping him tease out meaning and spot the big threads weaving through a story.

Student B's tale took its own shape, but it gleamed just as real. Table 2 showed he'd gained 10 points after the lessons—not a giant leap, maybe, but a solid step all the same. The researchers saw it as a quiet win, proof that the mix of teamwork and solo reflection had given his reading a boost. Peeking at Table 2 and Figure 2, they spotted where he'd stretched furthest: understanding basic facts. That's where he'd planted his flag, picking up the nuts and bolts of a story with a surer hand than before. It was as if the back-and-forth with peers and the moments of talking himself through had steadied his grip on the basics.

To the researchers, those scores scratched onto paper weren't just cold numbers—they were bursts of life, tiny beacons marking two boys' climb over walls that once loomed too high to scale. Student A and Student B, with every word they unraveled, seemed to carry a quiet pride, their faces breaking into shy grins as the tangle of language started to loosen in their hands. Watching them, the researchers couldn't help but wonder: maybe these lessons—rough around the edges, stitched together with hope and a bit of grit—were starting to crack open a door, letting a sliver of light spill onto a path toward reading that these kids could finally call their own.

Table 2. Pre-Test and Post-Test Data in Reading Comprehension Skills

Reading Comprehension Sub-Skills	Participant A		Participant B	
Pre-Test	Post-Test	Pre-Test	Post-Test	
Phonological Processing Ability (12 pts)	6	7	6	8
Semantic Ability (13 pts)	1	3	3	4
Syntactic Ability (12 pts)	2	3	4	5
Understanding Basic Facts of the Article (23 pts)	9	10	10	14
Comparative Analysis (13 pts)	6	7	6	6
Extracting the Main Idea (12 pts)	1	3	2	2
Inference (15 pts)	5	6	5	7
Total Score	30	39	36	46
Percentile Rank	4	8	6	14
T Score	29	33	32	38

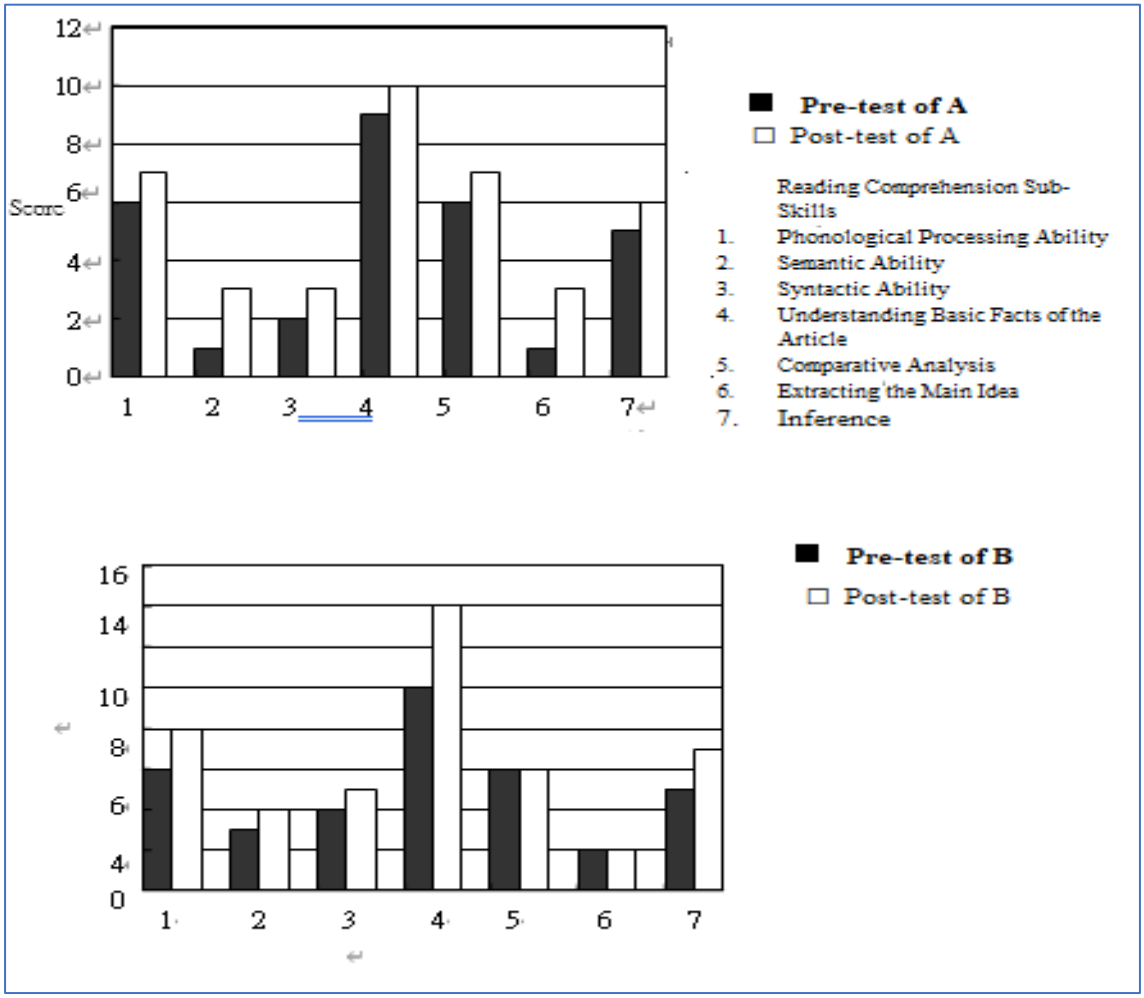

Figure 2: Reading Comprehension Sub-Skills

DISCUSSION

The researchers dove headlong into this adventure, poring over scribbled notes and rough sketches like trailblazers mapping the winding paths of two fifth-graders' reading lives—Student A and Student B, boys whose hearing impairments had long draped a quiet curtain over their worlds [4, 5, 11]. Their story hooked the researchers, unfolding like a tale they couldn't turn away from. At first, before the lessons kicked in, the boys wrestled with texts, their understanding dimmed by the silence that shaped their days, a struggle echoed in studies of hearing-impaired learners lagging their peers [2, 8, 12]. Then cooperative learning burst in, a lifeline tossed by friends pulling them into the fold [6, 14], and on a custom-made Reading Comprehension Test, their answers began to hum—a leap from those early stumbles—mirroring the gains others had seen when kids learn together [1, 10, 13]. Self-instruction followed softer, a steady voice guiding them along [7], and it too stirred their reading awake, coaxing growth through quiet reflection, a nod to how structured support can lift special learners [9]. Stepping back, the researchers caught a glint: cooperative learning glowed a bit brighter, its weave of shared voices leaving a deeper mark through the teaching stretch [14], a rhythm that held strong to the end, suggesting that, for these boys, the dance of teamwork outshone solo steps, much as Slavin's work had hinted [14]. That custom test sliced reading into four vital threads—understanding basic facts, comparative analysis, extracting the main idea, and text integration—and both boys wove stronger lines in each, with understanding basic facts rising tallest, as if they'd finally grasped a story's pulse after fumbling in the dusk [8]. Student A sharpened comparative analysis and text integration most in group huddles [1], while Student B bloomed in understanding basic facts, comparative analysis, and extracting the main idea with pals at his side [10], little victories that lit up the researchers' faces, echoing tales of collaboration lifting comprehension [9, 13]. On the broader Chinese Reading Comprehension Test [3], run before and after it all, the boys climbed too—not a mad dash, but a slow, sure rise, their progress whispering of barriers easing, a finding that chimes with research on tailored teaching for hearing-impaired kids [11, 12]. Those gains weren't just scratches on paper; they were sparks of something breaking free, proof that these lessons—raw, messy, and brimming with heart—were parting the fog, turning reading from a steep, shadowed climb into a trail these kids could tread with a flicker of new light, a hope bolstered by fresh ideas like virtual tools nudging language forward [15].

CONCLUSION

The researchers stumbled into a tale that grabbed them by the heart—a story of growth lit by two teaching paths, cooperative learning and self-instruction, carving fresh trails for hearing-impaired kids who'd long tangled with words. Where reading once flickered faint, held back by language walls others had mapped out over time [4, 5, 11], cooperative learning swept through like a summer gust, stirring understanding with the lift of shared hands, its spark ringing true with what folks have long praised as teamwork's quiet wonder [1, 6, 13]. Then came self-instruction, slipping in soft like a friend's murmur, coaxing kids to nudge their own way forward through the stillness of thought, a gentle nod to the steady strength of a guiding frame [7, 9]. But the louder song came from collaboration—its warm hum weaving a thread that drowned out the hush of solo strides, a tune Slavin had been humming for years [14]. Reading opened into four sturdy branches—understanding basic facts, comparative analysis, extracting the main idea, and text integration—and each stretched taller, with basic facts blooming boldest, as if kids could finally hold a story's soul close [8]. On a wider canvas, the Chinese Reading Comprehension Test [3], the climb wasn't a race but a slow, honest rise, hinting that these lively, hope-soaked efforts might just sweep the mist from literacy's path [12]. With that whisper in their ears, the researchers couldn't help but dream—they'd nudge teachers toward cooperative learning, a bridge held up by the jostle of kids swapping ideas, lifting each other's grip on tales [1, 10], and they'd root for self-instruction too, laced with picture hints to light a lone wanderer's road [7, 9]. They pictured workshops bursting with life, spilling teamwork's ordered joy to every teacher's hand [14], and quieter gatherings to hone skills and tame wilder spirits [9], while reading circles sprouted, rich with all kinds of kids chasing stories together, stretching toward bigger fields like science to see how far the good could roll [15], a starting stone begging for broader paths to find what truly carries kids past life's rough patches [13].

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9] Miscellaneous:
Table 1: Participating Students Data.
Table 2: Pre-Test and Post-Test Data in Reading Comprehension Skills.
Figure 1: Research structure.
Figure 2: Reading Comprehension Sub-Skills

10] Data Availability:
The data that support the findings of this study are available from the second author.

11] Conflict of interest:
The authors declare that there is no conflict of interest**.**

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