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Improving Collaboration Skills of Grade 8 Students Through Cooperative Learning Strategies: A Classroom Action Research

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ABSTRACT

Collaboration is recognized as a core 21st-century skill, yet it is often assumed rather than deliberately taught. This classroom action research examined whether Cooperative Learning Strategies (CLS) could improve the collaboration skills of Grade 8 science students and how the process contributed to the teacher-researcher's professional practice. Following the action research cycle of Kemmis and McTaggart (1988), 57 Grade 8 students from two intact sections of a private secondary school were organized into twelve small groups and engaged in a series of cooperative, artifact-based science activities across three life-science topics over one instructional cycle. Collaboration was measured before and after the intervention with a twenty-item Survey Questionnaire on Collaboration (SQC), during the intervention with the Level of Collaboration Scale (LCS), and through rubric-based peer and teacher assessment of group artifacts (RSA). Students' baseline responses on collaboration were uncertain (composite mean = 3.25). Following the intervention, SQC composite scores rose from "agree" (grand mean = 3.92) to "strongly agree" (grand mean = 4.64) on both group-trust and collaborative-learning indicators. During the intervention, groups demonstrated a mean collaboration level corresponding to "coalition", with seven of twelve groups reaching the highest level, "collaboration". Peer- and teacher-rated group artifacts were judged advanced to proficient in completeness, creativity, organization, and accuracy. Students' reflections corroborated the quantitative gains, describing increased trust, openness, and enjoyment in group work. The findings suggest that deliberately structured, artifact-based cooperative tasks, rather than group work alone, can move adolescent learners from uncertainty about collaboration toward confident, trust-based teamwork within a single instructional cycle, offering science teachers a replicable, low-cost model for embedding collaboration in content instruction.

INTRODUCTION

Curriculum frameworks increasingly frame science education as preparation for participatory citizenship rather than content mastery alone. The Philippine Department of Education (2016), for instance, holds that science instruction should develop scientific literacy so that learners "can make judgments and decisions regarding applications of scientific knowledge that may have social, health, or environmental impacts." Achieving this aim depends on the extent to which learners actively participate in constructing knowledge, and the Partnership for 21st Century Learning (P21) (n.d.) places collaboration, alongside creativity, critical thinking, and communication, among the four core competencies (the "4Cs") that this participation requires. This gap between the curricular aspiration for collaboration and its everyday classroom reality is the starting point for this

present study.

To establish whether this gap existed in the researcher's own context, a reconnaissance of the school setting was conducted. It identified collaboration as a recurring concern: students tended to prefer completing tasks independently, struggled to apply concepts learned in class, and had difficulty constructing arguments when solving problems. To verify this impression, the researcher administered a survey adapted from Dewiyanti *et al.* (2007) and Laux (2014) to 67 respondents (27 Grade 7 students, 25 Grade 8 students, and 15 teachers). As Table 1 shows, every respondent group registered a composite mean in the "uncertain" range, indicating that students themselves were unsure whether they possessed collaboration skills and that teachers were equally unsure whether existing group activities were building that skill.

Follow-up interviews reinforced this pattern. One Grade

Table 1: Baseline survey on collaboration skills among students and teachers (n = 67)

Respondents	Mean	Qualitative Interpretation
Grade 7 Students	3.50	Agree
Grade 8 Students	3.28	Uncertain
Teachers	2.94	Uncertain
Composite Mean	3.25	Uncertain

Note: Scale: 4.21-5.00 Strongly Agree; 3.41-4.20 Agree; 2.61-3.40 Uncertain; 1.81-2.60 Disagree; 1.00-1.80 Strongly Disagree

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7 student described redoing group output alone rather than relying on teammates (“If I am not that satisfied with the products my groupmates accomplish, I will redo it and polish it”), a Grade 8 student noted that some groupmates contributed nothing (“Some of my groupmates are not doing anything; they are not even sharing their ideas”), and a teacher observed that certain students’ names appeared on group outputs without a corresponding contribution. Taken together, the quantitative and qualitative baseline data indicated that group work was occurring in the school without necessarily producing collaboration.

These baseline findings, together with the theoretical and empirical literature on collaboration and cooperative learning, motivated the design of a structured intervention, Cooperative Learning Strategies, embedded in three Grade 8 life-science topics and implemented across one action research cycle.

Research Questions

This study sought to answer the following questions:

1. To what extent do Grade 8 students manifest collaboration skills (a) before and (b) after the implementation of Cooperative Learning Strategies?
2. What was the impact of Cooperative Learning Strategies on Grade 8 students’ collaboration, as evidenced by their group-produced learning artifacts?
3. How did conducting this action research inform and improve the practice of the science-teacher-researcher?

Significance of the Study

For students, the study offers evidence whether a deliberately structured intervention can move collaboration from an assumed by-product of group work to a directly taught and assessed skills, with implications for how they interact with peers, teachers, and content. For teachers and curriculum planners, it offers a concrete, replicable set of cooperative, artifact-based science activities and a triangulated assessment approach (self-report, peer rating, and rubric-scored artifacts) that can inform lesson planning and school-level instructional policy. For the researcher, undertaking the full action research cycle, diagnosing a classroom problem, designing and implementing an intervention, and reflecting on its results, constitutes a form of professional growth aligned with the personal and professional development domain of the National Competency-Based Teacher Standards (Salandanan *et al.*, 2013).

LITERATURE REVIEW

This section situates the study’s baseline problem within the wider research literature on collaboration as a twenty-first-century skill and on cooperative learning as an instructional means of developing it, before deriving the theoretical framework that guided the design of the intervention.

Collaboration as a 21st-Century Skill

Science education researchers have made an increasingly explicit case that collaboration is not incidental to science

learning but central to it. Mehta and Kulshrestha (2014) argue that contemporary science instruction must cultivate communication, leadership, critical thinking, and listening alongside content knowledge, since scientific and technological work is characteristically collaborative rather than solitary. The American Association for the Advancement of Science (1989) has similarly called for the collaborative nature of scientific work to be reflected in frequent group activity, contending that scientists should therefore gain experience sharing responsibility for learning, informing one another, arguing over findings, and assessing progress collectively, rather than completing tasks through a traditional individualistic, textbook-and-recitation approach.

This view is consistent with the Partnership for 21st Century Learning’s inclusion of collaboration among the four core competencies (the “4Cs”), alongside creativity, critical thinking, and communication. Research cited within that framework suggests several reasons for prioritizing collaboration as an explicit educational outcome: individuals who understand collaboration tend to perform better in team settings, students immersed in collaborative or cooperative learning tend to be more successful, strengthened collaboration skills can enhance employment and career-advancement prospects, and students accustomed to collaborative learning tend to participate more readily in resolving issues within their communities. Laux (2014) similarly identifies collaboration as one of the twenty-first-century skills with lasting effect on learners’ future work lives. Taken together, this literature positions collaboration as a skill that, like literacy or numeracy, should be deliberately taught and assessed rather than assumed to develop on its own.

Cooperative Learning: Theoretical and Empirical Foundations

Cooperative learning is the instructional approach most directly associated with developing collaboration in the classroom. Felder and Brent (2007) define it as an approach to group work that minimizes the dysfunction commonly associated with student groups and maximizes the learning and satisfaction that come from working on a high-performing team. Relative to instructor-centered instruction with individual assignments and competitive grading, cooperatively taught students tend to show higher academic achievement, greater persistence, better high-level reasoning and critical thinking, deeper understanding of material, more time on task and less disruptive behavior, lower anxiety and stress, greater intrinsic motivation, greater ability to take others’ perspectives, more positive peer relationships, more positive attitudes toward the subject, and higher self-esteem (Felder & Brent, 2007). Felder and Brent (2007) also offer an explanation for why cooperative learning is effective: students learn more by doing something active than by watching and listening, and cooperative learning is inherently active. Beyond this general mechanism, cooperation appears to help in more specific ways: weaker students who would otherwise disengage when stuck are kept going by their groupmates;

stronger students, in explaining material to peers, often discover and fill gaps in their own understanding; and students who might otherwise delay or skip assignments are motivated by the knowledge that others are relying on them. However, cooperative learning is not simply a synonym for students working in proximity. Building on the Johnson and Johnson (2009) model, Felder and Brent (2007) specify five conditions that distinguish genuine cooperative learning from unstructured group work: (1) positive interdependence, in which team members must rely on one another to reach the goal and share the consequences if any member fails to contribute; (2) individual accountability, in which every member is answerable for their share of the work and for mastering the material; (3) face-to-face promotive interaction, in which some portion of the work must be done interactively, with members giving feedback, challenging one another's reasoning, and teaching and encouraging one another; (4) appropriate use of collaborative skills, in which students are explicitly helped to develop trust-building, leadership, decision-making, communication, and conflict-management skills; and (5) group processing, in which teams periodically assess their own functioning and identify changes needed to work more effectively. A learning activity qualifies as cooperative learning, in this context, only to the extent that these five conditions are present, a distinction with direct implications for how the intervention in the present study was designed.

Hermann (2013) grounds this account in social interdependence theory, whose basic premise is that the structure of social interdependence determines how individuals interact within a situation, which in turn shapes outcomes. Under this theory, cooperation is most effective when group members perceive shared goals and that each member's success depends positively on the group's collective action. Such positive interdependence is theorized to produce promotive interaction, members encouraging and helping one another, exchanging feedback, challenging one another's conclusions, and taking one another's perspectives; by contrast, it arises when one member's success comes at another's expense (as in competitive settings), while an individualistic structure exists when members' efforts are unrelated to one another. Other studies converge on similar conclusions: Gokhale (1995) found that collaborative learning enhances critical thinking beyond what individual study achieves, and Ronfeldt *et al.* (2015), working with teachers rather than students, found that collaboration within instructional teams was associated with improved student achievement, suggesting that the benefits associated with structured collaboration are not limited to the K-12 classroom alone.

Two recent Philippine classroom-based studies lend further, more localized support to this picture. Johnson and Johnson (2009), writing directly on social interdependence theory, argue that cooperative arrangements generate the promotive interaction on which academic gains depend, a claim corroborated in

a Region X study of junior high school teachers, where collaboration was the highest rated of seven 21st-century skills domains self-assessed by teachers, ahead of critical thinking, creativity, communication, social skills, leadership, and notably, digital literacy, which scored lowest (Cabahug *et al.*, 2024). The same study found that teachers' weakest collaboration-related competency was managing time during group tasks, even as their ability to provide feedback and involve others in shared work scored highest, a pattern that echoes Felder and Brent's (2007) observation that structured collaboration requires a deliberate investment of time that unstructured group work does not. Complementing this, a phenomenological study of a Philippine Department of Education reading initiative found that peer collaboration served as a practical substitute for inconsistent teacher availability, with students reporting that working with classmates made lessons easier to understand "when the teacher wasn't around" (Saro *et al.*, 2024). These studies suggest, therefore, that the benefits of structured collaboration identified in broader literature (Felder & Brent, 2007; Hermann, 2013) are not confined to Western or higher education settings, but recur in Philippine K-12 classrooms as well.

Project-based Learning (PBL), like the CLS activities in this study, organizes learning around producing an authentic group product and offers a closely related line of evidence. As Elaoufy and Dardour (2026) review, PBL is characterized in the literature as moving students beyond simple cooperation toward collaboration in which learners are responsible not only for their own learning but for that of the whole team, with the teacher's role shifting from instructor to facilitator. Evidence from inclusive classrooms points the same way. In a phenomenological study of 15 general and special education teachers in Maryland, Angco *et al.* (2025) identified collaborative teaching and peer support systems, including buddy systems, cooperative learning groups, and peer mentoring, among the main strategies for mainstreaming learners with special educational needs, and participants linked these strategies to improved academic performance, stronger peer relationships, and greater self-confidence. These studies suggest that peer-based collaboration succeeds when it is deliberately structured and monitored.

Theoretical Framework

The present study is framed by two complementary theoretical perspectives. Vygotsky's sociocultural theory situates learning as fundamentally socially mediated: higher-order cognitive development occurs through interaction with more capable others and with peers, not through solitary cognition alone, which grounds the premise that collaboration is not merely a delivery mechanism for content but a legitimate developmental outcome in its own right (Lin, 2015). Social interdependence theory, discussed above, supplies the more operational account: it specifies the structural conditions, positive interdependence, individual accountability, promotive

interaction, collaborative skill use, and group processing, under which group activity is expected to translate into genuine collaboration and, ultimately, improve outcomes. The positive-interdependence and individual-accountability conditions central to the Johnson and Johnson (2009) model also intersect with self-determination theory: Deci and Ryan (2000) argue that autonomy, a sense of control over one's own learning decisions, supports intrinsic motivation and a stronger sense of responsibility toward shared goals. Within the CLS activities used in this study, groups were given autonomy over materials and design choices while still being bound to a single, consensus-based product, a structure intended to combine the motivational benefits of autonomy with the accountability conditions that social interdependence theory identifies as necessary for genuine collaboration to occur. This combination is also consistent with Thompson and White's (2021) finding that collaborative learning enhances academic outcomes specifically by giving students the opportunity to support one another and share knowledge, and with Johnson's (2022) observation that peer interaction boosts engagement, motivation, and comprehension by allowing students to work through content collectively rather than in isolation.

These two perspectives justify the design logic of the intervention reported in this study: rather than simply increasing the amount of group work students experienced, the Cooperative Learning Strategies (CLS) were deliberately structured around the five Johnson and Johnson (2009) conditions, on the premise, drawn from Vygotsky, social interdependence theory, and self-

determination theory alike, that it is this structuring, and not group placement as such, that should be expected to improve students' collaboration skills.

MATERIALS AND METHODS

Research Design

This study used a classroom action research design, following the plan-act-observe-reflect cycle of Kemmis and McTaggart (1988). An exploratory reconnaissance phase established the problem and baseline data; an intervention (CLS) was then implemented across three life-science topics; data on collaboration were gathered during and around the intervention; and the researcher reflected on the results to evaluate the intervention's effectiveness and its implications for practice. Because of time constraints associated with the academic quarter, the study was limited to a single cycle.

Participants and Sampling

Participants were 57 Grade 8 students from two intact sections of the high school department of a private secondary school. Table 2 shows the distribution of participants by section. The sections were pre-existing (intact) classes assigned to the researcher, and all students in both sections participated in the regular instructional activities that constituted the intervention and in the associated research instruments, following permission secured from the school principal prior to implementation. Students were randomly assigned within each section to small groups of five to six members, yielding twelve groups in total (Groups 1-6 in Grade 8-A; Groups 7-12 in Grade 8-B).

Table 2: Distribution of student-participants by section

Section	Number of Students
Grade 8-A	30
Grade 8-B	27
Total	57

Intervention: Cooperative Learning Strategies

The intervention consisted of five cooperative, artifact-producing activities embedded in lesson plans for three

Grade 8 life science topics, the digestive system, cell division (mitosis and meiosis), and an introduction to Mendelian genetics, taught over three to four weeks.

Table 3: Cooperative learning strategies implemented, by topic

Topic	Strategy	Required Group Artifact	Assessment
Digestive System	Group model construction	Apron model; yarn model of the digestive system	Peer + teacher rubric
Cell Division (mitosis and meiosis)	Group model construction	Edible cell models of mitosis and meiosis	Peer + teacher rubric
Introduction to Mendelian Genetics	Group model construction	"Reebop" babies (edible allele-based models)	Peer + teacher rubric
Introduction to Mendelian Genetics	Group experimentation	Inventory of shared/unique traits (graph)	Peer + teacher rubric
Introduction to Mendelian Genetics	Group experimentation	Face-trait illustration	Peer + teacher rubric

All activities required a group-constructed product and were assessed by both peers and the teacher. Table 3 summarizes the topics, strategies, required artifacts, and assessment approach.

Across activities, groups were given autonomy in materials and approach (e.g., use of the culinary arts rooms for edible models) but were required to reach consensus on a single group product, which operationalized the positive interdependence and face-to-face promotive-interactive conditions of the Johnson and Johnson (2009) cooperative learning model.

Instruments

Survey Questionnaire on Collaboration (SQC). A 20-item instrument adapted from Dewiyanti *et al.* (2007) and Laux's (2014) adaptation of the Broadleaf Organizational Trust Index, divided into a group-trust subscale and a collaborative/team-learning subscale. Items used a five-point scale (1 = Strongly Disagree to 5 = Strongly Agree) and were administered as a pre-assessment before and a post-assessment after the intervention.

Level of Collaboration Scale (LCS). Adapted from Frey and Bruce (University of Kansas), this instrument describes six ordinal levels of group functioning – from 0 (no interaction) through 1 (networking), 2 (cooperation), 3 (coordination), and 4 (coalition), to 5 (collaboration), each defined by observable characteristics of role definition, communication frequency, and decision-making. Students use the LCS to rate themselves and their groupmates after each group activity during the intervention.

Rubrics of Students' Artifacts (RSA). Analytic rubrics, tailored to each artifact, scored group products on criteria such as completeness, creativity, accuracy, construction/materials, and organization, using a four-band qualitative scale. Each artifact was scored independently by peers and by the teacher.

Data Collection Procedure

Following principal approval, the SQC was administered as a pre-assessment before the five CLS plans were

implemented over three to four weeks. During this period, students completed the LCS after each group activity, rating themselves and their groupmates, and selected students were informally interviewed about their reactions to the activities. Field notes on classroom observations and student exit passes were collected throughout. The SQC was re-administered as a post-assessment at the end of the cycle, and peers and the teacher scored completed group artifacts using the RSA.

Data Analysis

SQC and LCS responses were analyzed using frequency counts and arithmetic means, interpreted against the five-band qualitative scales. RSA scores were averaged by criterion and by section and interpreted against a four-band qualitative descriptor scale (Advanced/Proficient through Below Basic). Qualitative data from interviews, field notes, and exit passes contextualized and corroborated the quantitative results.

Ethical Considerations

The intervention was embedded in regular, curriculum-aligned classroom instruction, and permission to conduct the study was secured from the school principal prior to implementation. Informed consent documents were also obtained from the participants.

RESULTS AND DISCUSSION

Pre- and Post-Intervention Collaboration (SQC)

Table 4 summarizes students' pre- and post-assessment responses on the SQC. Before the intervention, the group-trust subscale had a composite mean of 3.98 ("Agree"), and the collaborative/team-learning subscale had a composite mean of 3.85 ("Agree"), for a pre-intervention grand mean of 3.92. One item, "The people involved in our team accept the opinions of others", fell into the "Uncertain" band (mean = 3.40), the only item not already rated "Agree" at baseline.

After the intervention, every indicator on both subscales rose into the "Strongly Agree" band, including the

Table 4: Pre- and post-intervention means on the survey questionnaire on collaboration (n = 57)

Indicator	Pre-M	Interpretation	Post-M	Interpretation
Group Trust Index				
I care about the people I work with.	4.12	A	4.53	SA
I demonstrate respect and concern for everyone I interact with.	3.92	A	4.46	SA
I possess the knowledge needed to succeed in my work.	4.04	A	4.49	SA
I make everyone around me better.	3.60	A	4.42	SA
I am a "go-to" person on our team.	3.80	A	4.54	SA
I tell my opinions openly to my groupmates.	4.00	A	4.70	SA
I want the people I work with to win/create better outputs, not just myself.	4.32	A	4.79	SA
I get along well with my groupmates.	3.96	A	4.67	SA
I communicate very often with my groupmates during group activities.	3.84	A	4.58	SA

I share my ideas regarding the tasks assigned to us.	4.16	A	4.46	SA
Composite Mean	3.98	A	4.56	SA
Collaborative/Team Learning				
The people in our team share a common vision.	3.88	A	4.84	SA
The people in our team have open and frequent communication.	3.80	A	4.75	SA
The people in our team are open to discussing different options.	3.92	A	4.72	SA
The people in our team accept the opinions of others.	3.40	U	4.88	SA
Collaborative learning experiences are better than independent learning.	3.72	A	4.75	SA
I felt part of a learning community in my group.	4.08	A	4.61	SA
I actively exchanged my ideas with my group members.	3.92	A	4.75	SA
I was able to develop problem-solving skills through peer collaboration.	3.92	A	4.68	SA
I was able to develop new skills and knowledge from other group members.	3.92	A	4.67	SA
Collaborative learning in my group was effective.	3.96	A	4.42	SA
Composite Mean	3.85	A	4.71	SA
Grand Mean	3.92	A	4.64	SA

Note. Scale: 4.21–5.00 Strongly Agree (SA); 3.41–4.20 Agree (A); 2.61–3.40 Uncertain (U); 1.81–2.60 Disagree; 1.00–1.80 Strongly Disagree

previously uncertain item on accepting groupmates' opinions (3.40 to 4.88). The post-intervention grand mean of 4.64 represents a 0.72-point increase over baseline. Consistent with these gains, students' open-ended remarks described the group activities as effective for building trust and valuing others' input (e.g., one student reported learning to "value the opinions of others" and to "come up with a resolution" when disagreements arose; another noted enjoying, not merely completing, the activities).

Level of Collaboration during the Intervention (LCS)

Table 5 presents groups' mean LCS ratings, aggregated across all group activities administered during the intervention. Groups 1-6 were drawn from Grade 8-A and Groups 7-12 from Grade 8-B.

The composite mean of 4.12 corresponds to Level 4 (Coalition), characterized by shared ideas and resources and by all members holding a vote in group decisions. Seven of the twelve groups (58%) reached Level 5 (Collaboration), the scale's highest band, indicating

Table 5: Level of collaboration by group during the intervention

Group	Mean	Level	Description
1	3.96	4	Coalition
2	4.24	5	Collaboration
3	3.28	3	Coordination
4	4.52	5	Collaboration
5	2.20	2	Cooperation
6	4.48	5	Collaboration
7	4.69	5	Collaboration
8	4.81	5	Collaboration
9	4.16	4	Coalition

10	4.60	5	Collaboration
11	4.56	5	Collaboration
12	3.89	4	Coalition
Composite Mean	4.12	4	Coalition

Note. Scale: 4.21–5.00 Level 5 (Collaboration); 3.41–4.20 Level 4 (Coalition); 2.61–3.40 Level 3 (Coordination); 1.81–2.60 Level 2 (Cooperation); 1.00–1.80 Level 1 (Networking).

frequent communication grounded in mutual trust; only one group (Group 5) remained at Level 2 (Cooperation), suggesting that gains were not uniform across all groups.

Assessment of Group Artifacts (RSA)

Group-produced artifacts were scored by peers and the teacher against topic-specific rubrics; the two artifact types with the most complete comparative data, the apron models of the digestive system and the edible models of mitosis and meiosis, are reported in the succeeding tables.

Both artifact types received consistently favorable ratings across sections, “Advanced” for the apron models and “Proficient” for the edible mitosis/meiosis models, corroborating the SQC and LCS findings by showing that the products of group work reflected accurate content, organized presentation, and thoughtful material choices, all of which depend on groups having actually negotiated and coordinated their output rather than dividing tasks and submitting them unintegrated.

Table 6: Peer- and teacher-assessed scores for apron models of the digestive system, by section

Section	Completeness	Creativity	Accuracy	Ave.
Grade 8-A	4.11	4.33	3.83	4.09
Grade 8-B	4.25	4.25	3.75	4.08
Composite Mean	4.18	4.29	3.79	4.09

Note. Scale: 4.00–5.00 Advanced; 3.00–3.99 Proficient; 2.00–2.99 Basic; 1.00–1.99 Below Basic. Composite descriptor: Advanced.

Table 7: Peer- and teacher-assessed scores for edible models of mitosis and meiosis, by section

Section	Completeness	Creativity	Accuracy	Ave.
Grade 8-A	4.33	4.42	3.83	4.19
Grade 8-B	4.27	4.20	3.73	4.07
Composite Mean	4.30	4.31	3.78	4.13

Note. Scale: 4.21–5.00 Advanced; 3.41–4.20 Proficient; 2.61–3.40 Basic; 1.81–2.60 Below Basic; 1.00–1.80 Far Below Basic. Composite descriptor: Proficient.

Discussion

This study asked whether a single cycle of Cooperative Learning Strategies could move Grade 8 students’ collaboration skills from an uncertain baseline to a demonstrably stronger footing, and how conducting the study shaped the researcher’s own practice. Across three independent measures, self-reported attitudes (SQC), peer-rated group functioning (LCS), and rubric-assessed group artifacts (RSA), the evidence converged on a consistent answer: students who began the cycle uncertain about their collaboration skills ended it strongly endorsing group trust and collaborative learning, exhibited group behavior consistent with the two highest levels of the LCS framework in most groups, and produced artifacts that peers and the teacher judged as accurate, complete, and well-organized.

These results are consistent with the mechanisms of cooperative learning: the CLS activities in this study built in positive interdependence (a single group artifact

requiring consensus), individual accountability (peer rating via the LCS after every activity), and face-to-face promotive interaction (hands-on model construction requiring negotiation over materials and design), the same structuring conditions the Johnson and Johnson (2009) model identifies as distinguishing genuine cooperative learning from students merely sharing a table. The results also align with Hermann’s (2013) social-interdependence account: as the structured tasks made students’ goals positively interdependent, promotive interaction, encouragement, feedback, and perspective-taking appear to have followed, consistent with students’ post-intervention endorsement of items about openness to others’ opinions and shared vision.

The one item that remained “Uncertain” at baseline, whether teammates accept one another’s opinions, is notable both for what it suggests about the original problem and for how sharply it shifted (3.40 to 4.88). This pattern is consistent with the teacher’s baseline

observation that some students' names appeared on group outputs without a corresponding contribution: the specific deficit was not a lack of interaction as such, but a lack of confidence that one's input would be taken seriously by groupmates, which is precisely what positive interdependence and structured group processing are theorized to address.

At the same time, the results were not uniform. One group (Group 5) remained at the "cooperation" level of the LCS scale throughout the intervention, well below the composite. Because the design did not collect data on group composition, prior peer relationship, or within-group dynamics, this study cannot explain why that group's trajectory diverged; it does not indicate that a single intervention cycle does not guarantee uniform gains across all groups, and that teachers implementing CLS should expect to monitor and support lower-performing groups individually rather than assume a uniform effect. These findings resonate with recent Philippine studies conducted in comparable DepEd settings. Cabahug *et al.* (2024) found that junior high school teachers' weakest self-assessed collaboration competency was managing time during group activities, the same constraint that, in the present study, surfaced as the lowest-rated SQC item at baseline and plausibly as a contributing factor in Group 5's comparatively weak LCS trajectory. Saro *et al.* (2024), studying a different DepEd reading initiative, likewise found that students facing limited teacher availability leaned on peer collaboration to compensate, reporting reduced stress and improved comprehension when they could "help each other out" independently of the teacher, a pattern broadly consistent with the present study's finding that structured peer interdependence, rather than teacher presence alone, appears to drive collaboration gains. These parallel findings suggest that time-management strain and uneven teacher support are recurring features of cooperative interventions in under-resourced Philippine classrooms, and that peer-structured tasks may be a particularly cost-effective lever for addressing both.

Implications for Practice

For classroom teachers, the findings suggest that embedding collaboration activity explicitly into the structure of an activity, a shared product, defined roles, and peer accountability, rather than simply assigning students to groups, is what produced the observed gains. The five CLS activities used here required minimal specialized materials (edible and craft models, surveys, drawings) and were integrated directly into existing life-science content, suggesting the approach is transferable to other topics and, potentially, other subject areas without displacing curricular coverage.

For the researcher, the action research process itself functioned as a form of professional development consistent with the personal and professional growth domain of the National Competency-Based Teacher Standards (Salandanan *et al.*, 2013): diagnosing a genuine

classroom problem, searching the literature for an appropriate intervention, designing assessment-aligned lesson plans, and reflecting on the results are practices that extend beyond this single study's substantive findings.

CONCLUSION

This classroom action research found that a single cycle of structured Cooperative Learning Strategies, embedded in Grade 8 life science instruction, was associated with a marked improvement in students' self-reported collaboration attitudes, peer-rated group functioning, and the quality of group-produced learning artifacts. The findings support the view that collaboration, as a twenty-first-century skill, responds to deliberate instructional structuring rather than simply being an incidental by-product of group assignments, and they offer science teachers a concrete, curriculum-embedded model for pursuing that structuring.

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