

Implementation of *Falulu Fohalöwö*-Based Jigsaw to Improve Learning Outcomes and Social Skills in Natural and Social Sciences Learning

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ABSTRACT

This study aimed to describe the implementation of a *falulu fohalöwö*-based Jigsaw cooperative learning model and changes in Grade III students' learning outcomes and social skills across Classroom Action Research cycles in Natural and Social Sciences (IPAS) learning. The study was conducted in two cycles involving 21 students at UPTD SD Negeri 078081 Saombo. Data were collected through tests, observations, field notes, and documentation, and analyzed using quantitative and qualitative descriptive techniques. Learning mastery increased from 23.81% in the pre-cycle to 42.85% in Cycle I and 80.95% in Cycle II. The mean social-skills score increased from 2.82 in Cycle I to 3.70 in Cycle II, with improvements in participation, cooperation, responsibility, mutual cooperation, and respect for peers' opinions. The action was refined between cycles through clearer role allocation, stronger expert- and home-group activities, additional support for students experiencing difficulty, and more explicit reinforcement of *falulu fohalöwö* values. The findings indicate that *falulu fohalöwö*-based Jigsaw is a promising contextual approach for supporting academic learning and social interaction in the studied classroom, although the contribution of local-cultural integration cannot be isolated from the Jigsaw structure and cycle-by-cycle instructional improvements.

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INTRODUCTION

Primary education plays an important role in developing students' knowledge, skills, and character as a foundation for their development at subsequent levels of education. In the elementary school context, Natural and Social Sciences (*Ilmu Pengetahuan Alam dan Sosial* = IPAS) learning, particularly content related to social life, is directed not only toward conceptual mastery but also toward developing students' ability to interact, cooperate, communicate, respect differences, and demonstrate responsibility in communal life. Therefore, IPAS learning needs to be contextual, participatory, and closely connected to students' sociocultural environment so that academic achievement and social skills can develop in a balanced manner.

This need aligns with national education priorities, which identify collaboration, communication, independence, critical reasoning, creativity, and character formation as essential graduate competencies. Elementary education therefore should not merely position students as recipients of information; it should provide learning experiences that enable them to actively acquire, process, communicate, and apply knowledge. In IPAS learning, such experiences are particularly important because the content studied is closely related to human life, the environment, social interaction, communal values, and community life.

However, IPAS learning in Grade III at UPTD SD 078081 Saombo has not fully reflected this orientation. Initial observations showed that instruction remained predominantly teacher-centered and relied on one-way delivery of material. Students had limited opportunities to discuss, express opinions, ask questions, cooperate, and help one another understand the material. Learning content was also not optimally connected to social and cultural experiences close to students' daily lives. These conditions

were associated with suboptimal learning outcomes and social skills, particularly in active participation, cooperation, communication, respect for peers' opinions, and responsibility in group activities.

These problems indicate the need for a learning model that shifts instruction from teacher dominance toward active student engagement. One relevant model is Jigsaw cooperative learning. Aronson & Patnoe (2011) explain that Jigsaw is a cooperative learning model in which each group member is essential to achieving the group's learning goals. Students are placed in home groups, and each member studies a particular portion of the material in an expert group before returning to the home group to explain what has been learned to the other members. This structure creates positive interdependence because group success depends on each member's contribution.

Lubis & Harahap (2016) explain that Jigsaw cooperative learning assigns each student responsibility for mastering a specific portion of the material while also helping other group members understand the material as a whole. Thus, students acquire knowledge not only through teacher explanations but also through reading, discussion, explanation, questioning, responding, and cooperation with peers. Theoretically, these activities are associated with improved learning outcomes and the development of students' social skills.

Previous studies have shown that the Jigsaw model can positively affect learning processes and outcomes. Fitriani et al. (2024) found that Jigsaw can improve elementary students' IPAS learning outcomes because each student is responsible for a particular portion of the material and subsequently shares that understanding with group members. Pratiwi & Harsiwi (2024) likewise showed that Jigsaw cooperative learning can make learning more participatory because students are involved in both home-group and expert-group activities.

The benefits of Jigsaw are not limited to cognitive outcomes. Indriwati et al. (2019) showed that learning involving the Jigsaw mechanism can support the development of students' collaborative skills. Interactions during group activities give students opportunities to communicate, share responsibility, assist group members, and complete tasks together. Rachmah (2017) also reported a positive relationship between the Jigsaw method and students' self-efficacy and learning motivation. These findings suggest that Jigsaw's core characteristics—positive interdependence, individual accountability, communication, and cooperation—can support both students' academic and social development.

Nevertheless, a learning model becomes more meaningful when it is adapted to the social and cultural environment in which students grow. Local-wisdom-based learning gives students opportunities to connect learning content with the experiences, values, and practices of the surrounding community. Hazlim et al. (2024) showed that local-wisdom-based social studies learning can contribute positively to elementary students' cultural awareness. Local wisdom, therefore, can be positioned not only as learning content but also as a source of values that underpin the learning process.

Within Nias society, one social value is known as *falulu fohalöwö*. This value is associated with togetherness, mutual assistance, collective cooperation, and completing work together. Laia & Darwin (2019) identified *falulu fohalöwö* as a living value in Nias society associated with mutual cooperation. Suwartiningsih & Samiyono (2014) likewise showed that Nias local wisdom plays an important role in maintaining social relationships and harmony. The communal values embedded in Nias culture are relevant to education because they can strengthen cooperation, responsibility, care for others, and respect from the elementary-school level onward.

Conceptually, the principles of Jigsaw cooperative learning are compatible with the values of *falulu fohalöwö*. In Jigsaw, group success depends on each member's willingness to fulfill responsibilities, share knowledge, help other members, and work toward shared goals. Meanwhile, *falulu fohalöwö* emphasizes mutual assistance and cooperation in community life. Integrating these two concepts allows learning not only to develop students' knowledge but also to bring local cultural values concretely into learning activities.

A review of previous research shows that studies of the Jigsaw model have generally focused on improving learning outcomes, activity, motivation, or collaborative skills. By contrast, studies of local-wisdom-based learning have more often highlighted the use of local culture as a learning resource or as a means of strengthening character and cultural awareness. Studies of Nias society have also documented *falulu fohalöwö* as a value of mutual cooperation embedded in community life. However, these lines of research have tended to develop separately.

Accordingly, a research gap remains because few studies have specifically integrated the Jigsaw cooperative learning model with *falulu fohalöwö*, a form of Nias local wisdom, to improve both learning outcomes and social skills among elementary school students. Research on Jigsaw generally positions it as a cooperative learning strategy, while local-wisdom research more often positions culture as a learning resource or learning content. Relatively few studies have used local cultural values as a behavioral foundation throughout the stages of cooperative learning.

Based on this gap, the novelty of the present study lies in integrating *falulu fohalöwö* values into the implementation of the Jigsaw cooperative learning model. In this study, *falulu fohalöwö* is not merely introduced as knowledge about local culture; it is operationalized in the learning process through mutual assistance, knowledge sharing, fulfillment of individual responsibilities, respect for group members' contributions, cooperation, and joint completion of tasks. In this way, the Jigsaw model is contextualized through sociocultural values already familiar in the community where the students live.

Integrating Jigsaw with *falulu fohalöwö* also provides an important contextual dimension for IPAS learning. Students do not merely learn about cooperation as a concept; they experience and practice it throughout the learning process. Each group member is responsible for studying the material, sharing knowledge with peers, assisting members who experience difficulty, listening to others' opinions, and contributing to group success. This process is expected to strengthen understanding of the material while cultivating social skills relevant to students' lives.

Based on the empirical problems, theoretical foundations, previous research findings, research gap, and novelty described above, this study was conducted as Classroom Action Research (CAR). CAR was selected because systematic improvement of learning was required through the stages of planning, action, observation, and reflection. Through gradual, reflective action, the teacher can evaluate changes in the learning process and make improvements in the next cycle.

Accordingly, this study aimed to describe the implementation of a *falulu fohalöwö*-based Jigsaw cooperative learning model and examine changes in the learning outcomes and social skills of Grade III students across action cycles in IPAS learning (social studies content) at UPTD SD Negeri 078081 Saombo. The social skills emphasized in this study included participation, cooperation, responsibility, mutual cooperation, and respect for peers' opinions. Because the study was conducted as Classroom Action Research in a single class, the findings are interpreted as evidence of instructional improvement within the studied classroom rather than as isolated causal effects of *Falulu Fohalöwö* or Jigsaw.

METHOD

This study employed Classroom Action Research (CAR), implemented cyclically through planning, action, observation, and reflection. This approach was used because CAR focuses on improving learning practices through systematic, continuous action and reflection (Kemmis et al., 2014; Arikunto et al., 2019). The researcher and classroom teacher conducted the study collaboratively to improve the learning process and enhance students' learning outcomes and social skills through a *falulu fohalöwö*-based Jigsaw cooperative learning model.

The study was conducted at UPTD SD Negeri 078081 Saombo during the second semester of the 2025/2026 academic year, from April to May 2026. The participants were all 21 Grade III students, consisting of 11 boys and 10 girls. The learning material referred to Chapter VII, Stories from My Hometown, in IPAS, covering family and local community traditions, the history of traditions or cultures in Indonesia, and traditional values in Indonesia.

The action was implemented in two cycles, with two meetings in each cycle. The learning process followed the Jigsaw procedure: students were placed in heterogeneous home groups, each member was assigned a specific portion of the material, and students then joined expert groups to discuss the same material. After mastering the material, students returned to their home groups to share their knowledge with the other members. This structure positions every member as an important contributor to the group's learning success (Aronson & Patnoe, 2011). *Falulu fohalöwö* values were integrated into this process by encouraging mutual assistance, cooperation, knowledge sharing, responsibility, respect for opinions, and joint task completion. Observation and evaluation results from Cycle I were used as the basis for reflection and improvement in Cycle II.

Research data were collected through tests, observations, field notes, and documentation. Individual tests were administered at the end of each cycle to measure students' learning outcomes, while observations were used to obtain data on social skills and the implementation of learning. Tests were used to determine students' achievement after participating in the learning process (Sudjana, 2017). Social skills were observed using five indicators—participation, cooperation, responsibility, mutual cooperation, and respect for peers' opinions—on a 1–4 scale. Field notes recorded students' responses, classroom situations, and constraints encountered during the action, while activity photographs, attendance lists, students' work, and achievement scores served as supporting data.

All research instruments were validated before use. Validation focused on content validity to ensure alignment between the instruments, research objectives, learning indicators, and measured constructs (Sugiyono, 2022). Validation of the learning-outcome test covered content appropriateness, indicators, item construction, readability, and language use. Validation of the social-skills observation sheet addressed the alignment between indicators and observed behaviors as well as the clarity of the scoring rubric. The learning-implementation observation sheet was also validated to ensure that the observed aspects represented the stages of the *falulu fohalöwö*-based Jigsaw model. Feedback from the validation process was used to revise and refine the instruments before data collection.

Data were analyzed using quantitative and qualitative descriptive techniques. Learning-outcome data were analyzed by calculating students' scores, the class means, and the percentage of classical learning mastery. The mastery percentage was obtained by comparing the number of students who achieved the school's Criteria for Learning Objective Achievement (KKTP) or mastery criterion with the total number of students. Changes in learning outcomes were determined by comparing the initial condition, Cycle I, and Cycle II (Sudjana, 2017; Arikunto et al., 2019).

The integration of *falulu fohalöwö* was operationalized within the Jigsaw procedure rather than treated only as cultural content. Its values were translated into observable learning behaviors at different stages of group work, as summarized in Table 1. This operationalization was intended to align the cooperative structure of Jigsaw with the local values of togetherness, mutual assistance, shared responsibility, and respect that characterize *falulu fohalöwö*.

Table 1. Operationalization of *Falulu Fohalöwö* Values within the Jigsaw Procedure

Jigsaw Stage	Student Activity	<i>Falulu Fohalöwö</i> Value
Home-group preparation	Students receive portions of material and clarify individual responsibilities.	Responsibility and shared commitment
Expert-group discussion	Students discuss the same material, assist peers who experience difficulty, and build shared understanding.	Mutual assistance and cooperation
Return to the home group	Each student explains the material learned in the expert group to other members.	Knowledge sharing and responsibility
Home-group discussion	Students listen, respond, ask questions, and give peers space to express their understanding.	Respect for opinions and cooperation
Joint task completion	Group members complete tasks together and support members who still need assistance.	Mutual cooperation and togetherness

Source: Developed by the researchers based on the learning procedure used in the study, 2026.

Social skills were observed using five indicators on a 1–4 scale: participation, cooperation, responsibility, mutual cooperation, and respect for peers' opinions. Participation referred to students' active involvement in discussion and group activities. Cooperation referred to students' ability to perform assigned roles and coordinate task completion with group members. Responsibility referred to students' fulfillment of individual learning and group duties. Mutual cooperation referred more specifically to students' willingness to actively assist other members and contribute collectively beyond their own assigned task, reflecting the mutual-help orientation of *falulu fohalöwö*. Respect for opinions referred to listening to, acknowledging, and responding appropriately to peers' ideas. This distinction was used to reduce conceptual overlap between cooperation and mutual cooperation.

The study was considered successful if: (1) the mean learning-outcome score increased and at least 70% of students achieved the school's KKTP/mastery criterion; (2) the mean social-skills score increased and at least 70% of students were in the good or very good category; and (3) the stages of *falulu fohalöwö*-based Jigsaw learning were implemented well and students demonstrated increased participation, cooperation, responsibility, mutual cooperation, and mutual respect. These success indicators served as the basis for reflection in deciding whether to continue or terminate the action cycles (Arikunto et al., 2019).

The study followed ethical principles for educational research. The school granted permission, students' identities were kept confidential, and the research data were used for academic purposes. The action implementation continued to safeguard students' right to receive learning that was safe, comfortable, and non-harmful.

RESULTS AND DISCUSSION

The study was conducted in two cycles, each consisting of two meetings. Before implementing the action, the researchers conducted initial observations and a pre-test to provide an overview of the learning conditions, students' learning outcomes, and social skills. The results of each cycle were used as the basis for reflection and improvement in the subsequent cycle.

Students' Initial Conditions

Initial observations showed that IPAS learning in Grade III at UPTD SD Negeri 078081 Saombo remained predominantly teacher-centered. Instruction was dominated by lecturing and question-and-answer methods, while students' involvement in discussion, cooperation, expressing opinions, and mutual-help activities was still limited. Most students received information passively and were not yet accustomed to collaborative learning.

The pre-test administered to 21 students produced a class mean of 65.24, below the established *Kriteria Ketercapaian Tujuan Pembelajaran* (KKTP; Criteria for Learning Objective Achievement) score of 70. Five students (23.81%) achieved mastery, while 16 students (76.19%) did not. Initial observations also showed that students' social skills—particularly cooperation, willingness to participate, responsibility, mutual assistance, and respect for peers' opinions—had not yet developed optimally. These conditions provided the basis for implementing the *falulu fohalöwö*-based Jigsaw cooperative learning model in Cycles I and II.

Initial social-skill conditions were described qualitatively. Because no quantitative pre-cycle social-skills score is reported, numerical change is analyzed from Cycle I to Cycle II; the pre-cycle observation is used only to describe the classroom problem that motivated the action.

Students' Learning Outcomes

In Cycle I, learning was implemented by forming home groups and expert groups. Each student was responsible for studying a specific portion of the material in the expert group and then re-explaining it to members of the home group. *Falulu fohalöwö* values were applied through mutual assistance, cooperation, responsibility, and respect for opinions during group activities.

The evaluation at the end of Cycle I showed that 9 of the 21 students had achieved the KKTP, while 12 students had not. Thus, classical mastery in Cycle I reached 42.85%. This represented an improvement over the initial condition but had not yet met the study's success indicator.

Reflection on Cycle I identified several aspects that still required improvement: student participation was uneven, the distribution of group tasks was not yet optimal, discussion time was limited, some students still had difficulty understanding the material, and several students lacked confidence when explaining or presenting discussion results.

Based on this reflection, the action in Cycle II was improved by providing clearer instructions, assigning roles more systematically, offering additional support to students experiencing difficulty, strengthening expert-group and home-group activities, and applying *falulu fohalöwö* values more consistently.

Table 2. Cycle I Reflection and Improvements Implemented in Cycle II

Cycle I Reflection Finding	Improvement Implemented in Cycle II
Student participation was uneven.	Instructions and group roles were clarified, and less-active students received additional motivation.
Group-task distribution was not yet optimal.	The group assigned roles and individual responsibilities more systematically.
Discussion time and support in expert groups were limited.	Expert-group activities were strengthened, and additional time/support was provided during discussion.
Some students still had difficulty understanding the material.	The teacher provided additional assistance and clarification during group learning.
Several students lacked confidence when explaining the material.	Home-group sharing was strengthened through guidance, encouragement, and more structured opportunities to explain.
<i>Falulu fohalōwō</i> values were not yet consistently visible in all group interactions.	Mutual assistance, shared responsibility, respect, and joint task completion were reinforced more explicitly.

Source: Researchers' reflection and field notes, processed in 2026.

The Cycle II evaluation showed that 17 students achieved the KKTP, while 4 students did not. The classical mastery percentage increased to 80.95%. Table 1 presents the development of learning outcomes from the pre-cycle through Cycle II.

Table 2. Development of Students' Learning Mastery

Stage	Mastered (n)	Mastered (%)	Not Mastered (n)	Not Mastered (%)
Pre-cycle	5	23.81	16	76.19
Cycle I	9	42.85	12	57.15
Cycle II	17	80.95	4	19.05

Source: Students' test data from the pre-cycle, Cycle I, and Cycle II, processed by the researchers (2026).

Table 1 shows a gradual increase in learning mastery from 23.81% in the pre-cycle to 42.85% in Cycle I and 80.95% in Cycle II. From the pre-cycle to Cycle I, mastery increased by 19.04 percentage points, while from Cycle I to Cycle II it increased by 38.10 percentage points. Overall, learning mastery increased by 57.14 percentage points from the initial condition to Cycle II. By the end of Cycle II, the mastery percentage had exceeded the established success indicator of at least 70% of students achieving the KKTP.

Students' Social Skills

In addition to learning outcomes, this study observed the development of students' social skills across five indicators: participation, cooperation, responsibility, mutual cooperation, and respect for opinions.

In Cycle I, Meeting I, the mean social-skills score was 2.35, which was categorized as fair. One student (4.76%) was in the poor category, 12 students (57.14%) were in the fair category, and 8 students (38.10%) were in the good category. No students were yet in the very good category.

In Cycle I, Meeting II, the mean social-skills score increased to 3.28. One student (4.76%) was in the fair category, 13 students (61.90%) were in the good category, and 7 students (33.33%) were in the very good category. The overall mean social-skills score for Cycle I was 2.82, placing it in the good category.

Further improvement occurred in Cycle II. In Meeting I, the mean social-skills score reached 3.58, and in Meeting II it increased to 3.81. The overall mean social-skills score for Cycle II was 3.70, which was categorized as very good. A comparison of each social-skills indicator between Cycles I and II is presented in Table 2.

Table 2. Comparison of Students' Social Skills in Cycles I and II

No.	Indicator	Cycle I	Category	Cycle II	Category
1	Participation	2.77	Good	3.81	Very Good
2	Cooperation	2.81	Good	3.67	Very Good
3	Responsibility	2.74	Good	3.74	Very Good
4	Mutual cooperation	2.74	Good	3.62	Very Good
5	Respect for opinions	2.81	Good	3.64	Very Good
Mean		2.82	Good	3.70	Very Good

Source: Observation results of students' social skills in Cycles I and II, processed by the researchers (2026).

As shown in Table 2, all social-skills indicators improved from Cycle I to Cycle II. The greatest increase occurred in participation, from 2.77 to 3.81. Responsibility increased from 2.74 to 3.74, cooperation from 2.81 to 3.67, mutual cooperation from 2.74 to 3.62, and respect for opinions from 2.81 to 3.64.

Overall, the mean social-skills score increased by 0.88 points, from 2.82 in Cycle I to 3.70 in Cycle II. The shift in category from good to very good indicates the development of students' social skills during the implementation of the action.

Action Outcomes

By the end of Cycle II, classical learning mastery reached 80.95%, exceeding the minimum threshold of 70% established for mastery. The mean social-skills score also increased from 2.82 in Cycle I to 3.70 in Cycle II, and all five observed indicators were classified as very good in Cycle II. These findings provided the practical basis for concluding the action after Cycle II.

The improvement from Cycle I to Cycle II should be understood within the reflective structure of Classroom Action Research. The second cycle did not merely repeat the first; it incorporated clearer instructions, more systematic role allocation, stronger expert- and home-group interaction, additional support for students experiencing difficulty, and more explicit reinforcement of *falulu fohalöwö* values. Thus, the results reflect the combined effect of the learning model and cycle-by-cycle instructional refinement within the studied classroom.

Discussion

The findings show that improvements in learning mastery and social skills occurred across the implementation of *falulu fohalöwö*-based Jigsaw and the reflective refinements made between action cycles. Learning mastery rose from 23.81% in the pre-cycle to 42.85% in Cycle I and 80.95% in Cycle II, while the mean social-skills score increased from 2.82 in Cycle I to 3.70 in Cycle II. Rather than attributing these changes automatically to a single element, the findings are interpreted as the outcome of a classroom intervention in which the Jigsaw structure, local-cultural values, teacher support, and improvements made after Cycle I operated together.

Improving Learning Outcomes through Falulu Fohalöwö-Based Jigsaw Learning

The increase in learning mastery from the pre-cycle to Cycle II indicates a shift after instruction moved from a predominantly teacher-centered pattern to one that placed greater responsibility on students. Within the Jigsaw structure, students do not merely receive material from the teacher; they must study a particular portion in an expert group and then explain it to members of their home group. The home-group and expert-group structure is a defining characteristic of Jigsaw, positioning each member as a learning resource for the others (Aronson & Patnoe, 2011).

This mechanism may help explain the learning outcomes found in this study. When students act as "experts," they must understand the material before presenting it to their home group. Reading, discussing, reorganizing their understanding, explaining, and answering peers' questions provide a more active learning experience than merely listening to teacher explanations. Jeppu et al. (2023) showed that task distribution in Jigsaw creates both individual responsibility and responsibility for group learning; students also reported that teaching material to peers helped improve understanding and knowledge retention.

The findings can also be understood through the principles of positive interdependence and individual accountability in cooperative learning. The success of the home group depends on each member's ability to understand and communicate the portion of material for which they are responsible. Students therefore have a reason to master the material while simultaneously helping group members reach a shared understanding. Studies of cooperative learning show that structures that foster positive interdependence and individual accountability are important elements of group learning activities.

These findings align with the broader research trend showing a positive relationship between cooperative learning and academic achievement. A second-order meta-analysis published in 2026 found that, overall, cooperative learning is associated with improvements in academic achievement and higher-order thinking skills, although the magnitude of the effect may vary according to learning conditions and study characteristics. These findings strengthen the argument that structured collaborative learning activities can provide conditions that support the development of students' understanding.

Nevertheless, the improvement found in this study should not be explained as an automatic consequence of using Jigsaw. Cochon Drouet et al. (2023), in a systematic review of 69 Jigsaw studies, found substantial variation in learning achievement, motivation, social relationships, and self-esteem. Jigsaw effects may be influenced by the type of material, student characteristics, group size, and implementation quality. This is relevant to the present study because the larger improvement occurred only after reflection and improvements were carried out in Cycle II.

In Cycle I, some students remained inactive, role distribution was uneven, discussion time was not yet optimal, and several students lacked confidence when explaining the material. Following reflection, Cycle II was conducted with clearer instructions, more systematic allocation of responsibilities, more intensive support, stronger expert-group activities, and additional motivation for less active students. Thus, the increase in mastery from 42.85% to 80.95% was related not only to the use of the Jigsaw model but also to improved implementation quality based on the Cycle I reflection. This finding also illustrates CAR as a continuous process of instructional improvement.

Improvement in Students' Social Skills

Students' social skills also improved. The mean social-skills score increased from 2.82 in Cycle I to 3.70 in Cycle II. All indicators improved: participation from 2.77 to 3.81, cooperation from 2.81 to 3.67, responsibility from 2.74 to 3.74, mutual cooperation from 2.74 to 3.62, and respect for opinions from 2.81 to 3.64. Thus, the change did not occur in only one dimension of social behavior but was distributed relatively evenly across the five indicators observed.

This development is associated with the Jigsaw learning structure, which requires repeated interaction among students. Students move from their home groups to expert groups, engage in discussion, share information, listen to peers' explanations, return to their home groups, and take responsibility for explaining the material. These interactions provide direct opportunities to practice communication, cooperation, responsibility, and respect for group members' contributions.

Jeppu et al. (2023) found that Jigsaw learning was accompanied by development in individual accountability, interdependence, interpersonal skills, communication, teamwork, and consensus-building. Their study also showed that students learned to listen to others' views, share tasks, and work together toward group goals. Although the context and educational level differed from those of the present study, the interaction mechanisms at the core of Jigsaw provide a relevant explanation for the development of social skills among Grade III students.

The greatest increase in this study occurred in the participation indicator. This may be linked to the nature of Jigsaw, which gives each member a role that is difficult to replace. Students cannot remain entirely passive because they are responsible for a portion of the material that must be understood and shared. The clearer role distribution in Cycle II gave each student greater opportunity to participate in discussion. This pattern may also explain the increase in responsibility, because individual tasks in the expert group were directly linked to the home group's success.

Meanwhile, improvements in cooperation, mutual cooperation, and respect for opinions indicate that group learning produced not merely physical interaction but increasingly functional interaction. Students began helping one another, listening to peers' explanations, completing tasks together, and giving other members space to communicate their understanding. In other words, cooperative learning

provides opportunities to learn social skills through practice, rather than only through explanations about the importance of cooperation.

The Role of Falulu Fohalöwö as a Contextual Foundation for Learning

One characteristic that distinguishes this study from conventional applications of Jigsaw is the integration of *falulu fohalöwö* values. In the social traditions of Nias society, *falulu fohalöwö* is associated with mutual cooperation and togetherness. Laia and Darwin identified *falulu fohalöwö* as one of the living values in Nias society and interpreted it in the context of mutual cooperation. Suwartiningsih and Samiyono likewise demonstrated the importance of local wisdom in maintaining relationships and social harmony in Nias society.

In this study, *falulu fohalöwö* was not used merely as cultural content discussed by students; it was also translated into learning behaviors such as helping one another, cooperating, sharing responsibility, listening to other members, and completing group work together. This positioning matters because it allows local culture to serve as a foundation for action in learning rather than merely as an object of knowledge.

Integrating local cultural values aligns with the growing development of learning approaches that position students' experiences and cultural environments as part of the educational process. Niman (2025), in a study of local-culture integration in elementary social studies, found that contextualizing local culture in learning can support social awareness, social relationships, and responsible decision-making. The study also emphasized that local culture can serve a broader function than merely cultural-preservation content because local values and practices can build students' social-emotional competencies.

These findings are relevant to the present study. The cooperation required by the Jigsaw structure has a cultural counterpart in *falulu fohalöwö*. When students are asked to help one another and take responsibility for group members, these behaviors are not introduced as entirely unfamiliar values but are connected to principles of togetherness within their sociocultural environment. The alignment between the cooperative structure of Jigsaw and *falulu fohalöwö* values can therefore be viewed as one context that makes group activities more meaningful for students.

The contribution of this study lies in moving from learning about culture toward learning through cultural values. *Falulu fohalöwö* was not positioned merely as information about Nias culture; its values were translated into behaviors expected during cooperative learning. Responsibility in mastering assigned material, mutual assistance in expert groups, knowledge sharing in home groups, respect for peers' contributions, and joint task completion provided a culturally recognizable behavioral foundation for Jigsaw activities. In this sense, the pedagogical contribution can be summarized as:

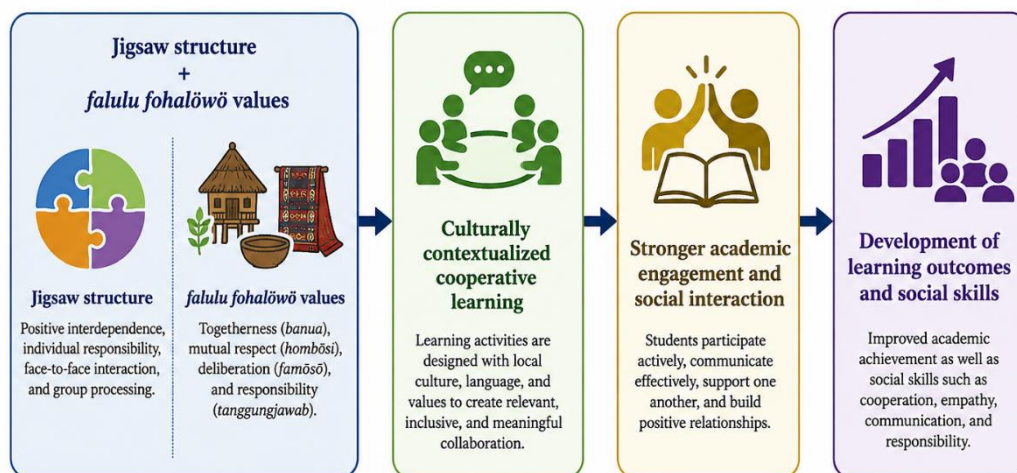


Figure 1. Pedagogical Contribution of *Falulu Fohalöwö*-Based Jigsaw Learning
Source: Developed by Author based on the study findings, 2026

However, the present findings do not demonstrate that *falulu fohalöwö* independently caused the observed changes. The study did not compare *falulu fohalöwö*-based Jigsaw with Jigsaw without local-cultural integration, and the action itself was refined between cycles. The contribution of *falulu fohalöwö* is therefore more appropriately interpreted as a contextual and behavioral foundation that was pedagogically aligned with the cooperative structure of Jigsaw. Stronger causal evidence would require comparative or experimental research designs.

The Relationship between the Development of Learning Outcomes and Social Skills

The findings also show that academic development occurred alongside social skill development. This makes sense because, in Jigsaw learning, acquiring knowledge depends strongly on the quality of interaction among students. For knowledge sharing to work, students need to listen, communicate, take responsibility, and cooperate.

Accordingly, learning outcomes and social skills in this study need not be viewed as two entirely separate outcomes. As participation and responsibility increase, students have greater opportunities to process and communicate the material. As cooperation and respect for opinions develop, knowledge exchange between expert groups and home groups can proceed more smoothly. Conversely, academic tasks that require each student to become a source of knowledge for peers provide an authentic context for practicing social skills.

These findings are consistent with cooperative-learning literature showing that cooperative approaches can be associated with both cognitive outcomes and noncognitive dimensions. Recent meta-analytic evidence indicates that the benefits of cooperative learning may be observed in academic outcomes, thinking skills, and various affective dimensions, although results continue to be influenced by implementation characteristics and the learning context.

In this study, this relationship is evident in the changes from Cycle I to Cycle II. After role allocation, communication, support, and group work improved, social skills increased, and learning mastery also increased during the same period. Because the study used a descriptive CAR design, this relationship cannot be interpreted statistically as causal. Nevertheless, the pattern suggests that improvements in the quality of learning interactions occurred alongside improvements in academic achievement.

Contributions and Implications of the Findings

This study contributes by contextualizing Jigsaw through *falulu fohalöwö* values in elementary IPAS learning. Rather than using local wisdom solely as subject matter, this study sought to operationalize local cultural values in students' learning behaviors. The study embedded values of mutual cooperation, mutual assistance, responsibility, and respect for others in expert-group and home-group activities.

From a pedagogical perspective, the findings suggest that local-culture-based learning can be developed not only by teaching culture but also by learning through cultural values. This distinction is important. In the first approach, culture is the content of learning; in the second, cultural values help shape how students interact and learn. Niman (2025) also showed the value of integrating local culture into elementary social studies to create more contextual learning experiences and support social-emotional development.

The practical implication is that Jigsaw implementation should include clear role allocation, sufficient time for expert groups, support for students who experience difficulty, and reflection on the quality of group interaction. The Cycle I findings showed that simply forming groups and following Jigsaw procedures was not sufficient; implementation quality determined the extent to which students genuinely participated. This aligns with systematic-review evidence showing that Jigsaw outcomes vary by implementation conditions, student characteristics, and the material studied.

Overall, the study shows that implementing a *falulu fohalöwö*-based Jigsaw cooperative learning model, refined through reflection across cycles, was accompanied by improvements in Grade III students' learning outcomes and social skills. The findings support using cooperative learning contextualized within students' culture and demonstrate the potential of Nias local wisdom to be integrated as a value in learning practice. However, because the study was conducted as CAR in a single

class without a comparison group, the findings should be understood as evidence of successful action within the studied classroom context rather than as broadly generalizable causal evidence.

Limitations and Directions for Future Research

This study has several limitations. First, it was conducted as Classroom Action Research in one class of 21 students at a single school; therefore, the findings primarily describe the success of the action in the classroom studied and cannot yet be generalized broadly. Second, the study was conducted in only two cycles and four meetings, so it cannot describe the long-term sustainability of changes in students' learning outcomes and social skills. Third, no comparison group was used, meaning that the contribution of the Jigsaw model and the integration of *falulu fohalöwö* values cannot be separated or compared causally. Fourth, social skills were measured primarily through observation during the learning process, so the assessment remained dependent on students' observable behavior in the classroom setting.

Future studies should involve larger and more diverse groups of students and educational institutions, including schools with different social and cultural characteristics, to examine the model's applicability in broader contexts. Subsequent research could also use quasi-experimental or experimental designs comparing *falulu fohalöwö*-based Jigsaw learning, Jigsaw without local-cultural integration, and conventional learning. Such designs could provide stronger evidence regarding the specific contribution of local-cultural integration to learning outcomes and social skills.

In addition, longitudinal studies could examine whether social skills develop and are sustained after the learning intervention ends. Social-skills measurement could also be strengthened by combining observation, peer assessment, self-assessment, interviews, or standardized instruments. Future research may further explore the application of *falulu fohalöwö* values across other subjects, grade levels, or cooperative learning models, thereby supporting the development of a broader and empirically tested Nias local-wisdom-based learning framework.

CONCLUSION

The implementation of a *falulu fohalöwö*-based Jigsaw cooperative learning model was accompanied by improvements in the IPAS learning process, learning mastery, and social skills of Grade III students at UPTD SD Negeri 078081 Saombo across the action cycles. Learning mastery increased from 23.81% in the pre-cycle to 42.85% in Cycle I and 80.95% in Cycle II, exceeding the study's minimum classical-mastery threshold by the end of Cycle II. Students' mean social-skills score increased from 2.82 in Cycle I (good) to 3.70 in Cycle II (very good), with improvement across participation, cooperation, responsibility, mutual cooperation, and respect for peers' opinions.

The Cycle II results were achieved after reflective improvements that included clearer role allocation, stronger expert- and home-group discussions, additional teacher support, greater encouragement for less-active students, and more explicit reinforcement of *falulu fohalöwö* values. The study therefore illustrates how local cultural values can be integrated not only as learning content but also as a behavioral foundation for cooperative learning. In this implementation, *falulu fohalöwö* was manifested through mutual assistance, shared responsibility, knowledge sharing, respect for group members' contributions, and joint task completion.

Accordingly, *falulu fohalöwö*-based Jigsaw can be considered a promising contextual approach for supporting academic learning and social interaction in elementary IPAS classrooms. However, because the study was conducted as Classroom Action Research in one class without a comparison group, the findings should be understood as evidence of successful instructional improvement within the studied context rather than as definitive evidence that *falulu fohalöwö* or Jigsaw independently caused the observed changes.

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