Group work in primary school - cooperation, collaboration and beyond

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Abstract
Group work is widespread in Danish schools yet recurrently marked by challenges of participation and coordination. Moreover, "group work" is not a single, stable practice but unfolds across instructional configurations with varying interdependence and digital mediation; an issue central to Networked Learning's focus on evolving connections between learners, tasks, and technologies. Drawing on year-long ethnographic fieldwork in an 8th-grade class, including observations, video and screen recordings, and interviews, the study analyses how students organise contact and manage task complexity in Danish and biology. Building on Strauss's concept of articulation work, we show that students continuously regulate contact in response to perceived task demands. Cooperation and collaboration emerge not as fixed categories but as fluid organisational modes through which students balance dependency, workload, and coordination. The analysis also identifies two additional forms that exceed this distinction. In codistribution, responsibility is shared yet differentiated, allowing subsets of a group to collaborate closely while maintaining looser cooperative alignment across the subgroups. In copresence, students work side by side within a shared social frame while primarily engaging in individual task completion, drawing on peers only intermittently. Together, collaboration, cooperation, codistribution, and copresence constitute the Co-4 model. The model conceptualises group work as a dynamic balancing of contact and complexity and offers a refined analytical lens for understanding networked learning processes in classroom practice.

Keywords
Group work, Problem-based learning, Classroom interaction, Articulation work, Task complexity, Coordination, CSCL, CSCW, Networked learning

Introduction

Group work is a central organisational form in Danish primary schools (TALIS, 2019) and is commonly associated with shared knowledge construction and dialogue. At the same time, research documents recurring challenges, including unequal participation and coordination difficulties (Theobald et al., 2017; EVA, 2020). Rather than attributing such issues to students' individual abilities, classroom studies show that collaboration depends on what unfolds between students - how ideas are taken up and developed in interaction (Barron, 2003). The key analytical task is therefore to examine how collaborative activity is organised in practice.

Recent large-scale research suggests that "group work" in Denmark is not a single, stable practice. Across Danish, science, and mathematics classrooms, it appears within different instructional profiles, ranging from procedural task-solving to inquiry-oriented activities (Bundsgaard et al., 2026). Group work thus functions as an organisational frame accommodating diverse interactional patterns and degrees of interdependence. Rather than seeking an ideal template, research must distinguish between organisational modes as they emerge in concrete situations.

This challenge is particularly salient within Networked Learning, which conceptualises learning as emerging through connections between learners, teachers, resources, and technologies (Goodyear et al., 2004; Hodgson et al., 2012; Networked Learning Editorial Collective, 2021). In Danish classrooms, collaborative activity is frequently digitally mediated (ICILS, 2019). While Networked Learning has foregrounded relational and sociomaterial configurations, further differentiation of how such connections are organised in everyday group work can deepen our understanding of networked activity in practice. This article therefore contributes by foregrounding students' organisation of collaboration across varying degrees of interdependence and technological mediation.

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Educational research commonly distinguishes between cooperation and collaboration (Dillenbourg, 1999). Collaboration involves joint engagement in shared meaning-making under high interdependence, whereas cooperation refers to distributed subtasks within a shared goal. Although analytically useful, this distinction does not capture the full range of organisational forms observed in classroom interaction.

Drawing on year-long ethnographic fieldwork, the study examines how 8th-grade students organise group work in relation to task complexity. The guiding questions are: **How do students organise group work, and how do they navigate task complexity in collaborative activity?** Extending earlier analyses of contact intensity (Karnøe, 2026), the study identifies four organisational modes of group work.

Building on Strauss's concept of articulation work, the analysis shows that students shift between different ways of organising contact and complexity. Alongside cooperation and collaboration, two additional forms - codistribution and copresence - are introduced and integrated into the four-part Co-4 model.

Theoretical background

This article adopts a process-oriented perspective on group work, approaching collaboration not as a stable instructional format but as an ongoing accomplishment enacted in situated interaction (Reinert et al., 2025). Within this perspective, the distinction between cooperation and collaboration (Dillenbourg, 1999) is treated as an analytical starting point rather than a fixed typology, allowing us to examine how these forms are enacted and transformed in practice.

To examine this processual dimension, the analysis draws on Anselm Strauss's (1988, 1993) concept of articulation work. Articulation refers to the continuous coordination required to align actions, distribute responsibilities, and sustain collective activity. Rather than treating collaboration as a stable state, Strauss conceptualises collective work as an alternation between action (task-oriented performance) and interaction (the negotiation and organisation of that performance). Research on classroom dialogue similarly emphasises that productive collaboration depends on how participants build on and respond to one another's contributions over time (Mercer, Hennessy, & Warwick, 2019). From this perspective, collaborative learning can be understood as a process of "interthinking," where shared reasoning is accomplished through talk and joint attention (Littleton & Mercer, 2013).

From this perspective, the organisation of group work depends on the relation between task complexity and interpersonal contact (see also Karnøe, 2026). Recent classroom studies likewise demonstrate how students orchestrate group work in relation to technological arrangements and perceived task demands (Sørensen, 2022). As complexity increases, coordination demands intensify, often requiring more explicit articulation. Conversely, groups may reduce complexity or limit contact to maintain progress. Articulation may be explicit, through verbal negotiation, or implicit, through tacit monitoring and adjustment. Breakdowns occur when coordination fails, prompting renewed efforts to re-establish alignment.

This framework shifts the analytical focus from predefined categories of collaboration to the situated balancing of contact and complexity. It thus provides a basis for examining how different organisational forms emerge in practice, including forms that cannot be fully described within the traditional distinction between cooperation and collaboration.

While CSCL research has primarily focused on knowledge construction (Dillenbourg, 1999), CSCW has developed a more detailed vocabulary for analysing the coordination of collective activity (Strauss, 1993). Bringing these perspectives together allows classroom group work to be examined both as a learning activity and as an organised form of collective work. In this study, analytical attention is directed towards how students organise activity in practice, while learning goals remain in the background.

Research method and empirical setup

The study is based on year-long ethnographic fieldwork in an 8th-grade class in a Danish lower secondary school. Rather than treating collaboration as a predefined category, group work is approached as a situated

organisational accomplishment observable in participants' concerted activity (McDermott, Gospodinoff & Aron, 1978).

Data include participant observation, video recordings of group work, screen recordings of students' digital activity, and focus group interviews. The analysis draws on material from the second half of the fieldwork, when recording practices were routinised and students organised work with limited teacher intervention.

Two groups were selected for analytical contrast:

Table 1: Overview of the two groups

Group A	Anna (F), Bjork (F), Chris (M)	Group B	Daisy (F), Erik (M), Frederik (M)

Both groups were recorded in Danish and biology, allowing comparison across tasks with different degrees of duration, interdependence, and digital mediation.

In Danish, students analysed rhetorical appeals during two 90-minute sessions. One task used a shared Word template; the other required individual submissions in MeeBook. In biology, students completed a 14-day problem-based project on plastic materials, working individually in digital templates but presenting collectively.

These differences in submission format, task duration, and digital setup created varying configurations of dependency and coordination demands. This variation provided the empirical basis for examining how students shifted between organisational forms of group work.

All focal sessions were video- and screen-recorded. The analysis follows a multimodal interactional approach (Davidsen & Ryberg, 2017), examining how collaboration is articulated through talk, embodied conduct, and digital artefacts. Inspired by Strauss's concept of articulation work (1988, 1993), episodes were selected where shifts in coordination and task complexity became interactionally visible. The aim is analytical generalisation through conceptual development rather than representational claims.

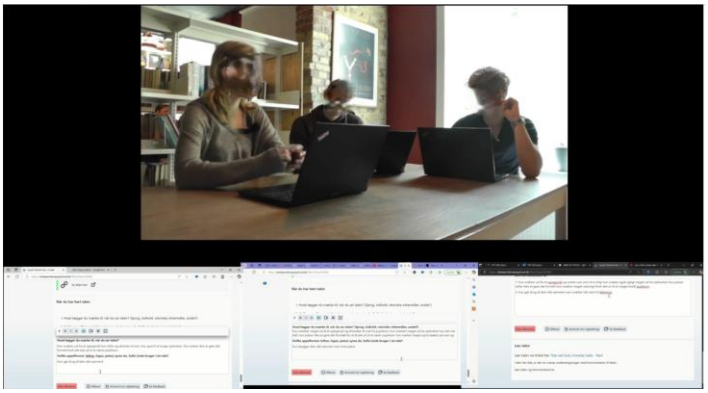

Figure 1: Photo from edited recording of group A (Anna, Bjork and Chris), who are working with appeal forms in individual documents at the school library. Under each student you see the image of the screen recording.

Analysis - Articulation of Collaboration and Cooperation

In the analysis, we examine how the two groups organise their work in relation to perceived task complexity. We choose to first look at the group work in Group A followed by B. Through the alternation between action and interaction, the groups' organization of collaboration changed during the group work-processes. Thus, there was not a static way they interacted. Therefore, the included observations will serve as examples rather than full descriptions.

Collaboration in Group A

In Danish, Group A worked on rhetorical appeals using individual documents. The teacher had not instructed them on how to collaborate. During the task, the group became uncertain about the definitions, and Anna said, "Give me a second." Bjork and Chris remained silent while Anna searched online.

Anna's request functions as an explicit articulation of coordination. Her utterance signals a desire to synchronise pace, and the others' silence indicates acceptance. This move effectively increases interdependence: although they are working in separate documents, the group aligns their progress. By choosing to follow one another's tempo, they complicate the task beyond what is formally required.

```
Anna:    Pathos, emotions and feelings. Logos logic and reasoning
Chris:   See, I said there was pathos
Anna:    Well, doesn't she use a little bit of everything?
Chris:   I said there was pathos
Anna:    She use them all
Bjork:   Yes, but mostly pathos
Anna:    She makes use of them all
Chris:   Buuuuuut, mostly pathos
Anna:     ... all of them
```

The teacher had not required identical answers. Yet the group seeks alignment. They discuss and negotiate before writing individually. The self-imposed demand for agreement increases task complexity, as disagreement emerges around whether the speech primarily uses pathos or all appeals. Screen recordings show that Anna writes that the speaker uses all appeals, while Bjork and Chris emphasise pathos. Had they been required to submit a single document, the disagreement might have resulted in breakdown. The potential conflict is momentarily diffused when Anna shifts topic, "Have you got exciting plans for the summer?", before they return to the task and continue seeking alignment.

In this sequence, collaboration is not simply given by the task design. Rather, the group actively intensifies contact and increases interdependence. They voluntarily move towards higher complexity by insisting on shared answers, thereby amplifying the need for articulation.

Codistribution in Group A

In biology, the group is tasked with selecting a plastic product, investigating its material properties, and later proposing an alternative. The initial phase requires agreement, and the group collaboratively decides to investigate toothbrushes. At this point, their organisation resembles the collaborative pattern observed in Danish.

A shift occurs after the teacher's plenary round and the subsequent break. Chris leaves the classroom carrying a ball under his arm and joins the other boys outside, while Anna and Bjork remain seated and continue working. During the break, the pair alternates between reading questions aloud and proposing answers, writing them down together. When Chris returns, he inserts Anna and Bjork's answers into his own document and then continues working independently in silence, while the two remain in close dialogue.

From this moment, the organisation of work changes. Anna and Bjork collaborate intensively, maintaining continuous verbal interaction and monitoring each other's writing. Their close coordination can be understood as a response to perceived task complexity; they appear uncertain and therefore increase contact to sustain progress. Chris, by contrast, seems comfortable proceeding alone. He works individually but intermittently monitors the group's position:

```
Chris:   Well, aren't we almost at that module two by now?
Bjork:   We haven't even started module one yet. (looks over at Chris's
         screen)
Chris:   I'm done with that
Anna:    (gaze at Bjork) We've already done that one
Bjork:   What?! (looks over at Anna's screen)
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Anna:     Yeah, we've already done that part
Chris:    Oh... (looks back at his own screen)
Anna:     We've already finished the first one, but we still need the
          one called module two, and we've already done a little bit of
          that one too.
```

Here, the group maintains alignment without engaging in full joint negotiation. Anna and Bjork operate as a collaborative pair, while Chris works in parallel. Interdependence persists, but it is organised differently: internally, within the pair, work is collaborative; externally, between Chris and the pair, coordination takes a cooperative form. Chris' status checks function as implicit articulation, ensuring that he neither advances too far nor falls behind.

This organisational pattern cannot be fully described as collaboration, since not all members engage in shared meaning-making. Nor is it simple cooperation, as responsibility is not cleanly divided into independent subtasks. Rather, the group distributes responsibility across differentiated positions: collaborative work within the pair and cooperative alignment across the group.

This pattern can be described as codistribution. Codistribution denotes a shared but distributed organisation of group work in which tasks and responsibilities are differentiated, often allowing subsets of the group to collaborate closely, while coordination across the group is maintained through periodic monitoring and selective interaction. It represents a hybrid form in which collaboration and cooperation coexist within the same group structure. In this case, Anna and Bjork intensify contact to manage perceived complexity, whereas Chris maintains looser contact while still aligning with the group's overall trajectory.

Cooperation in group B

In Danish, Group B worked on rhetorical appeals in a shared document that was to be submitted collectively. The task required interdependence, as all answers appeared in the same file. Although the group was known from fieldwork to be minimally talkative, coordination was nevertheless present.

The work begins when Erik says "Okay," and Frederik replies "Yes." Without further discussion, all three begin writing. What initially appears as contactless work is revealed through screen recordings as implicitly articulated cooperation. As one student places the cursor in a response field, the others move to different questions, silently distributing responsibility. The group progresses chronologically through the document, monitoring one another's contributions and occasionally revisiting earlier answers to add detail.

A brief interruption illustrates this pattern:

```
Frederik: What kind is it?
Erik:     (leans over and looks at Viktor's computer)
Daisy:    (stops typing and looks in the direction of the other two)
Erik:     Uh (looks back at his own computer, then back at Viktor's)
Frederik: Is it low style?
Erik:     Yeah, kind of. I mean, it's pretty straightforward. Maybe a
          bit of youthful language, too.
Frederik: Yeah.
```

The exchange remains short and task-focused. Daisy observes but does not join the discussion. After the confirmation, the students return to writing without further negotiation.

Here, cooperation is sustained through implicit coordination within a shared artefact. Although verbal interaction is sparse, interdependence is clear: the shared document requires distributed but aligned contributions. Contact is minimal yet functionally sufficient to maintain collective progress. Similar findings are reported by Lee, Tatar, and Harrison (2012), who demonstrate that coordination in collaborative work may unfold through subtle and often silent micro-adjustments rather than explicit negotiation.

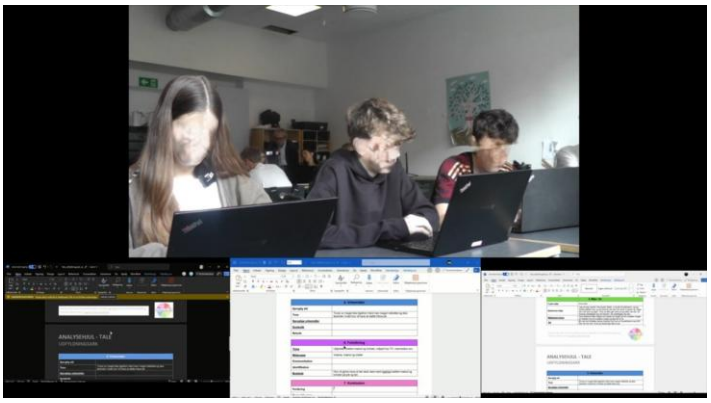

Figure 2: Daisy, Erik and Frederik work cooperatively in the same document in the Danish class.

Copresence in Group B

In biology, Group B is seated around a table in the library. They have chosen disposable cutlery as their shared object of investigation, but at this stage each student is answering general questions about plastic in their individual digital documents. Although the task is formally organised as group work, the questions can be completed independently and do not require shared answers or coordinated progression.

Unlike Group A, who organised their work through codistribution, Group B does not attempt to align responses or synchronise pace. Each student focuses primarily on completing their own document. The group setting nevertheless provides a shared frame: they sit together, work in parallel, and occasionally orient to one another.

This becomes visible when Daisy asks:

```
Daisy:   Should we do the carbon cycle or what? (looks towards Frederik)
Frederik:(leans over toward Daisy's screen and looks at it)
Erik:    (replies without looking up) You just find a model on the
         internet and copy it in.
Daisy:   (responds while looking down at her screen) Okay.
```

Daisy's question is directed toward the group, yet the response is brief and instrumental. Erik answers without looking up, offering a solution that allows Daisy to continue independently. There is no extended negotiation, no attempt to establish shared interpretation, and no effort to ensure that the others adopt the same approach. The purpose of the exchange is not alignment but progression.

Throughout the session, similar brief interactions occur. Students occasionally seek clarification or confirmation, but the exchanges remain short and task-specific. Contact functions as a resource to overcome momentary uncertainty rather than as a means of constructing shared understanding. Interdependence is minimal; although the group will later present a collective product, the ongoing work is experienced and enacted as individual.

This organisational form can be described as copresence. Copresence denotes a situation in which students work side by side within a shared group structure but with limited mutual dependency. The group provides proximity and potential access to assistance, yet the primary orientation is toward one's own task rather than toward coordinating collective activity. Contact is intermittent and instrumental, and complexity is managed individually rather than through intensified interaction.

In this case, the group does not seek to increase interdependence or establish common answers. Instead, the shared setting enables each student to proceed with an individual project, drawing on others only when necessary to move forward.

Discussion

The analysis shows that cooperation and collaboration remain analytically useful but insufficient for capturing the organisational variation observed in everyday group work. Across the cases, students modulate their engagement in response to perceived task complexity, shifting between intensified organisation and more distributed forms of contact. Rather than representing fixed categories, the four forms identified in the analysis – collaboration, cooperation, codistribution, and copresence – describe different ways of balancing interdependence and autonomy in practice.

The Co-4 model synthesises this variation by positioning the forms along two axes: contact and complexity. Collaboration emerges where interdependence is high and students intensify interaction to negotiate shared understanding. Cooperation reflects distributed responsibility within a shared task structure. Codistribution occupies an intermediate position, where subsets of the group collaborate closely while maintaining looser cooperation with others. Copresence marks situations of low interdependence, where students work primarily on individual tasks within a shared social frame, drawing on peers only when necessary to progress.

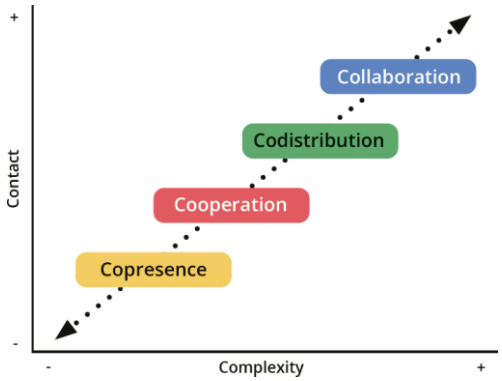

Figure 3: The Co-4 model shows the four patterns of group work determined by contact and complexity.

Importantly, the forms should not be understood as hierarchical or normative. As shown in earlier work (Karnøe, 2026), contact intensifies selectively in situations of perceived risk or ambiguity. The present study extends this by identifying differentiated organisational forms emerging from such modulation. In Group A, students during the Danish class voluntarily increased complexity by insisting on shared answers, thereby intensifying contact. In Group B, low interdependence allowed work to proceed in parallel with only intermittent coordination. The diagonal dynamic of the model thus illustrates how increases in perceived complexity tend to prompt greater contact, while reduced complexity permits looser forms of organisation.

By extending the established cooperation–collaboration distinction, the Co-4 model offers a more differentiated vocabulary for describing how group work is actually organised. It highlights that students are not merely positioned within predefined instructional formats, but actively regulate contact and coordination in response to task conditions. This perspective foregrounds group work as an emergent and situational accomplishment rather than a stable pedagogical form.

Conclusion

This article set out to examine how 8th-grade students organise group work and how they relate to task complexity in collaborative practice. The analysis shows that students do not operate within fixed modes of cooperation or collaboration. Rather, they continuously regulate contact and interdependence in response to how demanding the task appears.

While cooperation and collaboration remain analytically relevant, the empirical material demonstrates that they are insufficient to describe the full range of organisational patterns observed in everyday classroom interaction. To address this limitation, the article introduced two additional concepts: codistribution and copresence. Codistribution captures situations in which responsibility is distributed across differentiated positions, allowing subsets of a group to collaborate closely while maintaining looser coordination across the group. Copresence describes forms of parallel work in which students share a social setting but engage primarily in individual task completion, drawing on peers only intermittently.

Together, the four forms constitute the Co-4 model, which conceptualises group work as a dynamic balancing of contact and complexity. The model highlights that students actively shape the degree of interdependence in their work rather than merely enacting predefined instructional formats. Networked learning emphasises that learning emerges through connections between learners, technologies, and activities. The present analysis adds nuance by showing how these connections are dynamically reorganised as students respond to changing task demands. Group work thus appears not as a stable pedagogical arrangement, but as an emergent and situational accomplishment.

Future research may further explore how shifts between collaboration, cooperation, codistribution, and copresence are enacted and negotiated in real time through multimodal interaction and sociomaterial arrangements, and how students themselves orient to these changing configurations of contact and complexity in everyday classroom practice.

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