

# Task Regulation and Communication of High- and Low-performing Groups during the Execution of Collaborative Tasks\*

[English Version]

Regulación de la tarea y la comunicación en grupos de bajo y alto rendimiento durante la ejecución de tareas colaborativas

Regulação da tarefa e da comunicação em grupos de baixo e alto desempenho durante o desenvolvimento de tarefas colaborativas

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## Abstract

**Objective:** This paper reports the findings of a regulation task and communication during the development and execution of collaborative tasks in both high- and low-

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performing groups. **Methodology:** A qualitative and interpretative approach with a multiple-case study design was employed (Yin, 2006). The study examined interaction episodes related to the social regulation of tasks and communication captured in video recordings. The study involved the participation of first-semester students pursuing an online master's degree in education in the city of Manizales, Colombia (n= 15). Participants were organized into five spontaneously formed groups. **Results:** Findings revealed differences in both task regulation and communication. This promoted an understanding of the group dynamics concerning task regulation and communication and their influence on academic success. **Conclusions:** High-performing groups demonstrated task regulation and communication features, offering insights into academic success and the development of genuinely collaborative tasks.

**Key words:** collaborative learning; task regulation; communication regulation (UNESCO Thesaurus of Educational Psychology).

## Resumen

**Objetivo:** se reportan los hallazgos de una investigación en la que se tuvo por objetivo examinar la regulación de la tarea y de la comunicación, durante el desarrollo y ejecución de tareas colaborativas en grupos de alto y bajo rendimiento. **Metodología:** se optó por un enfoque cualitativo de tipo interpretativo con diseño de estudios de casos múltiple (Yin, 2006). Para el estudio se analizaron episodios de interacción relacionados con la regulación social de la tarea y la comunicación registrados en grabaciones de video. El estudio contó con la participación de (n= 15) estudiantes de primer semestre de una maestría en educación en modalidad virtual de la ciudad de Manizales, Colombia. Los participantes se distribuyeron en cinco grupos de trabajo constituidos de manera espontánea. **Resultados:** los resultados permitieron identificar diferencias en la regulación de la tarea y de la comunicación. Esto facilitó comprender la dinámica en los grupos relacionada con la regulación de la tarea y la comunicación y su impacto en el éxito académico. **Conclusiones:** los grupos de alto rendimiento presentan características en la regulación de la tarea y de la comunicación que podrían ayudar en la comprensión del éxito académico y desarrollo de tareas genuinamente colaborativas.

**Palabras clave:** aprendizaje colaborativo; regulación de la tarea; regulación de la comunicación (Tesoro de la UNESCO de Psicología de la educación).

## Resumo

**Objetivo:** relatam-se os resultados de uma pesquisa cujo objetivo era examinar a regulação da tarefa e da comunicação durante o desenvolvimento e a execução de tarefas colaborativas em grupos de alto e baixo desempenho. **Metodologia:** optou-se por uma abordagem qualitativa interpretativa com um projeto de estudo de casos múltiplos (Yin, 2006). O estudo analisou episódios de interação relacionados à regulação social da tarefa e da comunicação registrados em gravações de vídeo. O estudo envolveu a participação de 15 alunos do primeiro semestre de um mestrado virtual em educação na cidade de Manizales, Colômbia. Os participantes foram distribuídos em cinco grupos de trabalho constituídos espontaneamente. **Resultados:** os resultados permitiram a identificação de diferenças na regulação da tarefa e da comunicação, o que facilitou a compreensão da dinâmica dos grupos em relação à regulação da tarefa e da comunicação e seu impacto no sucesso acadêmico. **Conclusões:** os grupos de alto desempenho apresentam características na regulação da tarefa e na comunicação que podem contribuir para a compreensão do sucesso acadêmico e o desenvolvimento de tarefas genuinamente colaborativas.

**Palavras-chave:** aprendizagem colaborativa; regulação da tarefa; regulação da comunicação (Tesouro de Psicologia Educacional da UNESCO).

## Introduction

The social regulation of learning contexts is critical to academic success and student achievement. In educational settings, observing groups of students exhibiting varying levels of achievement is common; some excel, while others face difficulties making progress. This disparity can be attributed, in part, to variations in the social regulation of learning within these groups and, particularly, in how participants manage tasks and communication among group members (Baker, 2015; Baker et al., 2012; Koivuniemi et al., 2018; McCaslin & Murdock, 1991; McCaslin & Hickey, 2001).

The article aims to report the social regulation of learning contexts regarding collaborative task regulation and communication in collaborative processes in both high- and low-performing groups. The impact of social regulation processes, peer interaction, collaboration, and mutual support on students' academic performance is analyzed. Furthermore, this study examines how high-performing groups appear to foster more effective social regulation strategies, whereas low-performing groups may encounter challenges in this regard (Panadero et al., 2015; Panadero & Järvelä, 2015; Rogat & Linnenbrink-Garcia, 2011; Rogat & Adams-Wiggins, 2014).

A comprehensive understanding of the dynamics underlying social regulation of learning concerning task and communication within distinct achievement groups will further display opportunities for enhancing the academic performance of students at large (Rogat & Adams-Wiggins, 2015; Sobonciski et al., 2021; Zheng & Huang, 2016). Additionally, the development of strategies focused on task management and communication during the execution of collaborative tasks holds significance. These strategies contribute to improvement, academic success, and ultimately, the successful completion of group exercises.

Finally, acknowledging the significance of social regulation of learning in student achievement can foster a comprehensive understanding of the educational environment for the benefit of students, regardless of their current level of achievement (Hadwin et al., 2017; Perea et al., 2009).

Aligned with the above and to address the formulated objective, this study examined task regulation and communication during collaborative task execution in high- and low-performing groups. Data analysis comprised a concise description of task regulation and communication and examining the events constituting these aspects. Subsequently, the methodological section is presented paving the way for the analysis, results, and discussion. Lastly, the conclusion section presents the study findings.

## Social Task Regulation

According to Perea et al. (2009), Janssen et al. (2012), and Hadwin et al. (2017), task regulation is construed as the interaction among group members. This involves acknowledging individual and distributed responsibilities and emphasizing the importance of both group roles and dynamics. The task regulation was examined from seven events adapted from the framework proposed and documented by Perea et al. (2009), Janssen et al. (2012) and Hadwin et al. (2017).

Categorically, these events are defined as judgments of the task, task comprehension, information exchange, organization of information, goal setting, execution, and reflection on the task. Conceptually, "judgments of the task" encompass diverse conceptions formed by the group concerned. This may include aspects related to the task's difficulty, disagreements regarding execution, criticisms concerning the task's usefulness, or expectations associated with its execution. "Task comprehension" pertains specifically to the knowledge and conceptualization the group possesses regarding the topic or task to be addressed in the academic exercise.

The third event involves the "information exchange". This comprises contributions from group members regarding task-related information or documentation. These contributions serve as a foundation and argumentative support for task execution. Certain elements relevant to this event pertain to the interactions linked with the quality of contributions suggested by group members, alongside their considerations regarding logistical issues governing task execution and the subsequent developmental processes.

Following this is the "Organization of Information" event. This event describes how the group emphasizes components of the information hierarchy through its interactions and integrates them into the collective activity of task generation and execution. As a result, the information exchange focuses on elucidating how the group may progressively establish a task plan. This emphasizes the group's overt perspective on their common goals and aspirations. In this regard, the group examines collective and individual direction toward the achievement of shared objectives.

Finally, there are related to the "task execution" and "task reflection." The former encompasses interactions elucidating the methods or strategies employed by the group in executing the task. Particularly, this event attempts to highlight the group's execution of the task, delineating the most discussed aspects, and the most challenging ones.

The last event, "reflection on the task", is understood as a metacognitive activity undertaken by the group members upon the task completion. This form of

reflection tends to be more prevalent in high-performing groups. It encompasses the main aspects deliberated during the interaction, the quality of the exercise undertaken, the favorable perception of the outcome achieved by the group, and an assessment of the performance attained by the group members throughout the task execution.

## **Social Regulation of Communication**

Theoretically, communication as self-regulated learning explains the group interaction throughout task planning, execution, and reflection. Furthermore, how group members use the information provided by each other to strategically regulate their learning processes, to meet their objectives during the execution of collaborative tasks (Winne & Hadwin, 1998; Järvelä & Hadwin, 2013).

Communication regarding studying as self-regulated learning also encompasses a series of events. Regulation of communication involves four distinct events: group questioning, negotiation of objectives, adaptation of task perception, and goal-setting adjustment.

The initial event "group questioning" refers to measures performed to elucidate concepts, comprehend task requirements or assessment methods, and address issues concerning opinions and operational uncertainties which are critical for proper task completion. Such aspects significantly influence the group's ability to reach consensus on objectives. This consensus is understood as the acknowledgment of agreements by the group, accomplished through the harmonization of their perspectives on the task and its execution. The "negotiation of objectives" as a communicative event holds paramount importance as it fosters the adaptation of group members' perceptions regarding the task. In this regard, such adaptation occurs through dialogues among group members to agree on reconciling diverse viewpoints, clarifying task requirements, or addressing technical aspects. These dialogues favor adjusting conceptions held by different group members, which could otherwise hinder task completion.

The "adaptation of task perception" occurs when group members effectively manage their opinions and viewpoints. The group members' perception of the task facilitates communicative techniques for aligning their objectives with the requirements of the learning task.

The fourth and final event is the "adaptation of goals" which encompasses the actions to execute the task. It also includes the strategies for gathering information and task completion. This involves cognitive and procedural resources; such as understanding concepts and definitions, management of platforms, software, etc., which will allow for successful management of the task to be developed.

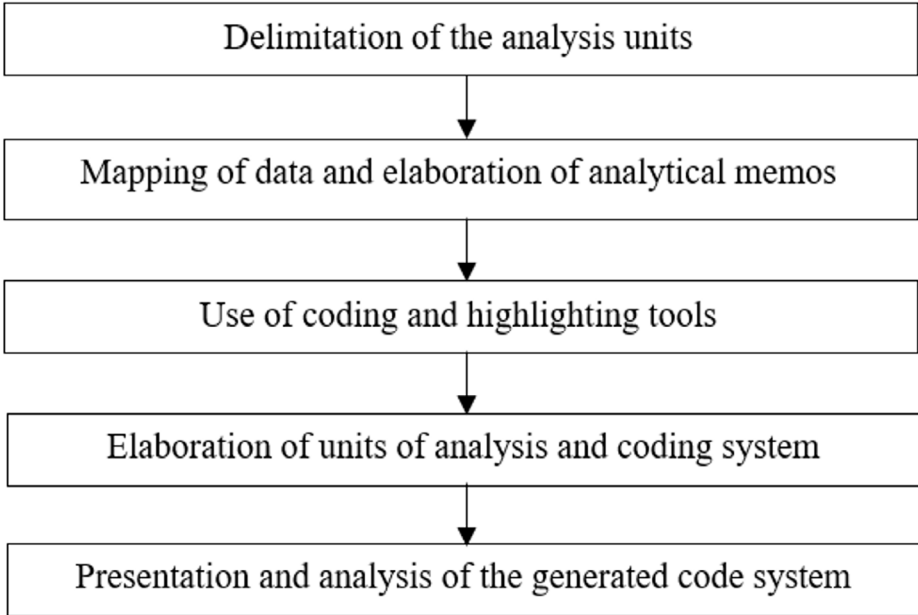
From a collaborative framework perspective, the events of task regulation contribute to achieving desired outcomes aligned with the dynamics and requirements of the learning task that are feasible to evidence at a cognitive, motivational, and behavioral level and, in turn, operate as elements that allow characterizing and accounting for what happens with group regulation during the process of executing a specific task collaboratively.

## Methodology

The methodological approach adopted in this study corresponds to an interpretive paradigm (Erickson, 1986). This qualitative approach facilitated the interaction among the various group members during the synchronous sessions. These sessions were recorded on video during the eight weeks of the group activity. The procedures of task regulation and communication, resulting from the activities of the five working groups were subject to analysis through a multiple-case study methodology (Yin, 1989). An inductive content analysis method was used to facilitate the interpretation of the video transcripts from the synchronous group work sessions. Data processing was conducted using MAXQDA personal license software.

Group monitoring was selected as the unit of analysis. This action is permanently conducted by the group during task completion. It is feasible that it is tracked from brief episodes that occur in each of the events involved in the components of regulation and collaboration in group work situations and, ideally, in situations of authentic collaboration (Soboncinski et al., 2021).

The following outlines the methodological pathway to analyze video data utilizing the MAXQDA software.



**Figure 1.** *Design for Qualitative Content Analysis Using the MAXQDA Software Program*

Source: Author's Elaboration based on Mayring (2014).

### **Participants and Groups**

Five groups of first-semester postgraduate students enrolled in a master's program in education at a private university in Colombia participated in online sessions. Participation was voluntary, based on research interest during the first week of admission to the postgraduate program. The groups were classified into low- and high-performing groups: low-performing group (LG-), average-performing group (AG+), and high-performing group (HG++). Table 1 depicts the interrelationship among the groups.



**Table 1.** *Groups and Number of Group Members*

<b>Group</b>	<b>No. of Members</b>	<b>Group Formation</b>	<b>M (SD) of age</b>
Group 1	3	2 male and 1 female.	43,7 (4,73)
Group 2	2	2 male	47,0 (4,24)
Group 3	2	2 male	30,5 (4,95)
Group 4	4	3 male and 1 female	32,0 (9,49)
Group 5	2	1 male and 1 female	31,5 (13,44)

The performance of each group in the collaborative task was measured by using the average grade obtained in the tasks completed during each of the four deliveries in which the activity was divided. Low-performing groups were defined by grades equal to or below 3.7 (Grades  $\leq 3.7$ ), whereas high-performing groups were associated with grades equal to or greater than 3.8 (Grades  $\geq 3.8$ ).

The following table shows the averages of the groups at the end of the completion of the collaborative task.

**Table 2.** *Averages Obtained by the Groups while Working in Groups.*

<b>Groups</b>	<b>Average obtained while Performing the tasks</b>
L1G-	Average obtained 3.5
L2G-	Average obtained 3.4
H3G++	Average obtained 4.1
A4G+	Average obtained 3.8
H5G++	Average obtained 4.5

## **Observation Time for Groups**

The groups worked together during the first academic semester, spanning eight weeks, upon starting their postgraduate study. Meetings were scheduled every two weeks to discuss issues of their research proposal, guided by a thematic agenda provided by the professor. Observation was conducted on interaction episodes among participants, which were recorded via video before the analysis. The following shows the activities that were included in the observation.

### **Weeks One and Two.**

Students were required to work in groups and search for at least five research reports published within the last six months. This task was required to be completed by all members of the group. The expected output consisted of a concise report detailing the methodological trends, key findings, and most cited authors within the selected topics by each group. The delivery dynamics were designed on prior meetings, which were online synchronous sessions and each group member presented and discussed the articles they had researched. Groups were required to deliver a preliminary report post-discussion, detailing their collaborative work. This report could further be refined and approved by the professor of the research seminar. Furthermore, each group provided a link to their meeting recordings as evidence of their collaborative work.

### **Weeks Three and Four.**

The second delivery involved constructing a Vester matrix based on the previous literature review. This matrix significantly frames the problem statement for the presentation. The task to be delivered was their approach to the problem statement and its corresponding research question. For both delivery tasks, the group convened synchronous meetings to discuss the findings of Vester's matrix and how it contributed to the construction of a hierarchical problem statement.

Based on the literature review and Vester matrix analysis, the groups identified key aspects of the research problem and presented them in a five-page maximum report. Additionally, a link to the meeting recording was provided as evidence of the dynamics of the collaborative work.

### **Weeks Five and Six.**

During weeks five and six, the groups focused on formulating the objectives of their research proposal. During these weeks, emphasis was placed on analyzing coherence and cohesion. Groups were tasked with reviewing their research proposal objectives to ensure they were closely aligned with the topic, the problem statement, and the research question. Therefore, each group convened meetings to discuss the problem statement and the associated question. The purpose of these meetings was to formulate procedural goals aimed at addressing research issues. The discussion was video recorded, serving as evidence of the collaborative work.

### **Weeks Seven and Eight.**

During weeks seven and eight, particular emphasis was placed on writing the rationale. The final task was to perform a thorough evaluation to find problems in the coherence and logical flow of the study proposal. After this review, each group responded to five questions to facilitate the construction of the rationale. The questions posed were as follows: 1. What is the problem being investigated? 2. What is the emergence of the study problem? 3. How feasible is the conduct of the research? 4. Which segment of the population benefits from the study? and 5. What personal, professional, or disciplinary benefit will be obtained from the study and its potential replication?

Questions were debated among group members serving as input for drafting the rationale. The task to be delivered contained a preliminary refined research proposal, alongside the corresponding link to the synchronous session recording during the task execution.

## **Regarding Video Data**

Following the professor's instructions, each of the five groups recorded meetings every two weeks, resulting in a total of 20 recordings. Each group autonomously managed the duration of the recording and the dynamics of their interactions. The total recording time was 779 minutes and 18 seconds. Table 3 shows detailed recording times allocated by the groups across individual sessions, and the total amount of time obtained from recordings and collaborative work.

**Table 3.** *The Distribution of Partial and Total Times, along with the Number of Interaction Sessions Recorded by the Groups during the Execution of the Collaborative Work.*

Groups	First Session Weeks 1 and 2	Second Session Weeks 3 and 4	Third Session Weeks 5 and 6	Fourth Session Weeks 7 and 8	Total Duration of Group Task Execution	Total Sessions during Collaborative Work
L1G-	50:57	42:11	60:06	180:09	332:83	252
L2G-	21:13	11:12	12:58	13:18	58:01	195
H3G++	22:41	25:25	19:43	12:58	79:67	253
A4G+	45:04	41:39	17:27	11:46	115:16	139
H5G++	49:27	60:22	11:46	69:63	193:51	205

## Method of Analysis

Once all the transcripts of the videos were generated, they were categorized and converted into a code system. Interactions related to task regulation and communication were identified and characterized as illustrated in Figure 1. Interactions were identified through events and phases to establish a hierarchical order. Both the task regulation and communication were instrumental in delineating various levels of complexity during the phase and the number of recorded events. An “event” refers to the interaction occurring during a collaborative activity which serves to elucidate aspects of communication and tasks during its execution. These events can manifest as brief interaction episodes among group members (Liskala et al., 2011; Volet et al., 2009).

Table 4 illustrates task regulation and communication, along with the events selected for analysis. These are hierarchically categorized by phases with the first phase marking the beginning of collaborative group work, progressing to phase four, which embodies the ideal of collaborative work.

**Table 4.** *Phases and Events Encompassing Task Regulation and Communication.*

<b>Phases and Events Categorized by Level of Complexity</b>	<b>Eventos en la regulación de la tarea</b>	<b>Eventos en la regulación de la comunicación</b>
<b>Phase 1</b>	Judgments regarding the task and comprehension of the task.	Group questioning.
<b>Phase 2</b>	Information Exchange and organization of information.	Adaptation and perception of the task.
<b>Phase 3</b>	Goal setting.	Negotiation of objectives.
<b>Phase 4</b>	Task Execution	Reflection on the execution of the task.

## Results

The following questions contributed to addressing the objective: Are there any discrepancies in time management between high- and low-performing groups during the execution of collaborative activities? Is there any indication of differences in the episodes of interaction regarding task regulation and communication recorded by high- and low-performing groups? The analysis of the relationship between the total time devoted to the execution of the group activity, and the total number of interactions recorded regarding task regulation and communication contributed to addressing both the objective and the questions. Subsequently, the frequency of interaction episodes recorded by the groups regarding task regulation and communication was analyzed. This analysis discerned differences among the interaction episodes related to task regulation and communication within the groups during the collaborative tasks.

### Total Amount of Time Dedicated to the Execution of the Collaborative Tasks

The interaction among the five groups during the execution of the tasks revealed that the first group (332 minutes and 83 seconds /237), the fifth group (190 minutes and 58 seconds/187), and the fourth group (115 minutes and 16 seconds /128) dedicated the greatest amount of time to executing the collaborative activity. Whereas the third group (79 minutes and 67 seconds /237) and the second group (58 minutes and 01 second /179) dedicated less time, registering a similar number of interaction episodes across all groups.

Table 5 illustrates the previous results.

**Table 5.** Relationship between the number of episodes and dedication time to the task within the groups.

	L1G-	L2G-	H3G++	A4G+	H5G++
Interaction Episodes	237	179	237	128	187
Total Time Dedicated to the Task	332:83	58:01	79:67	115:1	190:5

Results demonstrated distinct behaviors across groups. Dedication time between collaborative activity and number of interactions recorded among groups showed no significant differences except for with the second and third groups. These groups revealed a high number of interaction episodes about the total time dedicated to the collaborative activity.

However, worth noting is that the high-performing group displayed a high number of interaction episodes alongside a rational use of time. This provides an affirmative answer to one of the questions addressing differences in time management of time by high- and- low-performing groups during the execution of collaborative activities. Findings suggest high-performing groups exhibit superior planning and time management skills in executing collaborative tasks. This means both efficient time allocation management and an adequate working environment. Additionally, suitable dynamics of communication and task management facilitate quality interaction episodes associated with setting goals.

## Identification of Episodes Involving Regulation of Communication

During the eight weeks of the collaborative activity, a total of 367 episodes of interaction were observed: 79 episodes of interaction in the first group (L1G-), 72 in the second group (L2G-), 92 in the third group (H3G++), 42 in the fourth group (A4G+) and 82 in the fifth group (H5G++).

Table 6 illustrates these results.

**Table 6.** *Frequency of Interaction Episodes Involving an Event of Regulation of Communication.*

Events Involving the Regulation of Communication	L1G-	L2G-	H3G++	A4G+	H5G++
Group Questioning	12	14	6	10	8
Negotiation of Objectives	39	24	30	18	27
Adaptation and Perception of the Task	14	23	16	11	11
Reflection on the Execution of the Task	14	11	40	3	36
<b>Total</b>	79	72	92	42	82

Results showed a significantly higher number of interaction episodes in the objective negotiation event across groups. Additionally, high-performing groups exhibited a significant result in the reflection on the execution of the task. This suggests a metacognitive process within these groups.

The interaction dynamics of the negotiation of objectives were evidenced through the following expressions:

Well, we all have agreed on why our project is named: Influence of Didactic Resources and the learning environment of primary school children in the rural and urban area of San Pedro [...] Could you please confirm if you agree? (Personal Communication, 05 May, 2022, own translation).

The aforementioned fragment evidences effective communication among group members and collective decision-making.

The following fragment asserts effective interaction on how groups negotiated their objectives through successful communication as illustrated below:

It appears imperative to establish uniform criteria for our report preparation. [...] I think it is crucial to retain the section we worked on based on the colors assigned by the professor for consulting databases as it holds significance. (Personal Communication, April 11, 2022, own translation).

Regarding high-performing groups, results revealed a considerable number of episodes characterized by high interaction in goal setting as evidenced in the subsequent interaction fragments:

We had already discussed it in a previous meeting. We have already talked about that. So, to delimit the topic, we will focus on the creation of the manual that we have in mind. Emphasis will be on that because students with needs are many, right? [...] This includes everything that has to do with disability, everything that has to do with emotions, with diversity. [...] So let's just focus on that. We've already talked about it this week. (Personal Communication, May 5, 2022, own translation).

Another fragment evidencing the adaptation and goal setting pertains to the high-performing groups during the negotiation of objectives for subsequent collaborative planning together on the same task. As shown in the fragment below:

Well, the truth is that it doesn't catch my attention. Talking about needs and as I say, it is listening to the titles to choose between the two [...] I liked that about the inclusive perspective because it goes beyond creating an operational manual from an inclusive viewpoint at school care [...] the other title is insufficient, the one about an inclusive look from an operative and didactic manual in basic and middle preschool educational care and the last one that is very similar [...] An inclusive view in the light of education from a didactic perspective at primary and secondary preschool levels. [...] But remember that we had talked like that word - light - doesn't fit. (Personal Communication, May 5, 2022, own translation).

## Identification of Episodes Involving the Task Regulation

During the eight weeks of the collaborative activity involving task regulation, results displayed a total of 601 episodes of interaction: 158 episodes of interaction in the first group (L1G-), 107 in the second group (L2G-), 145 in the third group



(H3G++), 86 in the fourth group (A4G+), and 105 in the fifth group (H5G++). Based on the findings, all five groups exhibited episodes of interaction with a notable prevalence observed in the events of understanding the task and organizing the information. The high-performing groups stood out as the groups demonstrated a concentration of interaction episodes evident in goal setting and execution of the task. Table 7 illustrates these results.

**Table 7.** *Frequency of Interaction Episodes Involving a Task Regulation Event.*

<b>Social Task Regulation</b>	<b>L1G-</b>	<b>L2G-</b>	<b>H3G++</b>	<b>A4G+</b>	<b>H5G++</b>
<b>Judgments about the task</b>	65	17	12	18	3
<b>Comprehension of the task</b>	20	26	24	16	7
<b>Information Exchange</b>	18	15	12	7	18
<b>Organization of the information</b>	27	19	35	24	17
<b>Setting Goals</b>	17	13	39	13	32
<b>Execution of Tasks</b>	11	17	23	8	28
<b>Total</b>	158	107	145	86	105

The findings regarding task regulation and recurrent interaction episodes among the high-performing groups during the events of goal setting and execution of the task coincide with Pintrich's (2000) proposal that the initial phases of the regulation of learning manifest in students' forward anticipation. This fact is elucidated through actions linked to the planning and execution of academic activities, forming the core of monitoring that aids students or groups in goal setting. Similarly, the recurrence in aspects associated with compression, organization of information, and planning aligns with Zimmerman's (2000) proposal of the forecasting phase in his learning regulation model. This phase encompasses the interaction between task analysis, goal setting, and strategy planning.

Goal setting, the execution of the task, the negotiation of objectives, and the reflection on the task executed are pivotal events that contribute to elucidating authentic processes of social regulation and collaboration. Therefore, based

on the inquiry of this study, which aimed to discern differences in interaction episodes related to task regulation and communication between high- and low-performing groups, the findings indicate a notable presence of interaction episodes, particularly prevalent among the high-performing groups. These results suggest that within a collaborative framework framed by social task regulation and communication, there should be an emphasis on quality episodes concerning goal setting, task execution, objective negotiation, and task reflection. These aspects appear to be recurring predominantly in groups exhibiting above-average performance conditions.

## Discussion

The findings align with those documented by Rogat and Linnenbrink (2011), who observed in their study that the presence of listening elements, negotiation of viewpoints, and the willingness to generate and adapt shared goals are linked to communicative-level regulation processes among group members. These processes are conducive to, or positively impact, the execution of collaborative activities.

The findings are consistent with those reported by Rogat and Linnenbrink (2011), who noted in their study that the presence of elements such as active listening, negotiation of perspectives, *and* readiness to formulate and adjust shared goals are interconnected with communicative-level regulation processes among group members. These processes contribute to or have a positive effect on, the execution of collaborative activities. The aforementioned is directly associated with the group members' adeptness for discussing and negotiating their respective viewpoints and objectives during the execution of the task. Such engagement facilitates the adaptation of goals together to execute the task.

These findings regarding the prevalence of the communicative interaction of negotiation of objectives and adaptation of goals across groups working together are consistent with Isohätälä et al. (2017). They stated that the processes of social regulation, interaction, and participation reveal the level of involvement of groups during a collaborative task execution. This is exemplified by the advantages derived from mutually solving challenges within the group, and agreeing on various activities to effectively execute the collaborative task. These aspects were particularly observed among high-performing groups, as indicated by their average scores throughout the collaborative activity.

These findings corroborate Saab et al.'s (2007) assertion that positive interaction among group members is paramount in the organization, negotiation, and adaptation of goals during collaborative processes. This underscores the

significance of effective communication processes within the dynamics of collaborative execution of tasks.

According to Perera et al. (2009), task regulation involves comprehending the conditions that prompt a group to recognize the primary demands of a task, thus facilitating subsequent planning, execution, and collective reflection upon its completion.

Janssen et al. (2012) and Hadwin et al. (2017) posit that in social task regulation, group members can use mechanisms and strategies that aid them in defining various aspects of the task. This includes collaborative objectives and goal setting. High-performing groups demonstrated such aspects.

The findings of the present study align with those of Janssen et al. (2012), which suggest that collaborative goal setting and evaluation monitoring play a crucial role in task regulation. Specifically, these enhance students' collective perception of the execution of tasks and the overall performance perceived by the group.

These findings results are consistent with those of Soboncinski et al. (2021), who demonstrated that the groups exercising surveillance over their tasks exhibit greater comprehension in both the thematic and operational dimensions of the tasks. Goal setting and task execution demonstrate the above-mentioned.

Additionally, consistent with the findings of Hadwin et al. (2017), the comprehension of the task, the organization of information, and the goal setting within group interactions during the execution of a collaborative task significantly influence how students use their resources. This can result in either the establishment of distinct scaffolding mechanisms or, in the absence thereof, the gradual dissipation of a cohesive group strategy. Low-performing groups serve as an example, as they exhibited a recurrent pattern in interaction episodes related to judgments about the task, comprehension, or organization of information without delving into further analysis.

Similarly, Isohätälä et al. (2017) argue that learning processes characterized by social regulation, specifically interactions involving the negotiation of objectives by aligning perceptions regarding collaborative processes, appear to shape the group's development of strategies associated with the tasks, goal setting, and adaptation. This study's findings confirm prior observations regarding the presence of aspects related to the phases of task comprehension, information organization, and goal setting within group dynamics. High-performing groups consistently exhibit these aspects across a substantial number of interaction episodes; whereas low-performing groups demonstrate the opposite trend.

## Conclusions

The findings of this study facilitated the identification of disparities in interaction episodes related to time management, task regulation, and communication between low- and high-performing groups. Similarly, the study enabled a deeper understanding of which aspects hold greater significance or are more prevalent in interaction episodes; both within low- and high-performing groups during collaborative activities.

On the one hand, within group dynamics, general or similar aspects tend to predominate among groups regardless of their performance level during collaborative tasks. These aspects on which the groups seem to concur include: posing questions to the group, comprehending the task, and organizing information. While the findings revealed the recurrence of these events across all groups, it does not inherently imply a strictly collaborative or socially regulated trait. As demonstrated, other recurring events must occur within the collaborative process's greater complexity, such as negotiating objectives, goal setting, executing tasks, and reflecting on task performance. Such aspects appear to have or be prevalent in high-performing groups.

On the other hand, the study revealed specific types of events, particularly related to task regulation and communication that seem to contribute significantly to fostering a collaborative and socially regulated group dynamic. This, in turn, suggests that through the prevalence of these aspects in group interaction, collaborative production within a work group could be enhanced and considered more effectively.

As a pedagogical aspect, the study demonstrated a targeted approach to identifying collaborative and social regulation traits within work groups, focusing on analyzing task regulation and communication. Furthermore, through a suggested hierarchical organization, it provided insights into how these events constitute phases and sub-events, aiding in a deeper understanding of the collaborative process. This approach enables the identification of collaborative and socially regulated traits within groups more efficiently, facilitating the differentiation between high- and low-performing groups in executing joint tasks. Finally, as a central feature, the study was able to ascertain which aspects of social task regulation and communication are directly linked to the collaborative execution of tasks.

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