



ISSN: 2038-3282

**Publicato il: ottobre 2024**

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Registrazione Tribunale di Frosinone N. 564/09 VG

**Simulation games for developing skills in summarizing at primary school.  
Analysing the co-construction of understanding a text**

**Giochi di simulazione per sviluppare l'abilità di riassumere nella scuola  
primaria. Analisi della co-costruzione della comprensione di un testo**

*di*

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**Abstract:**

This article describes an educational project based on a collaborative simulation game designed to promote understanding a text as an essential first stage in developing summarizing skills for primary school pupils. The game has been developed and tested as part of a research project, which includes experiential simulation games involving Italian primary school children in motivating activities that facilitate the acquisition of a range of skills. Each game is structured so as to take account of the cognitive load associated with the complexity of the task and enable guided and gradual learning. During the games, 37 third-grade children, divided into groups of 6 to 8 participants, engage actively with the texts in a process of co-constructing understanding through interaction, discussion and cooperation among peers. To study this process, we present a classroom discourse analysis model designed to illustrate the steps taken by the children to work together to construct the meaning of the text.

**Keywords:** Simulation game, summarizing, co-constructing understanding, classroom discourse.

**Abstract:**

L'articolo descrive un intervento educativo-didattico basato su un gioco di simulazione collaborativo progettato per promuovere la comprensione di un testo come fase essenziale nello sviluppo dell'abilità di riassumere degli alunni della scuola primaria. Il gioco è stato sviluppato e testato come parte di un progetto di ricerca, che include giochi di simulazione esperienziali che coinvolgono i bambini delle scuole primarie italiane in attività motivanti che facilitano l'acquisizione di una serie di abilità. Ogni gioco è strutturato in modo da tener conto del carico cognitivo associato alla complessità del compito e consentire un apprendimento guidato e graduale. Durante i giochi, 37 bambini di terza elementare, divisi in gruppi di 6-8 partecipanti, hanno interagito attivamente con i testi in un processo di co-costruzione della comprensione attraverso interazione, discussione e collaborazione tra pari. Per studiare questo processo, viene presentato un modello di analisi del discorso in classe progettato per illustrare i passi compiuti dai bambini per lavorare insieme nella costruzione del significato del testo.

**Parole chiave:** gioco di simulazione, riassunto, co-costruzione della comprensione, discorso in classe.

## 1. Introduction

Although summarizing has at times not been fully considered in terms of its demands as a cognitive activity, it requires the learner to select significant ideas from a text, connect them into a coherent structure (Klein et al., 2017) and produce a new, shorter text, in oral or written form. In 2001, Andersen and Krathwohl proposed a revision of Bloom's Taxonomy (1956), in which they retained the original six categories, while introducing some significant changes (Andersen and Krathwohl, 2001; Krathwohl, 2002). Bloom's *Comprehension* category was renamed *Understand* and analyzed in terms of seven subcategories, the fourth of which is *Summarizing*:

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QTimes – webmagazine

Anno XVI - n. 4, 2024

[www.qtimes.it](http://www.qtimes.it)

doi: 10.14668/QTimes\_16429

*Summarizing* occurs when a student suggests a single statement that represents presented information or abstracts a general theme. *Summarizing* involves constructing a representation of the information, such as the meaning of a scene in a play, and abstracting a summary from it, such as determining a theme or main points. Alternative terms are generalizing and abstracting (Andersen and Krathwohl, 2001, p. 73).

Graham and Herbert (2011, in Klein et al., 2017) have shown how writing a summary has positive effects on text comprehension for weak as well as for average readers and writers. Indeed, summarizing is a particular and complex form of writing that includes understanding a text but involves going beyond a basic level of comprehension. It requires the learner to develop transversal learning skills to produce a new text that is the result of careful identification of the main information in the original one, processed and restructured in an essential and coherent form that, although shorter than the original, conveys the meaning and addresses the same recipients of the text (Piu et al., 2023). When learners read a text, they form a mental representation of what they are reading (Johnson-Laird, 1983; Kintsch, 1998; Kintsch & van Dijk, 1978), in which they condense the main points and, when asked to summarize, they transform this mental representation into a new, more concise text. A study of learners from grades 6 to 10 and college (Kintsch, 1990) explored how students' mental representations of an expository text and the inferences they generated varied as a function of text difficulty and of differences in the task. Learners were asked to write summaries of a text and then to answer orally several questions about the content. The results supported the prediction of qualitative changes in the way meaning is represented by different age groups in different textual conditions. These are related to the number and types of inferential processes on which the summaries were based. Thus, summarizing activities help learners focus on the important ideas in a text and build relations between them, while also drawing on students' previous knowledge. These processes, in turn, help the learner to organize and structure the text in a way that facilitates recall and comprehension.

In the following sections we first describe a research project designed to promote these processes and subsequently present a first stage of the project based on experiential simulation games together with a discourse analysis model devised to illustrate the steps taken by the children to work together to construct the meaning of the texts they work on.

## **2. The research project**

Our project has two main goals. One aims to involve primary school teachers in the development and implementation of a new methodology for the enhancement of children's ability to summarize a narrative text. The other aims to promote the gradual acquisition of summarizing skills by the children who participate. The general framework is related to building inclusive and collaborative learning contexts capable of enhancing the children's abilities in summarizing a narrative text. These contexts are envisaged as promoting the individual empowerment of each learner, paying particular attention to the cognitive workload (Sweller et al., 2019), which may vary based on the subject's experience and emotional-motivational elements (Piu, 2023).

Two principles guided the conception and implementation of the project. The principle of *flexibility* involves adapting the learning experience and the teaching materials to the educational needs and affective-motivational characteristics of learners. The principle of *gradualness* requires a gradual

increase in the difficulty of the narrative texts that children were asked to work on and in a progressive focus on the processes underlying the development of summarizing skills.

The project is built around three macro-areas. *Comprehension* involves the ability to identify information and concepts explicitly present in the text, make simple inferences, understand and integrate information and concepts, and analyze and evaluate textual elements. *Interface* concerns the ability to identify and select primary information cores and organize and connect the identified information units. *Production* entails the ability to plan, transform and revise, checking and correcting the new text (Piu, 2017).

Each of these three macro-areas is divided into a variable number of Learning Units (LU) which last 2 weeks and are composed of:

1. An *experiential simulation game*, first step at the beginning of each LU, to be played in small groups and based on realistic scenarios, in which children are asked to make decisions to solve problematic situations, working with structured materials provided by the teacher to identify and select appropriate content and linguistic forms (Piu, 2017). Each game is audio-video recorded, and the dialogues among children transcribed and analyzed.
2. *Lessons* on the concepts introduced in the simulation games and supported by practical exercises with the aim of enhancing the automatization of the processes underlying the learning experiences provided with the simulation games.
3. A *workshop*, the last step at the conclusion of each LU, conceived as a flexible environment of collaborative learning and socialization, where the learning process initiated with the simulation game and stimulated during the lessons is expected to be consolidated.

We developed a two-year project for the promotion of summarizing skills in primary school children designed to integrate these principles and macro-areas. The same groups were followed through the grades 3 and 4 while they were involved in a series of activities, each one focused on one of the skills that are necessary to learn how to summarize. This paper focuses on understanding a text as an essential first stage in developing these skills, while the children were in grade 3. The children were involved in a simulation game designed to promote co-construction of understanding.

The specific learning objectives at this stage are related to identifying and explaining the elements that constitute the story (characters, setting, plot and main idea); developing or choosing a title representative of the text read; organizing the parts of the story in oral and written form by using a narrative scheme; explaining choices with respect to the analysis of the story conducted; recognizing vocabulary and identifying the meanings of words and phrases. During the simulation game the children take on the roles of editors working for a publisher to make a collective decision that requires the analysis of narrative texts. The texts used present explicit information, a limited range of inferences, a commonly used lexicon, and a linear logical-sequential development.

### **3. Simulation games for the co-construction of understanding a text**

Far from being an easy task, the whole process of summarizing, from reading a text to generating a new, concise form (Wade-Stein & Kintsch, 2004) passes through a hierarchy of steps, each requiring the development of new and more demanding skills and the integration of previously acquired knowledge and abilities. In this respect, collaborative game-based learning based on simulation can

be effective in promoting understanding a text as an essential first stage in developing summarizing skills.

Simulation games in learning are considered successful in that they are seen as engaging an interrelated set of text processing skills while also enhancing a range of other skills, including persistence in solving challenging problems, information processing, communication, creative production, peer support and assistance for the good of the whole class (Papanastasiou et al., 2017). In learning through simulation games, the source of learning is what the participants do and how they practice skills in a relatively safe environment (Saenz, Cano, 2009). Each participant is involved in some type of personally meaningful activity where s/he is required to activate and apply prior knowledge while developing commitment to the task and experiencing a true sense of personal and collective accomplishment or need to rethink the outcomes achieved (Keys & Wolfe, 1990, in Saenz & Cano, 2009).

Moreover, we believe that experiential simulation games can be used for adjusting the cognitive load associated with the complexity of the task. Gathercole et al. (2004) show how children's knowledge of the world starts to come into play when engaging a task around the age of six. In grade 3 (at the age of 8 or 9), the knowledge they can bring to bear during reading of a text is still relatively limited, and this creates increased cognitive load. Furthermore, while cognitive load has often been considered principally in relation to individual learning, our project proposes an expansion of the horizon from individual to collaborative learning (Sweller et al, 2019). This involves paying attention to the human cognitive architecture that underlies group processes, group experience, and the distribution of information among peers (Kirschner et al., 2018), whereby multiple working memories come together while engaging the same task and their processing capacity can be increased due to a collective working memory effect (Kirschner et al., 2011; Sweller et al., 2019). While in individual learning all interacting elements must be processed in a single working memory, in collaborative learning various interacting elements can be distributed among the multiple working memories of the different group members, thereby reducing the cognitive load on a single working memory while creating a collective working memory that is greater than the individual one. Furthermore, through this process of interaction and sharing within the group, a collective and mutually shared knowledge is built, similar to collective mental models (Kirschner et al., 2018), and in line with research that shows how collective knowledge is functional to successful collaboration (Van den Bossche et al., 2006).

In game-based learning, students engage in a *partnership in learning*, working together in a process of co-construction of understanding. Reusser and Pauli (2015) found that the concept and process of co-construction can be defined based on the contexts in which they are embedded. At least three aspects are to be considered: (a) the social type of discourse that can be called co-constructive; (b) the psychopedagogical processes involved in the co-constructive activity; (c) the expected outcomes of collaboration.

Common to most theoretical contexts of co-constructivism is the implication of some kind of social interaction, collaborative activity and, through joint patterns of awareness, of seeking some sort of convergence, synthesis, intersubjectivity, or shared understanding, with language as the central tool and mediator for the negotiation of meaning (Reusser & Pauli, 2015, pp. 913-914).

Since understanding a text was the first step in the development of our project, the process of co-constructing the meaning of a narrative text was a principal focus. Collaborative work was initiated by a learning task (an experiential simulation game) presented by the teacher. While solving the task, children engaged in discussion on how to interpret the text while trying to collectively answer some questions related to it. This process of decoding and restructuring the meaning of the text was aided by images. Although summarizing is primarily intended as making oral or written summaries, a summary does not necessarily or exclusively involve only words. It can also have a pictorial format: “One advantage of the pictorial format compared to the verbal format is that it makes spatial relations among components explicit and thereby helps the learner to identify these relations (Larkin & Simon, 1987). [...] Verbal summaries, by contrast, maintain the sequential structure of a text. Therefore, it is more difficult to recognize the spatial and structural relations of the particular components and objects that are described by the text” (Leopold et al., 2013, p. 41).

Following this assumption on pictorial summaries, and in connection with the mental model theory (Johnson-Laird, 1983), students who learn with pictorial summaries can be expected to better understand a text than students who learn only with summaries based on words. For this reason, narrative texts and pictorial materials were both used to construct the experiential simulation games.

#### **4. The research discourse analysis model**

Our research discourse analysis model was developed as we examined transcripts of the interaction that took place during the first LU. This was conducted in November 2022, and three grade 3 classes, comprising 37 children, participated. They were divided into 3 groups of 6-8 children in the Valle d’Aosta, in Northern Italy, and two groups of 6-8 children in Rome. Currently, all the children are attending grade 4 and are still participating in the project activities.

In this LU our focus is on the initial stage of a learning pathway designed to promote summarizing skills and how discourse analysis can help examine the processes underlying the children’s co-construction of understanding of the text. They are engaged in discussions which lead to a process of co-construction where everyone contributes, not only with personal knowledge and understanding, but also by taking a role of the editor.

The discourse analysis is conducted to see how a series of individual, interactive contributions facilitates a gradual, collective growth whereby the group itself becomes increasingly cohesive and autonomous in carrying out the task of co-constructing understanding and achieving a specific outcome. Our model is used to investigate what constitutes exploratory talk (Mercer, 1995) where “partners engage critically but constructively with each other’s ideas. [...] In exploratory talk *knowledge is made more publicly accountable* and *reasoning is more visible in the talk*. Progress then emerges from the eventual joint agreement reached” (Mercer, 1995, p.104).

In our model, interaction during a given activity is considered as a composite of exchanges constituted by utterances produced by participants engaged in the co-construction of understanding of texts through exploratory talk, where necessary, aided by the guidance of a teacher (Lumbelli, 1985; Pontecorvo et al., 2004; Mercer, 1995; Wells, 2000; Bertolini, Cardarello, 2012; Piu, 2022). An exchange is built through an initiating utterance and a responding utterance, for example, question-answer or statement-question. The exchange can then be developed through a series of recalling utterances which refer back to previous ones and can give rise to new initiating and responding utterances.

Observation and data collection, together with subsequent discourse analysis of exchanges, is based on videorecording and transcription of activities. The data is then analysed to identify and assign codes to certain categories of utterances that can be considered particularly significant for investigating processes involved in the co-construction of understanding. The discourse analysis procedure followed is adapted from the model of constant comparative analysis (Strauss & Corbin, 1990) with phases of open coding, axial coding and selective coding.

In the phase of open coding, the categories of utterances are identified and codified, and each one is analyzed in terms of its function in the co-construction process. In the axial coding phase, the data collected, and the codes assigned, are reviewed so that particularly significant categories can emerge and constitute the axes on which the analysis and the interpretation of the data is based. In the final selective coding phase, the categories developed are organized in such a way as to provide an overall view of the outcomes that emerge from the research, as shown in Table 1.

Code	Utterance	Description
AS	Simple affirmation	Repeating, completing, or reproducing items without adding anything new
AE	Elaborated affirmation	Introducing new information without specifying why or what this contributes to the discourse
AJ	Justified affirmation	Contributing explanations, reasoning or exemplifications that clarify meanings or add further elements to previous justifications
AGAS	Agreement with a simple affirmation	Expressing agreement by repeating, completing, or reproducing items without adding anything new
AGAE	Agreement with an elaborated affirmation	Expressing agreement by introducing new information without specifying why or what this contributes to the discourse
AGAJ	Agreement with a justified affirmation	Expressing agreement by contributing explanations, reasoning or exemplifications that clarify meanings or add further elements to previous justifications
DGAS	Disagreement with a simple affirmation	Expressing disagreement by repeating, completing, or reproducing items without adding anything new
DGAE	Disagreement with an elaborated affirmation	Expressing disagreement by introducing new information without specifying why or what this contributes to the discourse
DGAJ	Disagreement with a justified affirmation	Expressing disagreement by contributing explanations, reasoning or exemplifications that clarify meanings or add further elements to previous justifications
E	Elicitation	Stimulating a contribution to the co-construction of understanding
MI	Mirroring	Selecting and repeating or reformulating a key portion or key portions of a previous utterance or previous utterances
MA	Management	Organizing and structuring group interaction

Table 1: Codes, utterances and descriptions.

Significant utterances typically produced by children participating in the activity are initially identified as affirmations. An affirmation (A) is an utterance produced by a participant during group interaction. An affirmation can be either simple (AS), elaborated (AE), or justified (AJ). An

affirmation is classified as simple when a child repeats or completes a previous utterance made by another participant, replies to an elicitation using given information without adding anything new, or reproduces an item chosen from a selection provided. An affirmation is classified as elaborated when a child spontaneously or replying to an elicitation introduces new information without specifying why or what this contributes to the discourse. An affirmation is classified as justified when a child spontaneously or replying to an elicitation contributes explanations, reasoning or exemplifications that clarify meanings or add further elements to previous justifications.

Key utterances in the co-construction of understanding of a text are then identified as expressions of agreement (AG) and disagreement (DG). Agreement can be expressed through simple affirmations (AGAS), elaborated affirmations (AGAE) and justified affirmations (AGAJ). Disagreement can be expressed through simple affirmations (DGAS), elaborated affirmations (DGAE) and justified affirmations (DGAJ).

Significant utterances typically produced by teachers conducting the activity are identified as related to elicitation, mirroring, and management. An elicitation (E) is an utterance intended to stimulate a contribution to the co-construction of understanding. An elicitation is most commonly made through a question, but it can also be made through a statement. It can be directed to the group as a whole or to one or more specific individuals. It can be an invitation to participate, raise a question about the meaning of particular words, or identify the need to explain better the meaning of affirmations or to consider alternative perspectives. It can tend towards limiting the contents of replies or opening towards the free expression of ideas.

Mirroring (MI) is an utterance in which a participant selects and repeats or reformulates a key portion or key portions of a previous utterance or previous utterances. According to Lumbelli (1985) repetitions and reformulations by the teacher facilitate understanding and encourage the continuation of a conversation, providing participants with the opportunity to clarify and elaborate the previous utterances. In this way, the semantic content of the speech can be easily processed and understood by all participants because of the focusing of attention and the fact that the content reformulated can have a higher chance of being within the reach of all the children. Moreover, mirroring also shows that what has been said is important. Mirroring can have various functions, including focusing on the relationship between premises, development, and conclusions; highlighting incoherencies or discrepancies within or between utterances; reordering contents; summarizing, valorising, or encouraging utterances; posing questions to stimulate completion of or addition to utterances; inviting the consideration of alternatives or the assumption of other perspectives.

Management (MA) is an utterance intended to organize and structure group interaction. Management can have various functions, including intervening to give indications or make suggestions about how to proceed, focusing attention on the task and the specific steps involved in the work in progress, emphasizing the need for respect of turn-taking conventions, time specifications, or other aspects of group interaction.

## 5. Analysing the discourse

The following exchanges are extracts taken from longer sequences during simulation game activities. They were chosen to illustrate three different ways in which the co-construction of understanding emerges from the interplay of utterances and exchanges during classroom interaction. The codes assigned and inserted after each utterance emerged as we discussed together our analysis, moving

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QTimes – webmagazine

Anno XVI - n. 4, 2024

[www.qtimes.it](http://www.qtimes.it)

doi: 10.14668/QTimes\_16429



from open to axial and finally selective coding. For reasons of privacy, the children have been assigned pseudonyms.

### 5.1 First extract

The first extract contains a brief series of exchanges in a group of children whose task is to choose from two drawings which one is most representative of the story they have read. The teacher begins by underlining the publisher's request and giving guidance for how to approach the task. The children begin discussing what they think and then Ben says that the first drawing is the best choice because it contains one of the characters.

Teacher: *The publisher has asked us to choose the drawing that best represents the story and the title. So first which drawing. Look at them and discuss your choice together.* (MA)

(The children discuss what they think and then Ben... makes a proposal)

Ben: *In the second drawing there isn't a mouse. In the story there's a mouse and here's one ...* (AJ)

James raises his hand, and the teacher invites him to say what he thinks. Initially, he only expresses his choice and, after the teacher encourages him to say why he thinks so, he gives his reasons. Jack then intervenes to express agreement with James and add a second reason why.

Teacher: *Let's see what James has to say.* (E)

James: *It's the first one.* (AS)

Teacher: *Why do you think so?* (E)

James: *Because there's all the stuff that he's eaten.* (AJ)

Teacher: *The weasel.* (E)

James: *Yes.* (AS)

Jack: *I still think it's the first one because the story says that the mouse tells the weasel that when she came in she was thin and now she's a bit fat and so here we can see all the things to eat ... so it's the first one.* (AGAJ)

The teacher then invites all the children to say what they think and discuss it together. After a further exchange of ideas, Ben expresses agreement with James and Jack and then asks the group to vote, first for the second drawing and then for the first drawing. All the children choose the first drawing and Ben underlines the outcome of the vote.

Teacher: *What do you think? Talk about it together.* (E)

Ben: *Put your hand up if you think it's the second one.* (MA)

(Nobody raises their hand)

Ben: *Put your hand up if you think it's the first one.* (MA)

(Everybody raises their hand)

Ben: *So, it's the first one.* (MA)

Then the teacher asks Alice to say if she has something more to add about the reason for the choice. She adds a further important detail, and this is mirrored by the teacher to invite other opinions from

the group. The children express agreement and decide how to record their decision as established by the instructions for the task.

Teacher: *Let's hear what Alice thinks.* (E)

Alice: *Here there's the hole where she came in and then she ate everything and a couple of days later she could get out.* (AJ)

Teacher: *So, Alice says there's something else that's important. The hole where the weasel could get out now.* (MI) *Do you agree with her? Jasmine, what do you think?* (E)

Jasmine: *Yes, I think so too!* (AS)

Teacher: *The first one?* (E)

Jasmine: *Yes!* (AS)

Teacher: *So, you can underline or highlight the first drawing.* (MA)

Ben: *Is it okay to put a cross here?*

Teacher: *Yes. What's important is to show your choice.* (MA)

This extract contains an example of the process of co-construction of understanding of the text during which the children find agreement on the choice of the drawing that best represents the story, justifying what they affirm with reference to the text they have read. Through exploratory talk, the children, encouraged and guided by the teacher, discuss what they think and come to agreement on the drawing to choose, building exchanges that gradually add different reasons for the choice on which they agree, each of which are clarified and expanded. Although they are guided by the teacher, the sequence demonstrates significant exchanges in the process of constructing together their understanding of the text, building agreement through justified exchanges, helped also by one member of the group who takes on the role normally assigned to the teacher in exhorting the others to express their opinion and make their choices.

## 5.2 Second extract

The second extract contains a series of exchanges in another group of children whose task is to choose from three titles which one is most representative of the story they have read. The teacher first encourages the children to read the titles and make their choice. At first they reply all together expressing their preference for the third title. At the teacher's request, they give their reasons. Two then justify their choices in more detail, while another one repeats the same choice, referring to something in the text.

Teacher: *Emily, can you read the titles now?* (MA)

Emily: *One, "The Thread of Friendship". Two, "The Kite Bird". Three, "The Child and the Bird".* (AS)

Teacher: *So, which title do you choose?* (E)

Children all together: *The Child and the Bird. Number three.* (AS)

Teacher: *Does everyone agree that it's number three? Remember you must give your reasons. You must explain why you chose title number three.* (MA)

Sabrina: *Because it's got the boy and the bird.* (AGAJ)

Rose: *Because the boy and the bird were really close ... and so they decided to put that title too because the boy was teaching the bird to fly.* (AGAJ)

Bart: *Because in the story it actually says the child and the bird.* (AGAE)

The teacher then asks a girl to repeat her choice, perhaps because of detecting an apparent disagreement with the group's choice. She proposes the first title as an alternative, giving reasons for this, while adding reasons why the third title could also be seen as appropriate.

Teacher: *Do you agree on number three, or do you want to tell us why you don't agree?* (E)

Mary: *I think it's number one because he says I believe in friendship because thanks to the child the little bird has begun to trust him and so it could also be number one. On the other hand, it could be number three because it says who the main characters are.* (DGAJ and AGAJ)

In the light of this, the teacher asks the children what they think about the alternative proposal. In the first instance they all express agreement, but one girl reminds them that they must choose only one of the titles. Once again, the teacher asks them to express their opinions, asking one girl to say what she thinks. She explains why she prefers the third title, while another child explains why she disagrees. Subsequently the teacher intervenes on two occasions by mirroring what the children have expressed, stimulating them to give further justifications for their choices.

Teacher: *Listening to Mary we heard the reasons why she thinks number one could be the title. (MI) Do you agree with her?* (E)

Children all together: *Yes.* (AGAS)

Ada: *It must be one of them.* (AS)

Teacher: *Wait a minute. Ada what would you propose?* (E)

Ada: *Number three because there is the child and the bird who are the two protagonists.* (AJ)

Andrew: *For me it's one and three. One because in the story they say that the little bird trusted Otto so it can be called the thread of friendship.* (DGAJ)

Teacher: *Did you all hear? It could be the thread of friendship because the little bird trusted Otto.* (MI)

Rose: *It can be one or three. I've changed opinion too. The first one too because they were friends it was the last time they saw each other and they decided that the child taught them to fly and they became friends and therefore it can also be the first one because at least it can be called the thread of friendship, given that they had become friends.* (AGAJ)

Teacher: *Did you hear? Rose says that there could be two titles too, number one and number three.* (MI)

Burt: *No, in my opinion it's only number three because then in the end they break away.* DGAJ

Emily: *But at the beginning she keeps it.* (DGAJ)

Rose: *But they are always friends. They don't break away and are no longer friends.* (AGAJ)

Teacher: *You heard what speaker Rose said. Even if they separate, in her opinion, they'll still remain friends. What do you think? Do you agree that even if Otto and the bird separate, the friendship will continue?* (MI)

The exchange ends with the agreed decision to opt for the two titles, both for different reasons, representative of the story.

Children: *Yes.* (AGAS)

Rose: *Yes, because if they break away, they're no longer friends.* (AGAS)

Teacher: *Ah, this is what our editor Rose says. (MI) ... So, what do we do? Shall we put the two titles one and three? Do you all agree?* (MA)

Children: *Yes, one and three.* (AGAS)

This extract shows a dynamic in the process of co-construction of the meaning of the text that is different from the gradual building in the first example. In the initial exchanges, the children quickly find agreement on a choice. Then further elicitation and mirroring on the part of the teacher lead to a discussion with various children justifying reasons for agreeing and disagreeing as they reconstruct the story together around the actions of the principal characters and the main theme and converging on the possibility of two equally valid choices.

### 5.3 *Third extract*

The following exchanges are an extract from a longer sequence in which the children are discussing the choice between two titles.

The teacher begins by underlining that one part of the group has already given its reasons for choosing the title "The Thread of Friendship" and asks a boy who had expressed disagreement in a low voice, to say out loud to everyone his reasons for choosing the title "The Child and the Bird".

Teacher: *So, we understand their reasons.* (MA)

Teacher: (turning to Dick who is saying something in a low voice) *Tell the others what you think. I'm sure you're giving some important reasons for your choice.* (E)

He begins hesitatingly, with a simple affirmation in which he gives examples from the text. This is disputed by two other members of the group, both of whom express disagreement and add further information through reference to the text.

Dick: *...Mmm...*

Teacher: *You think it's "The Child and the Bird because ...* (E)

Dick: *And then if the thread breaks away ...* (AS)

Marc: *But even if it breaks away, they remain.... if it breaks away, they separate but...but then they remain friends.* (DGAE)

(The children talk together)

Isabel: *But in the story, it doesn't say that the bird goes to see the child.* (DGAE)

The teacher asks if the reference to the text made by Isabel is really significant and this is followed by further examples of simple and elaborate information (without justification of an opinion).

Teacher: *Do you think it's important that she no longer visits him?* (MI)

Dick: *Then it breaks away.* (AS)

Marc: *I know, but then they remain friends.* (DGAE)

Dick: *But the thread of friendship is written there.* (DGAS)

The teacher then mirrors what Isabel previously said concerning the impossibility of being friends without contact between children. She then asks her for confirmation and on receiving it she encourages her to share her ideas with the rest of the group.

Teacher: *So, it seems that Dick is saying the thread isn't that important. I'm not sure if Isabel is saying that they won't see each other again or if she is wondering how they can remain friends if they never see each other again.* (MI) ... *Is that it, Isabel? Or something else?* (E)

Isabel: *No, that's it!* (AS)

Teacher: *That's it! And do you want to explain to your classmates why?* (E) ... *But then these friends don't see each other anymore ... So you say that it's difficult ...* (MI)

At this point another child expresses disagreement, saying that even if you are no longer in contact with a friend they can remain in your memory. The teacher again mirrors this, giving rise to a series of moves that express simple or elaborate agreement and disagreement about the two titles.

Philip: *But even if you had a friend in the past, you'll still remember him.* (AJ)

Teacher: *So, you're saying that even if you don't see a friend anymore, you'll remember him, so you'll still be fond of him.* (MI)

Dick: *Yes, but the story says the thread of friendship, not just friendship. It says that they remain friends. The thread is written there.* (DGAE)

Isabel: *And then the thread breaks away.* (AGAS)

Marc: *The thread of friendship is friends.* (AE)

Dick: *Yes, but the thread of friendship is written there. The thread! When the thread breaks away that's it!* (DGAE)

Marc: *Do you want to reread the story, where it says they are friends?* (DGAE)

Dick: *They may be true friends, but ...*

Marc: *Ah! ...*

Dick: *the thread is written there!* (DGAS)

Isabel: *But because the thread though....*

The teacher continues to intervene periodically, both to manage and mirror the interaction.

Teacher: *Marc let's listen to each other! Let's listen to each other!* (MA)

Isabel: *The thread ... but then they break apart and the thread isn't there anymore.* (AGAE)

Dick: *Just like I said.* (AS)

Teacher: *So, the thread is no longer friendship?* (MI)

Marc: *Friendship remains forever.* (AE)

Isabel: *Yes, but the thread is written here. So, if they break apart ...* (DGAE)

Teacher: *So, the thread ...* (MI)

Marc: *Yes, but then the bird doesn't learn to fly, even if they break apart.* (DGAE)

Isabel: *Yes, but the thread isn't there anymore.* (DGAS)

Marc: *The thread of friendship is the bond between them. Because if the boy hadn't tied his leg and helped him, they would never have been friends.* (DGAJ)

Dick: *No!* (DGAS)

Isabel: *I don't think so either.* (DGAS)

The teacher then says that the two different positions have now been clearly expressed and clarified and that the group should now try to find an agreement.

Teacher: *Okay. So, we see how you've still got different ideas. (MI) Remember you must find a solution and make a common choice.* (MA)

This extract shows the way in which the children begin to identify the textual clues on which to base their choice regarding the title. Some are more literal and anchored to the text, while others are more inferential and abstract. Moreover, the role of the teacher in managing and mirroring the interaction is clear in rendering explicit agreements, disagreements, and reasons. The extract also shows the relationship between reference to the text and to personal meanings attributed to friendship through experience.

## **6. Conclusions**

Starting from the premise that producing summaries is a cognitively demanding activity, in our paper we describe how a collaborative simulation game designed to promote co-construction of understanding a text can be used as a first stage in developing summarizing skills for primary school pupils. In order to illustrate this process of co-construction, we have proposed a discourse analysis model in which interaction during a given activity is considered as a composite of exchanges constituted by utterances that are produced by participants engaged in exploratory talk, in which cognitive, textual, and dialogic aspects are interwoven.

The model enables identification and classification of specific types and functions of utterances on the part of the children and the teacher, and can show how different patterns of interconnected affirmations, agreements and disagreements among the children can lead to intersecting individual and group contributions to the co-construction of meaning. The role of the teacher in guiding this emerges through elicitation and management utterances and, above all, through mirroring the children's utterances to facilitate understanding and encourage the continuation of the process. It can also be seen how roles typically assigned to the teacher can begin to be assumed by children as they become more autonomous as a group.

The purpose of this paper has principally been to illustrate the first step in an approach to promoting skills in summarizing and to show how the model proposed can be used for a qualitative analysis of the discourse involved in the simulation game presented. Future directions for research within our project will encompass the further extension of the qualitative analysis perspective and the introduction of a quantitative analysis perspective in a longitudinal study that will involve the successive steps in our overall project. A further development will be adaptation and application of the discourse analysis model to interaction among teachers within focus groups of teachers who reflect on the activities conducted and the implications they contain for them in terms of professional learning experiences.

## **Ethical statement**

The study was approved by the ethic committee of the Department of Human and Social Sciences, University of Aosta Valley, Italy. The participants provided their informed consent to participate in this study.

## **Declaration of Conflicting Interests**

The authors declare no conflicts of interest with respect to the authorship and/or publication of this article.

## References:

- Anderson, L.W. (Ed.), Krathwohl, D.R. (Ed.), Airasian, P.W., Cruikshank, K.A., Mayer, R.E., Pintrich, P.R., Raths, J., & Wittrock, M.C. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's Taxonomy of Educational Objectives* (Complete edition). Longman.
- Bertolini C. & Cardarello R. (2012), Shared reading for comprehending texts: describing and assessing communicative processes, in *Giornale italiano della ricerca educativa*, ISSN 2038-9744, 8, pp. 13-24.
- Bloom, B.S. (Ed.), Engelhart, M.D., Furst, E.J., Hill, W.H., & Krathwohl, D.R. (1956). *Taxonomy of educational objectives: The classification of educational goals. Handbook 1: Cognitive domain*. David McKay.
- Gathercole, S. E., Pickering, S. J., Ambridge, B., & Wearing, H. (2004). The Structure of Working Memory From 4 to 15 Years of Age. *Developmental Psychology*, 40(2), 177–190.  
<https://doi.org/10.1037/0012-1649.40.2.177>
- Graham, S., & Hebert, M. (2011). *Writing better: Effective strategies for teaching students with learning difficulties*. Paul H. Brookes.
- Johnson-Laird, P. N. (1983). *Mental models: Towards a cognitive science of language, inference and consciousness*. Cambridge University Press.
- Keys, J.B., Wolfe, J. B. (1990). The role of management games in education and research. *Journal of Management*, 16(2), pp. 307-336.
- Kintsch, E. (1990). Macroprocesses and Microprocesses in the Development of Summarization Skills. *Cognition and Instruction*, 7(3), 161-195. [https://doi.org/10.1207/s1532690xci0703\\_1](https://doi.org/10.1207/s1532690xci0703_1).
- Kintsch, W. (1998). *Comprehension: A paradigm for cognition*. Cambridge: Cambridge University Press.
- Kintsch, W., & van Dijk, T. A. (1978). Toward a model of text comprehension and production. *Psychological Review*, 85, 363 and 394.
- Kirschner, F., Paas, F., & Kirschner, P. A. (2011). Task complexity as a driver for collaborative learning efficiency: The collective working-memory effect. *Applied Cognitive Psychology*, 25, 615–624. <https://doi.org/10.1002/acp.1730>.
- Kirschner, P.A., Sweller, J., Kirschner, F. et al. (2018). From Cognitive Load Theory to Collaborative Cognitive Load Theory. *International Journal of Computer-Supported Collaborative Learning* 13, 213–233. <https://doi.org/10.1007/s11412-018-9277-y>
- Klein, P.D., Arcon, N., Baker, S. (2017). Writing to Learn. In C. A. MacArthur, S. Graham, J. Fitzgerald (eds). *Handbook of Writing Research*. New York: Guilford.
- Larkin, J. H., & Simon, H. A. (1987). Why a diagram is (sometimes) worth ten, thousand words. *Cognitive Science*, 11, 65-99.
- Leopold, C., Sumfleth, E., Leutner, D. (2013). Learning with summaries: Effects of representation mode and type of learning activity on comprehension and transfer. *Learning and Instruction*, 27, 40-49, <http://dx.doi.org/10.1016/j.learninstruc.2013.02.003>.
- Lumbelli, L. (1985). *The psychology of education. Communication at school*. Bologna: Il Mulino.
- Mercer, N. (1995). *The Guided Construction of Knowledge. Talk amongst teachers and learners*. Multilingual Matters.

Papanastasiou, G.P., Drigas, A.S., Skianis, C. (2017). Serious Games in Preschool and Primary Education: Benefits And Impacts on Curriculum Course Syllabus. *iJET* – Vol. 12, No. 1, pp. 44-56, <https://doi.org/10.3991/ijet.v12i01.6065>.

Piu, A., Dodman, M., & Timpano, G. (2023). Summary writing as cognition and communication: A process of mapping the territory. *Graphos. An International Journal of Pedagogy and Didactics of Writing*, 2, 69–79, <https://doi.org/10.4454/graphos.23>.

Piu A. (2022), Alla ricerca delle informazioni più importanti di un testo narrativo. Uno studio esplorativo nella scuola primaria. In *CADMO*, 1/2022, pp 82-97, DOI: 10.3280/CAD2022-001006

Piu A. (2017). Making a summary is no easy task. A teaching-learning path for the development of summarizing skills in primary students. In *Proceedings ICERI2017 10th annual International Conference of Education, Research and Innovation*, Seville (Spain). 16th - 18th of November, 2017, pp. 4613-4618.

Pontecorvo, C., Ajello, A.M. & Zuccheromaglio, C. (2004). *Talking together we learn. Social Interaction and Knowledge at School*. Roma: Carocci.

Reusser, K., Pauli, C. (2015). Co-constructivism in Educational Theory and Practice. In: James D. Wright (editor-in-chief), *International Encyclopedia of the Social & Behavioral Sciences*, 2nd edition, Vol 3. Oxford: Elsevier. pp. 913–917. ISBN: 9780080970868.

Saenz, M.J., Cano, J.L. (2009). Experiential learning through simulation games: An empirical study. *International Journal of Engineering Education*, Vol. 25, No. 2, pp. 296-307. [s12\\_ijee2144.pdf](https://doi.org/10.1007/s10648-019-09465-5)

Sweller, J., van Merriënboer, J. J. G., & Paas, F. (2019). Cognitive architecture and instructional design: 20 years later. *Educational Psychology Review*, 31(2), 261–292. <https://doi.org/10.1007/s10648-019-09465-5>

Van den Bossche, P., Gijssels, W., Segers, M., & Kirschner, P. A. (2006). Social and cognitive factors driving teamwork in collaborative learning environments. *Small Group Research*, 37, 490–521. <https://doi.org/10.1177/1046496406292938>

Wade-Stein, D., & Kintsch, E. (2004). Summary street: interactive computer support for writing. *Cognition and Instruction*, 22, 333-362. <https://doi.org/10.2190/DH8F-QJWM-J457-FQVB>

Wells, G. (2000). Dialogic Inquiry in Education. Building on the Legacy of Vygotsky. In C.D. Lee and P. Smagorinsky (Eds.) *Vygotskian perspectives on literacy research*. New York: Cambridge University Press, (pp. 51-85).