

Emotional Aspects for Productive Dialogues in Computer-Supported Collaborative Learning: A Systematic Literature Review

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Abstract: This paper presents a systematic literature review of the literature on productive dialogues and emotional aspects in Computer-Supported Collaborative Learning (CSCL) and also presents emotional aspects used in debates with conflicting points of view in other contexts. Initially, more than 400 articles were catalogued, belonging mainly to the databases of Springer and Science Direct, not limited by years, because of very important works referenced until today. The findings reveal that in CSCL there is a neglect in relation to the emotional dimension, the results also show that there are negative emotional aspects that impair the motivation in the participation of students in collaborative activities. Empathy is seen as an alternative to conflict resolution in different contexts, in addition to collaborative learning, but it is rarely addressed in CSCL.

Keywords: Productive dialogue, Emotional aspects, Conflict resolution, Computer-Supported Collaborative Learning

Categories: L.6.3, K.3.1, J.4

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1 Introduction

Collaborative learning may be considered as a form of group work that is organized to engage students in a process of intellectual negotiation and collective decision-making. Before reaching consensus, it is necessary expanding the conversation and negotiating many different perspectives. Students' knowledge improves further as they test, review and relocate, taking into account the arguments of their colleagues, teacher and voices outside the classroom [Trimbur, 89]. Computer-supported collaborative learning (CSCL) is an educational field in which learning takes place through social interaction using a computer. The sharing and construction of knowledge among the participants using technology are their primary means of communication or shared resources. CSCL can be implemented in both online and classroom learning environments and can occur synchronously or asynchronously [Halavais, 16]. Students may have different levels of maturity, intellectual conflicts, prejudices, and bad feelings that can make group learning unfeasible. Therefore, defining and working on the emotional dimension can

be an essential player in allowing for responsible, mature behaviour to be portrayed [Noguez, 06].

An emotional aspect that is widely used to pacify conflicts in different collective environments is empathy. Increasing empathetic inclinations promote democratic education [Morrell, 07], because equal consideration for all is better achieved if empathy plays a significant role in their communication [Morrell, 10]. Organizing students into groups within the classroom may have undesirable side effects, like conflicts and competition between students and individualism [Noguez, 06]. The application of empathy is successful in resolving personal conflicts in debates in other spheres, personal conflicts can negatively interfere in group learning [Rosenberg, 15] [Krznic, 14], and empathy is a skill that can be learned through conversations orchestrated by a facilitator [Beauvais, 16], so that students are able to identify their peers' emotions and thus resolve interpersonal conflicts by themselves. The application of empathy is not usual in CSCL, where dialogue plays an essential role. Therefore, the development of empathy in this case should advance for knowledge construction.

According to Gunawardena et al. (1998), the knowledge construction in CSCL is built by students' interactions, by means of the negotiation of meaning and co-creation of knowledge in a constructivist learning environment mediated by technology [Gunawardena, 98]. Pea et al. (1993) emphasizes that the social construction of knowledge is commonly made through collaborative efforts toward yielded objectives or by dialogues and hurdles brought about by differences in persons' perspectives [Pea, 93]. He uses Vygotsky's idea, who emphasized the ways that the character of social interactions and externally mediated actions explicitly create processes that internalize each individual's thinking [Gunawardena, 97] [Vygotsky, 78].

From a socio-cognitive perspective, conflicts may be beneficial for learning, particularly when contradictory evidence leads to deeper discussions and knowledge building; controversy awareness induces students to focus on selecting meaningful discussion threads [Heimbuch, 17]. In CSCL, awareness is generally subsumed as the perception of others' activities and knowledge about a certain situation or collaborative processes [Gijlers, 13]. In CSCL, the awareness concept not commonly includes awareness of other students' emotions.

In this work, we call attention to the fact that in the CSCL literature, the different strategies to promote a productive dialogue are focused on cognitive and interactive aspects of knowledge production, leaving the emotional aspects of interaction mostly marginalized. Strategies to promote knowledge building in CSCL are designed to foster productive collaborative processes, such as opposing points of view, cognitive conflict and conflict resolution, however personal conflicts can be generated during these processes [Heimbuch, 17].

Conflict of ideas is healthy for learning, but relationship conflict is not [Curşeu, 12]. Precise psychological prejudices give rise to and reinforce conflict. Reducing bias and relationship conflict between and within groups is critical to promoting peace and equity [Gaesser, 20], mainly in the actual scenario of Education 4.0.

With the occurrence of the Industrial Revolution 4.0, Education 4.0 emerges, where it is possible for students to turn ideas into reality with the advent of artificial intelligence, neural networks, big data, etc. Four words classify what education is experiencing today: volatility, uncertainty, complexity and ambiguity (VUCA). Volatility refers to the difficulty in predicting scenarios due to the great rapidity of change; uncertainty indicates that solutions to current problems will not necessarily

serve to future problems; high connectivity and activities of a global scope bring a greater number of variables generating complexity; and finally ambiguity where there are many ways of interpreting the same context, many possible answers to a single question. With all this problematic Education 4.0 requires some skills, among them is the socio-emotional that needs the application of cooperation, empathy and social awareness for interpersonal communications and negotiations [Caputo, 19].

The objective of the current systematic literature review is to unveil evidences of the need, importance and feasibility of incorporating strategies applying emotional aspects, such as empathy, in CSCL methods. The present systematic review provides a literature base to support more research on emotions in CSCL, pointing the need to fill the literature gaps regarding the role of emotional aspects in collaborative learning.

2 Method

This study has been undertaken as a systematic literature review based on the original guidelines as proposed by Kitchenham (2004), which is very similar to the set of items found in PRISMA website. PRISMA focuses on the reporting of reviews evaluating randomized trials, but can also be used as a basis for reporting systematic literature review of other types of research, particularly evaluations of interventions. This systematic literature review brings synthesized and relevant information for understanding the use of emotional aspects (e.g., empathy) towards productive dialogues in CSCL and other contexts. The details of the review method are explained below.

2.1 Research Questions

The research questions (RQ) addressed by this study are:

(RQ1) How has productive dialogue been characterized in CSCL?

(RQ2) Have emotional aspects been approached in dialogical processes in CSCL?

(RQ3) How have emotional aspects been used in debates with conflicting points of view in other contexts (For instance: politics)?

2.2 Search Process

The research process mainly involved the databases of Springer and Science Direct, we are not limited to years because there are old researches about CSCL of paramount importance to the theme, for instance [Vygotsky, 78] and [Zimmer, 96]. A limitation on the volume of articles was the number of articles per database. We manually select and peer-reviewed the articles that are closest to the themes of this systematic literature review, giving preference to indexing and similarity of the theme over age of work.

We use three main search strings (SS) to find works that can answer each of the research questions. To be inclusive, we combined keywords using the Boolean operators (AND, OR) using the following query strings to find related works to actual research:

(SS1) (“productive dialogue” OR “productive discourse”) AND “computer-supported collaborative learning”;

(SS2) “emotional” AND “collaborative learning” AND (“debates” OR “conflict” OR “disagreement”) and;

(SS3) “conflict resolution” AND (“emotions” OR “feelings”) AND “debates”.

2.3 First Selection Process

Considering that the databases returned a lot of trash with the use of the search strings, even before reading all the papers, some specific rules were used by researchers in the first selection process, including the exclusion of works with different topics. Several articles expatiated on data communication and computer networks. Articles from journals that do not belong to the themes of the research questions were also excluded.

2.4 Inclusion and Exclusion Criteria

Since it is impracticable to incorporate all studies, after the selection process, two inclusion criteria were considered, the papers should be written in English and answer at least one of the research questions. Duplicate reports from the same study and other literature reviews were excluded. After the inclusion and exclusion criteria, the articles underwent quality assessment.

2.5 Quality Assessment

For the works that were accepted for this research, those that met the inclusion criteria, four quality assessment (QA) questions were used:

(QA1) Does it apply emotional aspects (e.g., empathy, sensing of belonging) in dialogical processes?

(QA2) Is the study empirical?

(QA3) Is the article cited by other studies?

This step is useful to categorize the most important articles for this systematic literature review. The scoring procedure was Y (yes) = 1, P (partially) = 0.5, N (no) = 0.

2.6 Data Extraction

In order to know which research question was answered by each of the selected articles and aid in possible recurring queries, the following form was created to be answered by using the information in all the works individually:

1. What is the contribution of the work?
2. What emotional aspects are addressed in the dialogue?
3. What strategies are used for conflict resolution?
4. The study has any evidence? Which one?
5. Has a path to productive dialogue?
6. Is it related to CSCL?
7. Is there any method of measuring discourse quality?

2.7 Data Analysis

There were 307 records identified records through Springer and Science Direct, and 176 additional records through other sources. Over 20 duplicated records were removed. 269 were excluded with the exclusion criteria, 314 were accepted because inclusion criteria (see *Figure 1*). 244 full-text articles were excluded, with different reasons, for instance duplicate reports from the same study. All other 70 studies were included in qualitative synthesis. More precisely, eight articles on Code Scheme, 28

articles on exploratory talk, seven articles on Academically Productive Talk (APT), five on controversial talk, nine on desirable feelings in CSCL, two on emotional aspects in CSCL, four on Discourse Quality Index (DQI) and finally seven on Nonviolent Communication (NVC). The *Figure 1* presents the articles accepted per year in the first step.

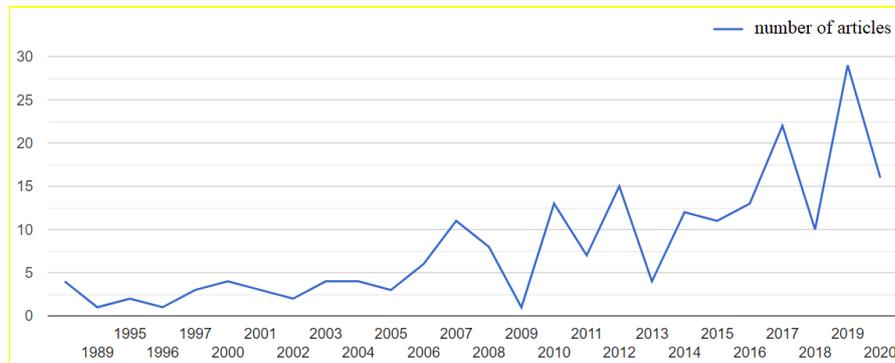


Figure 1: Articles per year after inclusion and exclusion criteria

2.8 Deviations from Protocol

It was necessary to look in other sources for authors cited in the selected works, some of the works of these authors were not in the original databases of the protocol. Also, after discovering the answers to research questions 2 and 3, about emotional aspects, it was necessary to search for works related to themes of these answers, for example, the word empathy was added to a new search string.

3 Results

3.1 Productive dialogue in CSCL

Regarding the productive dialogue in CSCL questioned in (RQ1), the literature indicates code schemes for dialogue analysis and talk alternatives to induce productive dialogue.

3.1.1 Code schemes for analysing the quality of the dialogue

There are several code schemes in the literature to analyse students' discourse. Usually, the dialogue must evolve between phases or stages, beginning with a phase of identification of a problem or challenge, followed by disagreement between the students, who must argue and counter-argue refining the knowledge until they reach a consensus and deliberate a proposal or solution. For instance, [Daniels, 96] created a collaborative learning framework consisting of 9-stages of collaborative learning's iterative process: 1. Introduction to collaborative learning process; 2. Identify situation (problem); 3. Share situation perceptions; 4. Dialogue about interests and concerns; 5. Develop transformative models; 6. Compare models with collective reality; 7.

Collaborative argument about; 8. Implementation and; 9. Taking stock [Daniels, 96]. Gunawardena's model assumes five phases to analyse the interaction for examine the social construction of Knowledge. Briefly, in phase 1, students state their opinions; in phase 2, there is an exploration of disagreement or inconsistency between ideas due to different experiences of participants, literature, collected formed data, relevant analogies and so on; phase 3 are like negotiations and clarifications, in this phase areas of agreement are identified; in phase 4, tests against experimental and formal data are carried out; finally, phase 5 is the phase in which there is a change in thinking resulting from interaction with others. However, the authors themselves point out possible problems, such as the lack of conflicts between ideas, making the discussion may never leave phase 1. It may also happen that the conflict occurs, but has not reached the resolution stage. In addition, operations at different stages can occur at the same time [Gunawardena, 97]. Newman uses the model of [Garrison, 92] as a 5-stage/skill process to measure critical thinking in speeches during group learning, they perform comparisons between learning in face-to-face and computer conference seminars. The stages are: 1. Problem identification; 2. Problem definition; 3. Problem exploration; 4. Problem evaluation/applicability and; 5. Problem integration. The skills are: 1. Elementary clarification; 2. In-depth clarification; 3. Inference; 4. Judgment and; 5. Strategy formation. The authors developed their own set of paired indicators to measure the critical and uncritical thinking [Newman, 95].

The stages or phases are used to section the discourse selected for analysis and to encourage students to advance their ideas. However, some dimensions can be considered. The works are not very different from each other, basically considering the social and cognitive dimensions. For this systematic review of the literature, to show the dimensions taken into account in collaborative learning, we selected eight code schemes, the best evaluated in the quality assessment in Method section. The dimensions that each literature addresses are presented in the *Table 1*; it is possible to conclude that even over the years the models do not include the emotional dimension.

Authors	Dimensions
[Newman, 95]	1. Participative 2. Social 3. Interactive 4. Cognitive 5. Metacognitive
[Daniels, 96]	1. Learning 2. Social cognition
[Gunawardena, 97]	1. Construction of knowledge 2. Social interaction
[Janssen, 07]	1. Performance of task-related activities 2. Regulation and coordination of task related activities
[Ioannou, 11]	1. Learning 2. Social interaction
[Hämäläinen, 13]	1. Knowledge 2. Interaction

Authors	Dimensions
[Biasutti, 17]	1. Cognitive 2. Social
[Chen, 19]	1. Cognitive 2. Social 3. Integrated

Table 1: Code schemes dimensions

Most works encompass dimensions divided into categories and sub-categories or indicators, so that they can be scored in the dialogues to measure the quality of the discourse (see Figure 2). Jeroen Janssen distinguished five main categories of communicative functions: argumentative, responsive, informative, elicitive, and imperative. Each category consists of several sub-categories, 19 in total. Of these, confirmations, acknowledgements, and positive evaluations are considered indications of agreement, while denials verification questions, negative evaluations, and counterarguments are considered indications of discussion or debate. The coding scheme consists of four different dimensions, each dimension contains two or more coding categories, others additional categories that did not belong to any of the four dimensions are included [Janssen, 07].

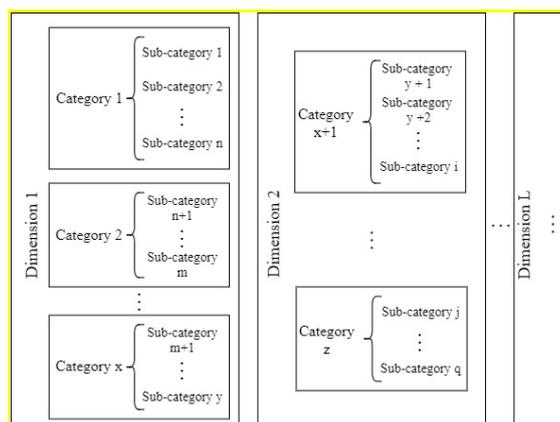


Figure 2: Code scheme categories

3.1.2 Strategies inducing productive dialogue

There are some strategies for the productive employment of dialogue in the literature. There are different types of talks that approach socio-cognitive models to boost knowledge construction during dialogue in collaborative learning. The Table 2 summarizes the strategies found in the literature to make dialogue more productive, it also shows the number of articles accepted for each of the strategies, after the inclusion and exclusion criteria and the quality assessment. Some of these articles approach more than one strategy among the four selected.

Number of Articles	Strategy
28	Exploratory talk
7	Academically productive talk
5	Controversial discussions/issues

Table 2: Dialogue strategies in collaborative learning

Mercer highlights three types of talking and its adjacent thinking: disputational talk, cumulative talk, and exploratory talk. In disputational talk are few attempts to pool resources, or to offer constructive criticism of suggestions, and is characterized by disagreement, individualized decision making, and for having short exchanges consisting of assertions and counter-assertions. In cumulative talk speakers build positively but uncritically on what the other has said, they only construct a "common knowledge" by accumulation. When partners engage critically but constructively with each idea, they are using exploratory talk. These may be challenged, but this is justified by the knowledge that is made more reasoning. Progress then rises from the eventual collective agreement arrived. Disputational talk means talk dominated by assertions and counter-assertions, with few of the repetitions and elaborations which characterize cumulative talk. Exploratory talk, in contrast, means talk which combines challenges and requests for clarification with responses that provide explanations and justifications [Mercer, 96].

Barnes argues that when young people are exchanging ideas as they speak, their change is likely to be hesitant, broken and full of dead ends, although exploratory talk provides an essential means of working on learning, students are expected to use it only if they feel comfortable, and confident that they will not be aggressively opposed or ridiculed. Conflict of ideas is healthy for learning, but relationship conflict is not [Curşeu, 12] [Barnes, 93].

Academically productive talk (APT) is a method used in collaborative learning; APT facilitation moves aim to increase the amount of transactivity by dynamically reacting to student discussions, prompting them to build on each other reasoning. Moreover, the APT refers both to learners' social positioning to each other and their conceptual positioning to knowledge. Productive talk can be structured from a facilitator who promotes some moves to encourage students, like revoicing, asking students to restate someone else's reasoning, asking students to apply their own reasoning to someone else's, prompting students for participation and asking students to explicate their reasoning. The characterization of APT involves exploratory talk, because encouraging an awareness and use of this alternative talk help learners develop intellectual habits that will serve them in different situations [Mercer, 99].

Another important concept used in collaborative learning is socio-cognitive conflicts that can be named as academic controversy [Santicola, 15], controversy awareness [Heimbuch, 17], or controversial discussions [Buder, 08]. Conflicts emerge when a student's cognitive knowledge contradict either another perspective base and as a consequence leads to reorganization and restructuring of cognitive processes, if consensus building is requested or required. This kind of conflict promotes opportunities of taking another perspective to discussants while contributing to meaningful discussions can foster elaboration process and trigger situational epistemic

curiosity. Implementation of controversy awareness representations help students to focus on selecting meaningful discussion threads, students can benefit increasing their learning when being aware of occurring controversies [Heimbuch, 17]. These grounded classroom discussion practices equip all students to participate in academically productive talk.

3.2 Emotional aspects in CSCL

Emotions are seen as the objects of appeals which function as adjuvants to argumentation, speakers appeal to listener emotions to enhance the cogency of an argument [Herman, 19]. Emotions also create some of the requirements for engagement and motivation, they are part of the social interaction and cognitive performance of the participants in CSCL, which means that one needs to study how emotions contribute to and are co-constituted [Ludvigsen, 16]. Unfortunately, the emotional aspects are scarcely approached in CSCL. Sections 3.2.1 and 3.2.2 respond to (RQ2).

3.2.1 Desirable feelings in CSCL

There are several desirable feelings for the productivity of collaborative learning, but there are few strategies in the literature to achieve or develop these feelings in students. CSCL may exhibit problems with communication, problems with technology, lack of synchronous meetings, lack of familiarity between students, motivation, emotions, feelings, dependence, need to meet face to face and strangeness [Robinson, 13]. The sum of the student's experiences in the environments is responsible for the construction of the student's sense of belonging [Ratcliffe, 12]. Sense of belonging to a group and connectedness with members affects students' motivation to and engagement in collaboration [Kwon, 14]. By engaging emotion regulation, groups can actively improve their motivation and direct the group's emotional atmosphere to overcome the challenges [Järvenoja, 17]. Another important feeling in CSCL is the confidence of students and teachers. Students' perception of their level of confidence in PC skills in CSCL is related to improving collaborative skills [Iinuma, 16]. Sufficient confidence or awareness, in short, could increase the teacher's ability to regulate and scaffold student learning adequately and to regulate activities during collaboration [van Leeuwen, 15]. Their confidence in developing activities (performance) generates satisfaction and well-being [Sundararajan, 09]. For this systematic literature review, we categorize some desirable feelings to increase group learning and coexistence of students in CSCL, see *Table 3*.

Feelings	Authors
Confidence	[Inuma, 16] [van Leeuwen, 15] [Sundararajan, 09]
Sense of belonging	[Chavez, 12] [Hernández-Sellés, 19] [Reis, 18]
Motivation and engagement	[Robinson, 13] [Kwon, 14] [Järvenoja, 17].

Table 3: Desirable feelings in CSCL

3.2.2 The employment of empathy in collaborative learning

Empathy is much more than kindness and sensitivity, but an ability that can be learned, and whoever develops it has the ability to listen and understand the other in order to choose better actions [Krznaric, 14]. Empathy contains two dimensions, cognitive empathy, and affective empathy [Eisenberg, 87]. Cognitive empathy reflects the ability to adopt another's perspective and identify their emotions, while affective empathy is described as more immediate and unintentional, the feeling of sharing the other's feelings. Cognitive empathy can be developed with age as a more intentional and controlled component [Topcu, 12]. Empathy is intrinsically related to ethics, while subjects in inter-subjective relationships are driven to understand the experiences of the other, considering it as their own experience, which leads the subject to adopt ethical perspectives with respect to otherness [Stein, 12].

Two important aspects for learning empathy are perspective-taking and perspective-giving. Perspective-taking activities commonly ask participants to 'step in the shoes' of a representative member of a distinct group to influence empathy for that out-group. Perspective-giving proposes that members of non-dominant groups may benefit from exercising their voices, from providing a chance for members of the disempowered group to speak to an individual from the dominant group, and (critically) feel 'heard' is an effective way to address their needs [Bruneau, 12].

Empathy training includes developing self and other awareness and practical communication skills such as careful listening and responding [Wright, 08], which is very important for students' behaviour. A severe problem that occurs with students is bullying, which can damage self-perceptions (e.g., self-esteem, self-concept, self-confidence and, self-efficacy) [Durlak, 11]. Empathy is considered a common protective factor against traditional and cyberbullying [Graf, 19], [Fredrick, 20]. Some works have argued that bullies, whose cognitive empathy level is high, will be good at hurting their victims because they know what hurts more. Nevertheless, affective empathy balances the possible adverse effects of cognitive empathy [Dautenhahn, 03]. Males tend to bully others more than females do, because males were seen to be less empathetic than females [Topcu, 12].

Bad experiences can cause changes in the perceived space. Things no longer have their usual practical meaning and therefore seem distant, disconnected, the feeling of being part of the world is eroded; the person disconnects [Ratcliffe, 12]. Judgment

involves much more than pure reason, empathy as self-regulation involves cognitive, motivational, affective and behavioural components that enable individuals to adjust their actions and/or their goals in order to achieve desired results in changing environmental circumstances [Hughes, 18]. In collaborative positive psychology, the principle of freedom is based on defending each member as a leader among co-leaders implying collective empowerment, equality, and shared normative social justice. Solidarity at the group level implies empathy, perspective and collaborative problem solving to solve shared problems [Hogan, 20].

Despite all the benefits of developing empathy in collaborative learning, it is still little explored today, with empathy occasionally cited but very little worked on in collaborative learning.

Zimmer argues that in CSCL-at-a-distance, the competitive opposition or withdrawal is worse than in-person classes. These bad behaviours rather than collaborating, can cause students to abandon their course. To encourage creative cooperation online, Zimmer developed a set of protocols called empathy templates and a collaborative-learning cycle consisting of three factors identified as the core behaviours behind successful communication, which results, for all participants, in a sense of togetherness in shared understanding. These factors are open disclosure, warm affirmation and empathic comprehension [Zimmer, 13] [Zimmer, 96]. The use of Zimmer's empathy templates was not very good, so they were soon dropped at the UKOU when they were discharged at UKOU when they were tested.

3.3 Emotional aspects in other conflicting dialogical contexts

For this section, we selected articles with studies about DQI (Discourse Quality Index) of deliberative democracy and the NVC (Non-Violent Communication) technique to avoid conflicts in many contexts, responding to (RQ3).

3.3.1 Deliberative discourse

The political tension on the skill of speaking increases inequalities while listening is a fundamentally more equal process that requires and encourages empathy and understanding between interlocutors [Dobson, 12]. Deliberative democracy or discursive democracy, created by the German Jürgen Habermas, constitutes itself as a model or process of democratic political deliberation characterized by a set of theoretical-normative assumptions that incorporate the participation of civil society in the regulation of collective life [Habermas, 94]. Various minorities can still be persecuted while equal rights are proclaimed for all. Empathy can turn people into better democrats, in order to remodel citizens to become attentive to others and more fully realized. In other situations, where minimal traces of intersubjectivity are already present, empathy could help build and strengthen predispositions to community, mutual understanding, agreement and lead to better dialogue [Morrell, 10].

Discourse Quality Index (DQI) is an established content analytical measure created by Steiner et al. (2005) for getting the quality of deliberative processes. The quality of citizen deliberation is evaluated by the degree to which citizen deliberation fulfils a number of vital characteristics ascribed by deliberative theory and whether deliberative behaviour is equally distributed among the participants. The DQI has some indicators

to be measured, they are participation, level of justification, content of justification, respect, and constructive politics [Steiner, 05].

For a better understanding of DQI, we selected four works that were based on the original indicators and adapted according to the needs of each work, [Ugarriza, 16] [Jennstål, 19] [Steenbergen, 03] [Himmelroos, 17].

Philosophical work on deliberative discourse implements the Accountable Talk, it emphasizes the importance to support and promote equity and access to academic learning, widely used. The idea is challenge premises, rather than directly attacking conclusions to build collaborative knowledge. Accountable Talk comprising three criteria: building contributions in response to the contributions of others; speeches that emphasize logical connections and drawing reasonable conclusions; speeches explicitly based on facts, written texts or other public information [Michaels, 08].

3.3.2 Nonviolent Communication

Nonviolent communication (NVC) is a method developed by American social psychologist Marshall Rosenberg and his team for peaceful conflict resolution. Its main means is the development of empathy, which helps even in the most difficult cases of breakups and poor communication. In 1984, Dr. Rosenberg founded, in California, the Center for Nonviolent Communication (CNVC), an international non-profit organization with influence in 30 countries. The work has been carried out with educators, health professionals, mediators, businessmen, prisoners and guards, police, military, clergy and civil servants [Rosenberg, 15].

Although Rosenberg treats compassion as part of empathy, for all his work, he stresses the importance of listening to the other, putting in the other's place. He also points out three types of communication that block empathy, that are: moralistic judgments; making comparisons and denial of responsibility.

A person trained in NVC, first observes what is happening in a given situation without making any judgment, then identifies how he feels when he observes that action. Third, the trained person recognizes what needs are linked to the identified feelings. Finally, she is able to articulate a request indicating what she wants. Therefore, part of NVC is to express the four information very clearly [Rosenberg, 04]. Hence, NVC has four components: observations; feelings; needs and; requests. Some articles were selected that indicate the effective application of nonviolent communication toward conflict resolution under different situations, including in education, see *Table 4*.

Scope	Application	Authors
Education	Peer-to-peer dialogue in higher education	[Fitzgerald, 19]
	Conflict behaviour of students in primary school	[Džaferović, 18]
Nursing	Foster collective leadership and clarification about the roles of health care and social teams' services	[Museux, 16]
	Relationship between the veteran nursing team and the training team	[Glazier, 19]
Court lawsuits	Out of court dispute resolution and extrajudicial dispute resolution	[Csilla, 19]
Latino immigrants	supportive relationships/trainings of Latino adults and youth	[Nosek, 17]
Politics	Mediating coalition politics at the local government level in South Africa	[Bradshaw, 19]

Table 4: Applications of NVC

4 Discussion

4.1 The lack of emotional dimension in CSCL

Very few studies consider the emotional dimension to be mandatory in code schemes and dialogue, yet there are plenty of articles reporting emotional problems in the classroom, which could not be resolved with only the cognitive and social dimensions. We have found few works that minimally consider emotional aspects or diminish them by placing them as a subcategory of the social dimension. In this work, we call attention to the fact that in the CSCL literature, the different talks to promote a good dialogue are focused on cognitive and interactive aspects of knowledge production, leaving the emotional aspects of interaction marginalized. Talks in CSCL are designed to foster cognitive conflict and conflict resolution, however personal conflicts can be generated during this process [Heimbuch, 17].

Some studies continue to report unsatisfactory results related to engaging students in online CSCL [de Paula, 99] [Stahl, 01] [Ioannou, 11]. From a sociocultural theory perspective, social interactions are an important strength in the learning process, as it supports thinking and knowledge construction [Wertsch, 94]. For this reason, knowledge arises from active dialogue and interaction between those who attempt to understand, before it is internalized an individual knowledge [Vygotsky, 78] [Brown, 94] [Brown, 87].

However, students are often not motivated to participate in these dialogues, probably because they are not emotionally involved or are not emotionally well in that environment.

Based on the problems pointed out in the Gunawardena's model and in the studies of Controversial Discourse, Empathy and Deliberative Discourse, we can consider that to reach exploratory speech so that students get out of Gunawardena's Model phase 2 maintaining the productivity of the interaction, the implementation of controversial

discourse is recommended. However, for students to listen to each other and consider divergent opinions, it is important to establish empathy. And for students to reach Gunawardena's Mode phase 5, which is decision making, it is necessary to address emotional dimension, for instance incorporating ideas from deliberative discourse in CSCL. For that, it is necessary to have facilitators who train students in ideal communication strategies and also to induce them in the elaboration of more elaborated and grounded arguments without losing empathy and respect.

4.2 The importance of empathy in socialization

The ability to empathize with people can reduce prejudice between different groups of people [Davis, 18], promote tolerance for opposing political views [Mutz, 02], and in tense situations, can ward off the potential risk of violence [Rosenberg, 15]. Precise psychological prejudices give rise to and reinforce conflict. Reducing bias and relationship conflict between and within groups is critical to promoting peace and equity [Gaesser, 20].

Empathy is an essential part of conflict resolution in the family, in the schoolyard, in the classroom and in the corporate meeting room [Krznicaric, 14]. Baron-Cohen argues that women are, on average, more empathic than men, not just because of cultural forces such as the massive onslaught of toy ads stereotyped according to gender or parental behaviours and expectations, but in their conception women are good at relationships and emotions.

Nevertheless, the big question is not the degree of empathy with which humans are born, but that this degree can be elevated if taught [Baron, 04]. Empathy is invaluable to strengthening ethics in democratic citizenship. With enough training in both aspects of empathy, men can be more aware of gender differences and the position of women in society. Nonetheless, in general, women and those with lower education have a smaller influence on the deliberative process [Himmelroos, 17].

Unfortunately, moralizing judgements, comparisons and denial of responsibility are still the basis of arguments of ignorant people regarding the problems suffered by distant social classes or even for classes that are in a subordinate position. The Empathetic construction in dominant groups is very important so that they can become aware of the problem of minority groups. This rationale can be expanded for dialogical processes at any scenario, including the CSCL context. In this work, we highlight the possibility to bring productive dialogues emotional features from other disciplines to CSCL.

5 Conclusion

In this systematic review we reviewed and presented a range of approaches to the issue of how to promote productive dialogue in CSCL. The exploratory and controversial statements used to promote productive dialogue and various code schemes to measure the quality of the speech in CSCL were found. Through the study of the articles selected for this review, a neglect with the emotional dimension in CSCL was noted, with the main focus of the works being the cognitive and social dimensions, however several of these works pointed out the students' lack of motivation to participate in collaborative dialogues due to negative emotional aspects with low self-esteem and low sense of belonging.

Research works in other areas pointed out that in a dialogue, a person can feel more motivated to contribute and participate if he is emotionally comfortable, in an environment that feels safe and very involved with the topic under discussion. Through several works it is possible to notice the importance of empathy in debates with conflicting points of view in different contexts, because through the learning of empathy the participants start to hear and better understand the adverse positions. In order for emotional aspects to be applied in CSCL it is very important to have a facilitator, who adds a third layer to the dialogue, inducing participants into empathic and respectful practices.

In this systematic review, we point out a gap in the CSCL concerning the emotional aspect and allude to the need to create code schemes and talks with a greater emphasis on the emotional dimension, enabling more inclusive collaborative learning settings.

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