

Original Article

Contingent interactions and the formation of a Community of Practice in an online discussion forum

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Abstract

This work aims to analyze the messages of an online discussion forum of a discipline of the Professional Master in Educational Technology of a Brazilian federal public university, taught in the hybrid modality, in order to identify the manifestation of contingent interactions, through their linguistic and cognitive elements. The theoretical framework of the research is based on the concept of contingent interactions and Communities of Practice (CoPs), mediated by Digital Information and Communication Technologies (TDIC). The study is exploratory based on bibliographic research, application of a case study and a qualitative-quantitative approach based on the data resulting from the application of the textualization and learning categories of the Contingent Interaction Analysis System (SAIC), according to David and Castro Filho (2012). Such a system seeks to identify interactions that reflect greater participant engagement and a more favorable context for learning. The forum had the participation of the teacher and ten students who were enrolled in the course, making a total of 31 messages. The results showed some variations in the way the participants wrote, in terms of clarity and coherence. In addition, it presented weaknesses in directing messages to the group, in addition to the lack of negotiation of meanings during the debate, which can be an obstacle to the advancement of students' knowledge.

Keywords: contingent interaction; discussion forum; knowledge construction.

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I. Introduction

The Brazilian educational system has developed according to the social, economic, political and technological changes manifested in Brazil over the years. However, the country's educational institutions, despite being adapted to face-to-face and distance education modalities, underwent an adaptation in teaching models as a result of the covid-19 pandemic, which began in 2020.

In this case, remote teaching (an educational model that became known during the pandemic) was carried out on an emergency basis through online classes, so that the student was not harmed and was able to continue the school year during the pandemic context. According to David et al. (2021), in 2020, schools and universities underwent a process of suspending face-to-face classes as a measure to contain the spread of the covid-19 virus, giving educational institutions the great challenge of continuing educational activities in the midst of pandemic.

After two years, educational institutions have been resuming face-to-face activities. Some of these institutions have combined the online format with the face-to-face (hybrid teaching), as is the case of the university where this study took place when establishing Normative Instruction n. 90, of September 28, 2021, of the Secretariat for Management and Personnel Performance (SGP) and the Special Secretariat for Debureaucratization, Management and Digital Government (SEDGG), which regulated the gradual and safe return to face-to-face work and also allowed for flexibility from remote teaching to teachers who fit some conditions or risk factors.

However, before the end of the first half of 2022, the university revoked Normative Instruction n. 90, establishing Normative Instruction n. 36, of May 5, 2022, of the SGP/SEDGG, which established the return to face-to-face work of all civil servants and public employees of the bodies and entities of the Civil Personnel System of the Federal Public Administration (SIPEC), directly impacting the functioning of the subject on screen in this study, which started online and ended the activities in a hybrid way.

Therefore, among the concepts presented in this course on interaction in virtual environments, it was evident that teaching mediated by Digital Information and Communication Technologies (TDICs) has the challenge of overcoming some paradigms of traditional teaching, as is the case of Communities of Practice (CoPs), which are characterized, according to

Machado, Forno and Almeida. (2020, p. 21), as “groups of individuals who come together because they have common interests in learning and applying the demands that are debugged in the group”.

Based on this assumption, the interaction in the exchange of messages can occur through some digital tools such as the discussion forum, the object of study of this research, whose objective is to promote a democratic discussion among students, in which everyone has the opportunity to express their point of view on the topic at hand. According to Portela and Mill (2018), the discussion forum is a tool used by groups in order to raise reflections and collaborate with each other in the construction of knowledge related to a particular subject.

Therefore, the epistemological conception defended in this article is based on learning theories related to the interactionist paradigm. According to Vygotsky (2008), the socio-historical theory already addressed the need for effective interaction between subjects with different experiences for learning situations to occur.

Thus, the interest in analyzing the messages of the participants of a forum arose during the preparation of a seminar on the Interaction Analysis in Virtual Environments discipline, of the Professional Master's Degree in Educational Technology of a Brazilian federal public university. The forum was created in the Integrated System of Academic Activities Management (SIGAA) with the objective of identifying, in the messages, the manifestation of contingent interactions through their linguistic and cognitive elements.

To do so, we raised the following questions: which linguistic and cognitive elements characteristic of contingent interactions emerged through the forum under analysis? Can this forum be considered a starting point for the formation of a CoP?

Therefore, in order to resolve these questions, in addition to the section that introduces this article, the theoretical foundation on CoPs and discussion forums as a support for teaching mediated by DICTs will be presented. Then, the Contingent Interaction Analysis System (SAIC) developed by David (2010) to analyze and categorize messages shared through the discussion forum will be exposed. Soon after, we will present the methodological process applied in this research. Finally, the data analysis, research results and final considerations will be highlighted.

2. CoPs and discussion forums as tools to support online learning

With the development and application of TDICs in the field of education, virtual environments gained space in the context of educational institutions, mainly in communication processes and teaching methods, directly impacting the development of students' learning.

Thus, according to Vasconcelos and Heidrich (2016), the virtual learning environment is attractive and enables, through social networks, the creation of groups to build communities of interaction in the exchange of information. For Machado, Forno and Almeida (2020, p. 22), “these groups that are formed with the intention of promoting interaction, exchange of experiences and sharing of information can be understood and assimilated as CoP”.

For Rodrigues Netto (2021, p. 166), “Communities of practice, in addition to being conceived with the aim of fulfilling a certain objective, can be structured to function for a certain period or indefinitely”. This conception corroborates the idea of creating a forum to discuss a certain topic for a specific period.

Therefore, CoPs are classified as groups that come together to discuss common issues and put into practice actions established collectively with a focus on learning (MACHADO; FORNO; ALMEIDA, 2020). This term was created by Etienne (1998), who considered that there was no limited space for the virtual learning environment and for the exchange of information, presenting an approach to promoting and acquiring knowledge through these communities.

Therefore, the discussion groups in the school context were expanding, mainly with the use of TDICs, which made it possible to interact on curricular content, whether in person or virtually, with more intensity during the pandemic period of covid-19. Interactions began to occur synchronously and asynchronously through various digital tools, for example, the discussion forum.

In this sense, the forum can be used as a tool for presenting the participating group, a space for disclosing the programmed contents, discussions, clarifying doubts, proposing new ideas, suggestions, among other functions. According to Salgado (2021, p. 113):

According to Moodle version 3.6.35, the forum activity allows tutors and students to have discussions in asynchronous mode. There are several types of forum, such as the standard forum where any participant can start a new discussion, the forum where each student can only post a discussion topic or the question and answer forum in which students must first respond to a topic (question) to be able to see the answers of colleagues.

For Sousa and Oliveira (2020, p. 112), “the forum is a tool for discussion and exchange of knowledge, enabling interaction between students and teachers at any time”. Thus, this tool enables asynchronous participation in the debate, that is, the participant has the opportunity to read all the messages, research the topic and contribute in a more planned way, with reflective criticism and constructive ideas.

Among the forum characteristics and the different ways of using this digital tool in the educational field, David et al. (2021) demonstrate that individual messages from the discussion forum can be analyzed using a system that categorizes messages exchanged between group participants in order to verify whether there was individual or collective learning.

In this way, the forum will be able to enable the identification and characterization of the learning context through contingent interactions, because, according to David et al. (2021, p. 332), “Contingent interactions are understood as communication processes more directly associated with engagement and learning, based on a context that values reflective, critical and constructive practices”.

Thus, it can be considered that the messages published in the discussion forum are in the virtual environment as a CoP. In turn, to characterize the interaction process as a CoP, it needs to outline and achieve a specific objective. In the case of the forum under analysis in this study, its characterization will be done through the application of SAIC categories, which will be presented in the next section with the purpose of identifying the type of interaction between participants if it is contributing or not to learning. collective.

3. The SAIC and the characterization of CoP

TDICs allow several changes in the forms of interaction between subjects in society. Therefore, we hope that the production of knowledge

is done collectively and that digital technologies are a tool that favors the construction of this knowledge. In this way, as presented in the previous section, learning can take place in a virtual learning environment through CoPs, in which a group meets to exchange information using a digital tool such as the discussion forum.

In this context, David (2010) and David and Castro-Filho (2012) propose a theoretical model for the analysis of discussion forums called SAIC. This system is divided into four general categories — conversation, textualization, dialogue and learning — and the objective is to identify the foundation of the concepts of contingent interaction.

The conversation category seeks to present the relevance of messages published in a forum for the promotion of social interaction among the group based on parameters classified as theme, which is related to the type of content found in the messages; familiarity when identifying, in the messages, some previous knowledge about the subjects shared; unpredictability when the message generates curiosity about possible topics that will be addressed later; Continuity, which is based on messages with a broad, limited and non-existent meaning (DAVID; CASTRO-FILHO, 2012).

About the textualization category, David and Castro-Filho (2012) demonstrate the type of language addressed in the messages with regard to the parameters of clarity and coherence when it comes to the understanding of the messages by the participants in a complete, partial or non-existent way. The authors also present the orientation parameter, in which the analysis is carried out according to the direction of the messages, which can occur for all participants, one in particular or none.

Dialogue is the category based on Paulo Freire's dialogicity, and the parameters are: *affectivity*, which is the identification of proximity between the interlocutors in the messages; discursive symmetry, which occurs when messages have equal roles among all; *critical reflexivity* by demonstrating in the messages a reflection on the subject in a personal, interpersonal way or not presenting any reflection. In this category, parameters for valuing autonomy are also presented, which occurs when the teacher-tutor encourages student contributions, and for exercising autonomy, which happens when students show interest in going deeper into the subjects discussed (DAVID; CASTRO-FILHO, 2012).

Finally, the learning category seeks to identify elements in the interactions

that demonstrate the emergence of new knowledge through the parameters negotiation of meanings and production of meanings. The first identifies the strategies adopted by the interlocutor to understand the other messages, while the second signals when new elements are added to the debate, as well as the recognition of some information from the messages for learning or understanding some concept presented in the discussions (DAVID; CASTRO-FILHO, 2012).

Therefore, each category presents characteristics that help in the analysis of the messages of a discussion forum. In the next section, it will be exposed how these categories were applied to the forum analyzed in this research, taking into account their frequency of occurrence in the published messages.

4. Methodological route

The present study is an exploratory research, as the authors seek to survey information related to the investigated object. For Gil (1999), the exploratory type provides an overview of a specific fact, consisting of deepening fundamental concepts on the subject. In this sense, the exploratory design of this study is directly linked to the digital tool, with the aim of knowing how knowledge construction occurs through its usability.

As a methodological procedure, a bibliographical research was chosen. As Gil (2002) points out, this type of research refers to a methodology that encompasses bibliographic and documentary research, as well as the application of a case study focused on contingent interaction and the construction of knowledge mediated by technologies. For Gil (2002), the case study allows a deeper analysis of a certain group of people and, thus, it is possible to have detailed knowledge about the object of study.

In view of this, the study is also classified, in terms of approach, as qualitative and quantitative. It presents some characteristics of quantitative research due to the numerical data used to quantify the manifestation of the parameters of the categories, however the analysis of the messages published in the forum has a particularly qualitative character based on the reading and interpretation of each message, classifying the textual elements according to the selected categories. According to Yin (2016, p. 22), “qualitative research differs by its ability to represent the views and perspectives of study participants. Capturing their perspectives can be an important purpose of a qualitative study.

Based on this principle, the research consisted of the analysis of one of the forums of the Interaction Analysis in Virtual Environments discipline, of the master's degree at a Brazilian federal university, as it is an institution that presents research related to the theme of this study. The objective of the forum was the more effective participation of students in the context of a seminar proposed in the discipline and the identification of published messages, which would be decisive for the manifestation of contingent interactions through this digital tool.

Therefore, the forum was created in the university's SIGAA and is characterized by being a simple question and answer tool with few text formatting resources. The forum had the participation of ten students enrolled in the teacher's discipline. The discussion generated 31 publications, being the most discussed within the discipline until the deadline for participation.

The study data were produced through forum messages, which had the following proposal as a guiding question: *During the covid-19 pandemic, virtually all teachers/students had to adapt to remote teaching. In this semester of 2022.1, post-pandemic, many education systems are using both the face-to-face modality and the remote teaching modality. For you, who had these two experiences in practice, what is your opinion regarding your level of learning in relation to these teaching modalities?*

For that, it was decided to investigate, in this research, only the categories of textualization and learning, concentrating the analysis of the messages in the form of writing and the identification of elements that contribute to the advancement of the group's knowledge, since the subcategories of the two selected presented elements similar to those of the conversation categories and dialogs respectively.

Therefore, for the categorization of the forum in this research, the parameters listed in Chart 1 were used, according to David and Castro-Filho (2012), to evaluate the text of the messages regarding clarity and coherence, as well as authorial direction. Furthermore, the analysis investigated the forum's interactions with regard to the negotiation of meanings and whether the participants recognized the development of new knowledge on the topic proposed for the virtual debate.

Table 1 — SAIC categories and dimensions

TEXTUALIZATION CATEGORY	
Clarity and coherence	a) Total: message content is fully understandable by participants.
	b) Partial: The content contains some inconsistencies.
	c) Non-existent: the message content is totally incomprehensible by the participants.
Guidance	a) Social: The message is directed to all participants.
	b) Specific: the message refers to a particular person or subgroup.
	c) Undefined: the message does not refer to anyone specifically; is limited to commenting on the topic under discussion.
LEARNING CATEGORY	
Negotiation of meaning	The interlocutor uses communicative and cognitive strategies to understand the content(s) of the other message(s).
Production of meaning	a) The interlocutor added some new element to the debate.
	b) The message is recognized for its contribution to learning.
	c) The interlocutor verbalizes that he understood some concept or element under discussion.

Source: Adapted from David and Castro-Filho (2012).

From this perspective, with this interaction system, we seek to categorize the messages and analyze the interventions qualitatively and quantitatively, taking into account both the quantitative data and the qualitative aspects related to the context of the virtual environment with the intention of identifying the formation of a context more conducive to learning during the forum.

5. Data analysis and discussion of results

The analysis of the forum messages established for this research was carried out based on the SAIC presented in the previous section, taking into account only the parameters belonging to the textualization and learning categories (DAVID; CASTRO-FILHO, 2012).

For that, the frequency with which the terms related to the parameters of each category occurred in the analyzed forum was observed. Although the data collection presents quantitative aspects, the analysis of the forum messages is primarily qualitative and interpretative.

The analysis was carried out by reading each publication, reflecting on the complete content of the message, with the aim of identifying, based on the elements of the speech, and classifying the messages according to each parameter of the categories. The results that identify the presence of categories in the analyzed messages are presented in Table 2.

Table 2 — SAIC

CONTINGENT INTERACTION ANALYSIS SYSTEM		FORUM MESSAGES (N = 31)	
CATEGORY	PARAMETERS	ANALYSIS	ATTENDANCE (PERCENTAGE)
TEXTUALIZATION	Clarity and coherence	Total	25 (80,6%)
		Partial	06 (19,4%)
		Nonexistent	0
	Guidance	Social	05 (16,1%)
		Specific	16 (51,6%)
		Undefined	10 (32,3%)
LEARNING	Negotiation of meaning	Present	10 (32,3%)
		Absent	21 (67,7%)
		Undefined	0
	Production of meaning	Present	24 (77,4%)
		Absent	06 (19,4%)
		Undefined	01 (3,2%)

Source: Adapted from David and Castro-Filho (2012).

Before entering into the discussion of the results, we thought it appropriate to describe the forum tool of the virtual learning environment used in the discipline, the SIGAA.

5.1. The SIGAA forum tool

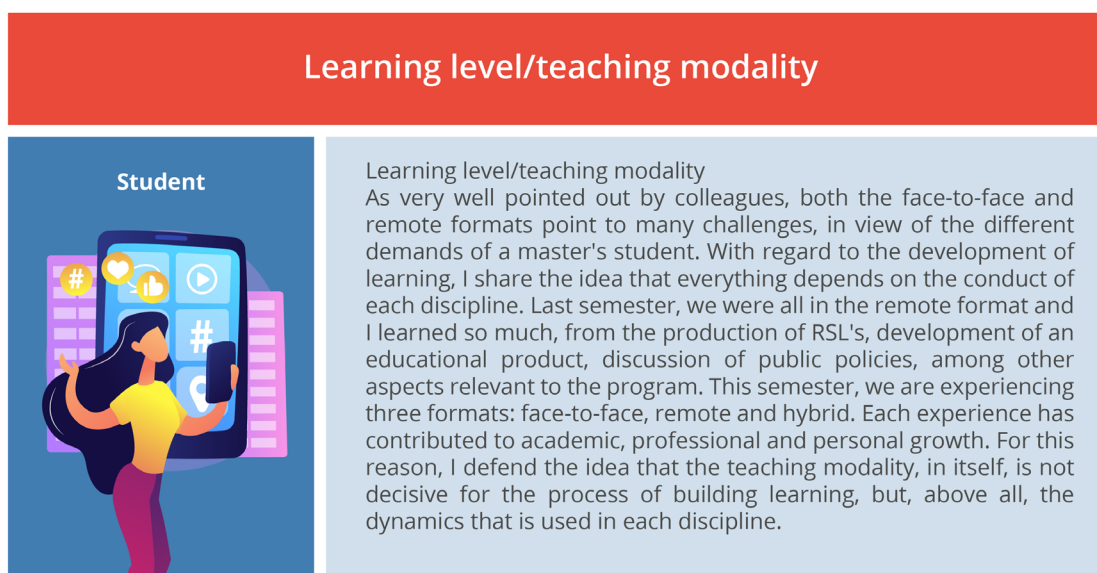
The SIGAA forum presents the structure of messages in a hierarchical format, that is, the messages are organized according to the order of posting, as in a news bulletin board. A positive aspect of this tool is that you receive an email notification whenever a new message is posted on the forum.

Some of the tool's limitations are: the lack of option to reply to messages directly in other participants' messages; the impossibility of re-editing the publication; and the lack of ways of inserting figures and including attachments by the interlocutors.

However, the participants themselves sought ways to circumvent these limitations by using the option of inserting the addressee in the title of the message, if it is directed to another student, teacher or tutor. Another strategy was the inclusion of quotes or changing the color in specific parts of the message as a way of highlighting them.

In view of this, the results regarding the textualization category, shown in Chart 2, demonstrate that there was clarity and coherence in 80.6% of the message contents, thus showing that most of them are fully understandable by the group, and this factor is paramount for the establishment of contingent interactions. On the other hand, in 19.4% of the messages, there was a partial understanding of the content, which constitutes an obstacle to understanding the speech of the sender of the message.

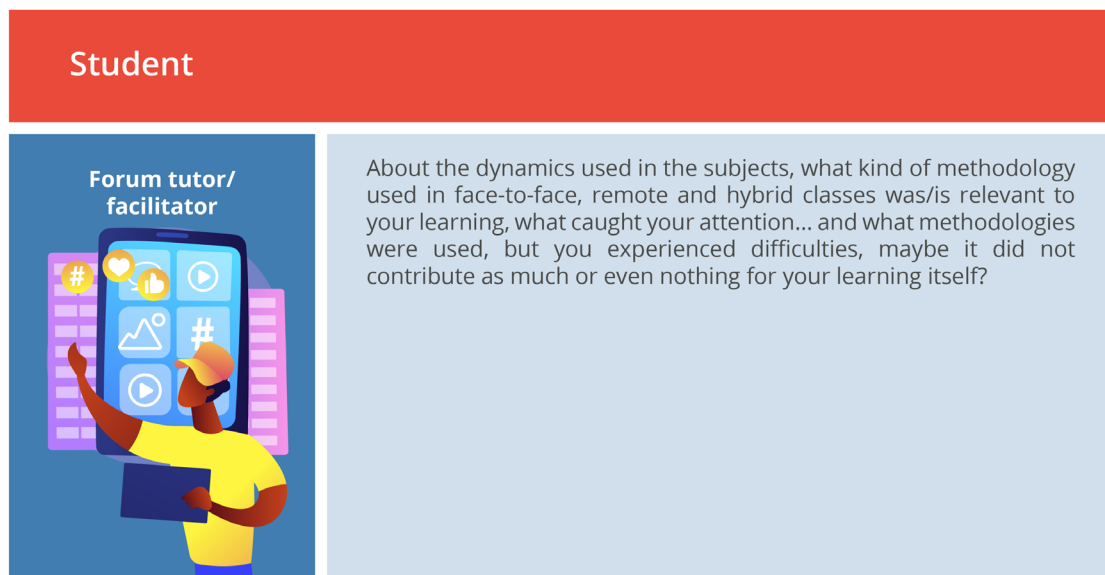
Figure 1 — Message about clarity and coherence



Source: Prepared by the authors (2022).

With regard to message orientation, which indicates who the messages were intended for, it was found that 51.6% of the messages were directed specifically to someone, mainly in response to the forum tutor/mediator, thus establishing a type of communication in particular, but which, in some situations, served as a context for the sending of new messages by other participants.

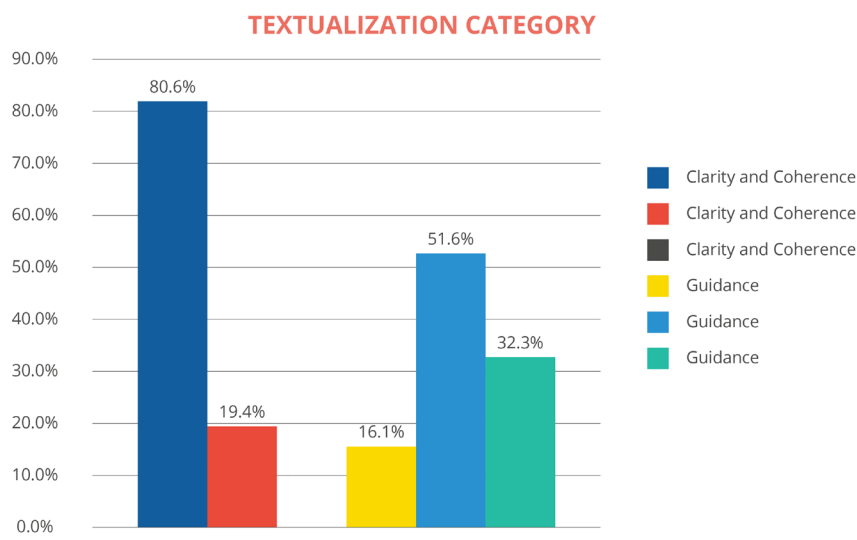
Figure 2 — Tutor message directed to a student



Source: Prepared by the authors (2022).

Furthermore, in 16.1% of the publications, the direction was aimed at the community, as they evoked all forum participants. A percentage of 32.3% of the messages did not have a specific recipient, being limited only to the discussion of the topic addressed in the forum. Soon it was observed that both the specific orientation of the messages and the social one are important and necessary for the development of contingent interactions.

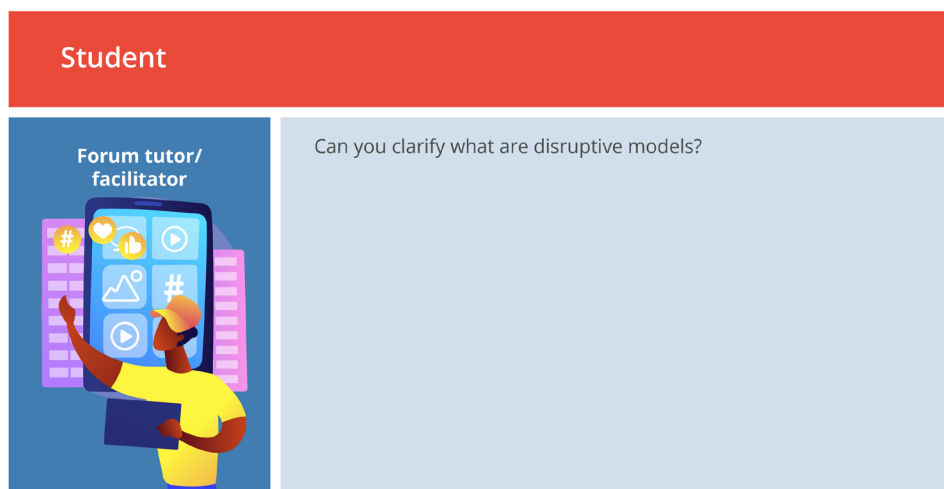
Graph I — Quantitative result



Source: Prepared by the authors (2022).

The second dimension of the contingent interactions analyzed, according to Chart 3, was the learning category. As for the parameter negotiation of meanings in this category, it was observed that 67.7% of the messages posted on the subject's forum did not present requests for clarification of doubts or any indication of misunderstanding about the contents. On the other hand, 32.3% of the messages pointed out some terms related to the search for more clarification on the subjects discussed in the forum, mainly on terms that were not directly related to the topic, which is considered a positive factor from the point of view of learning collective.

Figure 3 — Message about clarification of new terms

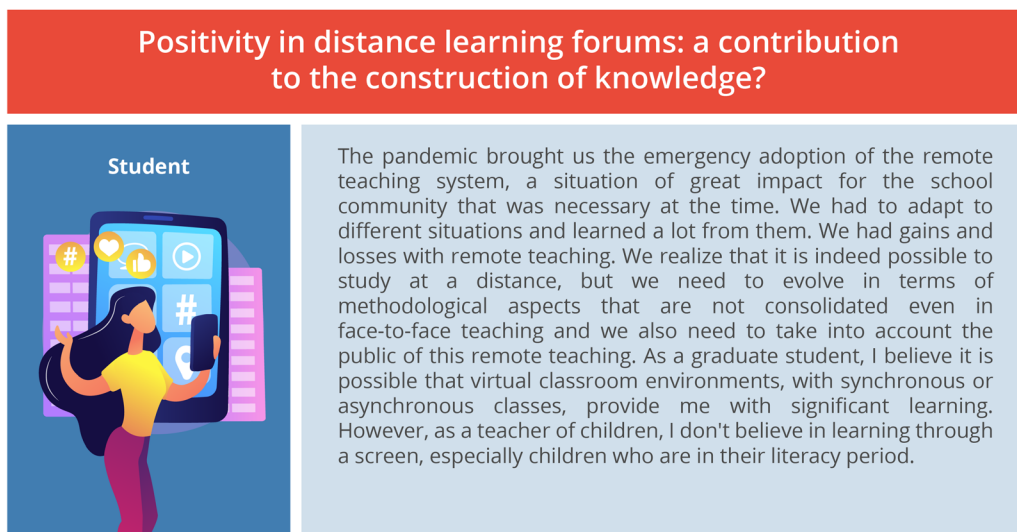


Source: Prepared by the authors (2022).

Thus, it was found that the level of negotiation of meanings was not as expressive in the analyzed forum, which may constitute an obstacle to the manifestation of contingent interactions. According to David and Castro-Filho (2012), this is a relevant factor in the context of an educational forum whose purpose is collective learning, in view of the group's engagement in clarifying possible doubts about the topic under debate.

Finally, in the production of meaning parameter, it was observed that, in 77.4% of the messages, the participants verbalized an evolution of knowledge or presented something new to the debate taking into account the theme of the forum.

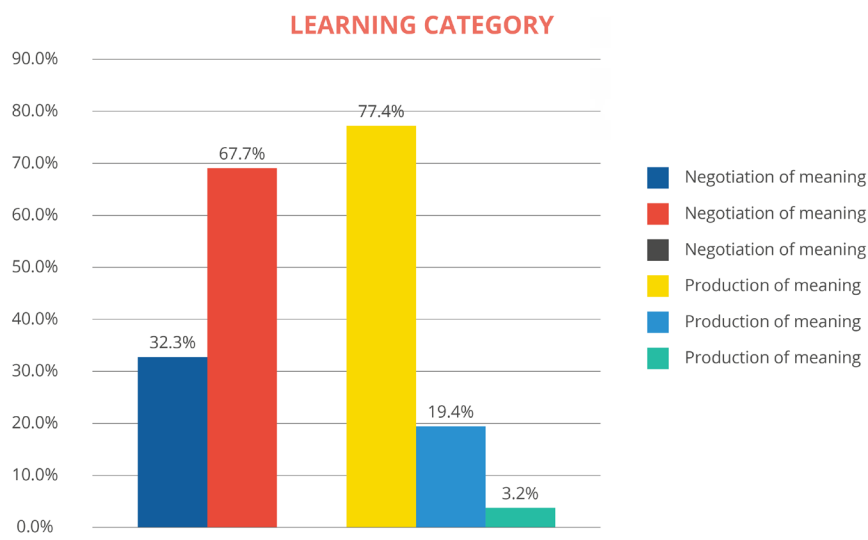
Figure 4 — Message that introduces something new to the debate



Source: Prepared by the authors (2022).

In this learning category, in 19.4% of the messages, it was also possible to identify the recognition of certain terms for the contribution of personal or collective learning. Already in 3.2% of the messages, there was a demonstration of understanding of some concept or element under discussion.

Graph 2 — Quantitative result



Source: Prepared by the authors (2022).

Therefore, the results of this research demonstrated that the discussion forum analyzed in this study presented characteristics that contribute to the manifestation of contingent interactions, whether they be the predominance of a clear and coherent speech in the messages exchanged, as well as the recognition by the participants about learning something new. from the debate, demonstrating the manifestation of contingent interactions during the debates in the proposed forum.

Therefore, in addition to the discussion forum allowing, through published messages, the manifestation of contingent interactions, it can be considered a CoP due to the fact that it brings together a group of people through a communication tool to promote interaction, exchange experiences and share information online and thus facilitate the coverage of the most diverse areas of knowledge.

6. Final considerations

The objective of this study was to analyze the messages published by the students and the teacher in a discussion forum proposed in a master's course at a Brazilian federal university, with the aim of identifying the manifestation of contingent interactions through linguistic and cognitive elements.

In view of this, after conducting the research, we found that the use of

discussion forums in virtual environments ends up becoming a CoP, as it enables discussion among the participating group on subjects related to the discipline or of interest to the members of the forum, facilitates the participation in an asynchronous way, allows the clarification of doubts, generates debate and builds new knowledge.

Thus, it was verified, through the application of the SAIC, that there was the elaboration of new knowledge by the members of the forum that was analyzed, even the results having presented some variations in the context of the published messages.

In the textualization category, the clarity and coherence of the messages published in the forum was evident, allowing a better understanding of the theme during the debate, however most of the messages were oriented towards someone in particular, mainly as a response to the forum tutor/mediator. There were also some messages aimed at the group in general, however a good part of them only argued about the topic of the forum.

Finally, in the learning category, a lack of negotiation of meanings was recognized, since this characteristic action of seeking to clarify doubts needs to be verbalized in the messages as a way to involve other participants in the debate and to enable the forum mediator to identification of these weaknesses, thus providing other interventions that facilitate dialogue in groups of this nature.

Thus, it was verified that the forum on screen achieved the proposed objective, which was to discuss the manifestation of contingent interactions through forum messages, resulting in the formation of a CoP. This is a permanent community, made up of members of a master's course, who remain engaged in other learning contexts, such as research projects and other disciplines.

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