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Asynchronous online debates for critical thinking in undergraduate psychology courses

Debates assincronos em linha para ensinar pensamento crítico a estudantes de psicologia

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Abstract: For several years now, we have been developing a program of education in scientific thinking as part of the psychology degree program at the distance learning institute of the University of Paris 8. After training in critical document analysis in the first year, students are introduced to analysis of socio-scientific controversies in the second year in asynchronous online debates in small groups of four. Student feedback on the course has been very positive. In this article we present cognitive-discursive analysis of the debates and a quantitative analysis of the annotations produced by the students. The results reveal a high level of student investment in this type of activity, with a number of references studied well above the prescribed minimum and rich annotations of the texts, but also difficulties in problematizing the debates. Our program offers both progressive and in-depth training in critical thinking. The fact that we rely on research and document analysis in our teaching scenarios also contributes to greater autonomy in learning and the development of solid cross-disciplinary skills that will be reinvested in the third year during the initiation to research, and then in the Master's program.

Keywords: Distance learning, Critical thinking, Education, Controversial analysis

Resumo: Há vários anos que desenvolvemos um programa de formação em pensamento científico no âmbito do curso de psicologia do instituto de ensino à distância da Universidade de Paris 8. Após uma formação em análise crítica de documentários no primeiro ano, os estudantes são introduzidos na análise de controvérsias socio-científicas no segundo ano, em debates online assíncronos em pequenos grupos. A reação dos alunos a este curso tem sido muito positiva. Neste artigo, apresentamos uma análise cognitivo-discursiva dos debates e uma análise quantitativa das anotações produzidas pelos alunos. Os resultados revelam um elevado nível de investimento dos alunos neste tipo de atividade, com um número de referências estudadas muito acima do mínimo prescrito e anotações ricas dos textos, mas também dificuldades em problematizar os debates. O nosso programa oferece uma formação progressiva e aprofundada do pensamento crítico. O facto de nos basearmos na investigação e na análise documental nos nossos cenários de ensino contribui também para uma maior autonomia na aprendizagem e para o desenvolvimento de sólidas competências interdisciplinares que serão reinvestidas no terceiro ano, durante a iniciação à investigação, e depois no mestrado.

Palavras-chave: Ensino a distância, Pensamento crítico, Educação, Análise polêmica

1 INTRODUCTION

Education in critical thinking in general, and scientific thinking in particular, is a major societal challenge in these times of proliferating fake news and multiplying controversies and polemics (Huguet et al., 2020; Xarhoulacos et al., 2021). The internet is the preferred medium for accessing information and documents (Wang et al., 2019; Zollo, 2019). This digitization of document access and the vast number of documents available place students in a paradoxical situation where it has never been easier to access resources and yet so difficult to sort through them. There is a high risk of getting lost in the mass of available information (Tricot & Rouet, 2015). Faced with this flood of documents, the pessimistic view sees a digital “tsunami” coming (Davidenkoff, 2014), submerging students under an astronomical amount of information whose medium no longer guarantees reliability (Boubée, 2018; Vivian & Dinet, 2008). The optimistic view sees the Internet’s documenta and informational ecosystem as a garden where everyone can cultivate their knowledge (Laborderie & Szoniecky, 2015). These activities require agents to instrumentalize documents in order to characterize and prioritize information, exploit and format information to produce new documents (Gueudet & Trouche, 2010a). These agents can be individuals, but also algorithms. Resisting the suggestions of the latter in order to sort through information has become a central issue requiring strong critical thinking skills (Meunier, 2021). As in many humanities disciplines, students come to psychology with a number of preconceived ideas acquired through their experience or their various readings, particularly on the Internet. The challenge is to give them the intellectual tools to question these preconceptions and move beyond them. This is the purpose of our critical thinking education courses.

2 CRITICAL THINKING AS A DIAGNOSTIC PROCESS

The question of critical thinking education is as old as philosophy itself, which, along with maieutics, proposed a pedagogical approach that used questions to challenge the convictions of the disciple and thus force them to construct alternatives. If we believe that critical thinking should be taught, it is precisely because this form of thinking does not come naturally, even though it is a necessary condition for the exercise of intellectual freedom, “...the freedom to doubt, to question, or to express oneself

subject only to the rigor of reason, which proceeds from the known and verified to the unknown and unknown...” (Desbiens, 1999, p. 7).

While recognizing the importance of the rational dimension in the implementation of critical thinking, several authors have emphasized the importance of knowledge and expertise (Polo et al., 2016; Villata et al., 2018). In other words, critical thinking cannot be reduced to a set of general and transferable skills (see Pallarès, 2019, for a review). Another criticism of the skills-based approach is its general and relatively static nature, which says too little about the developmental process at work.

2.1 A dynamic process within the activity

Our proposal is rather to view the evaluation of information as a diagnostic process that is part of both an activity and its social context (Meunier, 2022). We assume that critical thinking cannot be developed in an abstract manner. It is essential to consider the development of critical thinking from a civic perspective (Gagnon et al., 2018; Meunier & Jehel, submitted; Schubnel & Roy, 2017). Critical thinking must necessarily be applied to a field of knowledge and then transferred to new contexts. The evaluation of information is therefore not a fixed judgmental ability, but evolves according to the subject’s goals. The notion of diagnosis should be understood here as “ [...] an activity of understanding a situation, relevant to a decision to act.” (Hoc & Amalberti, 1994; p. 179). For these authors, decision-making and diagnosis are interactive processes resulting from a compromise between the necessary cognitive effort and efficiency. Their model was initially developed to account for the management of industrial processes or the operation of machinery. It is because the subject has control over their activity, if only to ensure that it proceeds according to their expectations, that they are led to make a judgment about the information they encounter. This judgment is not absolute; it is determined by the goal of the activity. When searching for information, an individual may therefore focus more on the relevance of the information to the task at hand than on its veracity, especially if the subject is unfamiliar. This primacy of action in diagnosis explains why an individual may be satisfied with a minimal understanding of the situation if it allows them to continue their activity. Two parameters determine the type and level of control: the requirement for understanding and the time constraint. For Hoc and Amalberti (1994), the levels of control of the activity and diagnosis are closely linked.

They distinguish between three types:

- Automatic responses are generally triggered by data and can be inhibited when a critical event calls their execution into question. These processes are very fast and often impervious to information that does not concern them.
- Rules are instantiated in an activity characterized by one or more goals. They are generative in nature, meaning that they generate the activity as it progresses by determining the actions and information necessary for the activity. We believe it is more accurate to place schemas at this level as structures that encompass rules.
- If the need for understanding increases, particularly when schemas are ineffective, the individual must reason on the basis of an explicit representation. This does not exclude schemas from continuing to influence the interpretation of the situation, particularly by guiding the search for information.

2.2 A socially situated process

In addition to these three levels, we propose adding a fourth with interpersonal regulations in order to take into account the fact that individual activities are socially situated and therefore require different forms of interpersonal regulation to control the activity. These activities are also part of an individual's history. Our students did not arrive at the bachelor's degree level without having developed some skills in evaluating information during their previous studies, but transferring these skills to new fields and formalizing them in a scientific approach is not easy. It requires a change in attitude toward knowledge. Rather than making the student the passive recipient of knowledge already formalized by the teacher, our approach consists of placing the student in a position to produce their own knowledge, in particular through the development of their critical understanding of the documents on which they rely to expand their knowledge. Comprehension and memorization are therefore no longer the end goal, but rather the medium through which knowledge is constructed and the processes of information evaluation are exercised, allowing assertions to be consolidated into knowledge. The RESOLV model (Britt et al., 2022) offers good examples of how these schemes can be applied to information evaluation through the concept of task schemas and helps explain why information evaluation depends on the type of text, knowledge of the subject, and the task in which the evaluation takes place.

3 THE INSTRUMENTAL APPROACH

To analyze our teaching situations, we use the instrumental approach developed by Rabardel (Rabardel & Beguin, 2005; Rabardel, 1995). This approach makes a major distinction between the tool (a material object given to a subject) and the instrument (the object and the associated patterns of action) that is constructed during a process known as instrumental genesis. Instruments play a dual role in teaching situations. They enable the shaping and dissemination of concepts and content (mediation). This process corresponds to what Rabardel calls instrumentalization, i.e., shaping to serve as an instrument. Instruments also serve as intermediaries between knowledge and the learner. This process, called mediation, aims to empower the learner with instruments for learning. Mediation is at the heart of the activity of teachers, but also of students, especially in a distance learning context. This mediation can have an epistemic purpose (negotiating knowledge using the instrument), a pragmatic purpose (obtaining a result, performing a task) or an interpersonal purpose (getting to know others or acting on them). The last form of mediation is reflexive. It allows individuals to test their representations or adjust their schemas (Lonchamp, 2012; Rabardel & Bourmaud, 2003). This instrumental genesis also involves a process of instrumentation, the purpose of which is to construct and adapt the learner's patterns of instrument use. If we consider that language, formalisms, and educational activities are all instruments, there are hardly any educational activities that are not instrumented. Based on this approach, Rézeau (2002) proposes adding a fourth pole to the classic didactic triangle (learner, knowledge, teacher), consisting of instruments that can be supports, activities, tasks, or any type of material, but also psychological instruments such as language or concepts. We defend the idea that this framework makes it possible to renew the approach to critical thinking and the definition and assessment of skills by looking at it from these different dimensions, its situated nature, and its dependence on the knowledge and goals of the individual.

3.1 The instrumental cycle in the document ecosystem

In the context of distance learning, we propose to generalize this analysis to describe the situation of online teaching, particularly in the field of critical thinking and controversy analysis education. We can thus consider that, for an author, a document is an instrument intended to promote his point of view. For a teacher, this same document

also serves as an instrument in that it serves the teaching objective and provides the student with a medium for acquiring the knowledge and skills targeted in the course, prescribing tasks to achieve this and means of monitoring their activity by anticipating the teacher's expectations (Meunier, 2021). The student's activity can be conceived in the same way, insofar as the homework, tests, or traces of activity that they present are all tools that enable the teacher to understand what has been learned and what has not (Gueudet & Trouche, 2010b). We emphasize here that what gives a document or record of activity its instrumental value is not the intention of the producer, but the ability of the receiver to treat it as such. The analysis can be applied recursively to documents, the educational situation, and the student's work. Finally, the teacher's feedback following the student's work can also be analyzed in this way. For the sake of simplicity, we have left out the technical artifacts that constitute tools and potentially instruments in this already complex situation. Feedback also introduces the dynamic dimension of the situation (encountering new documents; interactions with other students, with the teacher, etc.). It should be noted that the only elements that can be directly investigated, particularly in distance learning are the artifacts (documents, assignments, etc.) from which we must infer individuals' relationship to knowledge.

3.2 Application to course design

One of the main advantages of the concept of instruments for analyzing teaching situations is that it takes into account a double movement: firstly, towards the artifact (documents, arguments, or assignments in our case), which allows us to improve our knowledge of it, and secondly, towards the subject itself, by enabling the appropriation and construction of appropriate frameworks, particularly for the analysis of arguments or controversies that concern us (Rabardel, 1995; Samurçay & Rabardel, 2004). This need to acquire skills in the use of tools is fundamental, both for the student and for the teacher. While critical thinking is a powerful tool for intellectual freedom, it cannot be acquired directly and must be developed through activities that encourage reflection on the status and value of tools. The central tool in evaluating information is the document, which is why we have chosen to focus on document research in our training program. Students have already developed schemes for processing them (for example, for conducting web searches), but the challenge here is to develop a critical approach to documents. In this instrumental approach, the teacher's role is essentially one of support. The transmission of knowledge is not excluded (particularly regarding

conceptual or technical tools), but it is considered a medium, just like the activities proposed. Support can thus focus on operational invariants by selecting activities that the subject can handle by applying their routines (assimilation) and then encouraging them to modify these routines to better handle the situation (accommodation), possibly with the help of the teacher or peers (zone of proximal development; Vygotski, 1935) through feedback on the forum or formative assessments, or even the proposal of intermediate activities such as reading new documents.

4 PRESENTATION OF THE TRAINING PROGRAM

The development of critical thinking is only one of the objectives of our training program, as our main aim is to provide a gradual introduction to research while exploring the field of application of psychology. This training is part of a thematic course on the impact of digital technology on sociocognitive processes, consisting of one course in the first year and two courses in the second and third years. We have divided it into three stages: (i) acquiring critical document research skills, (ii) explaining controversy, and (iii) problematization and its operationalization. The aim of this approach is to enable students to empower themselves in the faceof authority figures, particularly teachers. To this end, but also to promote intrinsic motivation, students are free at each level to choose the documents and theme of their work. Basic knowledge is presented in a few introductory documents.

4.1 3.1 A multi-year program

In the first year, we aim to develop a critical approach to reading scientific documents. Students are trained in argumentative analysis and must produce a critical reading note, explaining their thinking using the annotation tool *Hypothesis* (https://hypothes.is/). In the second year, students become users of knowledge. The aim is to identify and evaluate a variety of points of view. Two activities are used to develop these skills: multi-document analysis (cross-reading of several documents) leading to the writing of a report on surprising findings, and an online debate on a socio-scientific controversy. In the third year, students become producers of knowledge during an introduction to research, where they are guided in developing a research question and then designing a research plan to test it.

4.2 Organizing online socio-scientific debates

In this article, we offer some reflections and feedback on the online debates carried out by our second-year undergraduate students. In our particular distance-learning environment, synchronous modality is not very effective, as students have heterogeneous personal rhythms and constraints. We have therefore opted for an asynchronous scenario, although videoconferencing is not ruled out. The technical set-up must also allow for the isolation of a collective debate space for a small group, in which each of the participants must be able to provide documents in support of the point of view he or she has to defend, and above all leave the teacher with a record of the debates to assess their quality and dynamics. We rejected the use of forums as tools for debate, as they did not allow us to maintain the contextualization of exchanges in the documents studied. In the end, we opted for *Hypothesis*, as it allowed us to work in groups and discuss annotations. Figure 1 shows the course scenario. The proposed topics for discussion deal with the impact of digital technology on socio-cognitive processes, and are divided into four categories:

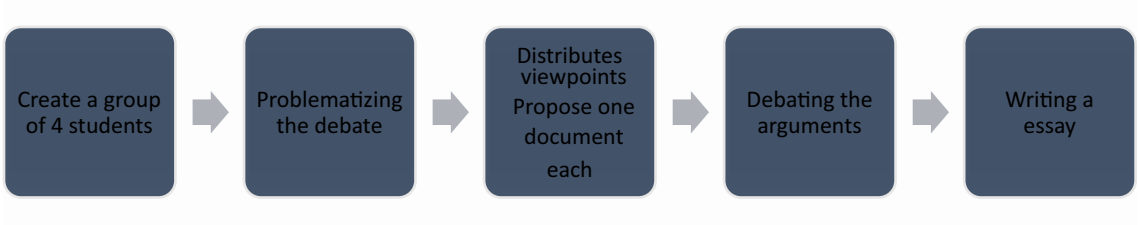
1. The impact of digital technology on the attitude to knowledge.
2. The impact on relationships and organization at work.
3. Digital communication and interpersonal relations.
4. New forms of deviance, relationship to ethics and moral judgment.

In each category, 12 themes are proposed. We therefore have 48 very general themes which, in order to be discussed in concrete terms, must first be contextualized. Here are two examples:

- Does infomediation limit access to knowledge?
- Does the Internet encourage authoritative discourse?

Students can choose any theme they like, or suggest others. They must then form teams of four. Some groups have been allowed to work with fewer than four people, to take account of the constraints on theme distribution.

Figure 1: The scripting of online debates



Source: Figure produced by the author.

Then students are invited to specify the terms of the debate and, above all, the conditions for its resolution (problematization). To do this, they can open a specific discussion for their group on the forum, to exchange ideas about their debate with each other and with the teacher. Each student then takes on the task of defending a point of view and proposing a document to the group for discussion. The organization of these debates is similar to a socio-cognitive conflict situation, but unlike these, we give priority to the collective defense of a point of view, with the aim of limiting leadership effects and personal involvement in the defense of a point of view. Each participant contributes to the debate by identifying arguments in defense of his or her point of view in the group's documents. At the end of the debate, students are asked to write an essay of four pages maximum, which is then submitted to the teacher for assessment. The assessment is based on the quality of the essay and, individually, on investment in the debate and the relevance of the arguments put forward, as identified in the annotation thread.

4.3 Critical thinking through discourse analysis

How can we evaluate the effects of our training system? One way is to focus on students' perception of the course, which we did in a previous online survey (Meunier & Zibetti, 2019). Nine out of ten students (92%) consider the course to be of a fair level of difficulty, would recommend it (90%) and would like to take further courses of this type (87%), although only six out of ten (61%) feel they have learned a great deal, which can no doubt be explained by the heterogeneity of previous backgrounds. We also noted a high level of motivation to take the course. Just over a third of students (37%) take the course out of personal interest, one in two consult the course at least once a week, and spend between two and five hours on it. Another possible method is to use a multiple-choice questionnaire. Quicker and simpler to use, this method makes

it easy to repeat measurements before and after the course to gauge its effects. There are several scales that share a number of constructs such as needs definition, information-seeking strategies, information evaluation and management, and abilities to interpret or reuse information (for a review see Sparks et al., 2016). However, these scales are generic and concern the assessment of document skills and, although they can be adapted to particular contexts, do not allow us to grasp the critical dimension of collective elaboration that interests us. This is why we have chosen to focus on the traces of activity constituted by the students' essays and annotations. Our aim is not to characterize document research skills, but to attempt to characterize the type of epistemic positioning of each group using the language traces present in the students' syntheses. To do this, we use the method of cognitive-discursive analysis (Ghiglione et al., 1995). This type of analysis makes it possible to apprehend the reference operations and articulation of affirmed, constructed and possible realities that characterize critical positioning, using a number of linguistic indices.

5 COGNITIVE-DISCURSIVE ANALYSIS OF STUDENTS' ESSAYS

5.1 Constitution of the corpus

The corpus analyzed in this article is made up of students' essays synthesizing the reflections of 283 students divided into 66 groups. To this data were added the annotation hypothesis of each group. The following table summarizes the main characteristics of the corpus.

Table 1 Characteristics of the corpus

	2021	2022	2023	Total
Students (N)	122	98	63	283
Groups (N)	38	25	17	80
Themes				
Relationship to knowledge	13 (19.7%)	8 (12.1%)	5 (7.6%)	26 (39.4%)
Relationship to work	2 (3.0%)	2 (3.0%)	2 (3.0%)	6 (9.1%)
Interpersonal relations	9 (13.6%)	2 (3.0%)	4 (6.1%)	15 (22.7%)
Pathology	6 (9.1%)	8 (12.1%)	5 (7.6%)	19 (28.8)
Cited references M(SD)	16.6 (8.71)	19.9 (11.2)	17.2 (13.6)	17.9 (11.17)
Annoted texts M(SD)	6.63 (4.1)	9.16 (4.83)	7.24 (3.75)	7.6 (4.2)
Annotation M(SD)	60.55 (39.62)	73.72 (39.32)	67.88 (42.92)	67.4 (40.6)
Annotations per text	10.8 (6.48)	9.25 (5.4)	9.81 (5.97)	9.9 (5.9)
Tags	6.41 (10.89)	4.22 (7.58)	1.76 (3.15)	4.1 (7.2)

Source: Table produced by the author.

The themes proposed to the students are the relationship to knowledge (39.4%), pathology (28.8%) and interpersonal relationships (22.7%). The relationship to work was chosen by less than one group in ten (9.1%). Although the instructions asked students to work on at least four documents, all the groups far exceeded this requirement, with almost 18 references cited (M=17.7) and almost eight documents annotated (M=7.55). Students produce an average of ten annotations per text, which is very low when we consider that just over half of these annotations are responses to other students' annotations. One possible explanation for this is that the *Hypothesis* annotation platform is not the only place to discuss documents. The forums on the distance learning platform are also used extensively to solicit the teacher's opinion. Students also use private messaging systems such as WhatsApp, and even organize synchronous meetings. These interactions are forms of debate more familiar to students. The tagging system available in hypothesis to classify interventions was little used, with an average of four tags (M=4.1) for over 60 annotations.

5.1 Methodology

To analyze the students' productions, we opted for a content analysis using TROPES© software. Our aim is to characterize these texts from the point of view of the critical dimension of the essays. We were particularly interested in the style of the text

and its staging, i.e. the way in which the speaker organizes and involves himself in his discourse. TROPES distinguishes four styles:

- Argumentative: the subject engages, argues, explains or criticizes in an attempt to persuade the interlocutor.
- Narrative: a narrator presents a succession of events taking place at a given time and place.
- Enunciative: the speaker and interlocutor establish a relationship of influence, revealing their points of view.
- Descriptive: a narrator describes, identifies or classifies something or someone
- The type of staging depends largely on the type of verbs used, but also on the use of pronouns.
- Dynamic, with a preponderance of action verbs
- Anchored in reality, with greater use of verbs of state (to be, to have, etc.)
- Taken over by the narrator, with many verbs used to make a statement about a state, an action, etc.
- Personal support, with extensive use of "I" or numerous first-person singular pronouns ("I", "me", "me", etc.).

5.3 Results

The results presented in table 2 show that almost nine out of ten essays (86.4%) are argumentative in style, but take little charge of the discourse (30.3%), and describe it in a more objective way, using dynamic staging (69.7%). This is corroborated by the frequency of the third person singular or plural, which represent 40% of the personal pronouns used, compared with 19% for the first person plural.

Table 2 : Style and type of presentation in texts

	Style			
Presentation	Argumentative	Descriptive	Narrative	Total
Dynamic, action	37	4	5	46
taken in charge by the narrator	20	0	0	20
Total	57	4	5	66

Source: Table produced by the author.

The analysis of connectors and modalizations enabled us to appreciate the type of articulation between parts of speech and the way in which the speaker involves himself or situates his discourse. Each text was analyzed individually, and we recorded the frequency in each word category. These frequencies were then analyzed using Jamovi© software. We present this analysis in table 3. Adverbs and adverbial phrases (modalization) of intensity (41%) and manner (17%) are the most frequent. The former, along with adverbs of negation, serve to dramatize the discourse, notably to set the scene for the controversy, while the latter, along with adverbs of time and place, help to situate and nuance the action. As for connectors, addition accounts for half (51%). This indicates a discourse structured more by enumeration, with little argumentative articulation. More directly involved in the expression of critical thought, cause and condition connectors place the discourse within a reasoning framework, and together account for 16% of connectors, versus 20% for comparison and opposition connectors, used to contrast points of view in order to build an argument.

Table 3 Results of cognitive-discursive analysis

Statistiques descriptives				Centroids of cluster			
	M	SD	%	Cluster 1	Cluster 2	Cluster 3	Examples
Modalisation	129.75	34.23	100%				
time	18.28	7.00	14%	0.72	-0.45	-0.7	In the first place, continually
Location	15.30	5.62	12%	0.25	-0.42	0.08	elsewhere,behind, inside, outside
manner	22.04	6.89	17%	-0.44	-0.11	0.88	How, rather, simply, in other words
Affirmation	5.56	3.18	4%	-0.59	0.1	0.88	Also, really, actually
Doubt	0.42	0.89	0%	0.01	0.32	-0.39	Perhaps, almost, seemingly
Negation	15.04	7.57	12%	-0.45	0.61	0.05	None, not, nothing, negatively
Intensity	53.09	15.10	41%	0.26	0.12	-0.6	Especially, also, more
Connecteur	127.742	29.52	100%				
Condition	4.63	2.87	4%	-0.21	0.66	-0.42	If, in this case, on condition that
Cause	15.31	7.30	12%	-0.04	-0.24	0.35	Indeed, therefore, since
Goal	2.48	2.09	2%	0.05	-0.24	0.2	in order to, so that
Addition	65.39	18.51	51%	0.38	-1.03	0.57	and, furthermore, so that
Disjonction	11.34	4.71	9%	-0.38	0.66	-0.13	Or
Opposition	14.97	6.13	12%	0.16	-0.09	-0.16	Yet, but, however
Comparaison	10.10	4.66	8%	-0.08	0.58	-0.54	As, such as, in relation to
Time	3.48	2.10	3%	-0.43	0.76	-0.17	Finally, when

Source: Table produced by the author.

While the academic exercise of synthesis is well mastered, as evidenced by the preponderance of argumentative style, the critical dimension of these essays appears rather weak overall. We wanted to check whether the groups were homogeneous in their use of modalizations and connectors. To this end, we carried out a cluster analysis to draw up a typology of groups according to the modalizations and connectors used. We have adopted the optimal number of clusters proposed by the software, i.e. three. We present the reduced centered means (centroids) for each modalization and connector. Cluster 1 (N=29) groups texts marked by a preponderance of time modalizations and addition connectors characteristic of essays organized around an enumeration of work with no real articulation. Cluster 2 (N=20) is characterized by extensive use of argumentative connectors, notably comparison and opposition, and is also the only cluster strongly associated with modalizations of doubt and negation. These indicators reveal a real argumentative structuring and a high level of critical thinking. Cluster 3 (N=17) is also characterized by an enumeration of facts or works, as evidenced by the preponderance of addition connectors, but this enumeration is qualified by adverbs of manner or affirmation and cause connectors, and could reflect an intermediate level of critical thinking

Cognitive-discursive analysis has shown that the restitution of an argumentative debate in the form of a collective synthesis is rather well mastered at the end of this course, as evidenced by the high proportion of argumentative style copies, with a rather dynamic staging. The distribution of different connectors and modalizers, however, shows a preponderance of enumeration-type connectors, which attest to a difficulty in articulating the different arguments and points of view. These difficulties can be interpreted as insufficiently critical thinking. The differences between the clusters could also be linked to the fact that these are collective syntheses, and that the number of resources consulted and the number of annotations is high in all groups. The difficulties of articulation could then reflect an attempt at consensual formulation that attempts to reconcile points of view by erasing oppositions. A third possible interpretation lies in the academic situation itself. If the document produced is a synthesis of the debates, it is also, for the teacher's benefit, a production that awaits evaluation by the teacher. In this context, taking an over-assertive position is risky if the teacher doesn't agree with the point of view developed. These considerations suggest that we need to take into account the interpersonal dimension, both within the group and with the teacher.

6 CONCLUSION AND DISCUSSION

The use of debates on socio-scientific controversies for the development of critical thinking, as used in this course, is in line with the objective of empowering students through the development of their document skills, but also with the rejection of a normative approach for which cognitive-discursive analysis could be an alternative.

From an educational point of view, these data have led us to revise the course syllabus, clarifying expectations regarding the type of argumentation expected and insisting on the fact that personal points of view, if argued, are appreciated. We have also proposed specific work on the articulation of arguments in the form of an argumentative analysis, as well as a database in which to identify outstanding good or bad essays. We also insist that personal points of view are not evaluated in the final document if they are well-argued.

Our approach is based on the dynamics of exchanges and the characteristics of debate as defined by the students themselves, with the help of the teacher in the problematization phase, with a view to using documents for argumentation purposes. To understand well this approach, we need to take into account the dialogical dimension of argumentation (Auriac Peyronnet, 2004), which we have begun to explore with the analysis of annotations, but which has yet to be completed. Furthermore, the themes on which the students are asked to work are open-ended questions in the sense that they admit several possible points of view likely to change the conditions of resolution of the controversy and therefore the evaluation of the arguments.

These three characteristics of debates - openness, complexity and social anchoring - are what make these themes so interesting, enabling students to understand what separates polemics from controversy, opinion from argument, and simple criticism from a scientific approach that opens the way to resolving the controversy through substantiated contradictory exchanges. These characteristics, however, exclude any normative assessment of argumentation, and make it essential to use specific activities that put them into practice. These developments are first and foremost individuals within group exchanges and within a very specific academic exercise. These processes should be studied in greater detail, taking a closer look at the articulation of linguistic, conversational and epistemic processes (Baker, 2023; Daniel et al., 2004).

On the other hand, these controversies are socially embedded (Bronckart & Schurmans, 2001; Lahire, 1996), making it difficult for students to distinguish between

opinions, beliefs and facts. For example, many students argue that screens have a detrimental effect on children's development on the grounds that they attenuate or mediate the relationship with the adult, without questioning the nature of the relationship, the type of mediation or the activity or age group involved, as if behind this commonly held opinion, activities, relationships and individuals were homogeneous. The proposed controversies in our course are therefore part of social habitus that partly shape opinions and condition the evaluation of arguments (Desfriches Doria & Meunier, 2021; Meunier & Jehel, submitted). It is precisely confrontation with a diversity of opinions that constitutes a powerful means of overcoming these habitus and combating confirmation bias and informational bubbles (Boyadjian, 2020; Dufrasne & Philippette, 2019).

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