«SNITCHING IS WRONG BECAUSE IT IS NOT RIGHT». TEACHING AND LEARNING CRITICAL THINKING IN ITALIAN TECHNICAL AND PROFESSIONAL SCHOOLS

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Abstract

In Italy, philosophy is a compulsory subject in the so-called *Licei* from the third to the fifth year of secondary education. At least since the Brocca Commission in 1992, the idea of introducing philosophy in technical and professional Italian schools has been discussed and endorsed in national documents. In this paper we describe a project that is aimed at introducing philosophy in the form of philosophical dialogue into technical and professional schools. In the scholastic year 2021-22, 35 classes, from 18 technical and professional Italian schools, took part in a pilot consisting of 10 hours of sessions of philosophical dialogue conducted according to the guidelines of the Community of Inquiry pedagogy that is adopted within the Philosophy for Children educational movement. One of the leading motivations for the adoption of philosophical dialogue in schools is that it is claimed to improve students' critical thinking skills and dispositions. In order to test this hypothesis, we administered to students and control groups a test on some basic critical thinking skills (the capacity to distinguish reason from claims, and the capacity to produce reasons for claims). In this paper we present the pilot, the structure of the critical thinking test, the philosophical and pedagogical rationale behind the project, and we discuss the results of the test.

Keywords: Critical Thinking; Community of Inquiry; Philosophical Dialogue; Philosophy for Children; Epistemic Normativity; Didactics of Philosophy.

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1. *Introduzione*

Starting from 2020, the *ΑΙΩΝ / AIÓN* Research Group at the University of Bologna, in collaboration with the *Filò* Association, began a research project – called INVENTIO[1] – on the introduction of philosophy in technical and professional schools (hereafter 'TPS'). Following this research, in the academic year 2022-23, a National Network of institutions committed to adopting the INVENTIO syllabus was established. Currently, the Network comprises 15 institutes covering 10 Italian regions, from north to south, and other 7 schools are going through the procedure to enter the Network.

The purpose of the syllabus is to provide guidelines for introducing philosophy into TPS. Each class participating in the project will do 24 hours of philosophy lessons every year, from the first to the fifth year of studies.

In the academic year 2022-23, the project began with selected classes from institutions belonging to the Italian Network. In the 2021-22 school year, a smaller-scale experimentation was conducted to reach two goals: first, to refine the syllabus before its full implementation in 2022-23; second, to test one of the leading hypotheses of the project, that is, that the practice of dialogue is conducive to the development of critical thinking skills. The main purpose of this article is to present a portion of the monitoring of activities carried out during the 2021-22 experimentation, focusing specifically on the results related to critical thinking learning.

The article is structured as follows. Section 2 provides a brief description of the INVENTIO syllabus. Section 3 describes the structure of the 2021-22 experimentation and presents the structure of the test administered to students to assess critical thinking skills. In the subsequent

[1] For more on the history of the project, see E. LIVERANI, A. MARCHETTI, L. ZANETTI, *Il progetto Inventio. Il dialogo filosofico nei tecnici e nei professionali*, in *Filosofia e istituti tecnici. Esperienze e questioni.*, ed. A. Caputo, Mimesis, Milano 2023, pp. 35-77.

paragraphs, the test results will be presented and discussed, and, finally, some didactic hypotheses will be formulated to promote the interaction between philosophical dialogue and the development of critical thinking skills.

2. *INVENTIO Syllabus*

The hypothesis of introducing philosophy into non-academic secondary education has a history spanning nearly three decades. First proposed by the Brocca Commission in 1992, the idea was subsequently supported by the so-called Commission of 44 Experts, formed in 1997 by then-Minister Luigi Berlinguer. The so-called 'Document of the Experts'[2] declares that the «general purpose [of philosophy] will consist in providing all young people with conceptual tools adequate for the reasonable construction of a proactive and critical subjectivity». In line with this, the *Società filosofica italiana* (SFI, Italian Philosophical Society) through the Protocol of Agreement with the Ministry of Public Education[3]), proposes extending the teaching of philosophy to all branches of the secondary cycle, with differentiated syllabus approaches depending on the type of institute.

More recently, an attempt to revive the debate was made by the Ministry's document 'Guidelines for Learning Philosophy in the Knowledge Society'[4], which emphasizes the importance of philosophy at all levels of the educational system and devotes some pages to the theme of philosophical education in TPS.

[2] *Contenuti essenziali per la formazione di base* [Essential Contents for basic education, 1998] (1998). Prot. n. 14/ris. Roma: Biblioteca di Consultazione Pedagogica.

[3] Protocollo d'Intesa SFI/MIUR [Memorandum of Understanding] (PI, 2011), Roma.

[4] Orientamenti per l'apprendimento della Filosofia nella società della conoscenza [Guidelines for the study of philosophy in a knowledge-based society] (O, 2017). Documento Ministeriale.

The previous documents offer guidelines and motivations for the introduction of philosophy in TPS. However, as far as we know there has not been so far any systematic attempt to detail how philosophy should enter into TP schools. The syllabus INVENTIO was designed to fill this gap by detailing a particular approach to the introduction of philosophy in TPS. The syllabus endorses an approach that puts an emphasis on doing philosophy, instead on learning philosophical contents. It is divided in three main axes: a1) the exploration of universal philosophical contents through dialogic inquiry; a2) the exploration of more specific philosophical questions depending on the subject of the class; a3) the development of critical thinking skills and attitudes through dialogic inquiry and specific activities.

a1) Some of the main topic of the philosophical tradition are chosen and proposed through the practice of collaborative philosophical inquiry that is described and recommended by the pedagogy of the Community of Inquiry, which was articulated within the Philosophy for Children educational movement[5]. Instead of teaching students philosophical contents – that is, instead of adopting a transmissive teaching model, which is the one favored in Italian Licei – students are invited, through the presentation of appropriate stimuli, to explore philosophical issues with the help of an expert[6] that operates as a facilitator of inquiry[7].

[5] M. LIPMAN, *Thinking in Education*, Press Syndicate of the University of Cambridge Cambridge (MA), 2003[2]; M. Santi, *Ragionare con il discorso. Il pensiero argomentativo nelle discussioni in classe,* Liguori, Napoli 2003.

[6] The experts receive specific training from members of the Research Group *ΑΙΩΝ / AIÓN*. Experts must have a master degree in philosophy. Each expert will co-design the activities with a teacher of the class that participates in the project.

[7] In designing the teaching activities and the philosophical dialogues, we use a variety of methods and insights from the community of practitioners of philosophical inquiry around the world. Each expert is free to construct her dialogic sessions according to her own preferred method and to the needs of the educational context. That being said, the most important sources of inspiration for practitioners is the work of Lipman, Sharp and colleagues (which encompasses the resources of the

a2) TPS offer to Italian students the possibility to be specialized on a great variety of subjects, from chemistry to informatics, from mechanics to international relations, etc. Each one of these subjects naturally raises specific philosophical questions. To illustrate, students who study healthcare subjects might be interested in questions about deontology, say, whereas students who study informatics might find more intriguing questions related to AI and related issues. For this reason, the expert is invited to propose stimuli and questions that touch upon philosophical questions that are related to the discipline that students explore in their specific studies.

a3) Along with the practice of philosophical inquiry, the syllabus emphasizes the importance of developing critical thinking skills and attitudes. The key idea is to develop these critical thinking skills through a dialogic practice regimented along the lines of the community of inquiry model. [8] The syllabus, however, also suggests devoting some hours each year to teaching specific notions that are instrumental in order to improve one's critical thinking skills (e.g., the notion of reason, argument, validity, etc.). We shall go back to this issue at the end of the paper, when

P4C curriculum): C. MCCALL, *Transforming thinking: philosophical inquiry in the primary and secondary classroom,* Routledge, New York 2009; P. WORLEY, *The If Machine. Philosophical Enquiry in the Classroom*, Bloomsbury, London 2011; ID., *40 lessons to get children thinking: Philosophical thought adventures across the curriculum,* Bloomsbury, London 2016; ID., *Corrupting Youth. How to Facilitate Philosophical Enquiry. Volume 2,* Rowman & Littlefield, London 2021; L. ZANETTI, *Il metodo per problemi e la strategia del contrasto. La filosofia con i bambini a partire da paradossi e rompicapi della tradizione filosofica* in *La società degli individui*, 68.2 (2020), pp. 127-135.

[8] The choice of *philosophical dialogue* as the main methodology of the project is justified by evidence, reported by some important studies on the educational impact of *Philosophy for Children*. Among the various studies available, it is worth mentioning the study conducted for two years by the Education Endowment Foundation (EEF) on a sample of around 3000 students aged 9 and 10 in 48 English schools (HC, 2014). The inquiry shows a development of linguistic and logic-mathematical abilities, as well as an improvement of relational competences.

we explore some didactic issues that emerge from the analysis of the first experimentation.

With regard to the objectives, the overarching educational goal of the INVENTIO project is to enhance the profile of students graduating from TPS. The aim of the INVENTIO project is to prepare professionals capable of managing the complexity of the knowledge society. The strategy is to make the students develop cross-cutting skills that enable them to actively manage the challenges of the modern work environment: communication skills and the communication process. Such skills are autonomy in decision-making, creativity and problem-solving, collaboration in group work and conflict management, adaptability, flexibility and, crucially, critical thinking.

Among the various goals of the project, there is also a systemic one aimed at addressing a long-standing issue in the Italian school system: to innovate the educational paradigm, thus overturning the traditional transmission-based pedagogy. The proposed methodology has the potential to deeply transform individuals and groups by leveraging, on the one hand, active learning – aimed at developing neglected aspects like motivation, participation in the educational process, self-awareness, autonomy, etc. – and, on the other hand, the creation of a dialectical space for free peer discussion on significant philosophical issues.

3. *2021-22 Pilot and the Critical Thinking Test*

The pilot conducted in the school year 2021-22 involved 35 classes from 18 TP schools. Instead of 24 hours - which is the amount of hours that the syllabus recommends for each year - each class did 10 hours of philosophy lessons conducted according to the Community of Inquiry pedagogy by a facilitator who received specific training from AION and Filò's members.

In order to monitor[9] the quality and the effect of the project, the Research Group developed the following activities, which are carried out each year.

Focus group. Two focus groups take place - one before the project, the other after the 24 hours of activities. The aim of the focus group is to know whether and how students' beliefs and expectations about philosophy and dialogue change after the project.

Questionnaire. Each student is invited to respond to a questionnaire that allows us to appreciate students' experience.

Critical Thinking Test. Each student must do a short critical thinking test on some basic skills that she is expected to learn during the 24 hours of activities. Moreover, for each class participating in the pilot, the test was also administered to a control class (the same number of the classes involved in the project).

During the 2021-22 pilot, we tested these monitoring tools - whose adoption was confirmed with minor changes also in 2022-23 - and gathered some initial data. The aim of this paper is to analyze the results of the Critical Thinking Test (hereafter just 'test').

The test is divided into four parts. Part A and B present students with sentences in which some fact is presented as a reason for believing in some claim. Students are asked to individuate the reason(s) and the claim. Here are some examples (translated into English from Italian) of sentences from Part A:

> (...) The primary victims of armed conflicts are always civilians; therefore, (...) war should always be avoided (...).
> I didn't call you because (...) I felt hurt by how you treated me the last time. Moreover, (...) I was very busy.

Students should write 'R' if they think that the sentence is used as a reason or 'C' if they think that the sentence is used as a claim.

[9] The pilot – as well as the full regime experimentation that began in 2022-2023 – is monitored by the AIÓN Group, in collaboration with Elisa Truffelli, professor of experimental education at the University of Bologna.

Part B contained a single item, which is the following:

> The lives of many people are worth more than the life of an individual because we are all equal, and the only thing that makes a difference is quantity, not quality. Therefore, someone who saves many lives is considered more of a hero than someone who saves few.

Here students must underlie the main claim and draw a box around the sentence that is used as a reason directly linked to the claim identified.

Part C and D are the most interesting ones, since they are the exercises that provided us the greatest amount of information. Here we ask students to invent reasons for claims that are given. In Part C we provide five claims and we ask them to write down two reasons in favor of each claim. In Part D we provide them with five claims that are the negation or the opposite of the claims provided in Part C and we ask again to offer two reasons in favor of each claim. Since in what follows most of our comments will be on parts C and D of the text, here is the full list of claims that students found in the test:

	C	D
1	Life is though	Life is not though
2	Snitching is wrong	Snitching is right
3	Happiness consists in the pursuit of pleasure	Happiness does not consists in the pursuit of pleasure
4	We should trust science	We should not trust science
5	The nature of humans is wicked	The nature of humans is good

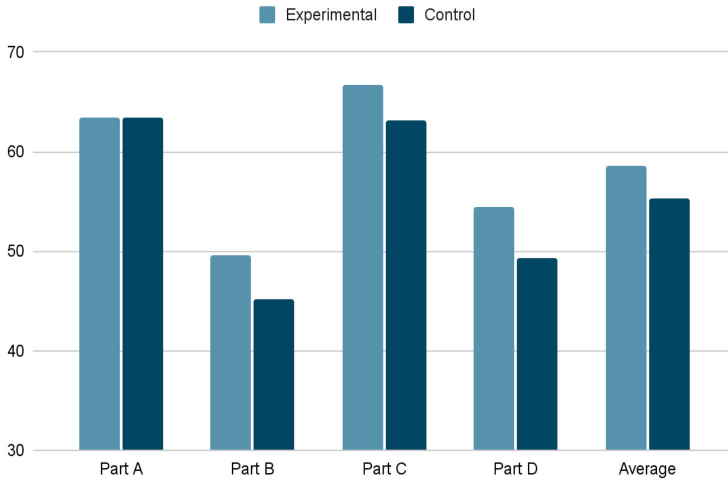
As mentioned above, we gave the same test to classes that participated in the pilot and to control classes. In doing so, our aim was twofold: first, to monitor student's critical thinking literacy and skills, and in particular to see whether there is any improvement after participation in the pilot; second, to see students' reaction to the test so that we could eventually modify and improve it for the subsequent years.

Before coming to an analysis of the results, some few comments are in order. In 2021-22 35 classes participated in the pilot, and so we expected the results from 70 classes (35 who did the pilot, 35 as control group). However, due to difficulty in the management of the project, we received fewer data than expected. Here is a table summarizing the main data about the pilot classes and the control classes.

	Pilot	Control
Classes	19	12
Students	298	183
Sex	59% male 41% female	45%male 55%female
Average Age	17,3	17,3
Institute	79%Technical 21%Professional	67%Technical 33%Professional
Year	2 2nd grade; 2 3rd grade;14 4th grade; 1 5th grade	2 2nd grade; 1 3rd grade; 8 4th grade; 1 5th grade

4. *Results*

Here is a graphic which summarizes the results.



The experimental and control groups had the same performance in task A, but the former performed slightly better in the other tasks. Specifically, there is a 5% difference in Part B, 3 in Part C, and 5 in Part D.

Before moving to an analysis of the specific answers that students provided in Parts C and D, here are some general data that we regard as interesting.

In Part 1, both groups had troubles in dealing with Items A5, A9, A10[10], which are the following:

[10] The average score in Part A is 63,4% of correct answers for the experimental group, and 63,5 for the control group. The experimental group scored 15,9% of correct answers in A5, 47,2% in A9, and 38,1% in A10. Similarly, the control group scored 15,8% of correct answers in A5, 47,4% in A9 and 45,9% in A10.

A5 (...) Millions of people are willing to risk their lives to leave their home country and (...) often leave their own families behind. This clearly means that (...) their situation is desperate.
A9 (...) Animals have the same rights as humans, so (...) we should stop eating meat. (...) Not to mention the impact that livestock farming has on the environment!
A10 (...) Remembering is a way to keep traditions alive and (...) allows new generations to avoid making the same mistakes as in the past. Therefore, (...) the memory of historical events is important.

The main difficulty that students encountered when working on item A5 may have been the absence of a clear conclusive linguistic connective (e.g., 'so', 'hence', 'therefore', 'consequently', etc.). The choice of the verb 'to mean' was intended to test their linguistic sensitivity, to determine whether they can recognize a claim even when other linguistic formulas are used. The data seem to demonstrate that, without specific linguistic training in argumentative sentences, students in TPS may not be able to recognize that a part of a discourse serves as the logical conclusion of other parts within the same discourse.

The issue appears to be different when it comes to items A9 and A10. In both cases, despite the use of clear conclusive connectives ('so' and 'therefore'), the whole sentences consist of three propositions, and many students demonstrated that they do not know that there could be just one claim, but more than one reason for the same claim. Indeed, in many cases, they wrote two 'C's and only one 'R'. This is elementary knowledge in critical thinking that the Italian school curriculum does not include. Without basic instruction in critical thinking, students are destined to be unable to distinguish between reasons and claims in slightly more complex sentences than those composed of just one reason.

In Parts C and D we found the following.

Most students were able to find reasons in favor of the claims (items C4 and D4) that we should (and should not) trust science. Perhaps the explanation of this fact is that all students have already heard reasons for and against science during the pandemic. In other words, by being

exposed to several discussions for and against science, students learnt what one can count as a reason for and against the trustworthiness of science.

The cases that students found more troublesome are C3, C5, and D3, D5. Our hypothesis is that students often found it hard even to understand the structure of these sentences. C3 says that 'Happiness consists in the pursuit of pleasure' and we think that students find it hard to reason with the notion of 'pursuing pleasure' and with the notion of 'to consist of'. In the case of C5, which says that 'The nature of humans is wicked' students often seem to conflate two interpretations of this sentence. In one reading, which is the one we had in mind while writing the sentence, it says that humans are wicked. In another reading, which we did not even anticipate, it says that nature is wicked, and that it being wicked is manifested in what makes it happen to us humans. This conflation resulted, we think, in a general difficulty to find reasons for this claim (and its opposite). Another possible explanation of this trend is that both items C/D 3 and 5 mentioned claims that arguably do not feature in the everyday life of students. The confirmation of this hypothesis is provided by the better results in items C/D1, C/D, and C/D 4. C/D1 speaks of life as (not) tough, C/D2 of snitching, and C/D4 of science, and all these subject-matters seem nearer to students' concerns, as compared to the question of whether happiness consists of the pursuit of pleasure and of whether human nature is wicked.

Another interesting trend that emerged from the analysis of the data is that students consistently (in both groups) scored better in Part C than in Part D. One simple explanation might be that Part D comes at the end of the test, and that as a result, students lacked the motivation to complete it (bear in mind that students did not receive a vote for their performance). Another more interesting explanation might be that students find it harder to argue for some claim if they have just argued in favor of their negation (or their opposite). Another interesting explanation still is that students find it harder to reason with sentences that feature negations. An additional hypothesis is that they have troubles in

providing reasons for claims that they disbelieve (assuming, of course, that the items in Part D are claims that they are likely to disbelieve).

5. *Bad Reasons vs. No Reasons*

Consider this claim: C) Snitching is wrong.

Consider the following propositions as candidate reasons for believing that snitching is wrong.

R1: Cats are cute
R2: Snitching is saying the false
R3: Snitching is harmful

We might suppose that R1, R2 and R3 are true. R3 seems to be a good reason for C; R2 can be used by some as reason for believing C, even if it seems to be a bad reason; as for R1, it is not clear whether there could be any normal context in which R1 is used as a reason for C. It is not that R1 is a bad reason for C; it does not even look like a candidate reason for C. In marking these distinctions, we are working with a notion of epistemic reason that we can characterize as follows: consideration that counts in favor of believing the truth of the sentence (assuming truth is the standard for correctness of belief)[11].

In the evaluation of student's answers, we were only interested in evaluating students' capacity to provide epistemic reasons for claims. We were not trying to evaluate student's ability to offer good reasons; we were trying to check students' capacity to understand the concept of reason, and we were doing so by asking them to produce reasons. That

[11] See K. SYLVAN, E. SOSA, *The Place of Reasons in Epistemology*, in *The Oxford Handbook of Reasons and Normativity, Oxford Handbooks*, ed. D. Star, Oxford Academic 2018 <https://doi.org/10.1093/oxfordhb/9780199657889.013.0025>, accessed 25 Sept. 2023: «Epistemically normative reasons are a subclass of these [normative reasons *vs* explanatory and motivating reasons], which bear on the correctness of doxastic attitudes like belief, disbelief, and suspension».

is why the attribution of scores followed the following general guidelines.

As a general rule, in all those cases in which we took the candidate's reason to be a good reason, we assumed that the reason actually worked as a reason in the mind of the student. Accordingly, in the interpretation of the answer provided by students we consider important the criterion of relevance, more than those of acceptability and sufficiency[12]. It was harder, however, to decide how to attribute scores in those cases in which the student's candidate reason either seemed a bad reason or a proposition that seemed completely irrelevant for determining the truth-value of the proposed claim[13].

A reason, in the form of a proposition, is something that can figure in an argument whose conclusion is the claim proposed by the test. Now, for any proposition *p* proposed as a reason by the student, it is easy to construct an argument in which *p* features as a premise that, together with another implicit premise, leads to the conclusion in a deductively valid fashion.

P1) p (the candidate reason proposed by the student)
P2) if p then q (the implicit major premise)
C) q (the claim proposed in the test)

[12] For the analysis of these three criteria, see R. H. JOHNSON, J. A. BLAIR, *Logical Self-Defense*, McGraw-Hill, New York 1994[3].

[13] Moreover, we followed these general guidelines: we did not consider as pertinent factors such as grammatical correctness and orthography; we did attribute a point even to candidate reasons that were, at least according to the reviewer's point of view, obvious bad reasons; provided that we could interpret the student's candidate reason as something that the student could have regarded as a reason, we attributed a score; in case of doubt, we considered the overall performance of the student; e.g., if it was obvious, from the context, that the student did understand the task, then we attributed to the student the score; in the context of the evaluation, we gradually elaborated categories for evaluating students' candidate reasons (more on this below); and as the evaluation continued, we refined our categories in the light of new cases.

So, to understand the student's proposed reason *p* as a genuine reason for claim C, it is enough to understand *p* as the antecedent of a conditional whose consequent features C, namely the claim proposed in the test.

To interpret the results in this way has, however, two obvious problems. First of all, it trivializes the test, for each student's answer turns out to be correct. Second, in most cases it violates some version of the charity principle[14]. To illustrate this point, consider this case (where 'C' is the claim proposed in the test and 'R' is the candidate reason provided by the student):

C: Life is tough.
R: Cats are cute.

Suppose that we attribute to the student a belief of the form if R then C, that is, 'if cats are cute, then life is tough'. In this case, since we are supposing that the context of the student is such that she would not regard this conditional as true, to attribute this conditional to the student will violate a very weak version of a charity principle according to which it is permissible to attribute a belief *b* to a subject S only if, from the point of view of S, it would not be blatantly irrational to regard *b* as true.

So, it was necessary to interpret the candidate reason, and we found no principled way of doing so. We tried to put ourselves in the student's mind, as it were. In doing so, we asked the following question: can this candidate reason be considered in normal contexts as a proposition that is relevant for determining the truth-value of C? And, of course, in all

[14] There is no canonical formulation of the charity principle. The principle was famously advanced by Quine and, later, by Davidson. We here refer to the following formulation attributed to Davidson. See: J. MALPAS, *Donald Davidson* in *The Stanford Encyclopedia of Philosophy* (Summer 2023 Edition), ed. E. N. Zalta, U. Nodelman. <https://plato.stanford.edu/archives/sum2023/entries/davidson/>, accessed 25 Sept. 2023: «The injunction to optimise agreement between ourselves and those we interpret, that is, it counsels us to interpret speakers as holding true beliefs (true by our lights at least) wherever it is plausible to do».

those cases where the candidate reason R was, in our view, clearly irrelevant for the truth-value of C, we assumed that the student did not have in mind a structured argument with the relevant conditional that would bring from R to C.

6. *Interesting cases*

In correcting the tests, we found some patterns in the answers that gave us useful hints for future critical thinking teaching activities. Here is a sample of some of the most noteworthy patterns.

6.1 *The reason is (almost) identical with the conclusion*

Sometimes students offer reasons that threaten to be identical with the content that they are supposed to justify. Here are some examples.

C: 'Snitching is wrong'
R: 'Snitching is not right'

C: 'Man's nature is evil'
R: 'In every man there is an evil part'

How do we evaluate these cases?

We think that students here are perhaps trying to give a reason for the claim, although they are failing to give a good one. We adopted this interpretation for two main reasons: first, because the candidate reasons are obviously *relevant* for determining the truth-value of their corresponding claim; second, because the same students proved to be able to provide good reasons in other items. The main problem with the reasons listed above is that they seem to provide a circular justification for their corresponding claim: to claim that snitching is not right seems to presuppose what is at stake in a dialectical context where the debated question is whether snitching is right or wrong. One might object that the snitching argument can be read as a good enthymematic argument

having as a middle implicit premise the disjunction `Either snitching is right or it is wrong'. Moreover, the reason `Snitching is not right` is different from the intended conclusion `Snitching is wrong` since a distinction can be in principle made between failing to be right and succeeding in being wrong -e.g.. a certain action could be neither wrong nor right. This interpretation would certainly make snitching argument a good one, but at the price of attributing to the students the previous implicit considerations. Would it be fair to do so? Well, it is difficult to answer lacking information on the context in which the student was trying to build the snitching argument. These reflections provide a moral with respect to teaching of critical thinking: a crucial aspect that needs to be consolidated is the skill of sensitivity to the *dialectical context* in which thinking is taking place.

6.2 *Modus tollens*

Sometimes - although very rarely - students offered propositions that would count as reasons if they figured as premises in *modus tollens*. Interestingly, these cases are introduced with the word 'otherwise' or 'if not'. Here are some examples.

C: 'The nature of man is good'
R1: 'Sure, otherwise we'd all be killing each other'
R2: 'How else could vegetarians and national parks with protected animal species exist?'

Consider R1. The student's reasoning seems to be something like the following.

P1) If the nature of man is not good, then we'd all be killing each other.
P2) We are not all killing each other.
C) Hence the nature of man is good.

Interestingly, we found that the implicit use of *modus tollens* (sometimes, as in the case of R2, coupled with the use of rhetorical questions) was rare among the student's answers. Most candidate reasons could be interpreted as potential premises in *modus ponens*. Since we think that it is valuable for students to be able to reason with a variety of argumentative schemas, in the last years of the INVENTIO syllabus (towards the last two years) students are expected to learn some argumentative schemas and the corresponding formal fallacies.

6. 3 *Sufficient conditions*

Sometimes students offered instances or cases in which the claim is true, rather than reasons to regard it as true. Compare R1 and R2 in the following case:

C: Life is hard
R1: When you are poor
R2: There are poor people

R2 can count as a reason. The student seems to be carrying out an inductive reasoning: there are poor people, if there are poor people life is hard (implicit conditional premise), then life is hard. The existence of poor people shows that life is hard.

What about R1? First of all, R1 is not a proposition, but a part of a conditional. In cases analogous to R1 we scored 0. R1 could be a reason if the student is using it as a conditional in an argument that *also* features the premise that there are poor people. But it seems to us that this is not how the student is reasoning. Rather, the student is providing us with conditions that are sufficient for C to be true. The student is not using the conditional 'When you are poor, life is hard' in order to show that life is hard, but, rather, she is offering us with a case in which C is true, but it is not saying or implying that this case obtains.

6.4 *Rejection*

One of the most interesting findings we encountered while correcting exercises C and D, but especially in D, is the general tendency of students to reject claims that contradict their beliefs. For instance, when they are asked to find two reasons to justify a sentence like 'Snitching is right' (2nd item, exercise D), most students refuse to find any reasons, because they generally believe that the claim is false. Consequently, instead of striving to search for relevant reasons, many of them provide incorrect answers such as 'No', 'False', or even 'You're a snitch!'. In some cases, the rejection is coupled with the sketch of an argument against the claim. In other cases, students leave the space blank, as if it were impossible to find reasons for such an unacceptable claim. This was not to be interpreted as a lack of understanding of the notion of reason and/or the demands of the exercise. Indeed, the same student might reject and/or argue against some of the claims proposed while being able to provide good reasons to some other claims.

This phenomenon is remarkable because it reveals something profound not so much about some commonly shared social belief among adolescents, as it is about a widespread cognitive tendency among individuals who have not been exposed to critical thinking training. This tendency involves evaluating the conclusion of an argument solely based on its acceptability, regardless of the logical validity of the schema. Indeed, «[...] even with clear instructions on logical reasoning, people are strongly inclined to believe that believable conclusions follow while unbelievable ones do not. This is known as the belief bias effect» [15]. Evans' finding demonstrates that belief-based reasoning is the natural way in which humans tend to reason. In other words, when faced with an argument, they struggle to set aside their beliefs about the content of the claim, without considering the premises and the whole syntactic structure of the argument. On the other hand, if we were accustomed to

[15] J. J. St B. T. Evans, *Thinking and Reasoning. A Very Short Introduction.* Oxford University Press, Oxford 2017, p. 70.

temporarily setting aside our current beliefs, we could reason more objectively, because we would no longer be anchored to the factual world, but could consider alternative possibilities, as required by hypothetical thinking.

In the test, students were not assessing the conclusion of a deduction as in Evans' experiment[16]; instead, they were supposed to follow the reverse process, searching for two reasons starting from a claim. However, when students reject unacceptable beliefs, we observe the same cognitive phenomenon: in the absence of specific critical thinking training, people tend to reason based on their beliefs rather than on the validity of the reasoning. In a curriculum like INVENTIO, which aims to open students' minds and provide them with new thinking tools, this can be a significant limitation from a dialectical perspective. It risks preventing students from learning the crucial attitude of a critical thinker, which is to consider the reasons (and claims) of their adversaries.

As a longstanding tradition from Aristotle onwards maintains, considering both the *pro* and *contra* of a claim is recommended both to conduct a comprehensive analysis of the problem at hand and to anticipate potential objections to our own claim. But, beyond the context of dialectical comparisons between adversaries, from a pedagogical perspective, it is a crucial goal to teach students to keep their minds open to possible changes of opinion, a crucial epistemic virtue that is perfectly aligned with the goals of the entire project. A virtue that the practice of philosophical dialogue lets students slowly cultivate, as they learn to embody beliefs for the sake of the inquiry that may not necessarily be their own.

[16] J. J. St B. T. Evans, J. L. Barston, P. Pollard, *On the Conflict between Logic and Belief in Syllogistic Reasoning*, in *Memory et Cognition,* 21, (1983), pp. 295-306.

7. *From Dialogue to Critical Thinking*

It is one thing to elaborate a clear detailed list of logical and argumentative skills that we expect students to acquire. It is quite another thing to know how to help students to acquire them. As mentioned above, one of the core hypotheses of INVENTIO is that the practice of philosophical dialogue, in the context of the Community of Inquiry pedagogy, will help students to learn the skills of critical thinking. As neuroscientific research suggests[17], inductive educational approaches seem to be the most effective methods for acquiring cognitive competences. Philosophical dialogue allows students to encounter concrete problems that are closely related to their experiential horizon, thereby engaging them in finding solutions. Since philosophical dialogue is a specific inductive approach, it is likely to facilitate the acquisition of critical thinking skills more effectively than traditional deductive approaches, which typically consist of presenting the notion/norm, providing examples, and offering exercises to reinforce the theory.

There are two more reasons for thinking that philosophical dialogue is suitable for fostering critical thinking[18]. First, this methodology appears capable of immersing students in a dialectical context similar to the natural environment where individuals, from a very young age, need to engage in argumentation[19]. Second, it implements a complex and collaborative approach to rethinking, which has been referred to as *distributive thinking*[20].

[17] *How people learn: Brain, mind, experience, and school.* ed. J. D. Bransford, A. L. Brown, R. R. Cocking, National Academy Press, Washington 2000.

[18] E. LIVERANI, *L'apprendimento dialogico del pensiero critico*, in *Beyond the Two Cultures*, ed. M. Badino, Erickson, Trento 2023, 27-48.

[19] H. MERCIER, *Reasoning serves argumentation in children*, in *Cognitive Development*, 26.3 (2011), pp. 177-191.

[20] E. HUTCHINS, *Cognition in the Wild*, MIT Press, Cambridge - London 1995.

The INVENTIO project has the aim of testing the leading hypothesis of the present project by gathering data from a large sample of students from TPS in Italy. The results analyzed in this paper show a slight difference between the experimental and control classes. However, we must consider that the Experimentation conducted in 2021-2022 consisted of only 10 hours of activity, compared to the 24 hours outlined in the syllabus. These data, although partial, seem to confirm the theoretical hypothesis that underlies the project. Certainly, we will need to await the analysis of the next available data for a more robust confirmation of the hypothesis, as they will include a larger sample and there will be a bigger difference between the experiential and the control class. For now, however, we find the data obtained from the tests to be encouraging.

Within the context of this didactical hypothesis – i.e., the hypothesis that we learn to think critically through dialogue – we would like to know whether there is some specific didactical intervention that might be conducive to the aim of learning critical thinking skills. Indeed, one could raise a possible objection to the approach fostered by INVENTIO. Assuming that philosophical dialogue is an appropriate way to teach critical thinking skills, because students are immersed in a pedagogical context where they are continuously challenged by others, what can guarantee that they also learn the basic notions of critical thinking (e.g., reason, claim, argument, premise/conclusion, relevance, necessary and sufficient conditions, etc.)? And how can they acquire the competence to transfer these notions to other contexts and apply them to different problems? In order to address these concerns, we did two things.

First, the INVENTIO syllabus also includes other activities (of an inductive nature) aimed at complementing philosophical dialogues. Some of these activities are specifically focused on critical thinking notions and norms.

Second, to ensure that the critical thinking activities enhance and enrich the skills exercised through dialogue, we outline an approach that departs from traditional deductive methodology. During philosophical dialogues, whenever the community of inquiry encounters a problem

that requires a new philosophical notion for proper analysis, the facilitator can introduce the notion and entrust it to the class. She does not necessarily need to provide a theoretical explanation beforehand, but her use of the notion should help students understand its meaning and how it can be employed effectively. For instance, if a student claims that *p* without justifying it, the facilitator can summarize her contribution as follows: 'Your claim is *p*, but *p* needs to be justified (or argued, supported, etc.)'; if a student asserts that memory is an essential property of human beings – i.e., a being without memory is not truly a human being –, then the facilitator can ask: 'Are you asserting that memory is a necessary condition for being human or even a sufficient one?'; if a student argues that, since every A is *q* and B is *q*, then B is A, the facilitator can simply provide a counterexample to demonstrate the flaw in this reasoning (e.g., 'Every human being has a head, my dog has a head, therefore my dog is a human being'). In all these examples, even though she does not provide the community of inquiry with a formal definition of the technical notions used or an explanation of the adopted norms, the context should enable them to grasp the meanings and structures, and the next time, they will likely use them consciously.

In conclusion, what we are asserting is that we cannot abstractly determine which notions and rules students need to know and which are irrelevant; it depends on what they practically encounter in investigating problems. Once philosophical dialogues set the agenda for the concepts and rules that are important for students to know, integrative activities specifically focused on critical thinking can be planned to reinforce these notions and rules and provide students with the opportunity to understand them theoretically as well. In this way, philosophical dialogue, being a specific inductive activity, is embedded within a broader inductive educational framework, serving as the starting point from which students can reach theoretical knowledge. In any case, it may be advisable for facilitators to introduce notions and rules with a gradual increase in complexity, taking into account students' philosophical backgrounds.

This is why the syllabus suggests certain critical thinking contents for each year, to be understood not as mandates but as suggestions.