BEYOND THE TWO CULTURES

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BEYOND THE TWO CULTURES

EXPERIENCES FROM A POT PROJECT

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How to recognise and avoid fallacies? Using audiovisual tools for logical education in schools

G. Casu (Università di Cagliari), C. Ternullo (Università di Barcellona), A. Floris (Università di Cagliari), G. Sergioli (Università di Cagliari)*

ABSTRACT. We present the results of the activity carried out by the University of Cagliari in the context of the Italian POT project *Oltre le due culture: per un dialogo interdisciplinare tra logica, filosofia e scienze della comunicazione*. The main purpose of the activity was to train high school students to use logical skills to recognise (and avoid) argumentative fallacies. The methodology in place was centered upon the use of audiovisual tools. The paper briefly surveys both argumentative fallacies and the use of audiovisual tools in schools, and then discusses the experiences.

Introduction

The prominence of logic within contemporary philosophical discourse, as well as its relevance for a broad range of disciplines, most notably scientific, is widely recognised. Less considered is the equally prominent role that logic can play in connection with subjects taught in schools (in particular, high schools).

That logic may be viewed as relevant to the methodologies and goals of high school teaching should not strike anyone as surprising, for two main reasons. The first is that logic is the science, as the definition goes, of valid reasoning. So, it might not feature among disciplines taught at school, but is, clearly, an integral part of the methods used by all of them.

The second reason is that logic has a noticeably interdisciplinary nature, which is both due to its history (its birth and development from a discipline, i.e., philosophy, which is already interdisciplinary), and to its having emerged,

in its more contemporary form, as a branch of mathematics and, thus, derivatively, also of science.

Indeed, after very illustrious, but somewhat restrained, beginnings among ordinary philosophical disciplines, in the XX century logic took center stage within several distinguished areas of knowledge, such as the foundations of mathematics, computer science, linguistics and the cognitive sciences.

As far as high school teaching is concerned, logic may be viewed as relevant to many disciplines, too: to Philosophy, as is natural, but also to Mathematics, Computer Science, and the other Sciences.

There are plenty of examples of relevant connections one could make. A typical high-school class about, say, the concept of function, algorithms, about the structure of the human genome, or Hegel's dialectic, will typically make use of a certain amount of «logical», broadly construed, notions and concepts.

Looking at the contemporary landscape, when one refers to logic, sometimes one refers to the whole spectrum of philosophical disciplines based on the study of logic, such as the philosophy of language, the philosophy of mind, the philosophy of mathematics, linguistics, etc. Therefore, the techniques, contents and methods of these disciplines may also be relevant to high school teaching.

It should be noticed that the use of logic does not imply or reduce to the use of complicated formal tools. In fact, what is sometimes called informal logic is already a very valuable tool to enhance students' logical skills and competences such as:

– the ability to formulate and use appropriate argumentation strategies;
– the ability to assess the validity/invalidity of arguments;
– the ability to assess the complexity of problems having prominent logical features;
– the ability to devise appropriate resolution strategies in different contexts, and so on.

One further reason why the study of logic has recently risen to prominence in Italian schools is a very practical one: entry tests for many University Faculties also include the resolution of simple logical exercises, and, as a result, many high school students have started taking an interest in the discipline, if not for anything else, for purely pragmatic reasons. Today, many schools even offer courses where students familiarize with and address the logic used in entry tests. In such courses, an examination of, at least, the basics of the discipline is, almost invariably, carried out.

The POT project *Oltre le due culture: Per un dialogo interdisciplinare tra logica, filosofia e scienze della comunicazione,* funded by the Italian Ministry

of University and Research, which has involved five Italian universities, and a sizable number of Italian high schools, has represented one of the first large-scale and systematic attempts to train teachers' and students' logical skills, and has fundamentally focused on the following activities:

– mini-courses on logical topics;
– planning, managing and delivering of activities;
– diffusion of specialised materials produced in schools;
– engagement with the teaching community to foster innovation of the curricula.

In particular, the University of Cagliari has been in charge of planning, managing, and delivering courses for the teachers, as well as for the students involved in the project, and of carrying out lab activities and practical experiences. The article precisely details one of the main experimentations undertaken in the context of such activities, that is, to produce audiovisual tools on logical fallacies. In particular, students have been asked to select arguments affected by several kinds of fallacies, and devise methods to detect them.

Overall, the experience has been rewarding for all the parties involved. Its outcomes and overall impact still wait to be examined in full, but already suggest potential extensions, improvements and, of course, a wealth of methodological and pedagogic reflections.

The structure of the paper is as follows. In section 1 we very briefly review the essentials of fallacies used in the experimentation. Section 2 deals with techniques to produce audiovisual footage, and its use in schools, whereas section 3, finally, describes the experimentation which has been conducted by the students and its final outcomes (the videos).

Argumentation Theory and Fallacies

Preliminaries

Fallacies clearly affect argumentation and communication in many contexts, but how? Which fallacies, in particular, are more dangerous? To answer these questions, we first have to introduce some preliminary notions.

Arguing correctly means to produce an argument in which a sentence (the conclusion) follows necessarily from other sentences (the premises). Technically, a correct argument is said to be valid, an incorrect one invalid (Copi, Cohen and McMahon, 2014, p. 27).

However, in ordinary-life contexts, people often enunciate arguments without being concerned about their validity, but rather about their communicative efficacy, their persuasiveness. Now, it may well be possible that an argument is persuasive (namely, that it looks like a good argument), but invalid. In such cases, what makes the argument persuasive (and invalid, at the same time) is the fact that it contains a fallacy.

The term fallacy comes from the Latin word *fallere*, which means, among other things, to mislead, and any argument that contains some argumentative mistake may be called fallacious, insofar as it misleads us to believe that it's valid (Tindale, 2007, p. 10). It is, however, important to stress that fallacies are not straightforward «argumentative errors»; more often, they are mistakes which are not easily detectable as a consequence of the structure itself of the argument. Typically, a fallacious argument is any argument which, although looking valid prima facie, no longer looks so after a more detailed examination of its structure and parts, insofar as the latter involve the violation of some logical or semantic rule. The 'use' of fallacies in an argument is sometimes unintentional, but in most cases, it is deliberate, since a shrewd and accurate use of fallacies may turn a poor argument into a persuasive one.

Fallacious arguments are used very often in everyday life; it is therefore useful, at this stage, to make some considerations about the role such arguments play in the broader context of social life.

Contemporary society has a constant need for unrestricted access to information. The latter has become so vital an ingredient of our socio-economic system that the «information industry» has become itself a major trigger of economic development and wealth.

Moreover, information is connected to and depends upon technological development. Indeed, it is technology which allows us to carry out most of our activities which require constant access to information in the most efficient way, activities such as generating and circulating texts, images and any other kind of audiovisual content. For this reason, we can rightfully define our age as the «age of information». However, such a massive exposure to information, and to the technology used to produce it, have taken their toll on our lifestyle and social relationships: everyday, we are literally showered by unchecked information coming from the most disparate sources (web, social media, papers, tv, radio, etc.) which influences our daily interactions with others, our family and work environment.

As a matter of fact, the power of contemporary mass media precisely lies in their ability to shape (social) reality. Very crudely, one could say that mass media aim to recreate reality, by suggesting what aspects of it are most worthy of our consideration and attention (Griffin, 2012).

Clearly, not all the information to which we are exposed can be considered «good». In fact, much of it is «bad» information: it suffices to consider, for instance, the recent proliferation of fake news, which has grown to the point of creating a parallel «information ecosystem» wherein disinformation is spread at an unprecedented scale.

In a sense, fallacious arguments are an integral part of this «ecosystem», insofar as they contribute to its survival. Persuasiveness, as is clear, plays a key role in this respect, since, as said at the beginning of this section, a fallacious argument, although invalid, may well look persuasive (Sergioli and Ternullo, 2014, p. 162).

In conclusion, on the grounds of all the considerations we have made, it has all the more become of fundamental importance to acquire skills to identify fallacious arguments; in particular, skills allowing one to critically evaluate the information to which one is exposed and avoid the logical loopholes hidden in it.

Ambiguity and Vagueness

In the next few subsections, we survey very briefly some types of fallacies which have been used for the experimentation discussed in section 3.[1] We start with *ambiguity fallacies*. This kind of fallacy is ubiquitous, as it can be detected in many everyday life arguments.

A word is said to be *ambiguous* when it has more than one *meaning*, and it is said to be *vague* when it is not clear whether it suits a certain context (Paoli, Crespellani Porcella and Sergioli, 2012, p. 83). Analogously, a *statement* is ambiguous when it can be interpreted in different ways. Sometimes, the ambiguity of a statement is caused by its containing one or more words which have different meanings: in this case, we say that the statement is *lexically ambiguous*. Fallacious arguments based on lexical ambiguity include the *fallacy of the fourth term* (also known as *quaternio terminorum*): a fallacy that occurs when, in a syllogism, an *incorrect* conclusion (C) is deduced from the premises (P), as a consequence of the fact that the syllogism's *middle term* has two different meanings in the two premises.

P1. Only *man* is born free.
P2. No woman is a *man.*
C. No woman is born free

[1] The first classification of logical fallacies is due to Aristotle, who, in his treatise *On Sophistical Refutations*, already identified thirteen types of fallacy. Clearly, new kinds of fallacies have since emerged, and several alternative classifications are currently in place (Sergioli, 2015, p. 2).

In the example above, «man» has two different meanings in the two premises: its first occurrence means humanity (P1), the second one male person (P2). The conclusion is therefore incorrect because the word has been used with two different meanings in the two premises (Sergioli and Ternullo, 2014, pp. 167-168).

Sometimes, ambiguity lies in the argument's structure, which means that the argument is *structurally ambiguous*. Structurally ambiguous arguments, in turn, contain structurally ambiguous statements, that is statements whose internal word order is a source of ambiguities. Suppose someone utters the following statement:

> «The poisoning of the victim is deemed intentionally caused by the police marshal».

The statement can be interpreted in two different ways: «the police marshal can be considered responsible for the murder», or «it can be assumed that the marshal believes that the murder is intentional». If the word order in the sentence had been as follows: «The police marshal believes that the victim's poisoning is intentionally caused», no ambiguity would have arisen. A fallacious argument whose conclusion is a structurally ambiguous statement is called *amphiboly* (Paoli, Crespellani Porcella and Sergioli, 2012, p. 88).

Biased Arguments

A second important class of fallacious arguments is that of biased arguments. Tendentiousness is typical of several communicative contexts: adverts, commercials, political speeches, etc. We may define an argument as biased, if it contains, as premises, tendentious expressions which do not really support its conclusion, but just make it look «attractive». In what follows, we make some examples.

In adverts, there is often a tendency to present products not as they are, but in a way which fulfils customers' expectations. For instance, consider the following advert (Sergioli, 2015, p. 12):

> «The new X does more than 40 km with only a liter of petrol».

In the statement above, locutions such as «more than» and «only» do not help describe any essential property of the product X (a car) which is being advertised, nor do they provide information which is essential to consumers,

and which would really support the conclusion: «X is the most convenient type of car»; they just contribute to presenting the said product in a way that misleads consumers to think that it would be unquestionably convenient for them to purchase it.

Locutions of this kind are typical examples of emphasis and minimisation: they are used with the aim of exaggerating or diminishing a particular quality or property of a person, object, or event. Analogously, euphemisms and dysphemisms are expressions used to put something in, respectively, a positive or negative light.[2]

Another example of a misleading statement is a question which makes some false assumption from the very beginning, a practice which is quite often used in politics to present one's interlocutors' theses in a distorted way. In questions such as:

> «Can you explain to me how you copied the test?».

It is already assumed that one's interlocutor has copied a test without intending to ask whether that really was the case; such questions, their tone, in particular, usually disarm the interlocutor and make him appear as if he was not able to defend himself against the question's implicit (and unforeseen) allegations.

Fallacy of Misleading

These fallacies are committed in various contexts, especially in political contexts. We could broadly define them as strategies used by a speaker to deliberately mislead their interlocutor(s). They aim to divert one's interlocutor's attention from the claim one has originally made to a different claim (or set of claims) that can be more easily defended; some other times, they attempt to weaken someone's argument by attacking them, rather than the argument itself (Sergioli, 2015, p. 18).

The most common type of fallacious argument belonging to this category is probably the ignoratio elenchi (red herring) that is committed when a speaker, rather than openly arguing in favor of a certain claim A, argues in favor of

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[2] For instance, we could *euphemistically* define someone who is stingy, stubborn and touchy as a «thrifty, determined and sensitive person», or describe our parents *dysphemistically*, as in the following statement: «We went out with our *old men*».

some other claim B, only seemingly related to A, and which is easier to defend. Consider the following example. A journalist says to a politician:

A: «For the problem of unemployment, your party has a failed policy».

The politician will try to avoid embarrassment by replying:

B: «My party has created new nursery schools for working mothers: don't you find this action in favor of workers very useful?».

In the example proposed, a proper response to A would consist in counter-arguing that the party's policy has, in fact, successfully contrasted unemployment. Instead, one of the two speakers uses A's premises inappropriately to support a different thesis, that the party has done good things anyway (B).

In order to detect this kind of argument, one should check whether an argument is introduced by expressions such as «but that is not the point» or «but the real problem is that...», that intentionally divert the listener's attention from the original argument.

Another fallacy frequently committed in political contexts is the ad populum fallacy, whereby the argument's conclusion is not supported by the premises, but by the appeal to popular consensus or common knowledge. This kind of fallacy is also quite often used in marketing strategies to convey the feeling or idea that possessing an object or joining a certain initiative would make one a member of an exclusive group of people.

«X dresses are only for naturally elegant people like you».

In this classic example of flattery, a desirable status is associated with the brand X, the possession of which means to be a very unique person. Through using «flattery techniques», expert marketers can make the product they are promoting more desirable to their targets. Another case of ad populum fallacy is conformism, that consists in concluding that a certain thesis is true because it is believed to be so by most people.

«The new Artist's CD has a great musical quality, since it has been first in the hit parade for weeks».

The fact that a musical CD has ranked first in the hit parade for weeks does not, per se, warrant the claim that it is of «great musical quality». A very similar

fallacy is the ad hominem fallacy, used often in conversation, which consists in discrediting a thesis by attempting to discredit the person who defends it. An ad hominem argument is called injurious when it contains insulting expressions against those who support it, as in the following example (Calemi and Paolini Paoletti, 2014, p. 67):

A: «Teresa says that if you go out at two in the afternoon, in this heat, you risk a sunstroke».
B: «Ah, Teresa: can't you see that she is crazy?».

Finally, an *ad hominem* argument is called circumstantial (*tu quoque*...), when it purports to show that a claim is faulty on the grounds that the person who makes it is not morally or professionally entitled to make it, as in the following example:

«How do you think you could find cancer therapy, if you are a heavy smoker?».

The argument is fallacious, as, clearly, a medicine researcher could be a formidable scientist despite having unhealthy personal conducts.

The Statistics Fallacy

Statistical tools allow us to make claims or predictions about large sets of things (events, people, products, etc.) by observing the behaviour of smaller samples of such things. However, in everyday life, appeal to such tools is very often made in an incorrect way, as the data mentioned have not been verified or have not been interpreted correctly. Some other times, the data is too vague to allow one to make plausible inferences from them (Sergioli, 2015). For instance, someone proclaiming that:

«By adopting the measures proposed by me, we could reduce illegality by 30%».

Will look like someone who is competent about illegal activities, as she knows the «stats» and, thus, is also supposed to know how to reduce the number of crimes; however, since she has not made clear what she means by «illegality», and in the absence of verifiable data, and criteria to assess their credibility, her claim has no force.

In conclusion, recognising the fallacies we have reviewed so far will, on the one hand, allow us to resist their force and potential persuasiveness, on the other, is also a useful activity, insofar as it may prompt us to produce better (more accurate) arguments. The purposes of our experimentation were precisely to allow students to defend themselves against other people's fallacious arguments, but also use their skills to test the force and defensibility of their own convictions.

Audiovisual Tools for Learning: A Brief Overview

Within the experimentation we have carried out we have utilised innovative and user-friendly audiovisual tools. In what follows, we make some preliminary reflections on the pervasiveness and successfulness of these tools in our society, as well as on their specific usefulness in learning environments.

Preliminaries

Today, communication processes make extensive use of the audiovisual language. Cinema, television, videos, even simple moving images without any accompanying narrative (for instance, those of surveillance cameras, weather webcams, or 3D viewers), have become a stable part of our daily lives. These tools, among other things, allow lots of people to have communicative and visual experiences which were absolutely unthinkable only a few years ago (Eugeni, 2021), and in which the audio-vision, as defined by Michel Chion (1990), is certainly the key ingredient.

Audiovisual language has immensely developed since the end of the nineteenth century. Just limiting ourselves to cinema, we notice that both the tools and the language of cinema have constantly evolved since the times of the Lumière brothers' first short movies: now filmmakers are able to make very complex products, in which images and sound accompany and follow each other to create often very elaborated and articulated narrations.

The contemporary scenario is one where anyone can build their own «narrations» with very simple cameras or smartphones, which most of us possess, and where we spend a lot of our spare and work time watching audiovisual contents.

Thus, audiovisual products, such as pure entertainment products (TV series or family movies), or more sophisticated ones, such as documentaries or educational videos, have become of primary importance to represent and understand the world. Modern media helps us imagine stories, places and situations, which provide us with a diverse range of sensations and also contribute to building

our personal identity. Cinema, in particular, has immensely contributed to the shaping of personal and collective imagery in the last decades.

In more recent times, communication media have undergone further evolution. The spread of social media and mobile devices, for example, has further changed the classic models of communication, especially the way we perceive and decipher images (Ambrosini, Maina and Marcheschi, 2009).

One further crucial transformation has been brought about by the interaction of the audiovisual media with each other, which has created an integrated media system full of criss-cross fertilisations and contaminations. With reference to this phenomenon, the American media scholar Henry Jenkins has coined the notion of «culture of convergence», suggesting that we should rather focus on different *media cultures* than on different *media technologies* (Jenkins, 2006;2009). It would precisely be this *convergence* of contemporary media into one unified *media culture* which would account for the contemporary pervasiveness of media and would also confer on them a decisive role in training and learning processes.

Educational institutions (we are now referring to Italian institutions, although this might also apply to those of other countries) are a lot backwards in the use of such media. Curiously enough, SARS-CoV-2 pandemic and the restrictions associated with it have been, in this respect, a major trigger of innovation, by prompting institutions to resort a lot more than they have done in the pre-pandemic era to audiovisual technologies, but, quite disappointingly, many institutions are still very far from being able to fully exploit the potential of technologies.

Full exploitation involves the acquisition of communicative competences that the American writer John Debes has called «visual literacy», that is, in the author's own words: «a series of competences that a person has to distinguish and to interpret visible actions, objects and symbols, naturals and artificials, that he meets in his space, and the applications of these competences in communicating with others and in evaluating images» (Zanin-Yost, 2014, p. 1). Developing visual competences also involves, among other things, learning to detach oneself from prejudices, as well as acquiring a critical approach to knowledge through the use of new media. And for that, in turn, it is crucial to understand how such media work.

Audiovisual Tools in Schools

The first introduction of audiovisual tools in schools dates back to the 1950s. Around that time, school teachers started realising that audiovisual

media could assist them in didactical actions, and that they had a very positive impact on students' learning processes. However, it was not until the 1990s that large-scale intervention projects were put in place.[3]

The main advantages in the use of such technology lie in the proved *efficacy* for learning processes of using images, audio files and videos, both for *digital natives* and *digital immigrants* (people who have had to adapt to digital technology).[4] In particular, both research and practice over time have proved that these instruments are very successful, above all, because of the immediacy with which they are able to transmit new knowledge to the students, for the quality of the management of the information flow, as well as of time and space, in the classroom. Moreover, the use of audiovisual products during lessons, if adequately managed, can also stimulate reflection, introspective and meta-cognitive abilities, and, overall, help students develop new skills or reinforce the old ones; it also helps them cope with emotionally complex situations.

The dynamic nature of the audiovisual language makes these tools especially suited to describe real-life processes, or represent natural and artificial phenomena, by suitably altering their speed or real dimensions (for example the *growth of a tree* or *cell reproduction*).

The visual richness of messages conveyed by audiovisual products makes communication much more engaging and manageable than that of more traditional media, such as written texts or audio files, and it also impacts on students' processes of motivation, attention, and conceptual memorisation.

It is precisely for these reasons that the audiovisual language suits a lot better than the traditional one students' differring approaches, and differring speeds in learning, and is also particularly suitable for students who have learning disabilities. Audiovisual tools can be used not only in the context of frontal lessons, but in the most diverse teaching environments, especially those more interactive.

For example, for the present project, we have, from the very beginning, required of the students to actively take part in the production of the videos. This has allowed them to familiarise with the logical topics addressed by the

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[3] For relevant Italian examples of these, see Lino Micciché's pioneering project described in Costantino (2005). For France, see Bergala (2002); for analogous experiences in Germany and in the Anglo-Saxon world, see Sommer, Hediger and Fahle (2011).

[4] «The film — says Christian Metz — gives us the feeling of directly assisting an almost real show. [...] It sets in motion in the viewer a process of participation both perceptive and affective [...], meets at first glance a kind of credit [...], finds a way to address us with the tone of evidence, in the persuasive ways of "it is so". In that way, it creates a sort of "aura of reality" that involves the viewer and leads him to participate in events as a direct witness: what happens is true because we are witnesses of what is happening» (Metz, 1968, p. 32).

project and, at the same time, make the most of the experimentation with these innovative tools.

The Activities Carried Out by the University of Cagliari

As said at the beginning, the main purpose of the POT project was to teach students of the Italian high schools key interdisciplinary notions of logic, communication and philosophy, some of which are already part of schools' curricula, through using innovative and interactive media, in particular, audio-visual tools (figure 2.1).

Due to the sanitary situation caused by the SARS COVID-2 pandemic, and the ensuing switch of all activities planned to the online mode, the project team at the University of Cagliari has mostly used online lessons and videos. The purposes of the videos were:

- to foster «listening education»;
- to train high school students in critical thinking skills, which might help them analyse and critically assess different types of «text» (where by «text» we mean any medium conveying a message: *videos, documentaries, images*, etc.);
- to enhance their communicative and content sharing-related skills with respect to several media;
- to make them understand the existing connections among logic and other disciplines.

The concrete work has been developed in two Stages. In Stage 1, we introduced the students to the basics of the *theory of argumentation*. In particular, the project team created video-lessons for students and teachers addressing basic concepts of argumentation theory, fallacies, and «real-life» contexts in which these fallacies are committed.

In Stage 2, the students were assigned the task of making themselves videos, in which they would discuss arguments containing fallacies, and would illustrate them. In order to carry out such tasks, they had to search for materials «containing» fallacious arguments, such as television programs, interviews, political speeches.

To help the students with their work, the project team has made videos providing them with technical tips on how to create audiovisual products: set-up, arrangement, framing, shooting and sound treatment, elements of photographic composition and video editing were addressed in the videos.

One of these videos shows how to create good audiovisuals with relatively unsophisticated tools such as mobile phones, cameras, and freeware software. In particular, it shows how to use natural and/or artificial lighting, how to position oneself within the frame, where to place the camera or mobile phone while one's shooting, where to direct the gaze and, at last, tips and advice on the use of the digital zoom.

Another video provides a practical example of video editing through the use of the free software *Da Vinci Resolve*.

Overall, the videos guide students step-by-step in the realization of their products, providing them with the necessary tools to approach editing and all other stages of film-making.

In turn, the videos were made by the project team using several devices, such as cameras and computers, and were edited using *Adobe Premiere. Adobe Illustrator* was used for the creation of the graphics, and other professional software was used for audio editing.

Finally, the team also made two further videos which showed how to select and process fallacious arguments. In the videos, audiovisual material taken from television interviews is examined by the project team, and, in particular, two specific kinds of fallacies are illustrated in much detail.

All the videos were made available to the students through the POT project's (figure 2.2).[5]

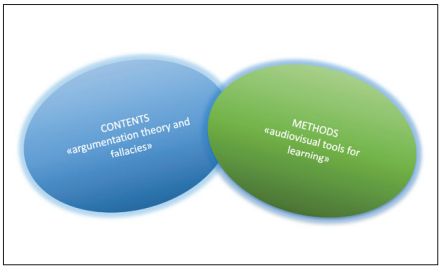

Fig. 2.1 Learning Logic and Argumentation Theory by exploiting suitable audiovisual tools for learning.

Fig. 2.2 The website https://www.pot-o2c.it/ contains information and materials regarding the project.

The website, also created by the project team, was a major resource for the students' activities. The website features the following pages.

[5] website www.pot-o2c.it/.

– *POT* contains general information about the project
– *Partners* contains information about the five Italian universities involved in the project: in particular, information about the persons (members) who have taken part in its execution.
– *Accomplished results* illustrates all the results achieved by the participating universities in the developing of the project.
– *Materials* features all materials used by the students and the teachers.
– *Contacts* contains all the participating institutions' main contacts.

Concluding Remarks

The data collected in the context of this experimentation, in particular those concerning students' performances, appreciation of the project and difficulties with it, are currently under examination by the project team; already at this stage, though, it is possible to make some considerations.

The methodology proposed is promising in many respects. Logic is commonly taken to be a tough subject, which can hardly be managed at the level of high school teaching. This is contradicted by the results of our experimentation. Dealing with *fallacies*, especially with contexts in which these are most frequently used, such as political debates, TV programmes, technical speeches, has proved a very pleasant experience for students. They have learnt by doing, that is, they have learnt fallacies and how they work by detecting their presence in concrete situations that had been previously selected.

There are two further aspects which are worth considering. The first one is that, by learning fallacies and detecting their presence in the most varied contexts, students can better understand the goals of logic, that is, checking the *validity* of arguments, they can be introduced to the basics of the discipline, and can also educate themselves to standards of rigor and precision in reasoning, which are fundamental for research work in all areas of knowledge.

Another takeaway for both students and teachers is that making educational videos is not only fun, but can also legitimately aspire to become an integral and defining part of schools' curricula and teaching methodologies, still too often exclusively based on frontal lessons and oral expositions.

Bibliography

Ambrosini M., Maina G. e Marcheschi E. (a cura di) (2009), *Il film in tasca. Videofonino, cinema e televisione*, Pisa, Felici Editore.

Bergala A. (2002), *L'hypothèse cinéma. Petit traité de transmission du cinéma à l'école et ailleurs,* Paris, Cahiers du Cinéma.

Calemi M. e Paolini Paoletti M. (2014), *Cattive argomentazioni: come riconoscerle*, Roma, Carocci Editore.

Chion M. (1990), *L'audio-vision: Son et image au cinéma*, Paris, Nathan. Trad. It., *L'audiovisione. Suono e immagine nel cinema*, Torino, Lindau, 2017.

Copi I. M., Cohen C. e McMahon, K. (2014), *Introduction to Logic*, Harlow, Pearson.

Costantino M. (2005), *Educare al film. Il Piano nazionale per la promozione della didattica del linguaggio audiovisivo nella scuola*, Milano, Franco Angeli.

Ervas F., Gola E., Rossi M. G. (2016), *Argomenti metaforici: come integrare persuasione e argomentazione,* «Rivista Italiana di Filosofia del Linguaggio», pp. 116-128, http://www.rifl.unical.it/index.php/rifl/article/view/380 (consultato il 21 settembre 2021).

Eugeni R. (2021), *Capitale algoritmico. Cinque dispositivi postmediali (più uno)*, Brescia, Morcelliana.

Griffin E. (2012), *Communication Communication Communication*, New York, McGraw-Hill.

Jenkins H. (2006), *Convergence culture: where old and new media collide*, New York University Press. Trad. It., *Cultura convergente*, Milano, Apogeo, 2007.

Jenkins H. (2009), *Confronting the challenges of participatory culture: media education for the 21st century,* Cambridge (MA), MIT Press. Trad. It., *Culture partecipative e competenze digitali: media education per il XXI secolo,* Milano, Guerini e Associati, 2010.

Metz C. (1968), *Essais sur la signification au cinèma*, Paris, Klincksieck. Trad. It., *Semiologia del cinema*, Milano, Garzanti.

Motta G. (2020), *Le fallacie logico-argomentative nel linguaggio politico*, in «Laboratorio di sociologia del diritto», https://www.giuseppemotta.it/wp-content/uploads/2020/06/Ifallacie-articolo7.pdf (consultato il 21 settembre 2021).

Paoli F., Crespellani C. e Sergioli, G. (2012), *Ragionare nel quotidiano*, Milano-Udine, Mimesis Edizioni.

Sergioli G. (2015), *Fallacie argomentative*, «APhEx», vol. 12, http://www.aphex.it/public/sito/ita/docs.php?&nomeCat=1&sezione=1&content=14&cat=1&view=2&id=208 (consultato il 21 settembre 2021).

Sergioli G. e Ternullo C. (2014), *Fallacious Analogical Reasoning and the Metaphoric Fallacy to a Deductive Inference (MFDI).* In F. Ervas, M. Sangoi (a cura di.), *Metaphor and Argumentation,* «Isonomia-Epistemologica», vol. 5.

Sommer G., Hediger V. e Fahle O. (2011), *Orte filmischen Wissens. Filmkultur und Filmvermittlung im Zeitalter digitaler Netzwerke,* Marburg, Schüren Verlag.

Tindale C.W. (2007), *Fallacies and Argument Appraisal*, Cambridge, Cambridge University Press.

Zanin-Yost A. (2014), *Competenza visuale: imparare e insegnare nella biblioteca accademica del XXI secolo e oltre,* «AIBstudi», vol. 54, n. 2/3, https://aibstudi.aib.it/article/view/9962/10191 (consultato in agosto 2021).