

TRANSNATIONAL REPORT

HOW AND TO WHAT EXTENT EDUCATIONAL INSTITUTIONS ARE ADDRESSING ENVIRONMENTAL AND DIGITAL ISSUES AT SECONDARY SCHOOL LEVEL IN BELGIUM, FRANCE, ITALY AND ROMANIA.



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1. Introduction

The "Anthropocene in the age of big data" project starts from the observation that our era is marked by the convergence between two accelerations, climatic and digital.

It postulates that this dual acceleration is creating a new environment with many challenges, including how societies will organise themselves to meet the challenges posed by these accelerations.

He also considers that the main role of the School is to prepare young people for the living environment that awaits them and to take up new challenges. They will have to seize the opportunities but also to face the risks of this changing world. These changes will affect the societal field and will be likely to call into question certain values which form the basis of the European ideal, particularly in terms of freedom.

The purpose of this project is to raise awareness and train teachers in these questions (IO2) and to help them work in this direction with their students, thanks to evolving tools for the classroom (IO3). The different partner countries of the project, offering, by their diversity, a certain representativeness of the situation within the European Union, it seemed necessary, in order to be effective, to establish a point of situation and of comparison in the different countries of the project.

This situation report was produced from a study, the results of which constitute this interim activity report. The first step in this study was to examine how the programs and official instructions of each country addressed these issues.

Secondly, a survey was launched among teachers to ask them how they appropriated the official instructions in their daily teaching with the students, if they considered themselves sufficiently armed for this work and in what fields they wished to be better trained.

Third, each partner conducted a survey of students in their country, to identify their preferred sources of information on these topics and their level of understanding according to their own assessment.

The study also aimed to better understand the place given to the School among the sources of information for young people and to identify their expectations in terms of content and methods, in order to then better target the project activities on awareness-raising, teacher training and tools.

2. Comparison of official instructions relating to climatic and digital accelerations in the 4 project countries.

It was to answer the question: "**How, in Europe, are climate and digital issues addressed in official instructions?** », starting from the 4 project countries : Belgium, France, Italy and Romania.

Each country had to take stock of its situation on the issue in order to be able to draw comparative elements on the way in which the public authorities take into account digital and climate accelerations in their official instructions.

The first part of this study concerns an analysis of official texts and reflection on existing situations and programs.

Three levels are targeted, linked to the two announced age groups (12-14) and (15-20), depending on the school organization of each country :

- Middle school (12-14 years old)
- General high school (15-18 years)
- Vocational or technical high school (15-18 years)

When this has been possible, a differentiation has been made between general education and technological and vocational training.

Four disciplinary fields were chosen for this study:

- Literary
- Human and social sciences
- Hard sciences
- Technological and professional education

In order to carry out the research work, each participant consulted the repositories on the themes of climate acceleration and digital acceleration sometimes referred to as homo data on the government site, the common base of knowledge and skills, identified in the school curricula the subjects devoted to the two themes that interest us, completed the work by a linguistic research targeted on the thematic vocabulary.

2.1 The diversity of education systems

Before starting the study of these programs, it should be noted that the school systems of the four countries present some differences in terms of the division of classes, their name and the number of years spent in college or in high school.

The level taken into account in our study is in blue : i.e. lower secondary (or college) and upper secondary (or high school).

Âge	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Belgique	école maternelle			primaire (1re à 6e)						secondaire (1ère à 6e)						
France	école maternelle			école élémentaire (CP à CM2)						collège (6ème à 3ème)			lycée (2nde à Terminale)			
Italie	Infanzia (materna)			primaria (elementare)						secondaria I (media)			secondaria II (liceo)			
Roumanie	grădinița			primară (I – IV)				gimnaziu (V – VIII)			liceu (IX – XII / XIII)					

The education system in each country reflects the country's history and culture. Societal changes influence the definition of educational goals and the means to achieve them (curricula).

For the most part, the European education systems, including the 4 countries in our study, show a "common core" between primary and lower secondary education.

The transition from lower secondary to upper secondary begins at age 14 (Italy, Romania) or at 15 (France) and the end of studies leads to a diploma allowing access to higher education (at 17 or 18).

The Belgian school system has a peculiarity because the primary and secondary schools are organized over six years. The secondary cycle consists of two cycles, the lower cycle and the upper cycle, lasting three years.

Given the existence of several different education systems in **Belgium** with different programs, the reference frameworks studied concern all the schools of the Wallonia-Brussels federation. These reference frameworks date back about twenty years and are currently in the process of being renewed.

In **Italy**, middle school and high school are often two worlds apart as regards the subjects and the way in which they are offered.

2.2 The question of the presence of climate and environmental acceleration in training programs and standards

2.1.1 At the global level

Environmental education does not seem to occupy the same place in school curricula depending on the country and subject.

In **Italy**, as in **Romania**, the subject is not included in government curricula ; some subjects in lower and

upper secondary schools refer to climate change and include a few small modules that are dealt with individually by teachers (Italy). It is integrated into school projects and is still taught by motivated teachers (Romania). But youth movements for an ecological awakening have convinced the Minister of Education to give an important place to environmental issues in the school curriculum, starting in 2020 in Italy. And in Romania, the government, faced with the lack of youth education in this area, has decided to react and raise awareness of climate change in schools and to increase the level of training of students and teachers.

Whereas in **Belgium**, as in **France**, education for sustainable development is part of the initial training of pupils in all schools and educational establishments. In France, the official texts speak of « Education au Développement Durable » (EDD) education for sustainable development, in Belgium, it is a question of « Education Relative à l'Environnement et au Développement Durable » (ErE DD) education relating to the environment and sustainable development, based on interdisciplinarity. As in France, teachers are invited to work on the concepts by building a "bridge" between disciplines.

In **France**, the policy of generalisation of environmental education for sustainable development began in 2004 (Bo n° 28 of 15 July 2004) and is part of the continuity (reference texts 2007, 2011, 2015). In 2019, the Minister of National Education included this transversal education in the continuity of the Agenda 2030 (EDD 2030), attesting to the role of education in the 17 sustainable development objectives (SDGs) included in the UN's Sustainable Development Programme for 2030. On the other hand, schools that enter into a global approach to sustainable development receive the "E3D" label « Ecoles en Démarche de Développement Durable » (Schools in the Sustainable Development Approach).

In conclusion, we can say that French educational policy, in official texts, integrates education for sustainable development by crossing other transversal education, including education for development and international solidarity, health education, artistic and cultural education and is present in the curricula of middle and high schools and in technological and vocational diplomas. Actions are carried out in each school to enable every pupil at every level to be made aware of the issue (introduction of eco-delegates in each class at the start of the 2019 school year, labelling of E3D schools: Schools / Establishments with a Sustainable Development Approach).

In **Belgium**, education relating to the environment and sustainable development is included in the inter-network references (core skills).

In **Italy** and **Romania**, the topic does not exist for the moment in the reference frames but should be included soon, under the pressure of the international situation.

The four countries have studied the presence of themes relating to our problem in school textbooks, in the various disciplinary fields mentioned above.

Apart from Italy where the theme is hardly addressed in the disciplines (except for a few college or high school modules dealing with climate change), the theme is featured in the programs in Romania, France and Belgium.

2.1.2 In the different disciplinary fields

A. In the literary field, in college and in high school

It is not found **in the literary field** (in college or high school in the three countries) but it remains a possible work object in Belgium and France.

B. In the human sciences, in college and high school

In **human sciences courses**, the topic is little covered in **Romania** where most teachers include it in their geography lessons ; in middle school : the effects of human activities on the environment and the changing planet ; in high school, in geography, in grade 11, some lessons focus on the protection and management of the environment, and in ecology (optional subject), the lessons deal with pollution and protection of the environment, of the world in ecosystems , habitat, protected areas, species, and protected species.

On the other hand, in **Belgium** and **France**, the humanities courses address the topic in a significant way, in middle and high school, by favoring interdisciplinarity mixing a geographical, historical, social and economic approach.

In **Belgium**, the theme is at the heart of the humanities repository in college, including in the content to be mastered by the students.

In **France**, in 6th year, the third part of the "inhabitant" civic education program constitutes a privileged entry point for tackling Sustainable Development in connection with the first geography theme "My nearby space, landscapes and territory". The 5th year geography program is entitled "Humanity and sustainable development". The notion of Sustainable Development sheds light on each theme of the program addressed during the year, from an economic, environmental and social perspective.

In high school, in **Belgium**, in human sciences courses, the theme is mainly addressed in geography where human-environment interrelations are one of the central themes of the frame of reference. In philosophy and citizenship, the framework emphasizes the citizen's commitment to sustainable development. One of the themes is the social and political relationship to the environment. In history and social and economic sciences, the theme is not present in the reference system.

In high school, in **France**, eco-delegates are elected in each class (as in college) and global change is the common thread of the geography program of the second class. As in **Belgium**, it is associated with the word "societies" and is defined in an economic, qualitative and human approach.

C. In the hard sciences

In middle school, the theme is present in a significant way in the repositories in **Belgium**, but not very significantly in **France** and **Romania**. In high school, if the theme remains present in the Romanian reference systems in a not very significant way, it is present in a significant way in Belgium and in France.

In **Belgium**, the contents are at the heart of science repositories only and even if the learning is not yet certified, it goes beyond awareness in upper secondary education and is an important part of the contents

to be mastered. One part is dedicated to environmental education and deals with management, use, conservation and protection of resources, depletion, destruction, pollution.

In **France**, the teaching on the topic of "the energy challenge" is part of education for sustainable development. It has so far been included in the "science" programs of the classes « Première L and ES » and is limited to the contribution of the physical and chemical sciences ; but they must be associated with social, humanistic and economic questions. In the earth sciences and life programs, in cycle 4 (5th, 4th and 3rd year of college), as in the programs of high school (« Seconde and Première), we find in the objectives, the contemporary issues of the planet, those of the environment, sustainable development, resource and risk management...

In **Romania**, a few lessons address the theme : in middle school, mathematics devotes 4 hours per year to exploring the environment, biology 6 at 10 hours per year, there are also a few chemistry lessons (in 6th and 8th year) devoted to the theme. In high school, the theme is covered in a few lessons in each high school class, in chemistry and physics.

D. In technological and vocational subjects.

The answers in this area vary from country to country and level to level. While the theme is not present in college programs in **France** and **Italy**, it is somewhat discussed in **Belgium** and **Romania**. In high school, the answers are different : it is still not present in **Italy**, remains addressed in a not very significant way in **Romania** but is approached in a significant way in **France** and in **Belgium**.

In middle school, in **Romania**, years 5 to 8 devote a module (out of the five allocated during the year) to sustainable development. But college teachers can be granted 35 hours per year by the school to cover this topic as part of their lessons. In **Belgium**, the theme is present in various technological contexts including biotechnology (water management and purification ..), food technologies or production and process techniques.

In high school, no class deals with the theme in **Romania**. In **Belgium**, the technology and technical education courses explicitly cite environmental constraints (energy, pollution, mobility as knowledge to be mastered in order to work on technology) and in **France**, a STI2D - Energies and Environment - stream (to be integrated after the « seconde générale ») explores the field of energy and its management, and provides comprehensive technological training in the fields of industry and sustainable development.

But the Romanian program includes counseling and guidance subjects with 4 to 8 hours per year allocated to the study of risks and opportunities linked to climatic and environmental acceleration, at the choice of the school counselor or the teacher or director of the class. High school teachers can allocate 35 hours per year to development education as an optional subject.

In summary, the hard sciences and humanities and technology courses in **Belgium** and **France** give an important place to the environmental theme in the programs, from awareness to mastery of content, which is not yet the case in **Romania** and **Italy** where this theme is left to the initiative of teachers with all the vagaries of individual sensitivities that this generates. In **France** and **Belgium**, development education is built on interdisciplinary and bridges the subject matter.

2.3 The question of the presence of digital acceleration and big data in training programs and standards

2.3.1 At the global level

Among the four countries represented, the digital theme is present in a significant way at college in **France** in human sciences and in technological subjects in **Romania** ; in high school, it is present in a significant way in human sciences, hard sciences in **France** and in technological subjects in **France** and **Belgium**.

In **France**, bringing the school into the digital age is one of the key measures of the bill for the re-foundation of the school. Media and information education (EMI) is part of the citizen journey and is defined in a transversal way, appropriating subjects such as plastic arts, history, geography, modern languages. This education contributes to the development of digital citizenship.

In **Italy**, the digital theme is not present or in a very insignificant way in the school curricula, and in **Romania**, if certain subjects approach a critical reflection on the sources of information and the rights of children (in college) or information and communication technologies (in high school), the theme is not part of the objectives of educational programs.

2.3.2 In the different disciplinary fields.

A. In literary matters

In **Romania**, no subject in literary subjects mentions the theme. In **Belgium**, literary subjects tackle the theme of digital communication, with an invitation to understand its mechanisms.

In **France**, in cycle 3 (CM1, CM2, 6ème), in the EMI (Media and Information Education), students pursue the construction of digital citizenship (started in cycle 1) by adopting a critical attitude towards the sources.

B. In the human sciences

The reference framework for philosophical and civic education in **Belgium** indicates an objective, that of "forming a citizenry that is sensitive and open to the issues that affect it ..." and two chapters concern the use of communication technologies in middle School ; and in high school, social networks are simply mentioned as a potential object of work.

In **Romania**, the digital issue is not very present, there are some avenues for reflection in social education (for example in the 5th year class (the first year of lower secondary) around communication on the internet, the violation of children's rights, different sources of information).

In **France**, geography history and moral and civil education have introduced into the programs of cycles 3 and 4 (5th, 4th, 3rd) the skill "to learn in the digital world", articulated around three dimensions, technical (knowledge and use of resources), informational and social (identifying resources and exercising a critical mind).

In high school, we find in **Belgium** the themes "Ethics and technology" and "Media and information" or "Speeches and discourse traps" as potential objects of work.

In **Romania**, some themes evoke digital acceleration, for example in 12th year (last year of upper secondary), in the subject : "integration and use of new information and communication technologies". But the question is little discussed.

In **France**, at the lycée, the program proposes to treat in EMC (moral and civic education) the theme "The moral and civic stakes of the information society" and in the class « Première », as part of the civic training of the student, in economic and social sciences, the students who have chosen this specialization course are led to understand how new technologies and social networks renew the reflection on the formation of public opinion.

C. In the hard sciences

In **Belgium**, it is in mathematics that the reference frameworks indicate that students must understand and grasp a changing society, but there is no explicit link with digital acceleration. In **France**, the teaching of Digital Sciences and Technology has been provided since this year in common education (1 hour 30 minutes in the second year of secondary school). This education is an extension of the computer science and programming education provided at the college in mathematics and technology. The concepts and practice of programming are deepened through activities related to the themes of the program : internet ; the Web ; social networks ; structured data and their processing ; location, mapping and mobility ; computers and connected objects ; digital photography. Each of the topics is taught over a period of approximately four weeks, the order being left to the teachers' free choice. "Digital and Computer Sciences" is taught as a specialist subject in « Première » (for a period of 4 hours per week) and in « Terminale » (for a period of 6 hours per week).

D. In technological and vocational subjects

In **France**, the use of digital technology is an integral part of industrial science and technology education in vocational high schools due to its presence in almost all vocational programs as well as in industry. This involves highlighting the links between the digitalization of professions, professional skills and learning conditions ; to highlight the essential character of transversal and in particular digital skills in society and in a lifelong learning path; to lay the foundations for reflection on the conditions for building skills.

In **Belgium**, too, we find in technology the exercise of a problem-solving approach in various technological contexts and particularly in information and communication technology in lower secondary education. In upper secondary school, students must reflect on technical objects in their various historical, socio-economic and ethical aspects. Questions of information transfer are mentioned in the targeted knowledge. There are also "computer science" options where the repository advocates work on "the influence of automatic information processing technologies on work methods, social ties, organization ...". In "applied sciences, biotechnology and industrial chemistry, the repository provides for highlighting the integration of technology into the culture of our society by taking into account economic, social, cultural aspects ..".

In **Romania**, a few modules fall under the theme, in computer science education; in the 6th year, for example, a subject deals with the protection of personal data in communication on the internet and it is also possible to devote 4 to 8 hours per year to a debate on the risks and opportunities associated with digital acceleration and important data. In high school, in computer science education, the specific approach to digital acceleration remains at the discretion of each teacher.

In summary, we could say that only the French and Belgian benchmarks grant an increasingly large place to digital acceleration, by including it in a civic course, in the civic training of pupils and in their academic and professional careers. The Romanian standards mention digital acceleration in certain subjects but do not

include it in the compulsory education of pupils for the moment. In Italy, the benchmarks do not take digital acceleration into account.

The digital approach is often approached more from the angle of mastery of tools than that of understanding the mechanisms in their societal issues. The notion of “big data” is very rarely discussed as such. This was confirmed during the tests on the teachers 'and students' questionnaires, whose reactions led us to include an explanatory note in the final questionnaire.

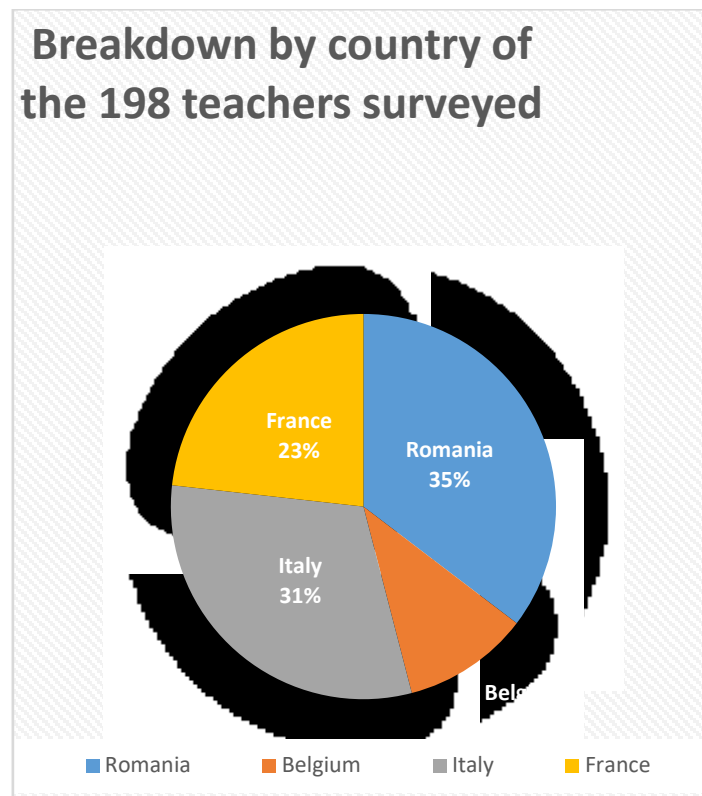
In conclusion of this first part, it appears that climate and environmental issues seem more anchored in official instructions with greater homogeneity between the project countries than issues relating to digital acceleration in its issues on lifestyles and individual freedoms.

3. Study of teachers' and pupils' perceptions of these two themes.

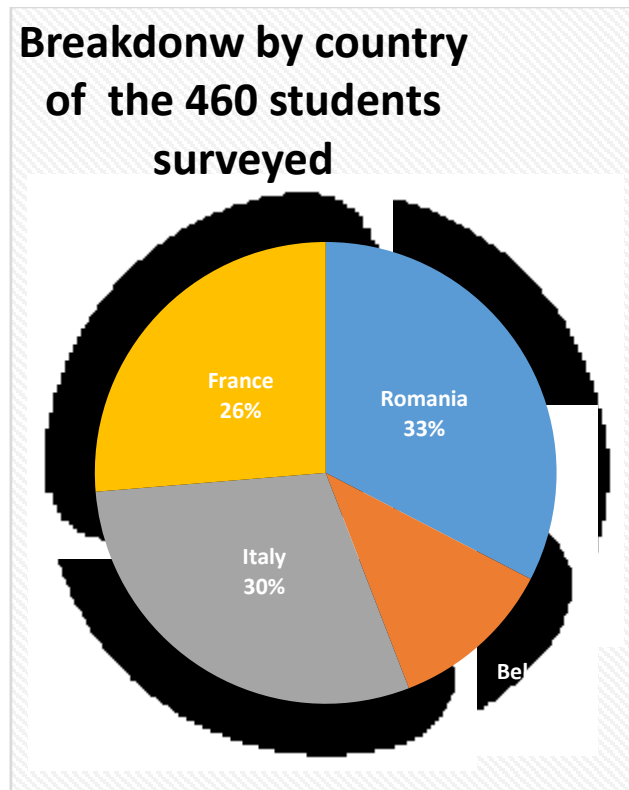
After having studied the way in which the official texts envisage the treatment of climatic and digital accelerations, each of the partners gave a sample of teachers and students a questionnaire allowing each other to express their perceptions of the way whose questions are really addressed at the School.

It was a question of bringing out their needs in order to better orient the work to be undertaken for the rest of the project: IO2: awareness raising training of teachers and IO3: Creation of a toolbox to optimize the work of teachers with their students.

The study sample consisted of 198 teachers distributed as follows:



And 460 students distributed as follows:



3.1 Study of the perception of the approach to the issue of climate acceleration at School from the point of view of teachers and students

3.1.1 The results of the survey conducted among teachers

A. Teachers' feedback on national programs

Feedback from teachers about the instructions of the national administration) in %					
	France	Italy	Belgium	Romania	together
Excessive	0,00%	1,64%	0,00%	20,00%	7,58%
Appropriate	28,26%	24,59%	4,76%	64,29%	37,37%
Insufficient	56,52%	63,93%	71,43%	15,71%	45,96%
Not at all	15,22%	9,84%	23,81%	0,00%	9,09%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

A majority of teachers (55.05%) consider that questions of climate acceleration are non-existent or insufficient in terms of the national official instructions of the different project countries.

However, we can note a notable difference between France (71.74%), Italy (73.77%), Belgium (95.24%) and Romania (15.71%). For the latter country, 64.29% of the teachers consider that climate acceleration has an appropriate or even excessive place (20%) in national programs.

B. Feedback from teachers about the interactions of the local administration

Feedback from teachers about the instructions of the local administration en %					
	France	Italy	Belgium	Romania	together
Excessive	0,00%	0,00%	0,00%	14,29%	5,05%
Appropriate	28,26%	32,79%	23,81%	71,43%	44,44%
Insufficient	50,00%	60,66%	57,14%	12,86%	40,91%
Not at all	21,74%	6,56%	19,05%	1,43%	9,60%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

The trend is confirmed when these same teachers are asked about the instructions given locally. Considered to be non-existent or insufficient at 50.51% at the global level with the same dispersion between France (71.74%), Italy (73.77%), Belgium (76.19%) on the one hand and Romania (14.29%) on the other hand.

This convergence of data seems to show that the local management of establishments do not generally take the opposite view or at least do not compensate for what is perceived as insufficient in the national instructions.

C. Feedback from teachers on the recommended and implemented timetables.

About the annual number of hours devoted to the topics, indicate: (based on the responses at all school levels in all disciplines)					
	France	Italy	Belgium	Romania	Together
A. The average number of hours contained in the official curriculum	6,70	2,80	89,50	8,00	18,88
B. The actual average number of hours in classroom work	11,14	2,70	131,00	6,00	21,74
B/A	1,66	0,96	1,46	0,75	1,15

The number of hours planned in the programs for all disciplines are quite divergent between the countries, ranging from 2.80 hours in Italy to 89.50 hours in Belgium. As at this level the survey was based on declarations, these raw figures should be taken with the greatest caution.

Feedback from teachers about the number of hours that are scheduled in the official curriculum					
	France	Italy	Belgium	Romania	Together
Excessive	4,35%	0,00%	0,00%	1,43%	1,52%
Appropriate	26,09%	16,39%	0,00%	97,14%	45,45%
Insufficient	69,57%	83,61%	100,00%	1,43%	53,03%
Not at all	0,00%	0,00%	0,00%	0,00%	0,00%

On the other hand, it should be noted that in France (1.66 times the official timetable) as in Belgium (1.46 times) teachers devote more hours to this topic than what is requested in the official instructions. While in Italy (0.96 times) and Romania (0.75 times) it is on average less time than indicated by the national administration.

There is a certain consistency between these data and the opinion that teachers have concerning the timetables appearing in the official instructions for France where they consider them insufficient at 69.57% and in Belgium (100%).

Likewise, Romanian teachers consider these instructions to be appropriate (97.14%) which is consistent with the fact that they only perform 75% of official schedules.

On the other hand, we can note a contradiction in Italy where this dimension is taught less than what is expected in the official instructions (0.96) but where they state at 83.61% that the schedules for the programs are insufficient.

D. Feedback from teachers on their level and training needs

Estimation by the teachers of their own level of training					
	France	Italy	Belgium	Romania	Together
Good	28,26%	44,26%	38,10%	45,90%	40,21%
A little weak	54,35%	44,26%	52,38%	37,70%	45,50%
Insufficient	17,39%	11,48%	9,52%	16,39%	14,29%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

Regarding their personal level of training, a total of 59.79% find it a little low or insufficient. While it is in France (71.74%) and Italy (61.90%) that this feeling is most marked, in Belgium (54.10%) or Romania (59.79%), teachers are also the majority to consider themselves insufficiently trained.

The Romanian case is particularly interesting since in this country we consider both that there are enough hours in the program but that therefore we are not adequately trained to teach it.

This generally perceived training gap is very important because it shows that there is indeed a gap to be filled at this level.

Topics the teachers would like to receive additional training ? (%)					
	France	Italy	Belgium	Romania	Together
Scientific field	17,39%	30,51%	60,00%	36,07%	32,26%
Societal issues	39,13%	18,64%	80,00%	60,66%	44,09%
Teaching methods	58,70%	50,85%	60,00%	67,21%	59,14%

While the need for training in teaching methods is requested in a majority way in all countries in France (58.70%), Italy (50.85%), Belgium (60%) and Romania (67.21%) , the results are more dispersed for societal questions ranging from 18.64% for Italy to 80.00% for Belgium.

This is also the case for training needs in scientific fields with 60% of teachers expressing this type of need in Belgium, 36.07% in Romania, 30.51% in Italy and only 17.39% in France.

This part of the survey shows that if we therefore observe a certain dispersion of teachers' opinions concerning the place of climate issues in official instructions and timetables, they generally express a need in terms of training and especially in terms of teaching methods.

This need reinforces our project which provides for an awareness / training time for teachers in IO2 but also the creation of tools to work with students in IO3.

3.1.2 The results of the student survey

A. Preferred sources of information

First Source of Information	France	Italy	Belgium	Romania	Together
What is the first source of information ?	TV	Others	TV	Internet	TV
% of student who answered this source	35,54%	31,62%	26,42%	30,67%	31,74%

While they had the choice between 10 items: television, print media, websites, social networks, lessons, activities organized at school outside of class, extra-curricular activities, family discussions, chats with friends and others

The first source of information indicated by pupils is television in France (35.54%) and Belgium (26.42%) and the internet in Romania (30.67%).

In general, the first source is between a quarter and a third of the responses.

B. Place of the School in the sources of information

Country	France	Italy	Belgium	Romania	Together
- What is the average ranking held by the courses on a scale of 1 to 10 ?	4,34	5,29	4,83	2	3,91
- What is the average ranking held by the extra-curricular activities at School ?	6,02	5,6	6,19	2	4,60

Regarding the place of the School as a source of information on climate acceleration, apart from Romanian students who place it in second position, both for lessons and for non-course activities, students from other countries give it a position in the middle of the classification between 4.34 and 5.29 for the courses while the classification went from 1 to 10.

Extracurricular activities are even located in the bottom third of the ranking between 5.6 and 6.19 for a ranking ranging from 1 to 10.

This positioning, far behind television and especially the internet, raises questions when we consider the unreliability of the information circulating on social networks.

C. Students' perception of their level of information and understanding

Perception of their level of information	France	Italy	Belgium	Romania	Together
- good, very good	78,51%	80,15%	67,92%	56,67%	70,65%
- weak, very weak	21,49%	19,85%	32,08%	43,33%	29,35%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

Perception of their level of understanding (%)	France	Italy	Belgium	Romania	Together
- good, very good	82,64%	80,15%	86,79%	56,67%	73,91%
- weak, very weak	17,36%	19,85%	13,21%	43,33%	26,09%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

Overall, students have a very optimistic opinion about their levels of information and understanding of issues affecting climate acceleration. France, Italy and Belgium show scores ranging from 67.92% to 80.15% for information and from 80.15% to 86.79% for understanding these phenomena. Note however, the scores slightly lower for Romania with 56.67% for these two dimensions.

D. Student's perception of how the School approaches these issues in time and method

These overall high scores contrast with the feeling that the School does not devote enough time to these subjects, expressed by French (47.93%), Italian (60.29%), Belgian (60.38%) and Romanians (60.22%)

Student opinion about the time the school dedicates the topics (%)	France	Italy	Belgium	Romania	Together
- too much	4,96%	2,21%	3,77%	0,00%	2,39%
- enough	47,11%	37,50%	35,85%	30,00%	37,39%
- not enough	47,93%	60,29%	60,38%	70,00%	60,22%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

Students' opinions about the way and methods with which the school addresses them (%)	France	Italy	Belgium	Romania	Together
- suitable	27,27%	12,50%	11,32%	32,00%	22,61%
- to be improved	64,46%	61,03%	64,15%	68,00%	64,57%
- not suitable at all	8,26%	26,47%	24,53%	0,00%	12,83%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

64.57% of the students from all the countries in the project consider that the School's methods of approaching these phenomena should be improved. The finding is relatively homogeneous between the different countries with figures ranging from 61.03% to 68.00%.

Almost a quarter of Belgian and Italian pupils even consider that the methods used by the School are not suitable at all.

These figures agree with the need for training in teaching methods to teach these questions expressed by teachers.

E. Themes that students would like to see addressed as a priority

Topics that the students would like to be addressed more deeply	France	Italy	Belgium	Romania	Together
Warming	34,71%	22,06%	96,00%	14,67%	26,91%
Pollution	31,40%	30,88%	70,00%	4,67%	22,98%
Animal diversity	28,93%	15,44%	26,00%	4,67%	14,88%
Deforestation/flora	20,66%	4,41%	16,00%	4,00%	8,32%

Among the themes that the students would like to see in greater depth at the School, we find in first place in all the countries of the project, global warming itself. The students would also like to see its consequences on pollution and biodiversity.

In conclusion of this part, we can note a certain convergence between the pupils and the teachers who find that the School does not spend enough time on the issue of climate acceleration.

Likewise, the expectation of more appropriate methods expressed by the students meets the need for training as a priority in matters of pedagogy expressed by the teachers.

If we add the fact that the School is located after Television and Internet in the sources of information for young people on climate acceleration, we find confirmation of the relevance of this project which aims both to raise awareness, train teachers on this issue, while providing them with tools to work with their students.

3.2 Study of the perception of the approach to the issue of digital acceleration and big data at the School from the point of view of teachers and students

3.2.1 The results of the survey conducted among teachers

A. Teacher's feedback on national programs

Feedback from teachers about the instructions of the national administration					
	France	Italy	Belgium	Romania	Together
Excessive	0,00%	3,28%	0,00%	40,00%	15,15%
Appropriate	26,09%	22,95%	4,76%	30,00%	24,24%
Insufficient	41,30%	57,38%	38,10%	27,14%	40,91%
Not at all	32,61%	16,39%	57,14%	2,86%	19,70%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

Based on the four countries, more than 60% of teachers consider that national instructions are either insufficient or non-existent regarding the teaching of issues relating to digital acceleration and big data. This figure is highest in Belgium with 95.24% and some convergence between France (73.91%) and Italy (74.77%)

Only Romania diverges with 70% of teachers who consider that the instructions leave an appropriate or even excessive (40%) place for these questions. These latest figures are somewhat surprising in view of the rather critical verbal comments on these subjects.

B. Feedback from teachers about the instructions of the local administration

Feedback from teachers about the instructions of the local administration					
	France	Italy	Belgium	Romania	Together
Excessive	0,00%	1,64%	4,76%	4,29%	2,53%
Appropriate	30,43%	31,15%	4,76%	62,86%	39,39%
Insufficient	39,13%	62,30%	42,86%	30,00%	43,43%
Not at all	30,43%	4,92%	47,62%	2,86%	14,65%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

As with climate issues, local hierarchies are not seen as engaging enough to compensate for what teachers see as insufficient in national instructions.

Although the scores are slightly lower, the same tendencies are found locally as at the national level.

Overall, 58.08% of the teachers surveyed consider that the local instructions concerning the teaching of digital acceleration and big data are insufficient or non-existent.

90.48% for Belgium, 69.57% in France, 67.31% in Italy. Only Romania considers them appropriate at 62.86%.

C. Feedback from teachers on the recommended and implemented timetables

About the annual number of hours devoted to the topics, indicate: (based on the responses at all school levels in all disciplines)					
	France	Italy	Belgium	Romania	Ensemble
A. The average number of hours contained in the official curriculum	1,14	2,20	18,00	8,00	6,60
B. The actual average number of hours in classroom work	2,07	3,50	27,00	6,00	7,72
B/A	1,82	1,59	1,50	0,75	1,17

The number of hours planned in the programs for all disciplines are quite divergent between the countries, ranging from 1.14 hours in France to 18 hours in Belgium. The declarative dimension can be at the origin of these divergences. Indeed, teachers do not all seem to put the same thing behind the notion of digital acceleration and big data. Some include computer education in this issue.

During the test questionnaires, it was demonstrated that the notion of big data was far from being explicit for all teachers. For this reason, a definition of this term was added to the final questionnaire.

Be that as it may, in France (1.82 times the official timetable), Italy (1.59 times), Belgium (1.50 times), teachers report spending more time on these questions than what is required in the programs.

Only in Romania (0.75 times) do teachers spend less time than expected in the curriculum. This seems consistent with the previous observation where they mainly consider that the programs give space or excessive or appropriate to these questions. On the other hand, it is paradoxical with the 85.71% of these same Romanian teachers who indicate that the timetables appearing in the programs are insufficient.

Feedback from teachers about the number of hours that are scheduled in the official curriculum					
	France	Italy	Belgium	Romania	Together
Excessive	0,00%	0,00%	0,00%	1,43%	0,51%
Appropriate	26,09%	11,48%	9,52%	12,86%	15,15%
Insufficient	73,91%	88,52%	90,48%	85,71%	84,34%
Not at all	0,00%	0,00%	0,00%	0,00%	0,00%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

This feeling in terms of schedules is shared by the Belgians (90.48%), the Italians (88.52%) and the French (73.91%), which represents 84.34% overall.

These data are both stronger and more convergent than for climate acceleration.

C. Estimation by the teachers of their own level of training

Estimation by the teachers of their own level of training					
	France	Italy	Belgium	Romania	Together
Good	17,39%	31,15%	14,29%	25,00%	23,89%
A little weak	39,13%	47,54%	33,33%	57,69%	46,67%
Insufficient	43,48%	21,31%	52,38%	17,31%	29,44%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

More than three quarters of the teachers questioned in the 4 countries of the project consider that their level of training is somewhat low or insufficient.

This feeling is shared in each of the countries: in France (82.61%), in Italy (68.85%), in Belgium (85.71%), in Romania (75.00%).

The lack of training expressed at 76.11% is significantly higher than for climate acceleration (59.79%).

It seems that teachers are aware that they do not master all facets of this phenomenon, which is both complex and constantly evolving, not to say dazzling.

Topics the teachers would like to receive additional training ? (%)					
	France	Italy	Belgium	Romania	Together
Scientific field	56,52%	22,95%	57,14%	61,54%	46,67%
Societal issues	54,35%	34,43%	76,19%	67,31%	53,89%
Teaching methods	50,00%	42,62%	52,38%	92,31%	60,00%

Overall, it is on the teaching methods of these subjects that teachers are the most demanding, especially in Romania which culminates at 92.31% of teachers wishing to be trained on this axis, against 52.38% in Belgium, 50,00% in France and 42.62% in Belgium.

Then come societal issues at 53.89%, with a certain convergence between countries outside Italy, which is in decline as for other themes.

Finally, scientific mastery of digital acceleration is also an area in which teachers outside Italy wish to be better trained.

On all three areas, the demand for training is greater than for the acceleration of the climate, which seems more familiar to them.

This part shows that teachers perceive the importance of teaching what digital acceleration and big data mean and in particular the challenges they bring.

They recognize, however, that their current level of training does not allow them to do so optimally, that they need to be trained both in terms of mechanisms and societal issues. But even more, they are asking for educational help to better meet the expectations of their students who have been immersed in the digital world since their birth.

3.2.2 The results of the student survey

A. Preferred sources of information



What is the first source of information ?	France	Italy	Belgium	Romania	Together
% of student who answered this source	TV	TV	TV	Internet	TV
What is the first source of information ?	33,88%	27,21%	28,30%	48,00%	35,87%

While for the record, the young people had the choice between 10 items: The first source of information is television in France, Italy and Belgium with a level of citation around 30%, the Romanian pupils on the other hand cite the Internet and more massive (48%)

It can be noted that these trends are in line with what has been observed for climate acceleration where TV and Internet were also prevalent.

B. Place of the School in the sources of information

	France	Italy	Belgium	Romania	Together
- What is the average ranking held by the courses on a scale of 1 to 10 ?	5,07	4,75	5,11	2	3,65
- What is the average ranking held by the extra-curricular activities at School ?	6,14	5	6,55	2	4,50

Regarding the place of the School as a source of information on digital acceleration, only Romanian students place it in the first part of the ranking, placing it in second position, just behind the Internet but with a minority score.

The other countries give the courses a position in the middle of the ranking between 4.75 and 5.11 for the courses while the ranking went from 1 to 10

The extra-curricular activities are even located a little further between 5 and 6.55 for a ranking ranging from 1 to 10

This positioning of the School as a source of information is of the same order as for the climate issue, that is to say, far behind the internet. Can we expect young people to build an understanding of internet phenomena through the internet?

It appears that young people need tools to decode the risks and opportunities offered by digital acceleration and that the School, through its institutional dimension, deserves to play a more decisive role than its current 5th place.

C. Student's perception of their level of information and understanding

Perception of their level of information	France	Italy	Belgium	Romania	Together
- good, very good	42,98%	71,32%	43,40%	24,67%	45,43%
- weak, very weak	57,02%	28,68%	56,60%	75,33%	54,57%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

Perception of their level of understanding (%)	France	Italy	Belgium	Romania	Together
- good, very good	55,37%	76,47%	54,55%	50,67%	59,96%
- weak, very weak	44,63%	23,53%	45,45%	49,33%	40,04%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

Apart from Italian pupils who display a very optimistic view of their level of information (71.32% good or very good) as well as of their understanding (76.47% good or very good), young people from other countries have a more nuanced.

The opinion of students in the other three countries is overwhelmingly on "poor or very poor" for information and barely majority on "good or very good" for the feeling of understanding.

We can also wonder about the contradiction between considering oneself under informed and saying that one has a good level of understanding.

D. Student's perception of how the School approaches these issues in terms of time and methods

Student opinion about the time the school dedicates the topics (%)	France	Italy	Belgium	Romania	Together
- too much	5,79%	2,94%	0,00%	0,00%	2,39%
- enough	24,79%	51,47%	9,43%	16,67%	28,26%
- not enough	69,42%	45,59%	90,57%	83,33%	69,35%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

It can be noted that the majority of students consider that the School does not devote enough time to the phenomenon of digital acceleration and big data. This feeling of inadequacy is much more marked than for climate issues.

It seems that this more recent acceleration is less well integrated by the School than Ecology.

Students' opinions about the way and methods with which the school addresses them (%)	France	Italy	Belgium	Romania	Together
- suitable	21,49%	15,44%	13,21%	10,00%	15,00%
- to be improved	43,80%	58,09%	43,40%	46,00%	48,70%
- not suitable at all	34,71%	26,47%	43,40%	44,00%	36,30%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

Also more markedly for digital and big data than for digital questions, students from all countries overwhelmingly believe that the methods practiced at school do not meet their expectations at all or should be improved.

78.51% for France, 84.56% for Italy, 86.79% for Belgium and even 90% for Romania.

Here again, these figures confirm the need to help teachers in how to approach this issue with their students through awareness-raising, training and the provision of efficient tools in line with the expectations of the students.

3.2.3 Topics that students would like to be addressed more deeply

Topics that the students would like to be addressed more deeply	France	Italy	Belgium	Romania	Together
Traçage des données	36,36%	23,53%	50,00%	20,67%	21,10%
Sécurité/piratage/Virus/cyber criminalité	21,82%	8,82%	45,00%	2,67%	12,39%
Réseaux sociaux	19,09%	4,41%	15,00%	-	7,57%

Among the topics that the students would like to see in greater depth at the School is the issue of data tracing and respect for privacy. This shows that the students are aware of the risks of commercial or other manipulation involved in the collection of data and wish to know more about this risk.

The other concerns are more dispersed and relate in particular to hacking and cyber-crime.

The issue of social networks, addictions and cyber harassment are also part of their concerns, but to a lesser extent. This can surprise or even worry in terms of risk awareness, when we know the time students spend on social networks.

In summary, we can note that the results of this part of the survey with teachers and students concerning numerical acceleration and big data is very convergent with that concerning numerical acceleration but

with more marked values concerning the expectations of the School and the improvement of its methods of approaching this subject.

We will also note the expression of a feeling of good understanding of this phenomenon which can cause concern in terms of awareness of the risks on their part.

But if we cross with the expectations of the School, we can consider that there is indeed ground to work on. This ground is the central object of our project.

Conclusion

In conclusion, we can note that the study of the official instructions has highlighted a certain disparity between the most northern countries (France and Belgium) and those further south (Italy and Romania) on both climatic and digital accelerations.

With a more directive logic in France and Belgium than in Italy or Romania where its themes depend more on decentralized or even individual initiatives. We can note a certain compartmentalization of approaches without real interactions or putting into perspective, in particular between Human Sciences and Hard Sciences. Regarding digital acceleration, its approach in technological or professional disciplines is often operative without real hindsight.

Overall, teachers, but more markedly for the digital field than the climatic one, consider that the official instructions, whether national or local, are insufficient, except in Romania. They also consider that the planned hourly means are not sufficient and spend there, except in Romania and Italy, more time than what is recommended.

They consider that their level of training is insufficient, especially in the digital field. They express higher priority needs in the field of methods of approaching these subjects with their students, then on societal issues. They seem less demanding for scientific content in terms of climate acceleration, whereas when it comes to digital acceleration, especially big data, a majority of them want to better master these questions.

On the student side, television and the internet are most often cited as the primary source of information, relegating the School to between 4th and 5th place.

They also consider themselves to be quite familiar with these questions, a little less for the topic of digital acceleration.

However, even if this may seem contradictory, they mostly ask that the School spend more time on these subjects with more appropriate methods than those used until now by the School. Global warming and data protection are the topics for which they are most in demand.

We feel that young people are aware that the massive flows of information they receive from the media need to be made more reliable and consolidated by the School, which for the moment plays this role in an insufficient and unsuitable manner.

This observation is in line with the need for training on the methods and societal issues expressed by teachers and confirm the relevance of the objectives of our project aimed at building awareness modules for training teachers and tools for working effectively with their students.

Concerning their scientific training on these subjects, for which they are less demanding and which constitutes a line of work envisaged. It will be necessary to differentiate the feeling of knowledge and the real knowledge of these subjects. This invites us for the next step to produce self-evaluation tools, allowing them to really situate themselves on their level of scientific mastery in order to produce relevant inputs within the framework of IO2.

