

NATIONAL REPORT – ROMANIA

HOW AND TO WHAT EXTENT ROMANIAN EDUCATIONAL INSTITUTIONS ARE ADDRESSING ENVIRONMENTAL AND DIGITAL ISSUES AT SECONDARY SCHOOL LEVEL



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1. Introduction

"The education of the child must pursue the development of respect for the natural environment" (Art. 29, Convention on the Rights of the Child).

The effects of climate change are a major problem in Romania in recent years, when extreme events have begun to occur more frequently, and their effects are often devastating. However, the number of victims affected by climate change is unknown and even less so the number of children affected.

The lack of specialized education in the field of climate change is very acutely reflected in the Romanian society, which is facing more and more visibly the lack of expertise and experience in the field of climate change.

"Adapting to the effects of climate change has become one of the most important concerns on the global development agenda. Quality education is absolutely necessary", Romania's National Strategy on Climate Change.

In the context in which, in Romania, we face the lack of education in the field of climate change among young people, which is one of the categories most vulnerable to the effects of this phenomenon; the following objectives are pursued:

- *Increasing the degree of training of students and teachers on the causes and effects of climate change;*
- *Awareness of the schools community about climate change;*
- *Influencing public policies on environmental education.*

Concerning the digital education, this has recently become one of the priority concerns of Romanian education, by imposing literacy and digital communication for any participant in the instructional-educational process. The integration and use of various types of technology in the educational process is no longer seen as an avant-garde movement, but as a necessity. Around the world, there is a transformation of cultural content into a digital form, promoting accessibility to educational products for anyone, anywhere and anytime.

Virtual education has become a phenomenon in the Romanian industry in recent years, and its short, medium and long-term effects should be evaluated more carefully.

In the context in which, in Romania the need for the adaptation to the digital acceleration has been identified as essential, the education in schools is facing major challenges; the following objectives are pursued:



- the transition from ICT to ICT - New Information and Communication Technologies -, attention was paid to the implications of the use of ICT in education, by relating not only to technological developments, but also to the transformations it has brought with it, which have determined major changes at the level of society, and therefore of teachers, students and schools;
- technological, informational and digital literacy - in a context in which the existence of a teaching staff with digital technological skills and openness - sometimes unconditional - to capitalize on the potential of ICT in instructive-educational activities is required;
- equipping school communities with appropriate tools to support the teaching process.

2. Method

We consulted:

- On the site of the Ministry of National Education, <https://www.edu.ro> : review of the proposed official curriculum addressing the 2 issues raised by the project. *Order of the Minister of National Education no. 3.393 / 28.02.2017 on the approval of school curricula for secondary education.*
- On the National Education website, <https://www.edu.ro/invatamant-gimnazial> : the information, standards, recommendation offered for the middle schools education.
- On the National Education website, <https://www.edu.ro/invatamant-liceal> : the information, standards, recommendation offered for the high schools education.
- On the Institute of Education Sciences website, <http://programe.ise.ro> : review of the national approved curriculum in force, the teaching programmes for middle schools and the high school.
- On the EduPedu.ro, <https://www.edupedu.ro> : online publication that exclusively hosts articles in the field of education and research.
- On the Iasi County School Inspectorate, <http://www.isjiasi.ro> : examples of extra-curricular activities proposed by teachers on the issues addressed by the project.

The conducted study done in Romania, within the Erasmus+ Athropocene project 2019-1-FR01-KA201-063149, involved the support of 70 teachers and 150 students (from over 40 schools from 4 Counties - Iasi, Suceava, Vaslui, Bacau; schools from rural and urban area).



3. Official curricula and national trends

3.1: Summary data for Issue 1 – Climate and Environmental acceleration

The Table here below summarises if and to what extent the Environmental issues addressed in the official curricula at lower and upper secondary level in the Romanian school system.

	Subjects	Answers
Lower of secondary level	Literary Subjects	<input checked="" type="checkbox"/> Non-existent or almost non-existent <input type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly
	Humanities	<input type="checkbox"/> Non-existent or almost non-existent <input checked="" type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly
	Sciences	<input type="checkbox"/> Non-existent or almost non-existent <input checked="" type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly
	Technological/Professional Education	<input type="checkbox"/> Non-existent or almost non-existent <input checked="" type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly
General upper secondary level	Literary Subjects (national and foreign languages)	<input checked="" type="checkbox"/> Non-existent or almost non-existent <input type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly
	Humanities (Hist/Geo, Social sciences, eco, philosophie..)	<input type="checkbox"/> Non-existent or almost non-existent <input checked="" type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly
	Sciences (Math, Phys Sc, Bio)	<input type="checkbox"/> Non-existent or almost non-existent <input checked="" type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly
	Technological / Professional Education	<input checked="" type="checkbox"/> Non-existent or almost non-existent <input type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly

Table 1: Presence of the Environmental Issue theme in the reference frames

At the secondary school level: The Romanian curriculum in force includes the following: Language and communication; Mathematics and natural sciences; Human being and society; Arts; Physical education and sport; Technologies; Counselling and guidance; Curriculum at the school's decision.

Within the Literary Subjects, the national curriculum includes the study of the Romanian language, also foreign languages and the Latin and Roman culture. There is no subjects or teaching classes addressing the issues of risks and opportunities related to climate and environmental acceleration.

Within the Humanities Subjects, the national curriculum includes the study of Social education, History, Geography, Civic culture. The environmental issue is relatively little addressed. There are not specific lessons addressed to the issues of risks and opportunities related to climate and environmental acceleration; nevertheless, most of the teachers include this topic in the lessons of the Geography subject - The effects of human activities on the environment. The planet in transformation.

Within the Sciences Subjects, the national curriculum includes the study of Mathematics, Physics, Chemistry, and Biology. The environmental issue is relatively little addressed.

Some examples collected from the teachers:

- *Mathematics and environmental exploration (4 hours/year).*
- *Biology subject, appears as a Learning Unit Environmental pollution (6-10 hours / year).*
- *Chemistry, year 6, Lesson title: Identification of the heating factors that resulted from the practical application of a chemical reaction.*
- *Chemistry, year 8, Lessons titles: Identification of some polluting agents of water, soil, air and of the ways to prevent / reduce pollution (at the end of each chapter: compounds / bases / acids / salts / oxides); Establishing sources of water and soil pollution with some compounds / bases / acids / salts / oxides (at the end of each chapter).*

Within the Technological/Professional Education Subjects, the national curriculum includes the study of Technological education and practical applications; Informatics and ICT. The environmental issue is relatively little addressed. The years 5-8 have one module, out of 5 allocated for the entire school year, for the topic: Sustainable development (healthy lifestyle, clean environment, influence on the individual / society).

The Romanian curriculum includes Counselling and guidance subjects, were there are 4-8 hours/ year allocated for the study/debate on issues of risks and opportunities related to climate and environmental acceleration.

The Middle School teachers can also opt for the Curriculum at the school's decision. Teachers can allocate, an estimative number of 35 hours / year, as optional discipline, within the lessons like: Create your environment; Ecological and environmental protection education.

At the high school level: The Romanian curriculum in force includes the following: Language and communication; Mathematics and natural sciences; Human being and society; Arts; Physical education and sport; Technologies; Counselling and guidance; Curriculum at the school's decision.

Within the Literary Subjects, the national curriculum includes the study of the Romanian language, also foreign languages. There is no subjects or teaching classes addressing the issues of risks and opportunities related to climate and environmental acceleration.



Within the Humanities Subjects, the national curriculum includes the study of Social education, History, Geography, Civic culture. The environmental issue is relatively little addressed.

Some examples collected from the teachers:

- *Subject: Geography; year 11; Lessons titles: Environmental protection, conservation and protection; Management of the environment.*
- *Subject: Ecology (high school - optional hours); Lessons titles: About the environment; Pollution and environmental protection; The world in ecosystems; Habitat; Protected areas; Species; Protected species.*

Within the Sciences Subjects, the national curriculum includes the study of Mathematics, Physics, Chemistry, and Biology. The environmental issue is relatively little addressed.

Some examples collected from the teachers:

- *Subject: Chemistry; year: 9; Lessons titles: Environment protection; Pollution; Sources of pollution; Combating pollution.*
- *Subject: Chemistry; year: 10; Lesson title: Natural and synthetic dyes.*
- *Subject: Chemistry; year: 11; Lesson title: The polluting action of organic compounds.*
- *Subject: Chemistry; year: 11; Lesson title: Environmental pollutants.*
- *Subject: Physics; year: 10; Lesson title: Consequences and applications - (at the end of each chapter).*
- *Subject: Physics; year: 11; Lesson title: Consequences and applications / Experiments (at the end of each chapter).*
- *Subject: Physics; year: 12; Lesson title: The impact of nuclear physics discoveries on the environment.*

Within the Technological/Professional Education Subjects, the national curriculum includes the study of Administration of computers and networks or professional occupational studies. There is no subjects or teaching classes addressing the issues of risks and opportunities related to climate and environmental acceleration.

The Romanian curriculum includes Counselling and guidance subjects, where there are 4-8 hours/ year allocated for the study/debate on issues of risks and opportunities related to climate and environmental acceleration, but this is at the option of the school counsellor or of the class master/principal.

The High School teachers can also opt for the Curriculum at the school's decision. Teachers can allocate, an estimative number of 35 hours / year, as optional discipline - Development education, within the lessons like: Globalization and its problems; Environment and sustainable development; Anthropogenic impact on ecosystems; Global Partnership for Development; The educational project for development.



3.2: Summary data for Issue 2 - Digital Acceleration and Big Data

The Table here below summarises if and to what extent issues related to Digital Acceleration and Big Data are addressed in the official curricula at lower and upper secondary level in the Romanian school system.

School level	Subjects	Answers
Lower of secondary level	Literary Subjects	<input checked="" type="checkbox"/> Non-existent or almost non-existent <input type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly
	Humanities	<input type="checkbox"/> Non-existent or almost non-existent <input checked="" type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly
	Sciences	<input checked="" type="checkbox"/> Non-existent or almost non-existent <input type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly
	Technological/Professional Education	<input type="checkbox"/> Non-existent or almost non-existent <input type="checkbox"/> Relatively little addressed <input checked="" type="checkbox"/> Significantly
General upper secondary level	Literary Subjects (national and foreign languages)	<input checked="" type="checkbox"/> Non-existent or almost non-existent <input type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly
	Humanities (Hist/Geo, Social sciences, eco, philosophie..)	<input type="checkbox"/> Non-existent or almost non-existent <input checked="" type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly
	Sciences (Math, Phys Sc, Bio)	<input checked="" type="checkbox"/> Non-existent or almost non-existent <input type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly
	Technological / Professional Education	<input type="checkbox"/> Non-existent or almost non-existent <input checked="" type="checkbox"/> Relatively little addressed <input type="checkbox"/> Significantly

Table 2: Presence of the Digital Acceleration Issue theme in the reference frames

In secondary school: The Romanian curriculum in force includes the following: Language and communication; Mathematics and natural sciences; Human being and society; Arts; Physical education and sport; Technologies; Counselling and guidance; Curriculum at the school's decision.

Within the Literary Subjects, the national curriculum includes the study of the Romanian language, also foreign languages and the Latin and Roman culture. There are no subjects or teaching classes addressing the issues of risks and opportunities associated with digital acceleration and big data.

Within the Humanities Subjects, the national curriculum includes the study of Social education, History, Geography, Civic culture. The digital issue is relatively little addressed.

Some examples collected from the teachers:

- Subject: Social education, 5th grade - Critical thinking and children's rights; practical lessons on the topic: regulation of internet communication; creating, in teams, a portfolio regarding the observance / violation of rights of the child, by using different sources of information, in order to establish ways to get involved in promoting the rights of the child; comparison of messages contained in texts (oral and written), television programs, web pages, movies, advertising, music, in which the rights of the child are promoted / in which some rights are violated.

Within the Sciences Subjects, the national curriculum includes the study of Mathematics, Physics, Chemistry, and Biology. There are no subjects or teaching classes addressing the issues of risks and opportunities associated with digital acceleration and big data.

Within the Technological/Professional Education Subjects, the national curriculum includes the study of Technological education and practical applications; Informatics and ICT. The environmental issue is relatively little addressed. 1h/week; 34h/year (during T.I.C. discipline), but the specific approach of the digital acceleration and big data issues are at the option of each teacher.

Some examples collected from the teachers:

- Subject TIC, year 6; Internet precautions (eg use of antivirus programs); Protection of personal data in Internet communication (eg construction and password protection, virtual identity).

The Romanian curriculum includes Counselling and guidance subjects, where there could be an average of 4-8 hours/year allocated for the study/debate on issues of risks and opportunities associated with digital acceleration and big data.

The Middle School teachers can also opt for the Curriculum at the school's decision. But there is no subjects allocated for the issues of risks and opportunities associated with digital acceleration and big data.

In High school: The Romanian curriculum in force includes the following: Language and communication; Mathematics and natural sciences; Human being and society; Arts; Physical education and sport; Technologies; Counselling and guidance; Curriculum at the school's decision.

Within the Literary Subjects, the national curriculum includes the study of the Romanian language, also foreign languages. There is no subjects or teaching classes addressing the issues of risks and opportunities associated with digital acceleration and big data.

Within the Humanities Subjects, the national curriculum includes the study of Social education, History, Geography, Civic culture. The digital acceleration and big data issue is relatively little addressed.

Some examples collected from the teachers:



- *Subject: New Education, year 11, lessons like: Education and issues of the contemporary world: The evolution of educational systems in the context of contemporary societies; Enriching the contents of education – response of educational systems to the evolution of the world contemporary.*
- *Subject: Innovative Teachings discipline, year 12, can be identified lessons addressing the competences for improving and innovating the educational process; integration and use of new information and communication technologies.*

Within the Sciences Subjects, the national curriculum includes the study of Mathematics, Physics, Chemistry, and Biology. There are no subjects or teaching classes addressing the issues of risks and opportunities associated with digital acceleration and big data.

Within the Technological/Professional Education Subjects, the national curriculum includes the study of Technological education and practical applications; Informatics and ICT – these subjects appear for the Vocational high schools of computer science. Nevertheless, even for the specific ICT schools, the specific approach of the digital acceleration and big data issues are at the option of each teacher. The digital acceleration and big data issue is relatively little addressed.

4. The point of view of Teachers

4.1: Quantitative data about teachers involvement

The general identification data of the respondents from Romania (70 in total):

The Field of study:	Number of answers:	Level of education:	Number of answers:	Type of school:	Number of answers:
Literacy	4	Middle School	39	General	46
Humanities	39	High school	31	Vocational-Technical	24
Sciences	22				
Technology	2				
Professional	3				

4.2: Teachers feedbacks on Issue 1 - Climate and Environmental acceleration

Section 1

The results related to the Questionnaire B for teachers concerning the instruction of the national and local administration:

Feedback from teachers about the instructions of the national administration (number of answers):

	Secondary school First level (Middle School)	Secondary second level (High School)
Excessive	13	1
Appropriate	20	25
Insufficient	8	3
Not at all	-	-

Comments:

- *Existence of Eco School-type programs aimed at protecting the environment.*
- *The quality of the environment is a fundamental factor for our health, economy and well-being.*
- *At the level of curricula and curricula (biology, chemistry, physics).*
- *There seems to be insufficient time allowed in the curriculum to debate this topic. We continue to follow an old curriculum which is not adapted to the new challenges.*
- *We are witnessing actions that make us hope that people will understand that the time has come to change their behaviour towards the environment, in order to preserve it.*
- *More student awareness activities should be organized regarding the impact of climate change on the environment.*
- *There is no coherent national approach.*
- *At the policy level - yes, at the implementation level – no.*
- *The lack of a coherent vision and the disinterest of the authorities for the environment have led to great material damage (such as the massive cutting of trees), but also to natural imbalances, the effects being the high degree of pollution, landslides, floods, etc.*
- *Risks: the devastating impact on the health of humans, animals, plants; morbidity and mortality; diseases; problems related to drinking water, air quality; increasing migration; decrease in importance of the educational act;*
- *Opportunities: creation of viable programs to prevent diseases favoured by climate change, to improve the current situation, to stop harmful actions; stimulation of research activities;*
- *Opportunities: creation of viable programs to prevent diseases favoured by climate change, to improve the current situation, to stop harmful actions; stimulation of research activities;*

Feedback from teachers about the instructions of the local administration (number of answers):

	Secondary school First level (Middle School)	Secondary second level (High School)
Excessive	9	1
Appropriate	25	25
Insufficient	6	3
Not at all	1	

Comments:

- *Involvement of students and teachers in environmental protection activities*
- *It requires the involvement of students in solving environmental problems. In this way, each unit of education should induce students the spirit of development of individual and community responsibility in relation to nature.*
- *For students in grades VII-VIII, with mild and moderate learning difficulties.*
- *Schools are subject to follow government directives. There is little room to digress from the curriculum, which is heavily prescribed.*
- *Through everything that the teachers do, at the school level but also at the class or individual level, we see a major concern in this regard.*
- *Our school has concerted actions for awareness.*
- *It does not exist in the national program, therefore it does not appear 'official' as a priority.*
- *Through the activities undertaken we help the students to raise awareness of the risks. It is now necessary more than ever for harsh environmental protection and conservation measures, and children can follow models acting in this direction.*
- *The next generations need to be aware of the risks.*
- *There have been discussions on this topic and some extracurricular actions in the direction of environmental greening, but insufficient to awaken students' awareness and to reduce the magnitude of this phenomenon.*
- *I think that more than ever the harsh measures of environmental protection and conservation are needed now, and children can follow models by acting in this direction.*

Feedback from teachers if the Issue 1 is addressed in the official curriculum (number of answers):

	Secondary school First level (Middle School)	Secondary second level (High School)
Yes	24	20
No	17	9

Comments:

- *It is an optional course that benefits from one hour per week / 35 hours per year.*
- *Education for Sustainable Development is transversally addressed in the formal curriculum of pre-university education in Romania, but also in extracurricular and extracurricular activities (especially in the national program Școala Altfel). As regards higher education, universities have begun to introduce elements of sustainable development, new disciplines in the compulsory or optional curriculum, depending on the study programs.*
- *Appears as a Learning Unit Environmental pollution - 6-10 hours / year.*



About the annual number of hours devoted to the topics, indicate: (based on the responses at all school levels in all disciplines)

	Secondary school First level (Middle School)	Secondary second level (High School)
<i>A. The average number of hours contained in the official curriculum</i>	<p>Most of the answers: 4-8 hours / year - is studied only during the Counseling hours. or 35 hours / year - as an optional discipline.</p> <p>Other answers: Appears as a Learning Unit Environmental pollution - 6-10 hours / year</p> <p>Mathematics and environmental exploration; Sciences; (4 hours/year)</p>	<p>Most of the answers: 4-8 hours / year if studied only during the hours of Counseling / Educational classes. or 35 hours / year (1h/week) if the optional of Ecological and Environmental Education is studied.</p> <p>Other answers: I think we find these themes only occasionally in geography, biology x3</p>
<i>B. The actual average number of hours in classroom work</i>	<p>Most of the answers: 4-6 hours / year extracurricular activities in the field of ecological education in the national program "A different kind of School"</p>	<p>Most of the answers: 5-7 hours / year</p> <p>Other answers: Many extracurricular activities regarding the environment and climatic changes are undertaken. Educational projects are carried out on this topic, in partnership with other schools; thematic projects for participating in different school competitions; special days are celebrated: March 22nd - World Water Day, April 7th - World Health Day, April 22nd - Earth Day, May 22nd - International Day for Biological Diversity, June 5th - World Environment Day.</p>

Comments

- 4-8 hours / year are studied with us, only during the Counseling hours.
- All in all, about 4-5 hours for the entire middle school curriculum of Geography.
- In French, there are topics in the native textbooks or in French methods that address this problem, partial activities, etc.



- *There are units / modules in each discipline. They can be included in optional or extracurricular activities. Anyway a small number of hours.*
- *The topic is found in the formal curriculum as well as in extracurricular activities.*
- *Few hours, insufficient.*

Section 2

The results about the annual number of hours devoted to the topics:

Comments:

- *This type of activity can also be organized in the Health Education classes, for example, which are included in the optional program proposed by the teachers but also during the activities organized in the programme A different kind of School.*
- *Each discipline; optional; extracurricular activities.*
- *Many extracurricular activities regarding the environment and climatic changes are undertaken. Educational projects are carried out on this topic, in partnership with other schools; (SNAC) thematic projects for participating in different school competitions.*
- *One hour, exactly when that earthquake simulation is done.*
- *I think we find these themes only occasionally in geography, biology and chemistry*

Section 3

The results about the feedback from teachers on the number of hours that are scheduled in the official curriculum:

Feedback from teachers about the number of hours that are scheduled in the official curriculum (*number of answers*)

	Secondary school First level (Middle School)	Secondary second level (High School)
Excessive	1	
Appropriate	1	
Insufficient	39	29

Comments:

- *There is a need for more nationally regulated activities dedicated to environmental protection.*
- *If more hours were introduced into the school syllabus on this topic, students might have the opportunity to learn more about issues related to accelerating the environment and climate change.*
- *The subject is approached theoretically and less practically.*
- *I notice a constant concern.*
- *Problem 1 is becoming more acute globally.*
- *School programs in disciplines such as chemistry, provide many hours of pure theory and few hours at all with reference to this subject.*
- *There are no hours in the official language and communication program.*
- *In almost all school programs there are no hours on this subject; very few disciplines have and are strictly based on theory.*
- *Some textbooks are outdated in context. A re-edition of them could introduce many more texts and exercises on these issues.*
- *At certain school programs (eg chemistry) there are many hours of theory with reference to this topic.*



Feedback from teachers about the way topics related to Issue 1 are addressed in the official programme / curriculum is appropriate (*number of answers*)

	Secondary school First level (Middle School)	Secondary second level (High School)
Fully appropriate	2	
Weakly appropriate	7	4
Not appropriate at all	32	25

Comments:

- *There is a need for more educational materials developed by specialists in the field of environmental protection.*
- *No, because it does not refer exactly to the object that is concerned, thus allowing only specific activities related to this topic to a particular object of study.*
- *For students with difficult and moderate learning difficulties, practical activities and to a lesser extent cognitive activities are useful, given the reduced potential for operationalizing ecological-specific scientific concepts.*
- *There are not addressed.*
- *It involves information delivered to students, proposed practical activities as well as models of good practices.*
- *Practical materials lacking convincing power are lacking.*
- *The more hours are allocated to these issues, the more and faster will raise awareness about environmental issues.*

Feedback from teachers about the main methodologies used (*number of answers the percentage*)

	Secondary school First level (Middle School)	Secondary second level (High School)
Regular courses	10	7
Projects	29	19
Inter/Trans discipline	27	23
Other	attractive information, videos, books x2 extracurricular activities	

Comments:

- *Clubs, Erasmus / Comenius projects.*
- *Students carry out projects, presentations on this topic, in extracurricular activities or on topics such as Air pollution, Water, Fuels, etc.*
- *The method of evaluation through thematic projects made by students is an efficient and attractive one.*

Section 4

The results about the feedback from teachers on the level of training to topics related to Issue 1

Estimation by the teachers of their own level of training (number of answers)		
	Secondary school First level (Middle School)	Secondary second level (High School)
Good	15	13
A little weak	13	10
Fair	9	
Insufficient	4	6

Comments:

- *I am a teacher of Geography and I've taught it from primary to 18 years plus students. I've also taught environmental management, students aged 14+.*
- *I consider myself a self-learner. I always find something to read to inform me about anything that could threaten human well-being, first and foremost. Questions like What Happens? on various environmental issues (Air pollution, Biodiversity, Chemicals, Climate change, Environment and health, Use of soils, Natural resources, Noise, Soil, Waste and material resources, Water, etc.) incite students' curiosity, together finding debate , for or against arguments, for analysis of real situations.*

Topics the teachers would like to receive additional training (*number of answers*)

	Secondary school First level (Middle School)	Secondary second level (High School)
Scientific field	8	14
Societal issues	25	12
Teaching methods	23	18
Other		

No comments.

The affirmations most agreed by the teachers (*number of answers*)

	Secondary school First level (Middle School)	Secondary second level (High School)
Topics related to Issue 1 are important and deserve to be addressed in the official curriculum/programme of my course	36	28
I have other priorities for my course but I believe that Topics related to Issue 1 should be addressed by other courses at school		
Topics related to Issue 1 are but should be addressed outside of school settings	5	1
Young people are already sufficiently informed on topics related to Issue 1 and it is not necessary to them to school course and/or activities.		

No comments.

4.3: Teachers feedback on Issue 2 - Digital Acceleration and Big Data

Section 1

The results related to the Questionnaire B for teachers concerning the instruction of the national and local administration:

Feedback from teachers about the instructions of the national administration (*number of answers*)

	Secondary school First level (Middle School)	Secondary second level (High School)
Excessive	15	13
Appropriate	13	8
Insufficient	10	9
Not at all	1	1

Comments:

- *There have been programs for digitizing schools, but they are insufficient in relation to the existing needs.*
- *The law of the protection of personal data.*
- *I am not aware of any subjects which address this area.*
- *There are digitization programs running.*
- *The importance of these problems is not yet reflected in the educational process.*
- *The population is concerned about digital acceleration, unlimited access, risks are ignored.*
- *The technologically saturated space in which children grow up is constantly changing. Children grow up in an environment of converged media devices, where significant opportunities for sociability, expression, learning, creativity and participation are provided by online media and especially mobile media. Beyond opportunities, children may encounter a number of risks on the Internet. The more children use the Internet, the wider the range of opportunities, as well as increasing their exposure to risky experiences. Changing the conditions of access to the internet through mobile media requires new research on children's online experiences, opportunities and risks of the mobile internet.*
- *Data collection is a priority, as regulations have been made to this effect.*

- *We must be informed and preventive of all the risks that may arise during the course of these things.*
- *The more children use the Internet, the wider the range of opportunities, also increasing their exposure to risky experiences. Changing the conditions of access to the internet through mobile media requires new research on children's online experiences, opportunities and risks of the mobile internet.*

Feedback from teachers about the instructions of the local administration (number of answers)

	Secondary school First level (Middle School)	Secondary second level (High School)
Excessive	2	1
Appropriate	23	21
Insufficient	14	7
Not at all	2	

Comments:

- *Poor digital skills among teachers. There is a need for the development of digital skills for teachers and school students.*
- *There's only so much schools can do given they are forced to follow a heavily centralised curriculum and most teaching is by the textbook rather than by concepts.*
- *There is no institutional concern in this regard.*
- *At the school level, risks in this regard are insufficiently controlled. Many students have high-performance mobile phones, connected to the Internet, and what they access in their free time is difficult to manage.*
- *There has to be a communication gateway between teachers and students (and outside of class hours, as is the case in these pandemic times) and new technologies can be a plus for them.*

Feedback from teachers if the Issue 2 is addressed in the official curriculum (number of answers)



	Secondary school First level (Middle School)	Secondary second level (High School)
Yes	10	9
No	29	22

Comments:

- *The official curriculum includes 35 hours.*
- *In the framework plans for 2019, for the V-VIII classes the ICT discipline (Information and communication techniques) is foreseen.*

Section 2

The results about the annual number of hours devoted to the topics:

About the annual number of hours devoted to the topics, indicate (based on the responses at all school levels in all disciplines):

	Secondary school First level (Middle School)	Secondary second level (High School)
C. The average number of hours contained in the official curriculum	<p>Most of the answers: 1h / week; 34h / year (during T.I.C. discipline)</p> <p>Other answers: 4-8 hours / year are studied only during the Counselling hours</p> <p>12 answers mentioned 0 hours allocated for this topic</p>	<p>Most of the answers: 4-8 hours / year if studied only during the hours of Counseling / Educational classes x2</p>
D. The actual average number of hours in classroom work	<p>Most of the answers: Extracurricular activities - 2-3 / semester; 4-6 / year</p>	<p>Most of the answers: Extracurricular activities - 2-3 / semester; 4-6 / year</p>

Comments:

- *Students are reminded of this problem whenever necessary. During the extracurricular activities courses are organized on this topic. For example, in the programme A different kind of School.*
- *We used to have a Robotics club but it didn't touch on the aspects of digital acceleration or data collection explicitly.*
- *Protecting students through technical restriction or by restricting the time spent on the phone is difficult to achieve, especially when their parents' cooperation is lacking.*

Section 3

The results about the feedback from teachers on the number of hours that are scheduled in the official curriculum:

Feedback from teachers about the number of hours that are scheduled in the official curriculum

	Secondary school First level (Middle School)	Secondary second level (High School)
Excessive	1	
Appropriate	5	4
Insufficient	33	27

Comments:

- *This topic can be approached by the Geography school discipline.*
- *Not enough digital skills are developed in the students during the hours, according to the new curriculum.*
- *I've never had such opportunities. My knowledge in the field includes personal experience.*
- *The number of hours allocated to this topic is insufficient to increase the visibility of the risks that students are exposed to when accessing unsecured links or starting discussions on social networking sites.*
- *The number of hours allocated to this topic is insufficient to increase the visibility of the risks that students are exposed to when accessing unsecured links or starting discussions on social networking sites.*

Feedback from teachers about the way topics related to Issue 2 are addressed in the official programme / curriculum is appropriate (*number of answers*)

	Secondary school First level (Middle School)	Secondary second level (High School)
Fully appropriate		
Weakly appropriate	11	9
Not appropriate at all	28	22

Comments:

- *The teachers do not fully know the key competences to be developed for the students.*
- *The formal educational context points too little to this theme.*

Feedback from teachers about the main methodologies used (*number of answers*)

	Secondary school First level (Middle School)	Secondary second level (High School)
Regular courses	12	8
Projects	16	22
Inter/Trans discipline	28	24
Other	Meetings between parents and students	

Comments:

- *The ECO-School Project*
- *There are created frameworks for conducting courses, thematic projects, interdisciplinary / transdisciplinary activities.*
- *Probably a lot of useful information is provided to students in the ICT and Informatics disciplines, using methods specific to the teaching methodology.*

Section 4

The results about the feedback from teachers on the level of training to topics related to Issue 2

Estimation by the teachers of their own level of training (*number of answers*)

	Secondary school First level (Middle School)	Secondary second level (High School)
Good	7	6
A little weak	19	11
Fair	8	7
Insufficient	6	3

Comments:

- *I attended training courses in the IT field and I am constantly concerned about self-improvement in a self-taught way.*



- *I've never had such opportunities. My knowledge in the field includes personal experience.*
- *I am aware of the issue, but I do not have the necessary training to act competently.*
- *I document myself systematically about the types of risks on this topic (such as the use of personal data in a negative way, the breaking of passwords and the use of personal data, viruses; initiating contacts on the Internet with unknown persons, followed by exposure to negative online content generated by users and exposure to images with sexual content; aggression arising through technological mediation / cyberbullying), but also to the forms of restrictive mediation.*
- *I am systematically documenting the types of risks on this topic (such as the use of personal data in a negative way, the breaking of passwords and the use of personal data, viruses; initiating contacts on the Internet with strangers, followed by exposure to negative online content generated by users and by exposure to images with sexual content; aggression arising through technological mediation / cyberbullying), but also by restrictive mediation forms.*

Topics the teachers would like to receive additional training? (*number of answers*)

	Secondary school First level (Middle School)	Secondary second level (High School)
Scientific field	17	15
Societal issues	22	13
Teaching methods	24	24
Other		

Comments:

- *It is a current problem that requires new methodological approaches.*

The affirmations most agreed by the teachers (*number of answers*)

	Secondary school First level (Middle School)	Secondary second level (High School)
Topics related to Issue 2 are important and deserve to be addressed in the official curriculum/programme of my course	27	26
I have other priorities for my course but I believe that Topics related to Issue 2 should be addressed by other courses at school	6	2
Topics related to Issue 2 are but should be addressed outside of school settings	7	
Young people are already sufficiently informed on topics related to Issue 2 and it is not necessary to them to school course and/or activities.		

No comments.

5. The point of view of Students

5.1: Quantitative data about students involvement

The general identification data of the respondents from Romania (150 in total):

Ages	Number of answers:	Level of education:	Number of answers:	Type of school:	Number of answers:
12-13	61	Middle School	67	General	122
14-15	29	High school	83	Vocational-Technical	28
16-17	46				
18-19	12				
20	2				

5.2: Students Feedbacks on Issue 1 - Climate and Environmental acceleration

The table below summarise the results about:

- Sources of information
- Perception of their level of information
- Perception of their level of understanding
- Student opinion about the time the school dedicates the topic
- Students' opinions about the way and methods with which the school addresses them
- 5 topics that the students would like to be addressed more deeply

	Secondary school First level (Middle School)	Secondary school second level (High school)
Sources of information	Answer and number of respondents	Answer and number of respondents
- What is the first source of information ?	TV x22 Social media x12 Official school curriculum x12 Internet x6 Family x6 Friends x5 Other x4	Internet x40 TV x16 Social media x8 Family x8 Friends x6 Mass-media x5

	Secondary school First level (Middle School)	Secondary school second level (High school)
-What is the most accurate source of information?	Official school curriculum x39 Internet x10 TV x7 Other x6 Extra-curricular activities at school x5	Official school curriculum x24 Mass-media x16 Activities outside of school (clubs etc.) x9 Extra-curricular activities at school x8 Family x7 Social media x6 TV x5 Friends x5 Internet x3
-What is the most reliable source of information?	Official school curriculum x37 Other x7 Internet x7 Activities outside of school (clubs etc.) x6 Extra-curricular activities at school x6 Family x4	Extra-curricular activities at school x39 Official school curriculum x12 Social media x9 Mass-media x7 TV x6 Family x6 Internet x4
- What is the average ranking held by the courses on a scale of 1 to 10 ?	1 x43 2 x5 3 x6 8 x6 No answer x7	1 x55 3 x7 5 x10 8 x6 No answer x5
- What is the average ranking held by the extra-curricular activities at School ?	2 x33 3 x16 6 x7 9 x6 7 x5	2 x48 6 x10 2 x9 3 x6 9 x6 7 x4
Perception of their level of information	number of respondents	number of respondents
- good, very good	55	30
- weak, very weak	12	53
Perception of their level of understanding	number of respondents	number of respondents
- good, very good	56	29
- weak, very weak	11	54

	Secondary school First level (Middle School)	Secondary school second level (High school)
Student opinion about the time the school dedicates the topics	number of respondents	number of respondents
- too much	0	0
- enough	27	18
- not enough	40	65
Students' opinions about the way and methods with which the school addresses them	number of respondents	number of respondents
- appropriate	28	20
- to be improved	39	63
- not appropriate	0	0
5 topics that the students would like to be addressed more deeply	Answer and number of respondents	Answers and number of respondents
- Topic 1 (the most frequently)	The impact of climate change on habitats x7	Causes, effects and prevention x22
- Topic 2	How does the climate affect the people's health/ How does climate affect diseases and the way people react to them? X6	Environmental changes and impact on human life x7
- Topic 3	How can politicians influence climate change? X3	Case studies x7
- Topic 4	The impact of climate change on different parts of the world / How climate change affects other countries x2	Ways of stopping climate change x6
- Topic 5	How do we stop industries which cause pollution?	Environmental protection measures x5
Other topics mentioned:	Politics of accepting refugees due to climate change Global warming Differences from country to country and why it has a climate like this and how it was before When does climate change occur?	How climate change affects us x4 How can we reduce pollution? X2 Climate change in Romania. Human life vs. climate change. Climate change and life on Earth Is climate change a social issue or not? Environmental changes

	<p>How to protect oneself from global warming's effects? How can one fix this? Who is responsible? Causes, effects and prevention Pollution Recycling</p>	<p>Does pollution affect climate change? How do animals perceive climate change? Carbon cycle and its impact on the environment Vulnerability and adaptability Central heating units Deforestation Climate change benefits on the environment</p>
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5.3: Students Feedbacks on Issue 2 – Digital acceleration and big data

The table below summarise the results about:

- Sources of information
- Perception of their level of information
- Perception of their level of understanding
- Student opinion about the time the school dedicates the topic
- Students' opinions about the way and methods with which the school addresses them
- 5 topics that the students would like to be addressed more deeply

	Secondary school First level (Middle School)	Secondary school second level (High school)
Sources of information	Answer and number of respondents	Answer and number of respondents
- What is the first source of information ?	<p>Internet x24 Official school curriculum x18 Social media x12 Family x5 TV x3 No answer x3</p>	<p>Internet x48 Social media x18 TV x17</p>
-What is the most accurate source of information?	<p>Official school curriculum x18 Internet x12 Social media x12 TV x6 Family x6 Friends x6 Extra-curricular activities at school x4 No answer x3</p>	<p>Internet x30 Official school curriculum x26 TV x10 Social media x6 Extra-curricular activities at school x6 Family x5</p>

	Secondary school First level (Middle School)	Secondary school second level (High school)
-What is the most reliable source of information?	Official school curriculum x16 Social media x12 Extra-curricular activities at school x12 Internet x12 TV x6 Friends x5 No answer x4	Family x39 Official school curriculum x15 Social media x11 TV x10 Internet x8
- What is the average ranking held by the courses on a scale of 1 to 10 ?	1 x25 7 x7 9 x5 No answer x30	1 x48 5 x12 8 x10 9 x7 No answer x6
- What is the average ranking held by the extra-curricular activities at School ?	2 x18 3 x5 4 x6 5 x4 8 x4 No answer x30	2 x48 3 x9 4 x3 6 x4 7 x7 8 x8 No answer x4
Perception of their level of information	number of respondents	number of respondents
- good, very good	13	24
- weak, very weak	54	59
Perception of their level of understanding	number of respondents	number of respondents
- good, very good	49	27
- weak, very weak	18	56
Student opinion about the time the school dedicates the topics	number of respondents	number of respondents
- too much	0	0
- enough	6	19
- not enough	61	64

	Secondary school First level (Middle School)	Secondary school second level (High school)
Students' opinions about the way and methods with which the school addresses them	number of respondents	number of respondents
- suitable	0	15
- to be improved	13	56
- not suitable at all	54	12
5 topics that the students would like to be addressed more deeply	Answer and number of respondents	Answer and number of respondents
- Topic 1 (the most frequently)	Ways of protecting personal data x6	Ways of protecting personal data / Reasons of collecting personal data x25
- Topic 2	How does it work? X5	Case studies / real life examples x11
- Topic 3	How can we avoid data stealing (hackers)? X4	Types of criminals and victims x3
- Topic 4	How to be safe on Facebook x2	Can online information affect the way we think? X2
- Topic 5	How does digitalization affect us in the long run?	Can personalized messages received on social media influence our perception of reality? X2
Other topics mentioned:	<p>How to learn about data collection</p> <p>How hackers steal money from banks</p> <p>How does the internet work?</p> <p>How suggestions are selected based on videos one has watched?</p> <p>How to get rid of it</p> <p>Who is engineering this "process"?</p> <p>What are the consequences?</p> <p>Types of data collection and how they can affect.</p> <p>What are the effects of people with bad intentions collecting our personal data? What do they seek?</p> <p>Is it OK to depend on technology?</p>	<p>Digital Era in 2020.</p> <p>Modern ways of learning.</p> <p>The influence of digital transformations on the human personality.</p> <p>How does the internet influence us?</p> <p>How do we check internet information authenticity?</p> <p>The use of personal data in influencing the citizens' political decisions</p> <p>How personal data collection affects us?</p> <p>How to use certain digital technologies?</p> <p>Accessing various platforms and portals</p> <p>The educational portal and the educational platform</p> <p>How acceleration is perceived based on age?</p> <p>How does acceleration make our lives easier?</p> <p>Causes and consequences</p> <p>Digital economy</p> <p>Human rights in the digital environment</p> <p>Cookies and ads</p>

6. Conclusions

Education for Sustainable Development is transversally addressed in the formal curriculum of pre-university education in Romania, but also in extracurricular and extracurricular activities (especially in the national program Școala Altfel – a Different kind of School). As regards higher education, universities have begun to introduce elements of sustainable development, new disciplines in the compulsory or optional curriculum, depending on the study programs.

There is a need for more nationally regulated activities dedicated to environmental protection in schools. The subject is approached theoretically and less practically. If more hours were introduced into the school syllabus on this topic, students might have the opportunity to learn more about issues related to accelerating the environment and climate change.

The study done emphasises the issue related to the textbooks that are outdated in context, and that the teachers are not supported and well prepared to approach these subjects. There is a need for more educational materials developed by specialists in the field of environmental protection.

The importance of approaching in schools the issues of digital acceleration and big data is not yet reflected in the educational process. There have been programs for digitizing schools, but they are insufficient in relation to the existing needs. At the school level, risks in this regard are insufficiently controlled. Many students have high-performance mobile phones, connected to the Internet, and what they access in their free time is difficult to manage. The issues raised are related to the fact that there are not enough digital skills developed in the students during the school hours, according to the new curriculum; there are poor digital skills among teachers, so there is a need for the development of digital skills for teachers and school students.

The Romanian authorities do not focus, yet, specific on the issues of climate change and digital acceleration, but slowly steps are made. Under the actual situation, the Romanian authorities launched for approval a new strategy for the pre-university education system (stated in February 2020).

The law is expected to be enacted, and the two most important "transformations" contained in the bill adopted by senators are:

- The first most significant is the change in the proportion between the common core and the curriculum at the school's decision, instead of 80-20, it is now 65% by 35%. Greater openness to what the curriculum means to the students' decision in the school's offer.
- The second important aspect is the configuration of the current Article 262, which, in fact, puts on the table an extremely new model of teaching and standardization careers, focused on equivalent horizontal options. This means that, from now on, teachers will be able to be remunerated, paid not only for teaching, but also



for other non-teaching actions such as, for example, career counselling for children, coaching and mentoring for teachers-beginners, project management for the benefit of the school.

In this context, the authorities offer more free space for the teachers to act in the directions they identify as being necessary for their students' development. So, for us, we just wish that more school lessons will approach the topics of climate change and digital acceleration.

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