Project Number: 2019-1-FR01-KA201-063149

NATIONAL REPORT – ITALY

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

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1. Introduction

This survey was proposed to a sample of 61 teachers, both from middle school and from high school. In Italy middle school and high school are often two worlds apart for what concerns subjects and the way are proposed. Moreover, middle school teachers are a few in comparison of high school ones. Thus, it was decided to analyse data considering the whole number of teachers.
Students involved were 136 instead of 150 because of the COVID-19 emergency which caused the lockdown in Italy. In order to describe the sample and to properly comment the obtained data, is necessary to put in evidence some characteristics of our school system and differences among types of school.

Environmental issues such as climate change or pollution to date are poorly represented in official curricula, depending on subjects and decision made by single schools thanks to our fraction of autonomy. In the last few years, Minister of Instruction proposed the idea of an established amount of time to be dedicated to environmental change, but he didn't have the chance to realize it. Climate changing and environmental issues became a thing thanks to the movement started by Greta Thunberg. Data acceleration is a relatively new issue, and Italian laws appear to be more accurate concerning privacy and data storage than considering our digital footprint.

The official website of Education Ministry was consulted, being possible to find information regarding official curricula. The website was consulted on 16th of May, 2020.

The sample of surveys we provided is a mix of teachers from different areas, not selected with the purpose to create a statistically perfect sample. We were able to collect surveys from 61 secondary level school teachers, 8 out of 61 employed in middle school and the remaining 53 in high school. Since subjects weren't matter of choice, the distribution is not perfectly arranged and it could potentially be a source of misleading data, or more precisely, it's difficult to extract general consideration and it should be better to consider this sample only a demonstrative one. Before the epidemic we were able to administer the survey to 136 student sample, 32 out of 136 (23,5%) attending middle school while the remaining 104 (76,5%) attending high school.

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2. Official curricula and national trends

The majority of Italian official curricula don't contain any reference to environmental issues. Some subjects taught both in middle school and high school reported topic referred to climate changes can have small modules to treat, but it depends on books and teachers. To date, data acceleration remains an almost unknown topic for official curricula. Table 1 and Table 2 illustrate this situation concerning Anthropocene themes: environmental acceleration and data acceleration.

2.1: 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 italian school system.

Table 1 - Summary data for Environmental Issue

School level	**Subjects**	**Answers**
Lower of secondary level	Literary Subjects	**X** Non-existent or almost non-existent ☐ Relatively little addressed ☐ Significantly
	Humanities	No teacher from this area
	Sciences	No teacher from this area
	Technological/Professional Education	**X** Non-existent or almost non-existent ☐ Relatively little addressed ☐ Significantly
General upper secondary level	Literary Subjects (national and foreign languages)	**X** Non-existent or almost non-existent ☐ Relatively little addressed ☐ Significantly
	Humanities (Hist/Geo, Social sciences, eco, philosophie..)	No teacher from this area
	Sciences (Math, Phys Sc, Bio)	**X** Non-existent or almost non-existent ☐ Relatively little addressed ☐ Significantly
	Technological / Professional Education	**X** Non-existent or almost non-existent ☐ Relatively little addressed ☐ Significantly

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2.2: 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 Italian school system.

Table 2 - Summary data for Digital Acceleration

	Subjects	**Answers**
Lower of secondary level	Literary Subjects	☐ Non-existent or almost non-existent **X** Relatively little addressed ☐ Significantly
	Humanities	No teacher from this area
	Sciences	☐ Non-existent or almost non-existent **X** Relatively little addressed ☐ Significantly
	Technological/Professional Education	☐ Non-existent or almost non-existent **X** Relatively little addressed ☐ Significantly
General upper secondary level	Literary Subjects (national and foreign languages)	**X** Non-existent or almost non-existent ☐ Relatively little addressed ☐ Significantly
	Humanities (Hist/Geo, Social sciences, eco, philosophie..)	No teacher from this area
	Sciences (Math, Phys Sc, Bio)	**X** Non-existent or almost non-existent ☐ Relatively little addressed ☐ Significantly
	Technological / Professional Education	**X** Non-existent or almost non-existent ☐ Relatively little addressed ☐ Significantly

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3. The point of view of Teachers

3.1: Quantitative Data

This survey was proposed to a sample of 61 teachers, both from middle school and from high school.

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

Generally speaking, teachers appear to be concerned by both environmental issues and data acceleration. Both general and local administration are not enough careful of these issues, so that an intense intervention is desirable. The perception of their own level of training is equally distributed between good and little weak level, and the subjects to be trained on are various.

Section 1

Feedback from teachers about the instructions of the national administration:

	Secondary school First level (Middle School)	Secondary second level (High School)
Excessive	-	1/53= 2%
Appropriate	2/8= 25%	13/53 = 25%
Insufficient	6/8=75%	33/53 = 62%
Not at all	-	6 /53= 11%

Feedback from teachers about the instructions of the local administration

	Secondary school First level (Middle School)	Secondary second level (High School)
Excessive	-	-
Appropriate	1/8 = 12,5%	19/53= 36%
Insufficient	7/8= 87,5%	30/53= 57%
Not at all	-	4/53= 7%

Teachers were asked to define the level of interest concerning environmental issues expressed by government and local administration. Both Middle school and high school teachers stated that both national and local administrations don't seem to assure enough attention to this kind of concerns. A small

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percentage of high school teachers indicated the total lack of focus on environment from both national and local administration. As a teacher said, the way Italian government deal with issues illustrated at point 1, "it seems to be, although, up to now, not much has been made in order to effectively face the issue". Someone else refers to the lack of a concrete politic concerning the sustainable power sources as a powerful tool to move economic interests, and therefore, political choices. According to teachers' point of view, local administrators seems to be more focused on this kind of problems, as we can see in a comment saying that "local administration is present", even if its efforts are considered not enough by teachers.

Section 2

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)
A. The average number of hours contained in the official curriculum	0	4
B. The actual average number of hours in classroom work	0	5, ranging from 1 hour (a professional subject), to 20 hours (italian language teachers)
Ratio B/A	0	5/4= 1,25
The three most involved subjects	Subjects belong to Scientific-technic group, literary subjects, Scientific subject.	Professional subjects, jurisprudence-like subjects, Italian language, English
The three less involved subjects		Other professional subjects.
The 3 most cited comments	There's no reference to this issues in official curricola. Sometimes teachers tackle the environmental issue. Some subject has space to deal with this issue.	More interventions are needed. Technologies should be improved in schools, to tackle this theme.

Italian official *curricula* don't contain any reference to environmental issues, except of geography ones. Other subjects can have small modules to treat, but it depends on books and teachers. The last summer was in discussion the opportunity to dedicate to environmental issues an official number of hours, but after some political changes (our Minister of Instruction) this possibility hasn't been mentioned anymore. Our results show this particular condition of lack of homogeneity regarding different subjects in different grade

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of schools. Some teachers stated that “much more might be done in classroom”, some others cited recent popular models for young people (“our commitment is not enough compared to the relevance of Greta Thunberg’s work”). Thus, the overall idea is well expressed by this comment: “we should be more attentive to these sudden climatic changes”.

Section 3

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	-	-
Insufficient	8/8= 100%	44/53 = 83%
Appropriate	-	9/53 = 17%
Excessive	-	-

Estimation by the teachers of their own level of training

	Secondary school First level (Middle School)	Secondary second level (High School)
Good	3/8= 38%	24/53= 45%
A little weak	5/8= 62%	22/53= 42%
Insufficient	-	7/53= 13%

Topics the teachers would like to receive additional training? (%)

	Secondary school First level (Middle School)	Secondary second level (High School)
Scientific field	3/8= 37%	15/53= 28%
Societal issues	2/8= 26%	9/ 53= 17%
Teaching methods	3/8= 37%	27/53= 51%

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Middle school teachers declared insufficient the amount of time dedicated to these issues at school, although their level of preparation was declared at least a little weak. Teaching methods and scientific area are the fields to focus on their future additional formation, but the distribution between the three items (teaching methods, scientific fields and societal issues) is almost equal.

High school teachers, probably due to sample size, showed a different distribution. Nine out of 53 (17%) defined appropriate the scheduled time, whilst the remaining 44 defined as insufficient the number of hours dedicated to environmental issues. Concerning future courses for teachers, the larger part of high school teachers preferred teaching methods (51%), followed by scientific field (28%) and societal issues (17%). One of the two teachers out of 53 (4%) stated that would have more training concerning explaining causes, effects and solutions. The other one chose to have more training concerning the preservation of our cultural and artistic patrimony. These data show emerging differences between the two groups of teachers, probably due to the different size and different area of subjects.

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

Section 1

Feedback from teachers about the instructions of the national administration

	Secondary school First level (Middle School)	Secondary second level (High School)
Excessive	-	2/53= 4%
Appropriate	1/8 = 12,5%	13/53= 24%
Insufficient	7/8= 87,5%%	28/53= 53%
Not at all	-	10/53= 19%

Feedback from teachers about the instructions of the local administration		
	Secondary school First level (Middle School)	Secondary second level (High School)
Excessive	1/8 = 12,5%	-
Appropriate	-	19/53 = 36%
Insufficient	7/8= 87,5%%	31/53= 58%
Not at all	-	3/ 53= 6%

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National administration is not perceived by the majority of teachers, both from Middle School and High School, to make enough efforts regarding the Big Data issues, as well as local administrators. Only a few of teachers belonging to both school grades considered appropriate the efforts of national government (24% of high school teachers, 12,5% of middle school teachers). Excessive efforts by national government are described by 4% of high school teachers, while 12,5% of middle school teachers considered excessively strong the efforts made by local government. In this case, sample size is crucial to look at facts in the correct prospective: the 12,5% of 8 teachers means 1. Some middle school teacher stated that "data production and storage have been regulated, otherwise data acceleration has been neglected by law", and "there are no sufficiently developed complex activity to face this particular issue". High school teachers are concerned about young kids, who "should be more informed", because "digital devices are used without considering privacy and related contents".

Section 2

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)
The average number of hours contained in the official curriculum	0	10
The actual average number of hours in classroom work	2	6
Ratio B/A	-	0,6
The three most involved subjects	none	Some professional disciplines Italian language
The three less involved subjects	all	Maths, Other professional disciplines
The 3 most cited comments	Teachers have can decide whether to talk about this issue or not. A few of hours is dedicated to this issue, when or if external projects are meant to this. These are not themes included in curricula.	Government does not show to be careful to this issue. Attention is required. The issue should be nationally treated by high-level experts.

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Only a few teachers released comments regarding this particular topic, so it's difficult to establish if these comments are truly the most representative. Anyway, middle school teachers recognized the possibility to "decide to talk about this issue or not, or more often external experts are designated to do this because « A few of hours is dedicated to this issue, when or if external projects are meant to this ». High school teachers showed almost the same feelings, lamenting the low-level carefulness of government concerning data acceleration, therefore stating that « attention is required » and that «The issue should be nationally treated by high-level experts ».

Section 3

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	-	-
Insufficient	8/8= 100%	46/53= 87%
Appropriate	-	7/53= 13%
Excessive	-	-

Estimation by the teachers of their own level of training

	Secondary school First level (Middle School)	Secondary second level (High School)
Good	4/8= 50%	15/53= 28,3%
A little weak	3/8= 37,5%	26/53= 49%
Insufficient	1/8= 12,5%	12/53= 22,7%

Topics the teachers would like to receive additional training? (%)

	Secondary school First level (Middle School)	Secondary second level (High School)
Scientific field	-	14/53= 26,4%
Societal issues	6/8= 75%	15/53= 28,3%
Teaching methods	2/8= 25%	24/53= 45,3%

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Sample size in this case plays a crucial role in data analysis: due the size of middle school teachers, it should be considered that one teacher represents 12,5% of the whole sample. Middle school teachers commented their training level stating that they feel “quite informed”, because they attended “classes concerning privacy and personal data”. They would prefer to receive additional formation mostly in societal issues and teaching methods. It is reasonable to address this particular data analysis to the fact that only teachers defining good their level of information released a comment. High school teachers’ survey highlighted an insufficient number of hours to be spent on these issues, weak as their own perceived level of training. High school teachers claimed to be formed mostly in teaching methods, to “properly explain students which risk they could deal with in case of incorrect use of devices”, in order to get “an approach allowing making students more conscious about data acceleration”.

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4. The point of view of Students

4.1: Quantitative Data

These data provide results of a 136 students' sample, 32 out of 136 (23,5%) attending middle school while the remaining 104 (76,5%) attending high school.

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

	Secondary school First level (Middle School)	Secondary school second level (High school)
Sources of information		
- What is the first source of information?	Web (2,937)	Web (3,98)
- What is the average ranking held by the courses on a scale of 1 to 10?	4,81	5,77
- What is the average ranking held by the extra-curricular activities at School?	5,15	6,05
Perception of their level of information (%)		
- good, very good	30/32= 94%%	79/104= 76%
- weak, very weak	2/32= 6%	25/104= 24%
Perception of their level of understanding (%)		
- good, very good	30/32= 94%	79/104= 76%
- weak, very weak	2/32= 6%	25/104= 24%
Student opinion about the time the school dedicates the topics (%)		
- too much	1/32= 3%	2/104= 2%
- enough	21/32= 66%	30/104= 29%
- not enough	10/32=31%	72/104= 69%

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Students' opinions about the way and methods with which the school addresses them (%)		
- suitable	10/32= 31,25%	7/104= 6,7%
- to be improved	17/32= 53, 12%	66/104= 63,5%
- not suitable at all	5/32= 15,63%	31/104= 29,8%
5 topics that the students would like to be addressed more deeply		
- Topic 1 (the most frequently)	Pollution due to plastic items	Pollution
- Topic 2	Global warming	Climate changes
- Topic 3	Ozone	Global warming
- Topic 4	Safety of animal and plants species	Environment
- Topic 5	Pollution	Impact on food

Only a few of middle school students correctly interpreted the first part of the survey, stating that other sources of information could be represented by books (6 out of 22), only one indicated game and another one sport. Despite this source of information registered the higher average value, we can't assume it to be strictly correct because many students pointed already cited categories as "other". Assuming that every middle school student properly understood how to give preferences, the most important source of information is web. Middle school students defined sufficient time spent at school on topics regarding climate changing, with methods that should be improved. Comments underlined that "teachers care a lot about consciousness in environmental issues", but that "in classroom we don't talk about it too much". High school students' sample showed almost the same results compared to the ones of middle school students. This group of students, on the opposite to middle school kids, does not consider enough accurate school as a source of information. This fact could be due to differences in official curricula between middle and high school.

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4.3: Students Feedbacks on Issue 2 – Digital acceleration and big data

	Secondary school First level (Middle School)	Secondary school second level (High school)
Sources of information		
- What is the first source of information?	Web (2,937 average ranking)	Social (4,06), TV (4,08), web (4,08) Average ranking
- What is the average ranking held by the courses on a scale of 1 to 10?	4,437	5,13
- What is the average ranking held by the extra-curricular activities at School ?	4,593	5,42
Perception of their level of information (%)		
- good, very good	24/32= 75%	73/104= 70%
- weak, very weak	8/32= 25%	31/104= 30%
Perception of their level of understanding (%)		
- good, very good	26/32= 81%	78/104= 75%
- weak, very weak	6/32= 19%	26/104= 25%
Student opinion about the time the school dedicates the topics (%)		
- too much	1/32= 3%	3/104= 3%
- enough	20/32= 62,5%	50/104= 48%
- not enough	11/32= 34,5%	51/104= 49%
Students' opinions about the way and methods with which the school addresses them (%)		
- suitable	9/32= 28%	12/104= 11%
- to be improved	17/32= 53%	62/104= 60%
- not suitable at all	6/32= 19%	30/104= 29%
5 topics that the students would like to be addressed more deeply		
- Topic 1 (the most frequently)	hacker	Cyber-bullying
- Topic 2	privacy	privacy
- Topic 3	Personal data	Personal data
- Topic 4	Cyber security	Cyber security
- Topic 5	Correct use of the web	Permission gave online

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This part of survey introduces data acceleration, which should be an important topic for young people considering the massive use of technology. Students' sample gave comparable results, showing as the school and extra-curricular activities are not the main source of information concerning data acceleration, while web and social media appear to be more suitable. In Italy extracurricular activities are defined every year, and it's not frequent to find clubs or other kind of associations in schools. Privacy and personal data are frequently cited as more interesting topic, and categories are comparable for both our groups of students. Some high school students admitted to have troubles "to understand what's true", or "to understand topics difficult to me". Among comments by younger students, it is interesting to note that "there is less knowledge on acceleration of data than on environmental issues", proving that in the last few years social phenomenon like Greta Thunberg's work had done great with information. Data acceleration does not appear as interesting as climate changing issues, and there is no possible "hero" promoting and informing people about it.

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5. Conclusions

This survey was proposed to a sample of 61 teachers, both from middle school and from high school. Students involved were 136 instead of 150 because of the COVID-19 emergency which caused the lockdown in Italy. In order to describe the sample and to properly comment the obtained data, is necessary to put in evidence some characteristics of our school system and differences among types of school. Environmental issues such as climate change or pollution to date are poorly represented in official curricula, depending on subjects and decision made by single schools thanks to our fraction of autonomy. In the last few years, Minister of Instruction proposed the idea of an established amount of time to be dedicated to environmental change, but he didn't have the chance to realize it. Climate changing and environmental issues became a thing thanks to the movement started by Greta Thunberg. Data acceleration is a relatively new issue, and Italian laws appear to be more accurate concerning privacy and data storage than considering our digital footprint.

In Italy middle school and high school are often two worlds apart, for what concerns subjects and the way are proposed. Moreover, middle school teachers are a few in comparison of high school ones. Thus, teachers' survey appears to be a remarkable collection of descriptive data and it is necessary to state that it is possible to have missed some shades in answers due to the sample size. Generally speaking, teachers appear to be concerned by both environmental issues and data acceleration. Both general and local administration are not enough careful of these issues, so that an intense intervention is desirable. The perception of their level of training is generally enough, and the subjects to be trained on are various.

Students' sample is wider than teachers' sample, and it counted 136 units, 32 out of which attending middle school and the remaining 104 high school (both general instruction and VET school). Middle school students stated that the the most important source of information about environmental issues is web, defining sufficient time spent at school on topics regarding climate changing, with methods that should be improved. High school students pointed out the importance of web a source of information. This group of students, on the opposite to middle school kids, does not consider enough accurate school as a source of information. This fact could be due to differences in official curricula between middle and high school.

Big data issue highlighted some differences in surveys results, probably due to the different age of students. Middle school students indicated web as the first source of information, while older students

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indicated social media, television and web. The general perception reading comments is the impression that more information are available concerning environmental acceleration than big data.

In conclusion, we can affirm that this sample could not be statistically representative for the whole Italian regions, but it could be for Tuscany and the middle part of Italy. Moreover, the composition of our sample suggests being careful interpreting obtained data, looking at it as mostly descriptive.

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