D5.4 Report on impact assessment

(Public)

Project Acronym: EDU-ARCTIC

Project Title:

"Edu-Arctic – Innovative educational program attracting young people to natural sciences and polar research"

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Document information summary

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Executive summary

This document contains Deliverable D.5.4 "Impact Assessment" which is part of WP5 Evaluation and Impact. The document presents the results of measurements of **Key Performance Indicators,** defined in the document called Evaluation Plan including KPIs (key performance indicators). The results are based on three main documents: "EDU-ARCTIC entry and after" skills assessment (two surveys) and "After EDU-ARCTIC survey - Main survey".

Additionally, in order to assess the number of schools implementing and interested in the EDU-ARCTIC program, project deliverables D6.1 "List of schools registered to the program," D7.8 "List of events and publications presenting the project" as well as google analytics for the portal were used.

In the document the methodology of evaluation of the project's impact and the techniques used for it were presented. Information on the questions assigned to particular KPIs was provided. The document also includes descriptions of surveys, the results of which were used for assessing the level of achieving KPIs.

The general results are very positive, as all Key Performance Indicators proposed for the project were achieved. Moreover, the presented results show clearly, that KPIs have been achieved in the level exceeding primary assumptions. The logical conclusion from this remark is to suggest that such initiatives as EDU-ARCTIC do make a difference and that positive action may lead to clearly improved results.

The results for all KPIs were presented in one table summarising the values and the means of their verification in the section 9. General conclusions.

1. Introduction

This report is part of the final evaluation report as foreseen in the Grant Agreement, WP 5, Task 5.4 Impact assessment. This document contains the results of the after-skills-assessment survey in comparison to the entry-skills-assessment survey and "After EDU-ARCTIC survey - Main survey".

These surveys were presented in deliverable D5.1 "Evaluation Plan including KPIs (key performance indicators)".

2. Methodology

2.1 CAWI (Computer Assisted Web Interviews)

For the evaluation of EDU-ARCTIC, specific computer assisted web interviews were developed. Participants were asked to fill in an on-line questionnaire received via Internet. This technique relies on the following principles: 1. Anonymity, 2. The opportunity to participate in the study at any time convenient for the respondent.

The entry-skills, after-skills assessment surveys and "After EDU-ARCTIC survey - Main survey" were uploaded on the portal.

The entry-skills assessment survey was available for all teachers, who registered before 28.03.2018, within 60 days after the registration to the EDU-ARCTIC program. The after-skills assessment survey was available to teachers, who had been participating actively in the program for at least one year (they registered before 31.12.2017 and gained at least 200 EDU-GAME points). The EDU-GAME points were granted to teachers for their participation in various activities offered by the program. The exact information on the number of points per activity may be found at: https://program.edu-arctic.eu/edu_games (e.g. for participation in one online lesson a teacher received 40 points). In the after-skills assessment survey the answers were gathered from teachers who got a minimum of 240 and a maximum of 26.728 EDU-GAME points.

The "Entry-skills assessment surveys" have been filled in by 379 persons and the "after-skills assessment surveys" by 89. All received surveys were analysed. In both questionnaires, teachers declared how many pupils and to what extent, meet the conditions defined by the question.

For example: in question *"1. Do your pupils use the knowledge in practice?"*, teachers entered the appropriate number of students (separately boys and girls) in 5 categories:

- 4 – Definitely use it
- 3 – Tend to use it
- 2 – Tend not use it
- 1 – Definitely do not use it
- I have no opinion – if option is selected, system will treat this as: no answer given.

The statistical analysis concerned the comparison of the average number of students declared in particular categories in the "entry-skills assessment survey" with the average number of students declared in particular categories "after-skills assessment survey" and the analysis of flows between categories. Detailed results are presented in chapter 4.3 *"Entry-skills assessment survey" and "After-skills assessment survey" – comparison.*

The second source of information on the implementation of the indicators is the "After EDU-ARCTIC survey - Main survey". This survey was completed by 80 teachers, in the period January – February 2019. Detailed results are presented in the chapter "After EDU-ARCTIC survey - results".

2.2 Key Performance Indicators (KPIs)

KPIs represent a set of values against which to measure items. The set of values was defined for each question separately. The surveys are based on the so-called SMART criteria: specific, measurable, achievable, realistic, time-bound.

3. Objectives – categories to be measured

Thanks to the KPI values, an evaluation of the 3 main categories-targets discussed below is possible.

Impact indicators and targets	Indicator value (KPI)
1. Measurement of the quality of educational program	1. Utility of educational tools proposed and implemented in the project during online lessons (70% of teachers who took part will assess utility of at least one tool on a grade of 5 or 6). 2. Visual attractiveness of educational tools proposed and implemented in the project (70% of teachers who took part will assess visual attractiveness of at least one tool on a grade of 5 or 6). 3. Frequency of using educational tools proposed and implemented in the project (70% of teachers who took part will assess frequency of at least one tool on a grade of 1, 2 or 3).
2. Measurement of project's direct results	1. Enhancement of knowledge about science and scientific research, as well as their place in the modern world (+ 15% compared to input level) 2. Enhancement of knowledge about nature, geography, natural resources, history, social and political specificities concerning polar regions and increase of sensitivity to environmental issues and climate change (+ 15% compared to input level) 3. Establishing strong links between the worlds of research and young people/ society in order to increase their ability to understand scientific messages and scientific language (+20% compared to input level) 4. Implementation of innovative tools by way of an e-learning portal and effective methods of teaching science on a regular base in schools in at least 10 European countries (minimum 500 schools from 10 European countries) 5. Introduction of the EDU- ARCTIC program in schools in at least 10 European countries (minimum 3.500 schools from at least 10 European countries).
3. Measurement of the project's impact upon the engagement of young people in STEM activities	1. Increase of the number of young people interested in STEM and scientific career (+ 25% compared to input level).
	2. Increase of the number of girls interested in scientific careers (+ 20% compared to input level).

	Minimum 500 schools from 10 European countries.
	Minimum 3.500 schools from at least 10 European countries

4. "Skills assessments" results

4.1 "Entry-skills assessment survey" – basic information

Numbers of surveys: 379

Teachers' sex

Teachers' sex	
Female	281
Male	98
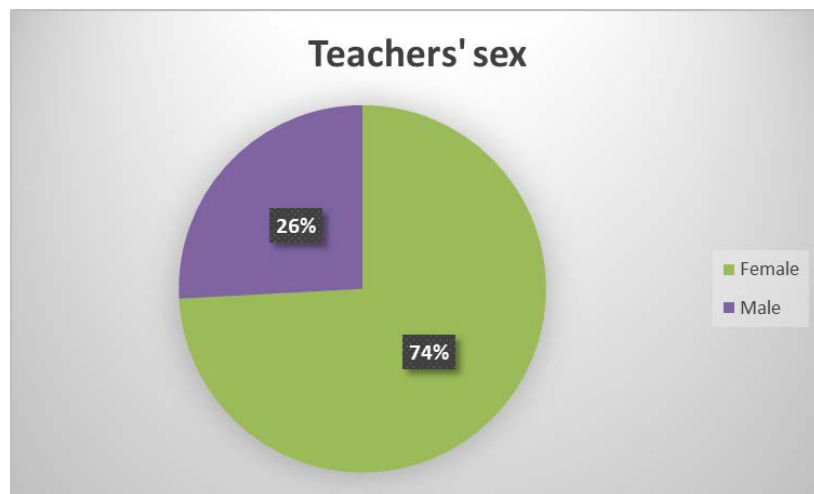
Average age of pupils:
15,01

Teachers' country

Teachers' country (in alphabetical order)	Number of teachers
Albania	54
Azerbaijan	1
Belgium	3
Bosnia and Herzegovina	1
Brazil	1
Bulgaria	12
Colombia	1
Croatia	3
Cyprus	2
Denmark	2
Estonia	1
Faroe Islands	19
Finland	3
France	4

Georgia	1
Germany	1
Greece	26
Greenland	1
Hungary	3
Israel	1
Italy	9
Kazakhstan	4
Latvia	2
Lithuania	4
Macedonia	11
Norway	3
Poland	103
Portugal	3
Romania	46
Russian Federation	8
Serbia	11
Slovakia	2
Slovenia	1
South Africa	1
Spain	11
Svalbard	1
Sweden	6
Switzerland	1
Turkey	2
Ukraine	1
United Kingdom	5
USA	4
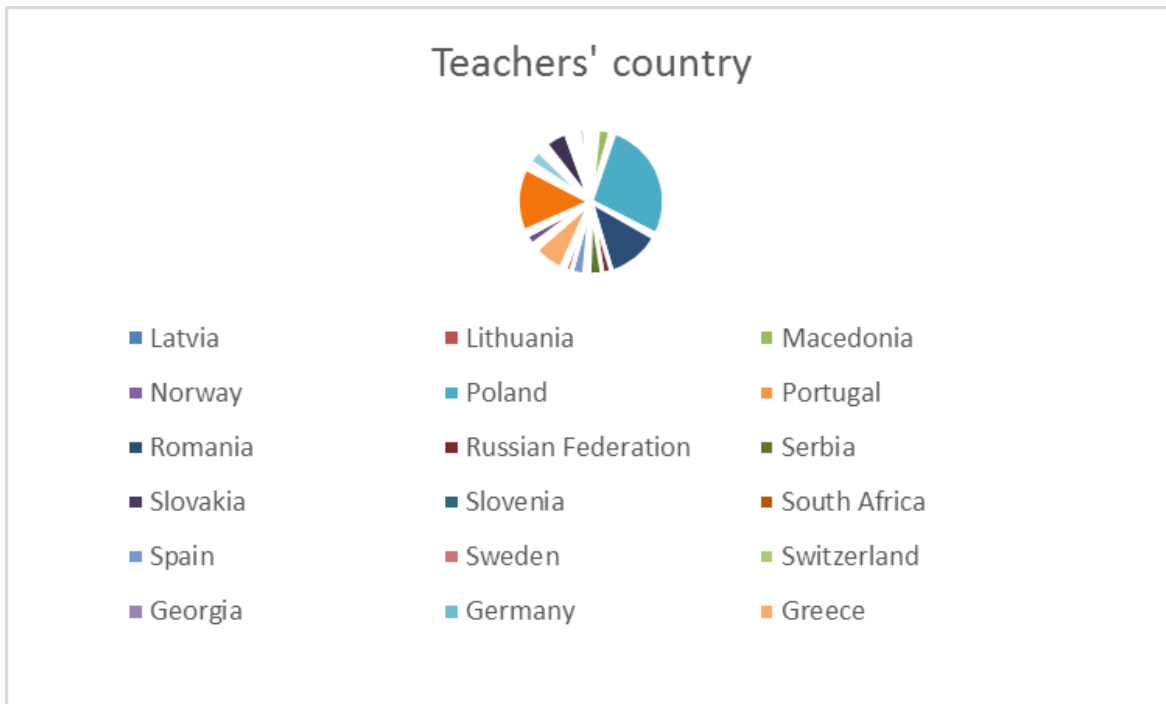
Teachers' country

- Latvia
- Lithuania
- Macedonia
- Norway
- Poland
- Portugal
- Romania
- Russian Federation
- Serbia
- Slovakia
- Slovenia
- South Africa
- Spain
- Sweden
- Switzerland
- Georgia
- Germany
- Greece

Number of pupils declared in all "entry-skills assessment" surveys filled-in

Number of pupils declared in all "entry-skills assessment" surveys filled-in	
Schoolgirls	20 473
Schoolboys	21 157

Number of pupils declared in all "entry-skills assessment" surveys filled in

- 51% Schoolboys
- 49% Schoolgirls
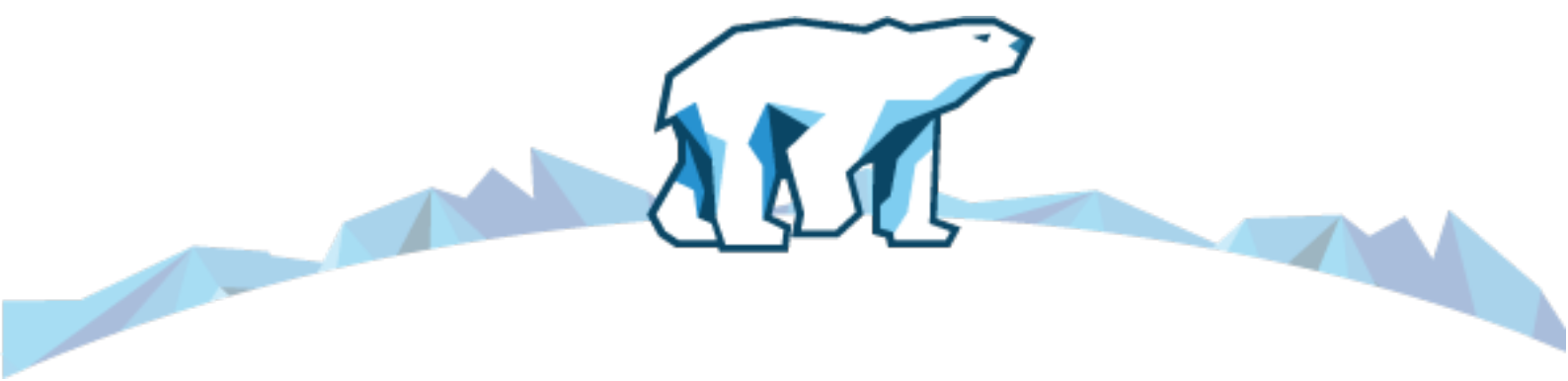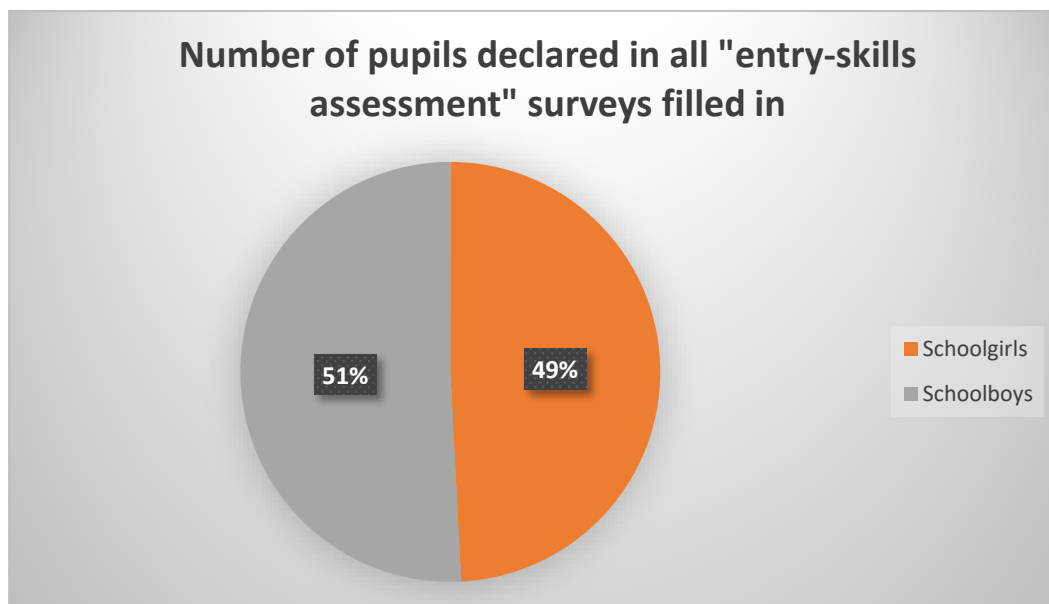
4.2 "After-skills assessment survey" – basic information

Numbers of surveys: 89

Teachers' sex

Teachers' sex	
Female	69
Male	20
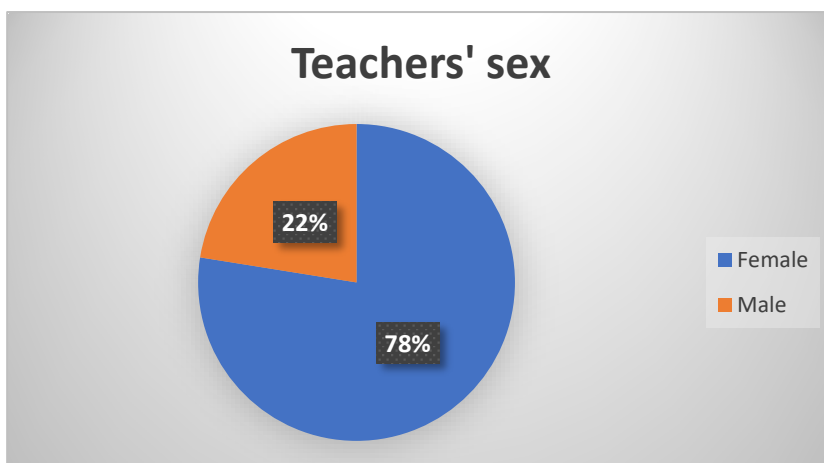
Average age of pupils: 14,93

Teachers' sex

Teachers' country

Teachers' country (in alphabetical order)	Number of teachers
Albania	16
Belgium	1
Brazil	1
Bulgaria	4
Colombia	1
Croatia	1
Cyprus	1
Faroe Islands	1
Finland	2
Greece	8
Hungary	1
Israel	1
Italy	3
Latvia	1
Lithuania	3
Macedonia	1
Poland	17
Romania	15
Serbia	5
Slovenia	1
Spain	2
Switzerland	1
Turkey	1
United Kingdom	1
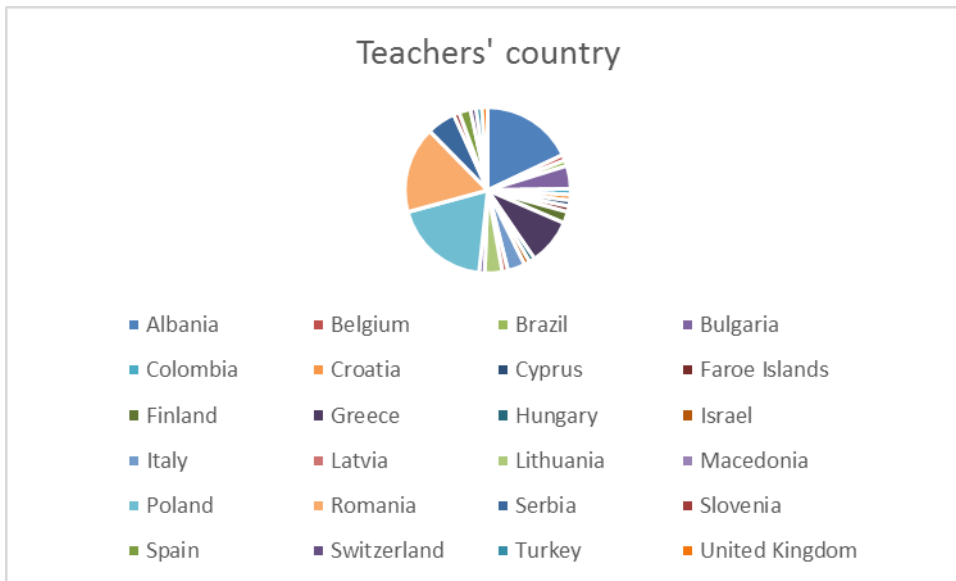
Number of pupils declared in all "after-skills assessment" surveys filled-in

Number of pupils declared in all "after-skills assessment" surveys filled-in	
Schoolgirls	1 926
Schoolboys	1 923
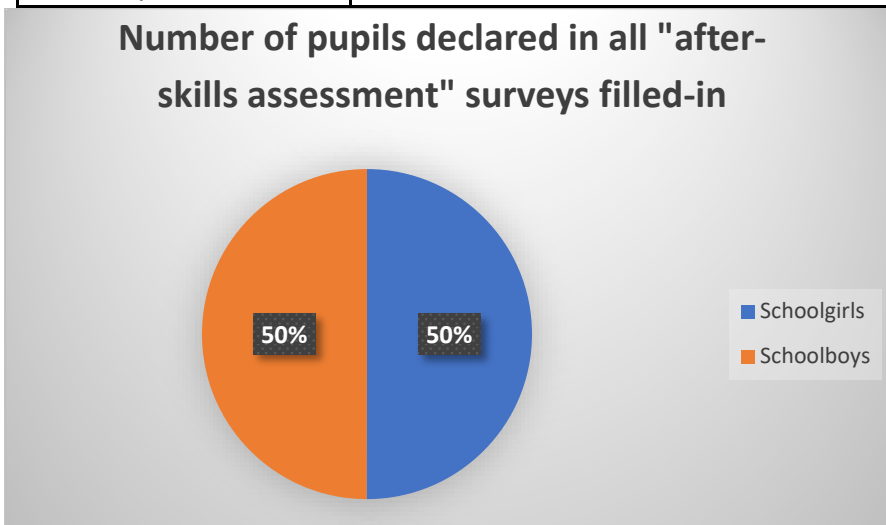
4.3 "Entry-skills assessment survey" and "After-skills assessment survey" – comparison

The survey contains 3 categories: (1) STEM SKILLS (2) KNOWLEDGE ABOUT SCIENCE AND SCIENTIFIC RESEARCH, AS WELL AS THEIR PLACE IN THE MODERN WORLD, (3) KNOWLEDGE ABOUT NATURE, GEOGRAPHY, NATURAL RESOURCES, HISTORY, SOCIAL AND POLITICAL
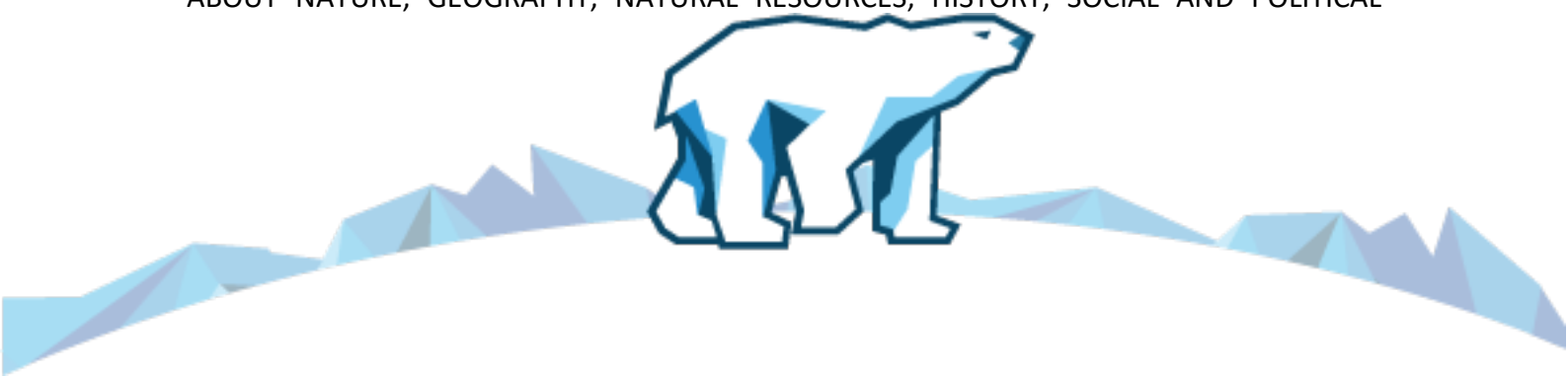
SPECIFICTIES CONCENRING THE ARCTIC AND INCREASE OF SENSITIVITY TO ENVIRONMENTAL ISSUES AND CLIMATE CHANGE

In the first category, there are 7 sections containing each two multiple choice questions:

1) LEARN AND APPLY CONTENT

2) INTEGRATE CONTENT

3) INTERPRETATION AND COMMUNICATION OF INFORMATION

4) ENGAGE IN INQUIRY

5) ENGAGE IN LOCAL REASONING

6) COLLABORATE AS A TEAM

7) APPLY TECHNOLOGY APPROPRIATELY

In the second category, there are 7 questions: knowledge about formulating research questions and a hypothesis, knowledge about applying adequate tools and methods to test the hypothesis, verifying the quality of research results, interest in scientific careers, interest in STEM, knowledge about the vocational tasks of a professional scientist, knowledge about the conditions of work of professional scientists.

The third category contains questions about the level of the pupils' knowledge about the polar regions in the following domains: nature, geography, natural resources, history, social and political specificities, sensitivity to environmental issues, climate change.

The "Before EDU-ARCTIC - entry skills assessment" survey is presented in Appendix 3 of deliverable D5.1 "Evaluation Plan including KPIs (key performance indicators)", and the "After EDU-ARCTIC - after skills assessment" survey in Appendix 9 to the above mentioned document.

According to the project's premises, the "Before EDU-ARCTIC - entry skills assessment" survey and "After EDU-ARCTIC - after skills assessment" are sources of verifying two KPIs: **Enhancement of knowledge about science and scientific research, as well as their place in the modern world (+ 15% compared to input level)** and **Enhancement of knowledge about nature, geography, natural resources, history, social and political specificities concerning polar regions and increase of sensitivity to environmental issues and climate change (+ 15% compared to input level).**

Some questions from the questionnaires were assigned to KPIs according to the following rule:

KPI: Enhancement of knowledge about science and scientific research, as well as their place in the modern world (+ 15% compared to input level)
1. Do your pupils have a knowledge about the vocational tasks of a professional scientist? Please put the appropriate number of schoolgirls and schoolboys that match to the given answers
2. Do your pupils know anything about the conditions of work of professional scientists (e.g. possibilities of employment, salary, requirements to obtain a degree)? Please put the appropriate number of schoolgirls and schoolboys that match to the given answers.
3. Knowledge about formulating research questions and hypothesis (Can your pupils formulate questions? Can your pupils formulate objectives of research? Can your pupils justify formulated objectives of research?)
4. Knowledge about applying adequate tools and methods to test the hypothesis (Are your pupils familiar with the scientific method of verification in the area of STEM? Do your pupils know examples of research in the area of STEM? Do your pupils have a knowledge about searching for reliable sources of information about scientific method and tools? Can they use these scientific method and tools effectively?)
5. Can your pupils verify the quality of research results? (Whether the purpose, objective of the research was achieved, whether there is a need to another attempt, whether the resulting data are inconclusive or ambiguous?)
KPI: Enhancement of knowledge about nature, geography, natural resources, history, social and political specificities concerning polar regions and increase of sensitivity to environmental issues and climate change (+ 15% compared to input level)
1. Knowledge about nature of polar regions
2. Knowledge about geography of polar regions
3. Knowledge about natural resources of polar regions
4. Knowledge about history of polar regions
5. Knowledge about social and political specificities concerning polar regions
6. Knowledge about sensitivity to environmental issues concerning polar regions
7. Knowledge about climate change of polar regions

4.3.1 KPI: Enhancement of knowledge about science and scientific research, as well as their place in the modern world (+ 15% compared to input level) – level of implementation.

Below a summary of all questions regarding KPI: "Enhancement of knowledge about science and scientific research, as well as their place in the modern world (+15% compared to input level)" is presented. The most important element to note is the change in the category "4" of all questions. Category "4", means the highest degree of given skills / knowledge. In the last column, marked in green, we presented the difference between percentage of pupils, declared in "Entry-skills assessment survey" and "After-skills assessment survey" in category "4". For most questions, the increase was above 15%. **The average increase for all questions is: 24% for schoolgirls, 23% for schoolboys and 24% for all pupils. Therefore, it can be concluded that the KPI has been achieved.**
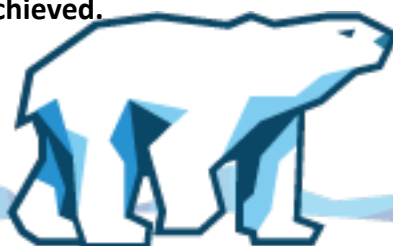
Have of your pupils got a knowledge about the vocational tasks of a professional scientist? Please put the appropriate number of schoolgirls and schoolboys that match to the given answers.

Schoolgirls

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
4	1010	22,12%	4	783	46,89%	24,76%
3	1123	24,60%	3	456	27,31%	2,71%
2	1454	31,85%	2	244	14,61%	-17,24%
1	191	4,18%	1	122	7,31%	3,12%
0	787	17,24%	0	65	3,89%	-13,35%
SUMA	4565	100,00%	SUMA	1670	100,00%	

Schoolboys

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
4	1274	27,06%	4	770	49,11%	22,05%
3	930	19,75%	3	360	22,96%	3,21%
2	1227	26,06%	2	268	17,09%	-8,97%
1	291	6,18%	1	107	6,82%	0,64%
0	986	20,94%	0	63	4,02%	-16,93%
SUMA	4708	100,00%	SUMA	1568	100,00%	

Average change for the category "4" for all pupils		23,40%

Do your pupils know anything about the conditions of work of professional scientists (e.g. possibilities of employment, salary, requirements to obtain a degree)? Please put the appropriate number of schoolgirls and schoolboys that match to the given answers.

Schoolgirls

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
4	993	21,75%	4	832	49,82%	28,07%
3	1172	25,67%	3	363	21,74%	-3,94%
2	1446	31,68%	2	289	17,31%	-14,37%
1	318	6,97%	1	127	7,60%	0,64%
0	636	13,93%	0	59	3,53%	-10,40%
SUMA	4565	100,00%	SUMA	1670	100,00%	

Schoolboys

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	1066	22,64%	5	811	51,72%	29,08%
4	1207	25,64%	4	355	22,64%	-3,00%
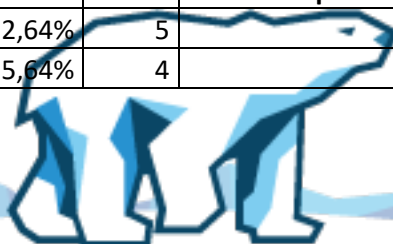
3	1136	24,13%	3	260	16,58%	-7,55%
2	455	9,66%	2	91	5,80%	-3,86%
1	844	17,93%	1	51	3,25%	-14,67%
SUMA	4708	100,00%	SUMA	1568	100,00%	

			Average change for the category "4" for all pupils			28,57%

Knowledge about formulating research questions and a hypothesis (Can your pupils formulate questions? Can your pupils formulate objectives of research? Can your pupils justify formulated objectives of research?)

Schoolgirls

entry	absolute number of all responses	%	after	absolute number of all responses	%	Absolute change
4	1113	24,38%	4	786	47,07%	22,68%
3	1209	26,48%	3	404	24,19%	-2,29%
2	1371	30,03%	2	338	20,24%	-9,79%
1	139	3,04%	1	105	6,29%	3,24%
0	733	16,06%	0	37	2,22%	-13,84%
SUMA	4565	100,00%	SUMA	1670	100,00%	

Schoolboys

entry	absolute number of all responses	%	after	absolute number of all responses	%	Absolute change
4	1275	27,08%	4	755	48,15%	21,07%
3	1141	24,24%	3	375	23,92%	-0,32%
2	1182	25,11%	2	311	19,83%	-5,27%
1	190	4,04%	1	95	6,06%	2,02%
0	920	19,54%	0	32	2,04%	-17,50%
SUMA	4708	100,00%	SUMA	1568	100,00%	

			Average change for the category "4" for all pupils			21,88%

Knowledge about applying adequate tools and methods to test the hypothesis (Are your pupils familiar with the scientific methods of verification in the area of STEM? Do your pupils know examples of research in the area of STEM? Do your pupils have a knowledge about searching for reliable sources of information about scientific method and tools? Can they use these scientific method and tools effectively?)

Schoolgirls

entry	absolute number of all responses	%	after	absolute number of all responses	%	Absolute change
4	1142	25,02%	4	799	47,84%	22,83%
3	1128	24,71%	3	398	23,83%	-0,88%
2	1361	29,81%	2	335	20,06%	-9,75%
1	159	3,48%	1	102	6,11%	2,62%
0	775	16,98%	0	36	2,16%	-14,82%

SUMA		4565	100,00%	**SUMA**	1670	100,00%	

Schoolboys

entry	absolute number of all responses	%	after	absolute number of all responses	%	Absolute change
4	1192	25,32%	4	751	47,90%	22,58%
3	1072	22,77%	3	377	24,04%	1,27%
2	1280	27,19%	2	316	20,15%	-7,03%
1	224	4,76%	1	96	6,12%	1,36%
0	940	19,97%	0	28	1,79%	-18,18%
SUMA	4708	100,00%	**SUMA**	1568	100,00%	
			Average change for the category "4" for all pupils			22,70%

Can your pupils verify the quality of research results? (Whether the purpose, objective of the research was achieved, whether there is need for another attempt, whether the resulting data are inconclusive or ambiguous?)

Schoolgirls

entry	absolute number of all responses	%	after	absolute number of all responses	%	Absolute change
4	1108	24,27%	4	776	46,47%	22,20%
3	1175	25,74%	3	410	24,55%	-1,19%
2	1402	30,71%	2	325	19,46%	-11,25%
1	147	3,22%	1	123	7,37%	4,15%
0	733	16,06%	0	36	2,16%	-13,90%
SUMA	4565	100,00%	**SUMA**	1670	100,00%	

Schoolboys

entry	absolute number of all responses	%	after	absolute number of all responses	%	Absolute change
4	1162	24,68%	4	727	46,36%	21,68%
3	1168	24,81%	3	367	23,41%	-1,40%
2	1295	27,51%	2	332	21,17%	-6,33%
1	195	4,14%	1	104	6,63%	2,49%
0	888	18,86%	0	38	2,42%	-16,44%
SUMA	4708	100,00%	**SUMA**	1568	100,00%	
			Average change for the category "4" for all pupils			21,94%

Average change measured for all questions, regarding KPI: Enhancement of knowledge about science and scientific research, as well as their place in the modern world (+ 15% compared to input level):

Schoolboys		23%
Schoolgirls		24%
All pupils		24%
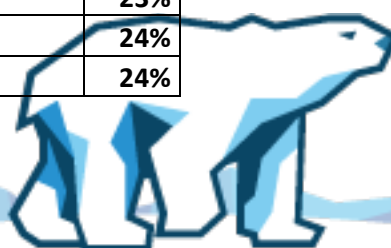
 4.3.2 KPI: Enhancement of knowledge about nature, geography, natural resources, history, social and political specificities concerning polar regions and increase of sensitivity to environmental issues and climate change (+ 15% compared to input level) – level of implementation.

Below, we present a summary of all questions regarding KPIs: "Enhancement of knowledge about nature, geography, natural resources, history, social and political specificities concerning polar regions and increase of sensitivity to environmental issues and climate change (+ 15% compared to input level)". The most important is the change in category "4" of all questions. Category "4", means the highest degree of given skills / knowledge. In the last column, marked in green, we present the difference between the percentage of pupils, declared in "Entry-skills assessment survey" and "After-skills assessment survey" in category "4". For most questions, the increase is above 15%. **The average increase for all questions is: 30% for schoolgirls, 28% for schoolboys and 29% for all pupils. Therefore, it can be concluded that the KPI has been achieved.**

<center>Knowledge about nature of polar regions</center>

Schoolgirls

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	955	20,92%	5	825	49,40%	28,48%
4	886	19,41%	4	347	20,78%	1,37%
3	1931	42,30%	3	315	18,86%	-23,44%
2	400	8,76%	2	138	8,26%	-0,50%
1	393	8,61%	1	45	2,69%	-5,91%
SUMA	4565	100,00%	SUMA	1670	100,00%	

Schoolboys

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	964	20,48%	5	771	49,17%	28,70%
4	1096	23,28%	4	320	20,41%	-2,87%
3	2003	42,54%	3	219	13,97%	-28,58%
2	365	7,75%	2	229	14,60%	6,85%
1	280	5,95%	1	29	1,85%	-4,10%
SUMA	4708	100,00%	SUMA	1568	100,00%	

Average change for the category "4" for all pupils	28,59%
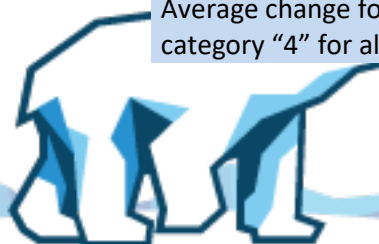
Knowledge about geography of polar regions

Schoolgirls

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	941	20,61%	5	921	55,15%	34,54%
4	1423	31,17%	4	363	21,74%	-9,44%
3	1119	24,51%	3	212	12,69%	-11,82%
2	626	13,71%	2	123	7,37%	-6,35%
1	456	9,99%	1	51	3,05%	-6,94%
SUMA	4565	100,00%	SUMA	1670	100,00%	

Schoolboys

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	1002	21,28%	5	820	52,30%	31,01%
4	1359	28,87%	4	332	21,17%	-7,69%
3	1624	34,49%	3	217	13,84%	-20,66%
2	512	10,88%	2	170	10,84%	-0,03%
1	211	4,48%	1	29	1,85%	-2,63%
SUMA	4708	100,00%	SUMA	1568	100,00%	
			Average change for the category "4" for all pupils			32,77%

Knowledge about natural resources of polar regions

Schoolgirls

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	821	17,98%	5	830	49,70%	31,72%
4	771	16,89%	4	349	20,90%	4,01%
3	1740	38,12%	3	280	16,77%	-21,35%
2	685	15,01%	2	123	7,37%	-7,64%
1	548	12,00%	1	88	5,27%	-6,73%
SUMA	4565	100,00%	SUMA	1670	100,00%	

Schoolboys

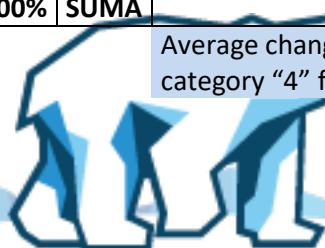| entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	924	19,63%	5	745	47,51%	27,89%
4	726	15,42%	4	267	17,03%	1,61%
3	2097	44,54%	3	264	16,84%	-27,70%
2	579	12,30%	2	212	13,52%	1,22%
1	382	8,11%	1	80	5,10%	-3,01%
SUMA	4708	100,00%	SUMA	1568	100,00%	
			Average change for the category "4" for all pupils			29,80%

Knowledge about history of polar regions

Schoolgirls

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	695	15,22%	5	711	42,57%	27,35%
4	401	8,78%	4	317	18,98%	10,20%
3	1617	35,42%	3	314	18,80%	-16,62%
2	1162	25,45%	2	195	11,68%	-13,78%
1	690	15,12%	1	133	7,96%	-7,15%
SUMA	4565	100,00%	SUMA	1670	100,00%	

Schoolboys

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	725	15,40%	5	636	40,56%	25,16%
4	653	13,87%	4	269	17,16%	3,29%
3	1188	25,23%	3	229	14,60%	-10,63%
2	1560	33,14%	2	289	18,43%	-14,70%
1	582	12,36%	1	145	9,25%	-3,11%
SUMA	4708	100,00%	SUMA	1568	100,00%	
			Average change for the category "4" for all pupils			26,26%

Knowledge about social and political specificities concerning polar regions

Schoolgirls

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	617	13,52%	5	635	38,02%	24,51%
4	446	9,77%	4	316	18,92%	9,15%
3	878	19,23%	3	356	21,32%	2,08%
2	1993	43,66%	2	245	14,67%	-28,99%
1	631	13,82%	1	118	7,07%	-6,76%
SUMA	4565	100,00%	SUMA	1670	100,00%	

Schoolboys

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	644	13,68%	5	626	39,92%	26,24%
4	655	13,91%	4	268	17,09%	3,18%
3	788	16,74%	3	217	13,84%	-2,90%
2	2037	43,27%	2	289	18,43%	-24,84%
1	584	12,40%	1	168	10,71%	-1,69%
SUMA	4708	100,00%	SUMA	1568	100,00%	
			Average change for the category "4" for all pupils			25,38%
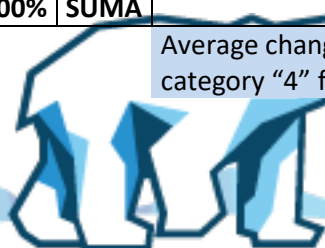
Knowledge about sensitivity to environmental issues concerning polar regions

Schoolgirls

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	923	20,22%	5	888	53,17%	32,95%
4	686	15,03%	4	291	17,43%	2,40%
3	1664	36,45%	3	266	15,93%	-20,52%
2	866	18,97%	2	160	9,58%	-9,39%
1	426	9,33%	1	65	3,89%	-5,44%
SUMA	4565	100,00%	SUMA	1670	100,00%	

Schoolboys

| entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	891	18,93%	5	771	49,17%	30,25%
4	873	18,54%	4	282	17,98%	-0,56%
3	1404	29,82%	3	227	14,48%	-15,34%
2	1210	25,70%	2	210	13,39%	-12,31%
1	330	7,01%	1	78	4,97%	-2,03%
SUMA	4708	100,00%	SUMA	1568	100,00%	
			Average change for the category "4" for all pupils			31,60%

Knowledge about climate change of polar regions

Schoolgirls

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	1116	24,45%	5	934	55,93%	31,48%
4	824	18,05%	4	280	16,77%	-1,28%
3	1689	37,00%	3	226	13,53%	-23,47%
2	704	15,42%	2	169	10,12%	-5,30%
1	232	5,08%	1	61	3,65%	-1,43%
SUMA	4565	100,00%	SUMA	1670	100,00%	

Schoolboys

entry	absolute number of all responses	%	after	absolute number of all responses	%	Change
5	1182	25,11%	5	819	52,23%	27,13%
4	937	19,90%	4	242	15,43%	-4,47%
3	1253	26,61%	3	215	13,71%	-12,90%
2	1102	23,41%	2	224	14,29%	-9,12%
1	234	4,97%	1	68	4,34%	-0,63%
SUMA	4708	100,00%	SUMA	1568	100,00%	
			Average change for the category "4" for all pupils			29,30%
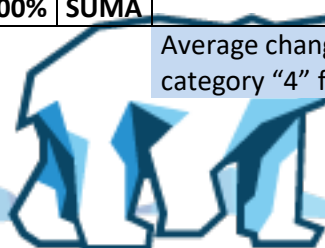
Average change measured for all questions, regarding KPI: Enhancement of knowledge about nature, geography, natural resources, history, social and political specificities concerning polar regions and increase of sensitivity to environmental issues and climate change (+ 15% compared to input level):

Schoolboys		**28%**
Schoolgirls		**30%**
All pupils		**29%**

5. "After EDU-ARCTIC survey - Main survey" results

5.1 "After EDU-ARCTIC survey - Main survey" – basic information

Numbers of surveys: 80

Teachers' sex

Teachers' sex

Female   60
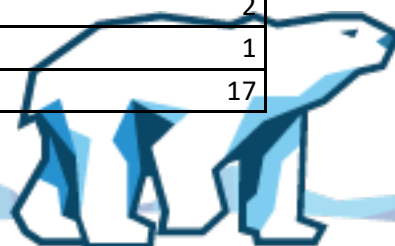
Male   20
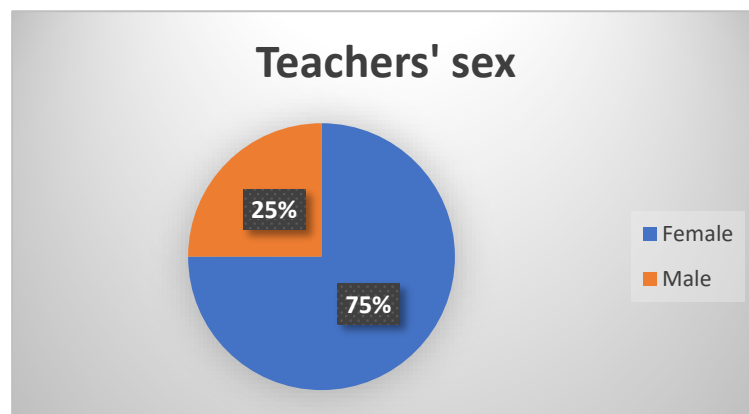
Average age of pupils: 15,08 y.o.

Teachers' country

Teachers' country (in alphabetical order)	Number of teachers
Albania	14
Brazil	1
Bulgaria	3
Colombia	1
Croatia	2
Cyprus	1
Finland	1
Greece	6
Hungary	1
Israel	1
Italy	3
Latvia	1
Lithuania	2
Macedonia	1
Poland	17

Romania	16
Serbia	5
Slovenia	1
Spain	3

Teachers' country

Legend: Albania, Brazil, Bulgaria, Colombia, Croatia, Cyprus, Finland, Greece, Hungary, Isreal, Italy, Latvia, Lithuania, Macedonia, Poland, Romania, Serbia, Slovenia, Spain
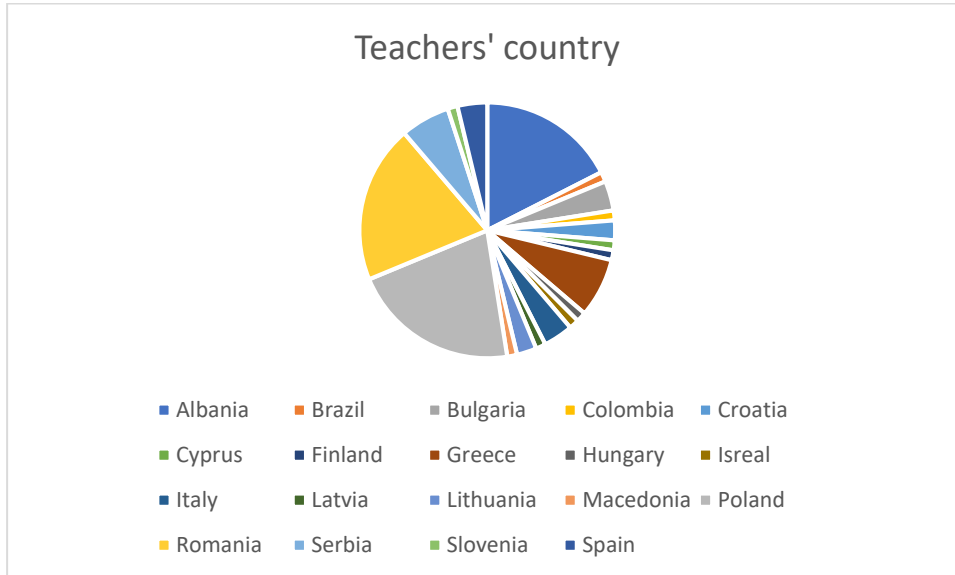
Number of pupils declared in all filled "After EDU-ARCTIC survey - Main survey"

Number of pupils declared in all "After EDU-ARCTIC survey - Main survey" filled-in	
Schoolgirls	1 412
Schoolboys	1 522

Number of pupils declared in all "After EDU-ARCTIC survey - Main survey" filled-in

5.3 "After EDU-ARCTIC survey - Main survey" – statistics

The survey contains 2 categories: (1) TECHNOLOGY and (2) FACTUAL.

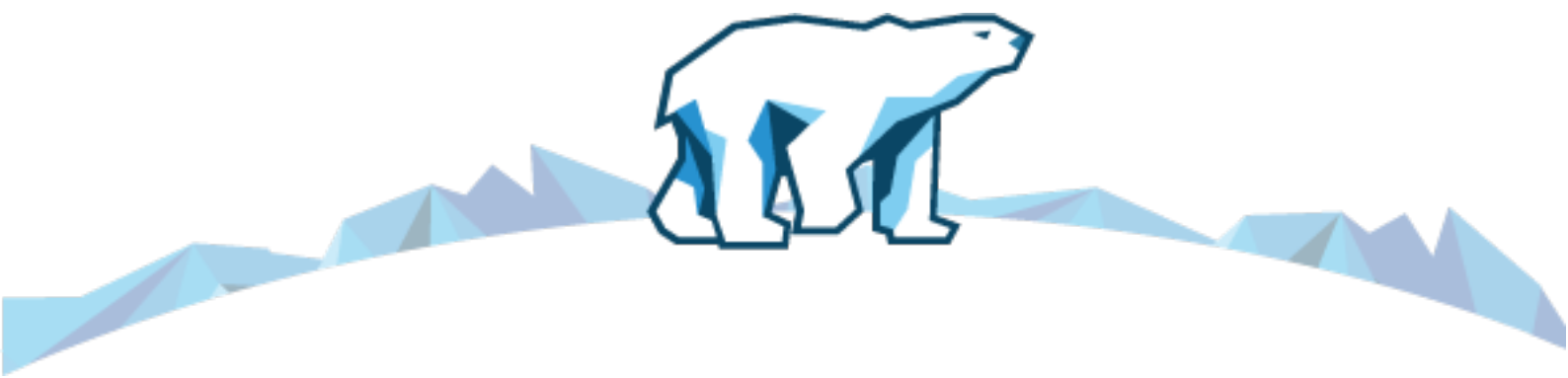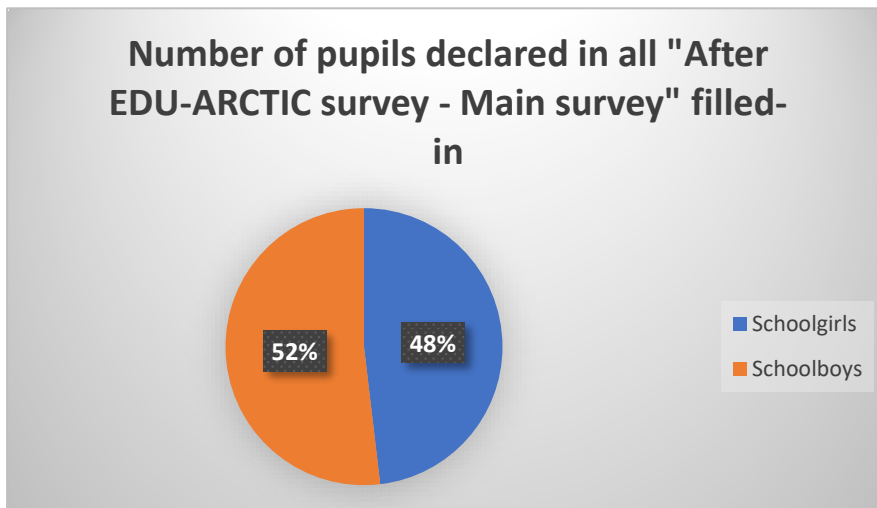In the first category, there are 3 sections, with questions about:

1) Utility of "Online lessons", "Polarpedia" and "Monitoring system".

2) Visual attractiveness of "Online lessons", "Polarpedia" and "Monitoring system".

3) Frequency of use of "Online lessons", "Polarpedia" and "Monitoring system".

In the second category, there are 6 questions:

1. What is the impact of each of the EDU-ARCTIC modules on your pupils' knowledge about issues related to the Arctic (nature, geography, natural resources, history, social and political specificities concerning the Arctic and increase of sensitivity to environmental issues and climate change)?

2. What is the impact of each of the EDU-ARCTIC modules on the level of understanding of scientific issues and scientific language among your pupils?

3. What is the impact of each of the EDU-ARCTIC modules on the level of interest in STEM and scientific careers among your pupils?

4. To what extent does the project contribute as far as their increase of knowledge on issues related to the Arctic is concerned (nature, geography, natural resources, history, social and political specificities concerning the Arctic and increase of sensitivity to environmental issues and climate change)?

5. To what extent does the project contribute to improve the level of understanding of the world of science and scientific language?

6. To what extent does the project contribute to the increase of interest in STEM and scientific careers among your pupils?

"After EDU-ARCTIC survey - Main survey" is Appendix 10 of Deliverable D5.1 "Evaluation Plan including KPIs (key performance indicators)".

According to the description in Appendix 1 to DoA of the Grant Agreement, the "After EDU-ARCTIC survey - Main survey" is a source of verifying the following KPIs: Utility of educational tools proposed and implemented in the project during online lessons (70% of teachers who took part will assess utility of at least one tool on a grade of 5 or 6), Visual
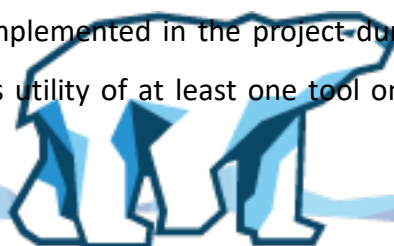
attractiveness of educational tools proposed and implemented in the project (70% of teachers who took part will assess visual attractiveness of at least one tool on a grade of 5 or 6), Frequency of using educational tools proposed and implemented in the project (70% of teachers who took part will assess frequency of at least one tool on a grade of 1, 2 or 3), Enhancement of knowledge about nature, geography, natural resources, history, social and political specificities concerning polar regions and increase of sensitivity to environmental issues and climate change (+ 15% compared to input level), Establishing strong links between the worlds of research and young people/ society in order to increase their ability to understand scientific messages and scientific language (+20% compared to input level), Increase of the number of young people interested in STEM and scientific career (+ 25% compared to input level), Increase of the number of girls interested in scientific careers (+ 20% compared to input level).

Some questions from the questionnaire were assigned to KPIs according to the following rule:

KPI: Utility of educational tools proposed and implemented in the project during online lessons (70% of teachers who took part will assess utility of at least one tool on a grade of 5 or 6)
Please mark on a scale of 1 to 6, where 1 is the lowest and 6 the highest, in order to evaluate the following modules of the EDU-ARCTIC portal and the whole EDU-ARCTIC project in terms of their utility in conducting various activities within the project.
KPI: Visual attractiveness of educational tools proposed and implemented in the project (70% of teachers who took part will assess visual attractiveness of at least one tool on a grade of 5 or 6)
Please mark on a scale of 1 to 6, where 1 is the lowest and 6 the highest, in order to evaluate the following modules of the EDU-ARCTIC portal in terms of their visual attractiveness.
KPI: Frequency of using educational tools proposed and implemented in the project (70% of teachers who took part will assess frequency of at least one tool on a grade of 1, 2 or 3)
How often do you use the following modules of the EDU-ARCTIC portal?
KPI: Enhancement of knowledge about nature, geography, natural resources, history, social and political specificities concerning polar regions and increase of sensitivity to environmental issues and climate change (+ 15% compared to input level)
To what extent does the project contribute as far as their increase of knowledge on issues related to the Arctic is concerned (nature, geography, natural resources, history, social and political specificities concerning the Arctic and increase of sensitivity to environmental issues and climate change)?
KPI: Establishing strong links between the worlds of research and young people/ society in order to increase their ability to understand scientific messages and scientific language (+20% compared to input level)

To what extent does the project contribute to improve the level of understanding of the world of science and scientific language?
KPI: Increase of the number of young people interested in STEM and scientific career (+ 25% compared to input level).
To what extent does the project contribute to the increase of interest in STEM and scientific careers among your pupils?
KPI: Increase of the number of girls interested in scientific careers (+ 20% compared to input level)
To what extent does the project contribute to the increase of interest in STEM and scientific careers among your pupils?

5.3.1 KPI: Utility of educational tools proposed and implemented in the project during online lessons (70% of teachers who took part will assess utility of at least one tool on a grade of 5 or 6) – level of implementation.

Below, we present a summary for the KPI: "Utility of educational tools proposed and implemented in the project during online lessons (70% of teachers who took part will assess utility of at least one tool on a grade of 5 or 6)". The most important are results in category "5" and "6". In the last column, marked in green, we presented total percentage of all indications for category "5" and "6". **For each tool more than 90% of teachers assess its utility on 5 or 6: online lessons: 94%, Polarpedia: 93%, Monitoring system: 91%. Therefore, can be concluded that the KPI has been achieved.**

Please mark on a scale of 1 to 6, where 1 is the lowest and 6 the highest, in order to evaluate the following modules of the EDU-ARCTIC portal and the whole EDU-ARCTIC project in terms of their utility in conducting various activities within the project:

Rate	Total percentage of indications for: ONLINE LESSONS
2	0,46%
3	0,69%
4	4,61%
5	33,41%
6	60,83%
Sum for category "5" and "6"	**94,24%**

Rate	Total percentage of indications for: POLARPEDIA
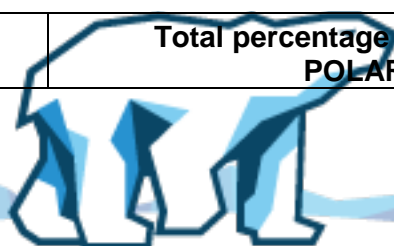
1	0,23%
3	1,40%
4	5,61%
5	33,88%
6	58,88%
Sum for category "5" and "6"	**92,76%**

Rate	Total percentage of indications for: MONITORING SYSTEM
2	0,47%
3	1,42%
4	6,64%
5	40,28%
6	51,18%
Sum for category "5" and "6"	**91,47%**

5.3.2 KPI: Visual attractiveness of educational tools proposed and implemented in the project (70% of teachers who took part will assess visual attractiveness of at least one tool on a grade of 5 or 6) – level of implementation.

Below, we present a summary for KPI: "Visual attractiveness of educational tools proposed and implemented in the project (70% of teachers who took part will assess visual attractiveness of at least one tool on a grade of 5 or 6)". The most important are results in category "5" and "6". In the last column, marked in green, we presented total percentage of all indications for category "5" and "6". **For each tool more than 90% of teachers assess its attractiveness on 5 or 6: online lessons: 98%, Polarpedia: 95%, Monitoring system: 94%. Therefore, it can be concluded that the KPI has been achieved.**

Please mark on a scale of 1 to 6, where 1 is the lowest and 6 the highest, in order to evaluate the following modules of the EDU-ARCTIC portal in terms of their visual attractiveness:

Rate	Total percentage of indications for: ONLINE LESSONS
4	1,77%
5	26,55%
6	71,68%
Sum for category "5" and "6"	**98,23%**

Rate	Total percentage of indications for: POLARPEDIA
4	4,55%
5	34,09%
6	61,36%
Sum for category "5" and "6"	**95,45%**

Rate	Total percentage of indications for: MONITORING SYSTEM
4	6,48%
5	39,35%
6	54,17%
Sum for category "5" and "6"	**93,52%**

5.3.3 KPI: Frequency of using educational tools proposed and implemented in the project (70% of teachers who took part will assess frequency of at least one tool on a grade of 1, 2 or 3) – level of implementation.

Below, we present a summary for KPI: "Frequency of using educational tools proposed and implemented in the project (70% of teachers who took part will assess frequency of at least one tool on a grade of 1, 2 or 3)". The most important are results in category "1", "2"and "3", where:

1 – A few times a month
2 – Less than twice every month
3 – On average once a month

Category "4" means "Less than once a month" and it is included in the calculation of level of realization of given KPI.

In the last column, marked in green, we presented total percentage of all indications for category "1", "2" and "3". **Each tool was used by more than 70% of teachers on average once a month and more often: online lessons: 76%, Polarpedia: 80%, Monitoring system: 74%. Therefore, it can be concluded that the KPI has been achieved.**

How often do you use the following modules of the EDU-ARCTIC portal?

Rate for ONLINE LESSONS	Absolute number of all responses	%
1	23	28,75%
2	18	22,50%

	3	20	25,00%
	4	19	23,75%
SUM		**80**	**100,00%**
SUM for categories 1, 2, 3		61	76,25%

Rate for POLARPEDIA	Absolute number of all responses	%
1	29	36,25%
2	18	22,50%
3	17	21,25%
4	16	20,00%
SUM	**80**	100,00%
SUM for categories 1, 2, 3	64	80,00%

Rate for MONITORING SYSTEM	Absolute number of all responses	%
1	33	41,25%
2	17	21,25%
3	9	11,25%
4	21	26,25%
SUM	**80**	100,00%
SUM for categories 1, 2, 3	59	73,75%

5.3.4 KPI Enhancement of knowledge about nature, geography, natural resources, history, social and political specificities concerning polar regions and increase of sensitivity to environmental issues and climate change (+ 15% compared to input level) – level of implementation.

Below, we presented a summary for KPI: "Enhancement of knowledge about nature, geography, natural resources, history, social and political specificities concerning polar regions and increase of sensitivity to environmental issues and climate change (+ 15% compared to input level)".

Teachers had to define the number of pupils in five categories (see below), related to the level of increase of knowledge. **As the figures show, in the case of 95% of schoolgirls and 95% of schoolboys (average for all pupils is 95%) the increase of knowledge has been declared by teachers.** It's worth to be highlighted, that the most popular category is "5": "The level of
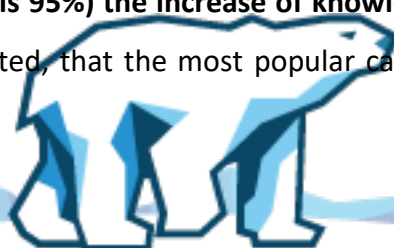
knowledge increased compared to the prior state before the EDU-ARCTIC project by 30% and more". This clearly illustrates the factual quality of the project. **Therefore, it can be concluded that the KPI has been achieved.**

To what extent does the project contribute as far as their increase of knowledge on issues related to the Arctic is concerned (nature, geography, natural resources, history, social and political specificities concerning the Arctic and increase of sensitivity to environmental issues and climate change)?"

Schoolgirls

Category	After	Number of pupils, declared by teachers in each category	%
1	There is no impact.	76	5,38%
2	The level of knowledge increased compared to the prior state before the EDU-ARCTIC project from 1% to 9%.	168	11,90%
3	The level of knowledge increased compared to the prior state before the EDU-ARCTIC project from 10% to 19%.	296	20,96%
4	The level of knowledge increased compared to the prior state before the EDU-ARCTIC project from 20% to 29%.	406	28,75%
5	The level of knowledge increased compared to the prior state before the EDU-ARCTIC project by 30% and more.	466	33,00%
	SUM	1412	100,00%
	SUM for categories: 2, 3, 4, 5.	**1336**	**94,62%**

Schoolboys

Category	After	Number of pupils, declared by teachers in each category	%
1	There is no impact.	73	4,80%
2	The level of knowledge increased compared to the prior state before the EDU-ARCTIC project from 1% to 9%.	180	11,83%
3	The level of knowledge increased compared to the prior state before the EDU-ARCTIC project from 10% to 19%.	380	24,97%
4	The level of knowledge increased compared to the prior state before the EDU-ARCTIC project from 20% to 29%.	411	27,00%
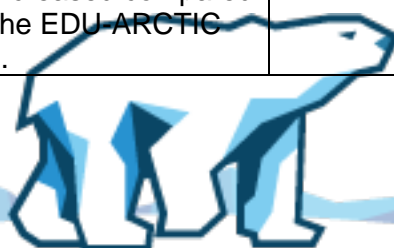
5	The level of knowledge increased compared to the prior state before the EDU-ARCTIC project by 30% and more.	478	31,41%
	SUM	1522	100,00%
	SUM for categories: 2, 3, 4, 5.	**1449**	**95,20%**

5.3.5 KPI Establishing strong links between the worlds of research and young people/ society in order to increase their ability to understand scientific messages and scientific language (+20% compared to input level) – level of implementation.

Below, we present a summary for KPI: "Establishing strong links between the worlds of research and young people/ society in order to increase their ability to understand scientific messages and scientific language (+20% compared to input level)".

Teachers had to define the number of pupils in five categories (see below), related to the level of increase of pupils' ability. **As the figures show, in the case of 95% of schoolgirls and 96% of schoolboys (average for all pupils is 95%) the increase of ability has been declared by teachers.** It's worth to be highlighted, that the most popular category is "5": "The level of understanding increased compared to the prior state before the EDU-ARCTIC project by 30% and more". This proves, very high, factual quality of the project. In this case, we assumed that in category "1" the typical increase for each pupil is 0%, in category "2" – 5%, in category "3" – 15%, in category "4" – 25% and in category "5" – 40%. For each category we assumed, that the distribution of values within it, is consistent with the normal (Gaussian) distribution, so the average of increase of knowledge in each category is the same as middle value of interval, defined in each category. In case of category "5", the interval is between 30% and 100%, so the middle value is 65%. For statistical purposes, we adopted a smaller value – 40%. **The average increase of ability to understand scientific messages and scientific language is 27% for schoolgirls and 26% for schoolboys (average for all pupils is 26%).**

Therefore, it can be concluded that the KPI has been achieved.

To what extent does the project contribute to improve the level of understanding of the world of science and scientific language?

Schoolgirls

Category	After	Number of pupils, declared by teachers in each category	%
1	There is no impact.	74	5,24%
2	The level of understanding increased compared to the prior state before the EDU-ARCTIC project from 1% to 9%.	112	7,93%
3	The level of understanding increased compared to the prior state before the EDU-ARCTIC project from 10% to 19%.	247	17,49%
4	The level of understanding increased compared to the prior state before the EDU-ARCTIC project from 20% to 29%.	382	27,05%
5	The level of understanding increased compared to the prior state before the EDU-ARCTIC project by 30% and more.	597	42,28%
	SUM	1412	100,00%
	SUM for categories: 2, 3, 4, 5.	**1338**	**94,76%**

Schoolboys

Category	After	Number of pupils, declared by teachers in each category	%
1	There is no impact.	65	4,27%
2	The level of understanding increased compared to the prior state before the EDU-ARCTIC project from 1% to 9%.	108	7,10%
3	The level of understanding increased compared to the prior state before the EDU-ARCTIC project from 10% to 19%.	327	21,48%
4	The level of understanding increased compared to the prior state before the EDU-ARCTIC project from 20% to 29%.	429	28,19%
5	The level of understanding increased compared to the prior state before the EDU-ARCTIC project by 30% and more.	593	38,96%
	SUM	1522	100,00%
	SUM for categories: 2, 3, 4, 5.	**1457**	**95,73%**

5.3.6 KPI Increase of the number of young people interested in STEM and scientific career (+ 25% compared to input level) – level of implementation.

Below, we present a summary for KPI: "Increase of the number of young people interested in STEM and scientific career (+ 25% compared to input level)".

Teachers had to define the number of pupils in five categories (see below), related to the level of interest of pupils. **As the firgures show, in the case of 94% of schoolgirls and 95% of schoolboys (average for all pupils is 94%) the increase of interest in STEM and scientific career has been declared by teachers**. It's worth to be highlighted, that the most popular category is "5": "The level of understanding increased compared to the prior state before the EDU-ARCTIC project by 30% and more". This proves, very high, factual quality of the project. We also calculated the average increase of interest in STEM and scientific careers among pupils. In this case, we assumed that in category "1" the typical increase for each pupil is 0%, in category "2" – 5%, in category "3" – 15%, in category "4" – 25% and in category "5" – 40%. For each category we assumed, that the distribution of values within it, is consistent with the normal (Gaussian) distribution, so the average of increase of knowledge in each category is the same as middle value of interval, defined in each category. In case of category "5", the interval is between 30% and 100%, so the middle value is 65%. For statistical purposes, we adopted smaller value – 40%. **The average increase of interest in STEM and scientific career is 26% for schoolgirls and 25% for schoolboys (average for all pupils is 26%).**

Therefore, it can be concluded that the KPI has been achieved.

To what extent does the project contribute to the increase of interest in STEM and scientific careers among your pupils?

Schoolgirls

Category	After	Number of pupils, declared by teachers in each category	%
1	There is no impact.	87	6,16%
2	The level of interest increased compared to the prior state before the EDU-ARCTIC project from 1% to 9%.	130	9,21%

3	The level of interest increased compared to the prior state before the EDU- ARCTIC project from 10% to 19%.	292	20,68%
4	The level of interest increased compared to the prior state before the EDU- ARCTIC project from 20% to 29%.	296	20,96%
5	The level of interest increased compared to the prior state before the EDU- ARCTIC project by 30% and more.	607	42,99%
	SUM	1412	100,00%
	SUM for categories: 2, 3, 4, 5.	**1325**	**93,84%**

Schoolboys

Category	After	Number of pupils, declared by teachers in each category	%
1	There is no impact.	75	4,93%
2	The level of interest increased compared to the prior state before the EDU-ARCTIC project from 1% to 9%.	140	9,20%
3	The level of interest increased compared to the prior state before the EDU- ARCTIC project from 10% to 19%.	334	21,94%
4	The level of interest increased compared to the prior state before the EDU- ARCTIC project from 20% to 29%.	398	26,15%
5	The level of interest increased compared to the prior state before the EDU- ARCTIC project by 30% and more.	575	37,78%
	SUM	1522	100,00%
	SUM for categories: 2, 3, 4, 5.	**1447**	**95,07%**

5.3.7 KPI Increase of the number of girls interested in scientific careers (+ 20% compared to input level) – level of implementation.

Below, we present a summary for KPI: "Increase of the number of girls interested in scientific careers (+ 20% compared to input level)".

Teachers had to define the number of girls in five categories (see below), related to the level of interest in scientific career. **As the figures show, in the case of 94% of schoolgirls the increase of interest in STEM and scientific career has been declared by teachers**. It's worth

to be highlighted, that the most popular category is "5": "The level of understanding increased compared to the prior state before the EDU-ARCTIC project by 30% and more". This proves, very high, factual quality of the project. We also calculated the average increase of interest in STEM and scientific careers among schoolgirls. In this case, we assumed that in category "1" the typical increase for each pupil is 0%, in category "2" – 5%, in category "3" – 15%, in category "4" – 25% and in category "5" – 40%. For each category we assumed, that the distribution of values within it, is consistent with the normal (Gaussian) distribution, so the average of increase of knowledge in each category is the same as middle value of interval, defined in each category. In case of category "5", the interval is between 30% and 100%, so the middle value is 65%. For statistical purposes, we adopted smaller value – 40%. **The average increase of interest in STEM and scientific career for schoolgirls is 26%.**

Therefore, it can be concluded that the KPI has been achieved.

To what extent does the project contribute to the increase of interest in STEM and scientific careers among your pupils?

Schoolgirls

Category	After	Number of pupils, declared by teachers in each category	%
1	There is no impact.	87	6,16%
2	The level of interest increased compared to the prior state before the EDU-ARCTIC project from 1% to 9%.	130	9,21%
3	The level of interest increased compared to the prior state before the EDU- ARCTIC project from 10% to 19%.	292	20,68%
4	The level of interest increased compared to the prior state before the EDU- ARCTIC project from 20% to 29%.	296	20,96%
5	The level of interest increased compared to the prior state before the EDU- ARCTIC project by 30% and more.	607	42,99%
	SUM	1412	100,00%
	SUM for categories: 2, 3, 4, 5.	**1325**	**93,84%**

6. General Conclusions

Primarily, the results show clearly, that each KPI defined within the project has been achieved to a degree exceeding primary assumptions. The logical conclusion from this remark is to suggest that such initiatives as EDU-ARCTIC do make a difference and that positive action may lead to clearly improved results.
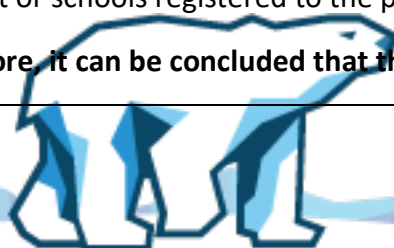
Generally speaking, there are no significant differences between girls and boys in the achieved level of knowledge about issues related to the Arctic, the level of understanding of scientific issues and scientific language among pupils and the level of interest in STEM and scientific careers after the participation in the EDU-ARCTIC project. However, the clear progression of girls' interest in STEM and careers as a scientist are a significant result of the project, just like the strong increase in knowledge about the Arctic, environmental issues and climate change. Regarding the interest of young people in STEM and their skills in related subjects, as well as knowledge about the Arctic, the project's objectives have been achieved.

The summary of results for all KPIs is presented in the table below:

Indicator value (KPI)	Results and means of verifications
1. Utility of educational tools proposed and implemented in the project during online lessons (70% of teachers who took part will assess utility of at least one tool on a grade of 5 or 6).	**ACCORDING TO „AFTER EDU-ARCTIC SURVEY – MAIN SURVEY":** For each tool more than 90% of teachers assess its utility on 5 or 6: Online lessons: 94% Polarpedia: 93% Monitoring system: 91% **Therefore, can be concluded that KPI has been achieved.**
2. Visual attractiveness of educational tools proposed and implemented in the project (70% of teachers who took part will assess visual attractiveness of at least one tool on a grade of 5 or 6).	**ACCORDING TO „AFTER EDU-ARCTIC SURVEY – MAIN SURVEY":** For each tool more than 90% of teachers assess its attractiveness on 5 or 6: Online lessons: 98% Polarpedia: 95% Monitoring system: 94% **Therefore, it can be concluded that the KPI has been achieved.**
3. Frequency of using educational tools	**ACCORDING TO „AFTER EDU-ARCTIC SURVEY – MAIN SURVEY":**

proposed and implemented in the project (70% of teachers who took part will assess frequency of at least one tool on a grade of 1, 2 or 3).	Each tool was used by more than 70% of teachers on average once a month and more often: Online lessons: 76% Polarpedia: 80% Monitoring system: 47% **Therefore, it can be concluded that the KPI has been achieved.**
4. Enhancement of knowledge about science and scientific research, as well as their place in the modern world (+ 15% compared to input level)	**ACCORDING TO „SKILLS ASSESSMENT SURVEY":** The average increase is: 24% for schoolgirls, 23% for schoolboys (**24% for all pupils**). **Therefore, it can be concluded that the KPI has been achieved.**
5. Enhancement of knowledge about nature, geography, natural resources, history, social and political specificities concerning polar regions and increase of sensitivity to environmental issues and climate change (+ 15% compared to input level)	**ACCORDING TO „SKILLS ASSESSMENT SURVEY":** The average increase is: 30% for schoolgirls, 28% for schoolboys (**29% for all pupils**). **ACCORDING TO „AFTER EDU-ARCTIC SURVEY – MAIN SURVEY":** the increase of knowledge has been declared by teachers for 95% of schoolgirls and 95% of schoolboys (average for all pupils is 95%) **Therefore, it can be concluded that the KPI has been achieved.**
6. Establishing strong links between the worlds of research and young people/ society in order to increase their ability to understand scientific messages and scientific language (+20% compared to input level).	**ACCORDING TO „AFTER EDU-ARCTIC SURVEY – MAIN SURVEY":** the increase of ability to understand scientific messages and scientific language has been declared by teachers for 95% of schoolgirls and 96% of schoolboys (average for all pupils is 95%) The average increase of ability to understand scientific messages and scientific language is 27% for schoolgirls and 26% for schoolboys (**average for all pupils is 26%**). **Therefore, it can be concluded that the KPI has been achieved.**
7. Implementation of innovative tools by way of an e-learning portal and effective methods of teaching science on a regular base in schools in at least 10 European countries (Minimum 500	**ACCORDING TO ONLINE REGISTRATIONS ON THE EDU-ARCTIC PORTAL:** The total number of schools registered to the EDU-ARCTIC program is **766**. They are located in **59 countries**. At least 700 schools are located in 35+ European countries. For details see D6.1 List or schools registered to the program. **Therefore, it can be concluded that the KPI has been achieved.**

schools from 10 European countries)	
8. Introduction of the EDU-ARCTIC program in schools in at least 10 European countries (Minimum 3.500 schools from at least 10 European countries).	**ACCORDING TO THE DISSEMINATION REPORTS FROM PARTNERS AND TEACHERS:** The number of teachers, who participated in events, where the EDU-ARCTIC program was presented is at least **4133** (see Deliverable D7.8 List of events and publications presenting the project). **ACCORDING TO THE GOOGLE ANALITICS FOR THE EDU-ARCTIC PORTAL:** Total number of individual users of the portal (program.edu-arctic.eu) in the last school year is **6478**. As the portal is dedicated to teachers (unlike the main website and Polarpedia, which are visited by general public), we assume that at least 75% of the users are teachers and educators (which means ca. 4850 individual users). The users were from **103 countries**. **Therefore, it can be concluded that the KPI has been achieved.**
9. Increase of the number of young people interested in STEM and scientific career (+ 25% compared to input level).	**ACCORDING TO „AFTER EDU-ARCTIC SURVEY – MAIN SURVEY":** the increase of interest in STEM and scientific career has been declared by teachers for 94% of schoolgirls and 95% of schoolboys (average for all pupils is 94%) The average increase of interest in STEM and scientific career is 26% for schoolgirls and 25% for schoolboys (**average for all pupils is 26%**). **Therefore, it can be concluded that the KPI has been achieved.**
10. Increase of the number of girls interested in scientific careers (+ 20% compared to input level).	**ACCORDING TO „AFTER EDU-ARCTIC SURVEY – MAIN SURVEY":** the increase of interest in STEM and scientific career has been declared by teachers for 94% of schoolgirls The average increase of interest in STEM and scientific career **for schoolgirls is 26%**. **Therefore, it can be concluded that the KPI has been achieved.**