

EDU ARCTIC

D3.2 Report on requirement analysis

Report

(Public)

Project Acronym: EDU-ARCTIC

Project Title:

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

NUMBER — 710240 — EDU-ARCTIC

Document information summary

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Target audience:	Consortium members, REA/European Commission (EC), other interested parties
Delivery date:	M4
Version:	3.



This project (EDU-ARCTIC) has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 710240.

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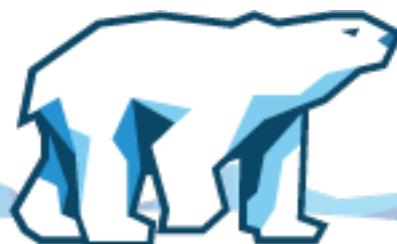
Executive summary

The current report concerns Deliverable D3.2 *Report on requirement analysis*. The report presents the results of the CAWI Survey (Computer Assisted Web Interview) that has been issued among STEM teachers in 4 countries (Poland, France, Norway and Faroe Islands). Information was collected from 42 schools. This report focuses on the requirements of STEM teachers concerning the EDU-ARCTIC program and helps to achieve the objectives set out in WP3 *Preparatory of EDU-ARCTIC Program*. This report is the second step for the preparation of recommendations for the EDU-ARCTIC program. It stresses the needs and possibilities to use the program by STEM teachers.

The report presents the statistical information from each question, which is followed by the descriptive part with global analyses and information on the differences among countries. The final part of the document contains recommendations for the program development. Materials presented in this document, together with the project's Deliverable 3.1 *Desk research* (delivered in month 2) will be further analysed and used for preparation of the Deliverable 3.3 *Recommendations for EDU-ARCTIC Program* (due in month 5).

1. Introduction

The first step for the preparation of this report was to prepare a survey addressed to stakeholders (teachers, schools) to collect their requirements as far as the EDU-ARCTIC program is concerned. The information was gathered with the use of CAWI survey (Computer Assisted Web Interview). The content for the survey was conceived by Instytut Geofizyki Polskiej Akademii Nauk (IGF PAS). It was then prepared in three languages: Polish for Polish schools, French for French schools, and English for Norwegian, and any other interested schools. Subsequently, the survey was conducted with the use of an online form elaborated by AMERICAN SYSTEMS SP. ZOO (AS). The survey about the implementation of EDU-ARCTIC was realized in June-July 2016 among potential participants from four countries in Northern, Western and Eastern Europe, representing four countries, and 42 schools. The survey gathered information about: the scope of educational material, major expectations from the program, suggestions regarding EDU-ARCTIC materials, recommendations what should be the focus of EDU-ARCTIC transmissions etc. Some organizational information was also collected: e.g. how often teachers could take part in online lessons and during what kind of classes, as well as in the range of which subject, etc. Results are analyzed and summed up in this report.



The purpose of the survey was to collect information illustrating the interest and readiness of teachers and schools from lower and higher secondary education to participate in the project. The aim was to determine preferred subject matters, themes and methodologies, as well as becoming aware of potential problems concerning language.

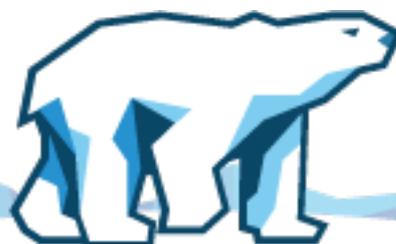
42 responses were collected. In the table below the distribution of the responders by countries and types of schools is presented.

Country	Number of schools	Type of schools
Poland	30	Lower secondary schools Higher secondary schools Vocational schools
France	4	Lower secondary schools Higher secondary schools
Norway	6	Lower secondary schools
Faroe Islands	2	Lower secondary schools

2. Methodology

The data was collected by use of a CAWI Survey. CAWI (Computer Assisted Web Interviews) research technique is an interview in which the participant fills in an online questionnaire or survey received via the Internet. Currently the CAWI method is one of the most popular and fastest-growing research methods. Compared to other methods, with a sense of anonymity and the opportunity to participate in the study at a time convenient for the respondent, it allows to collect more accurate data. It is also a very cheap method. Other important advantages in view of this report include:

- quick access to the data - received data is already in electronic form;
- easily obtained information on the number of filled-in surveys during the process;
- electronic surveys are easier to correct, even if an error is found after the survey has been prepared;
- participants have the opportunity to remain anonymous, hence more honest and this can provide more accurate data;
- a survey available on the network is available all over the world.

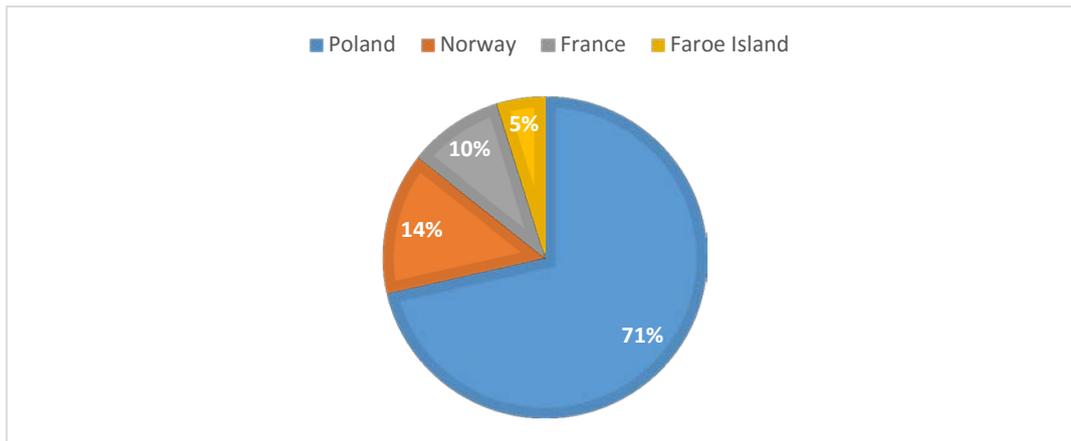


3. Requirement analysis

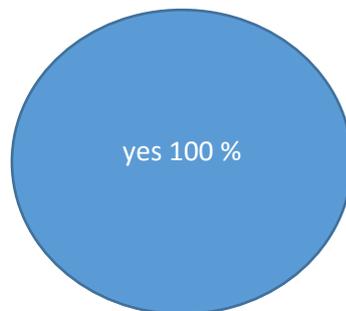
3.1 Analysis of responses to the survey – statistical part

The statistical analysis per each question from the survey is provided below:

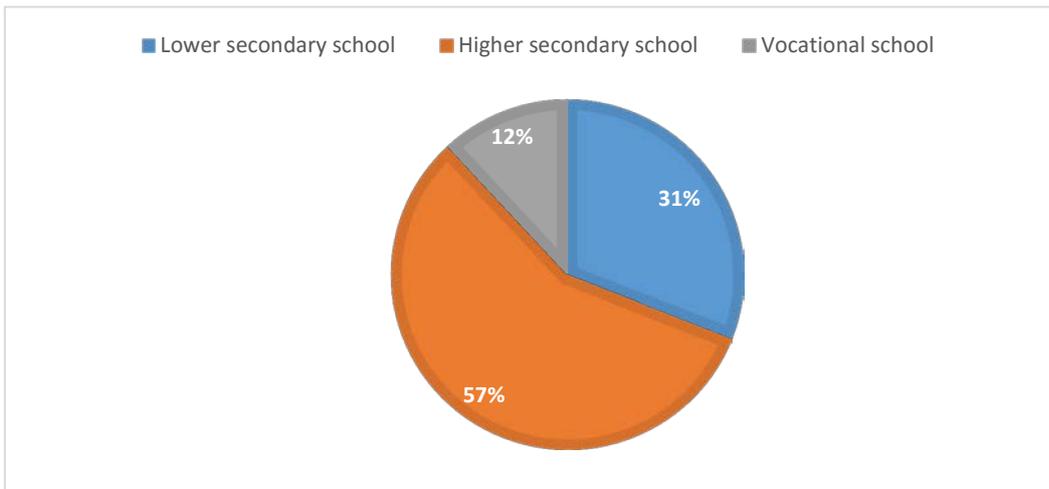
1. Please provide the name of the country you live in.



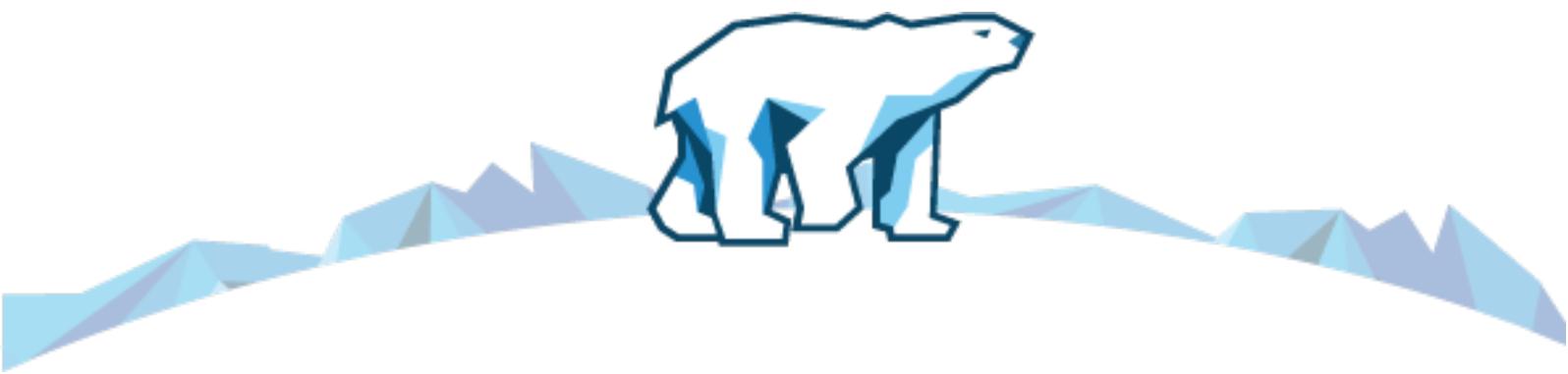
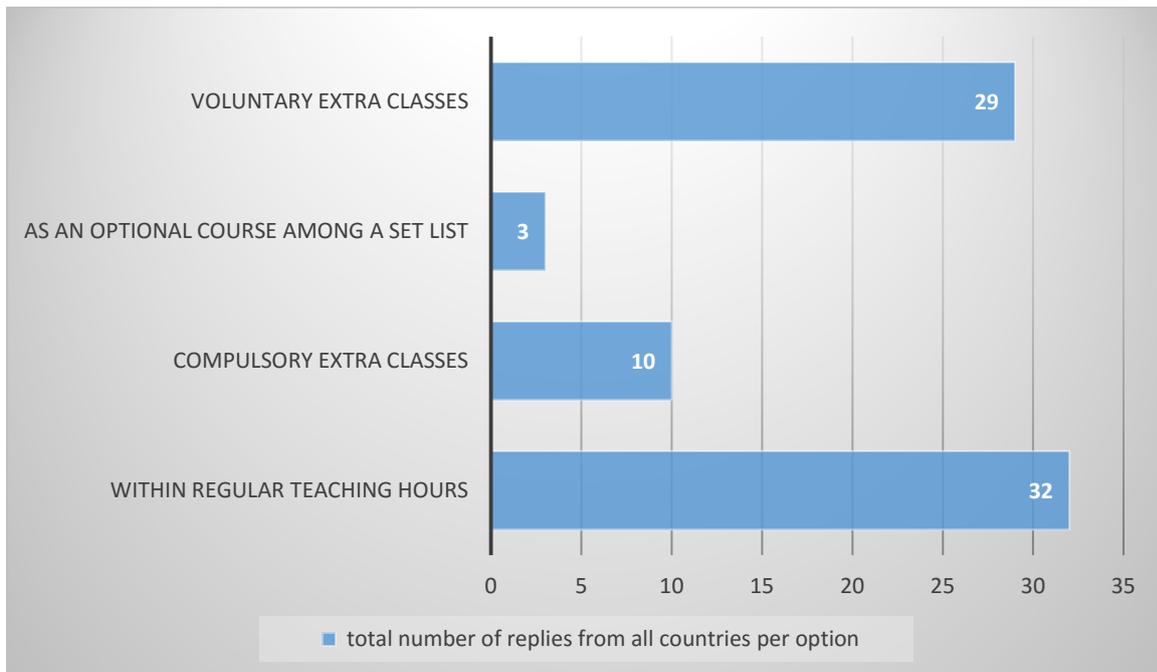
2. Are you interested in extending current science curricula at your school by including additional material on the Arctic environment and polar research?



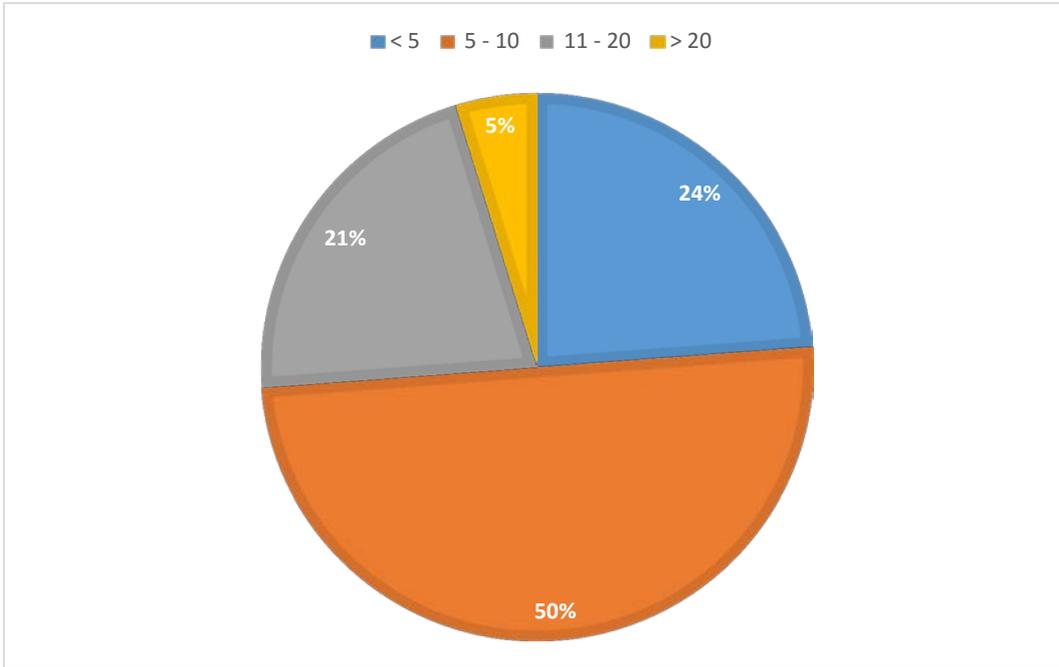
3. Please indicate the type of school you are teaching at.



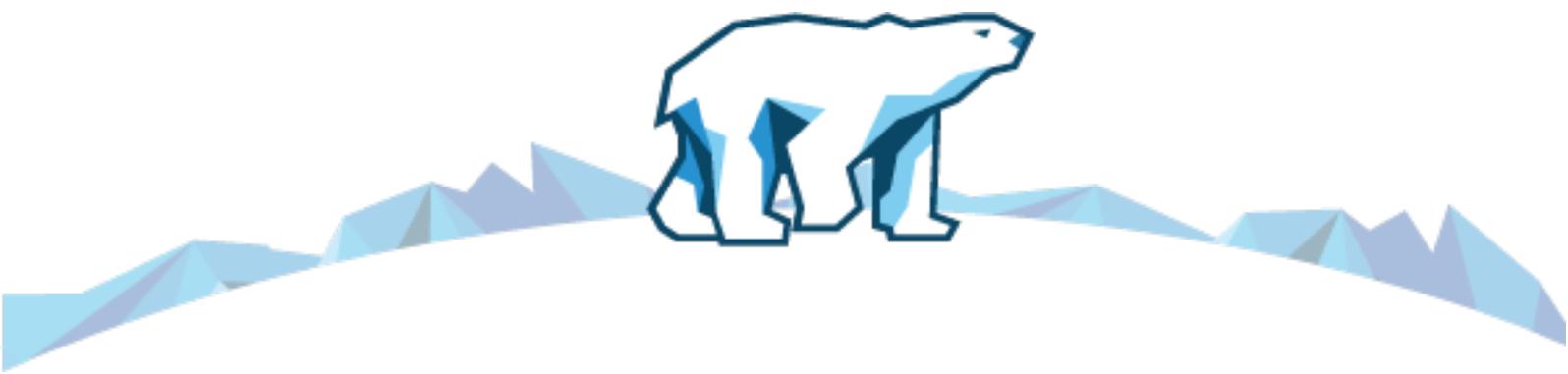
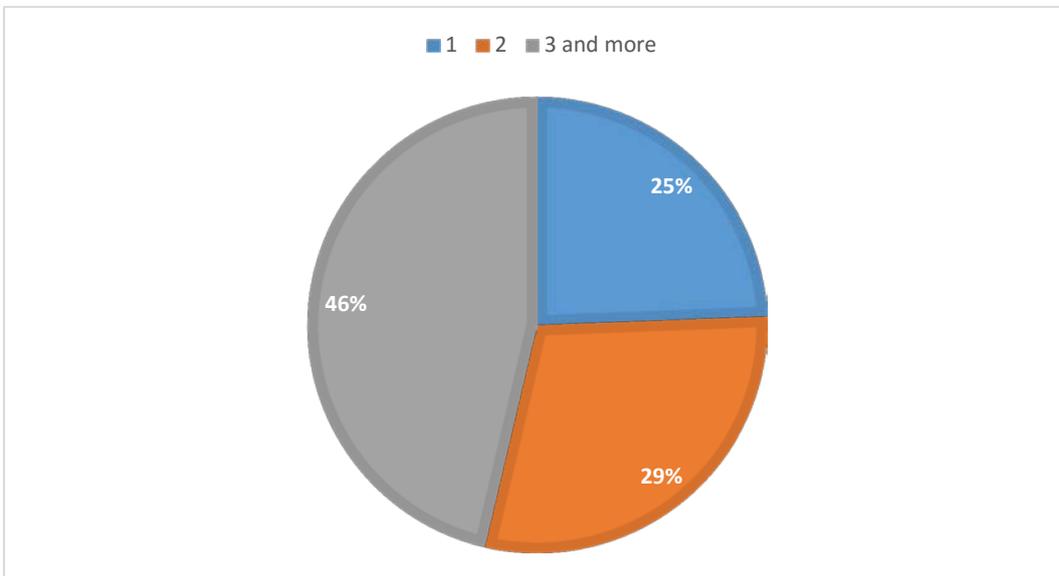
4. In what type of activities could you include elements of our project? (you can choose several answers).



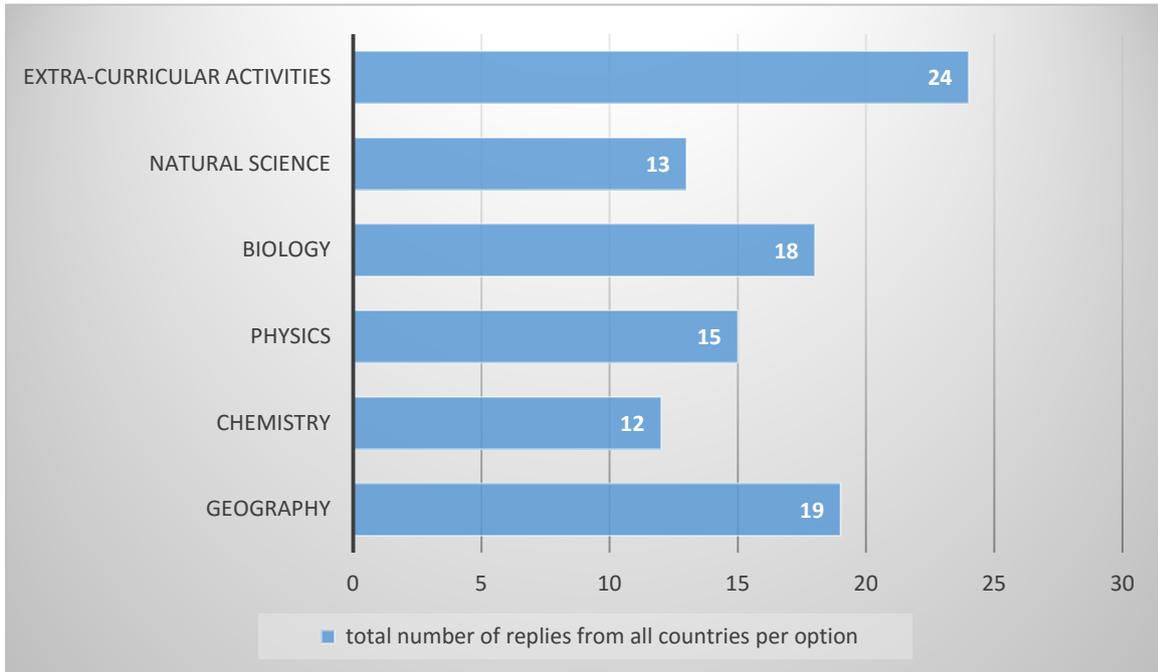
5. How many hours per school year could you dedicate to the Arctic and polar research per group?



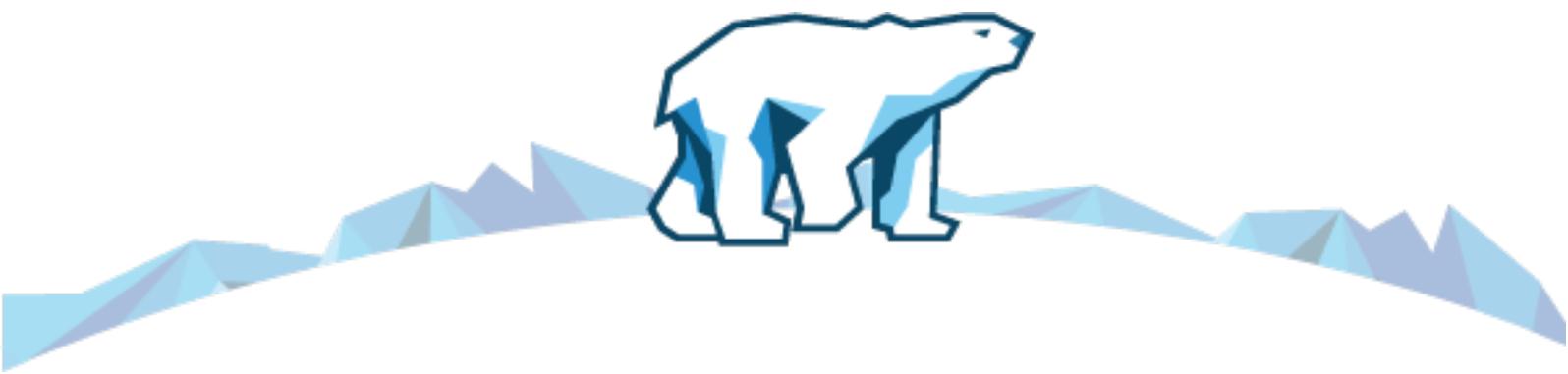
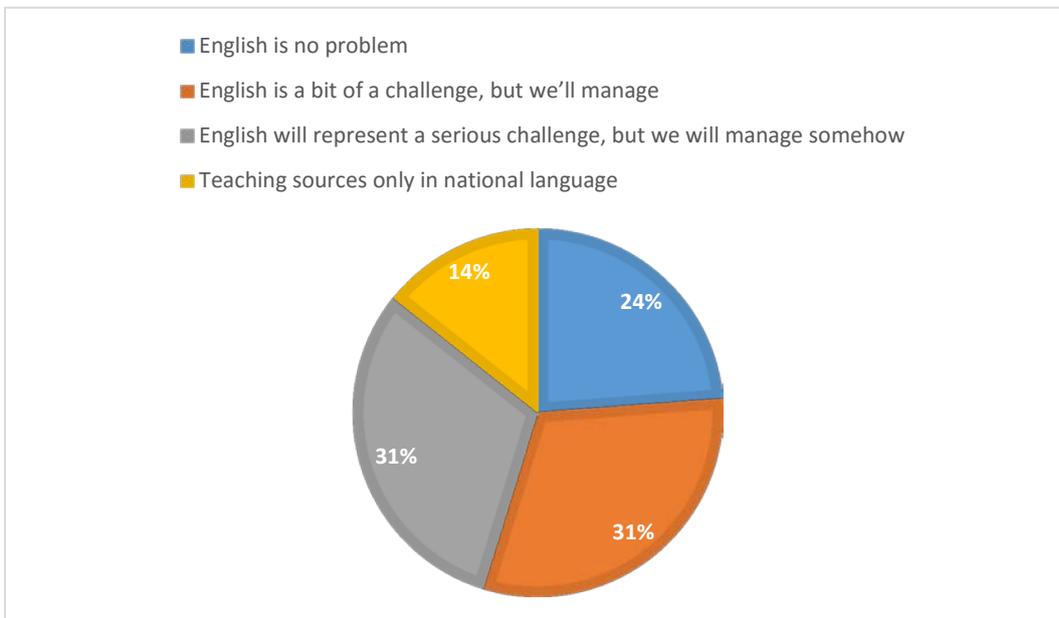
6. How many groups could benefit from EDU-ARCTIC at your school?



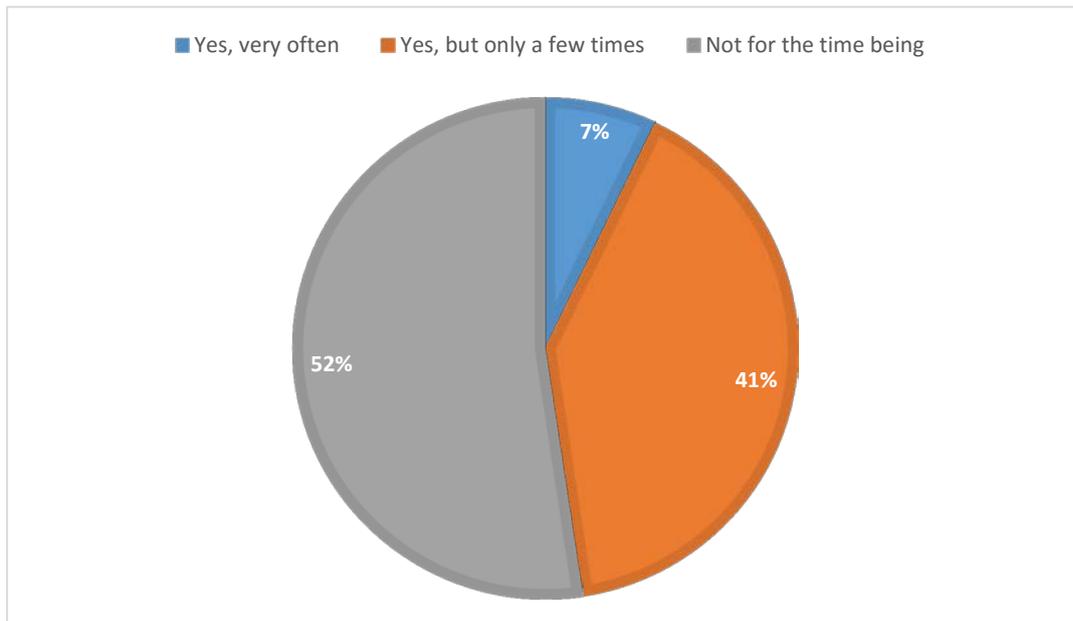
7. In which type of classes could you include EDU-ARCTIC elements? (you can choose several).



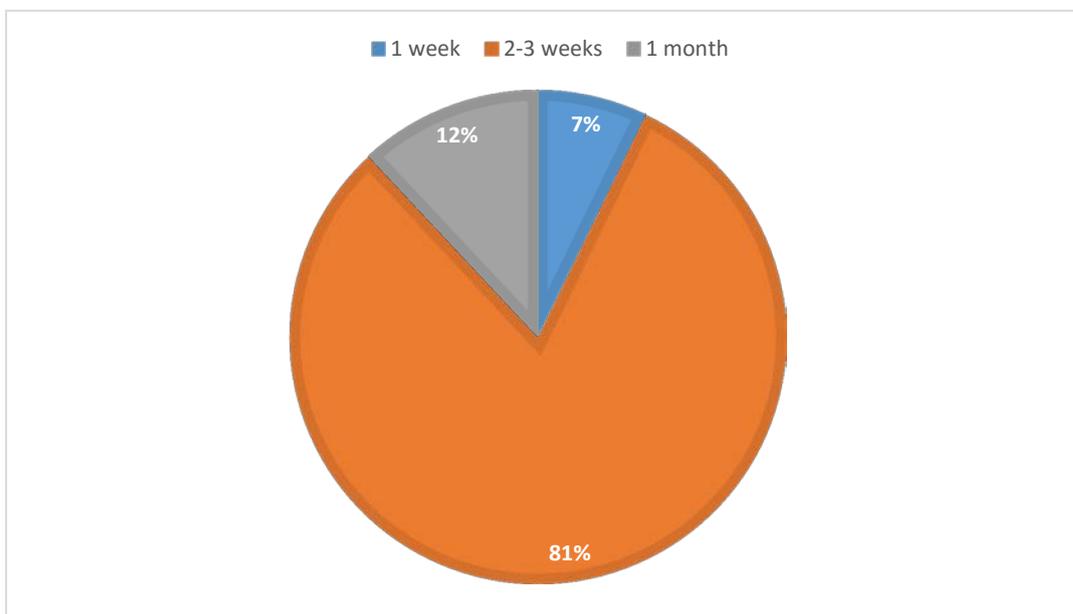
8. To what extent are your pupils in a position to benefit from the transmissions and educational material in English?



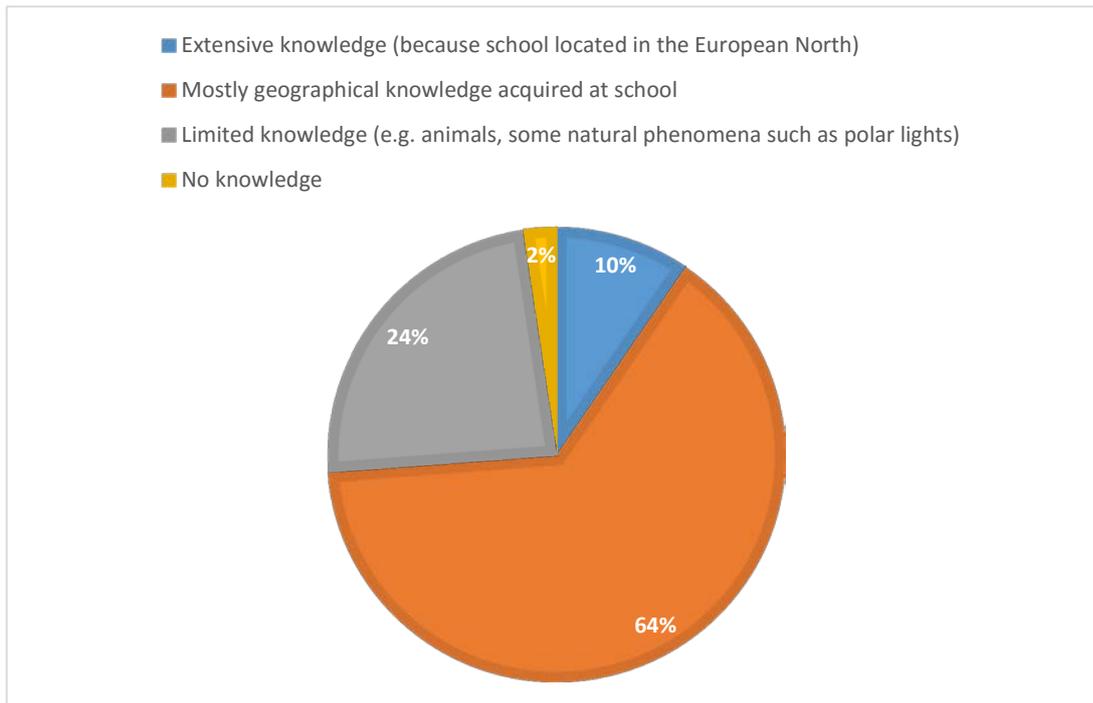
9. Have your pupils participated in online lessons already (e-learning platforms or webinars)?



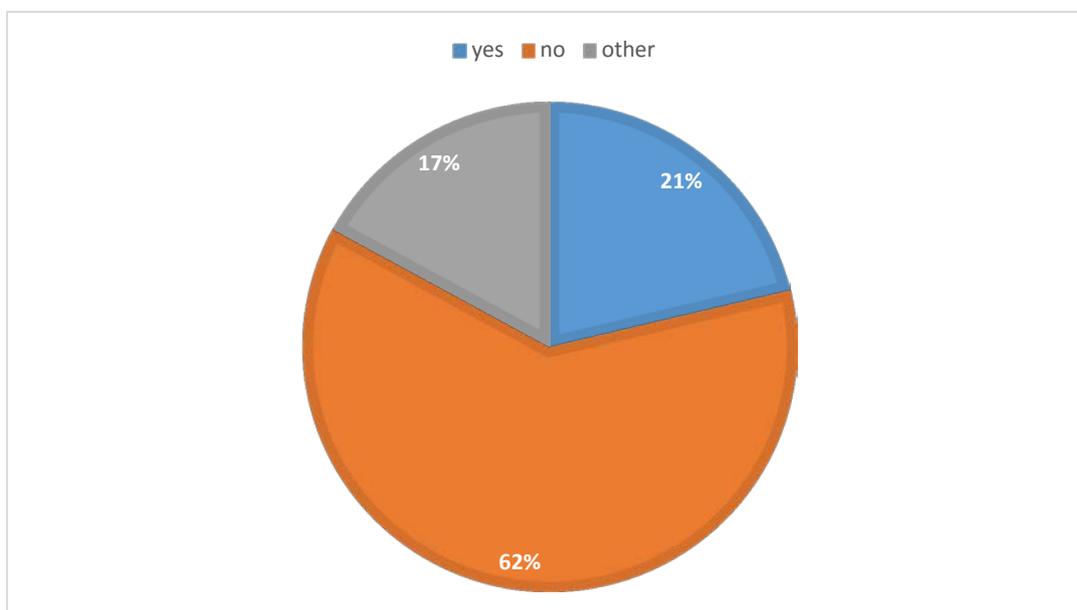
10. How far in advance do you need to be informed about an online lesson that will be proposed?



11. What do your pupils know about the Arctic already?



12. Do you or your school practice or participate in any program of nature observations? (If Yes, please elaborate on programs in other section).

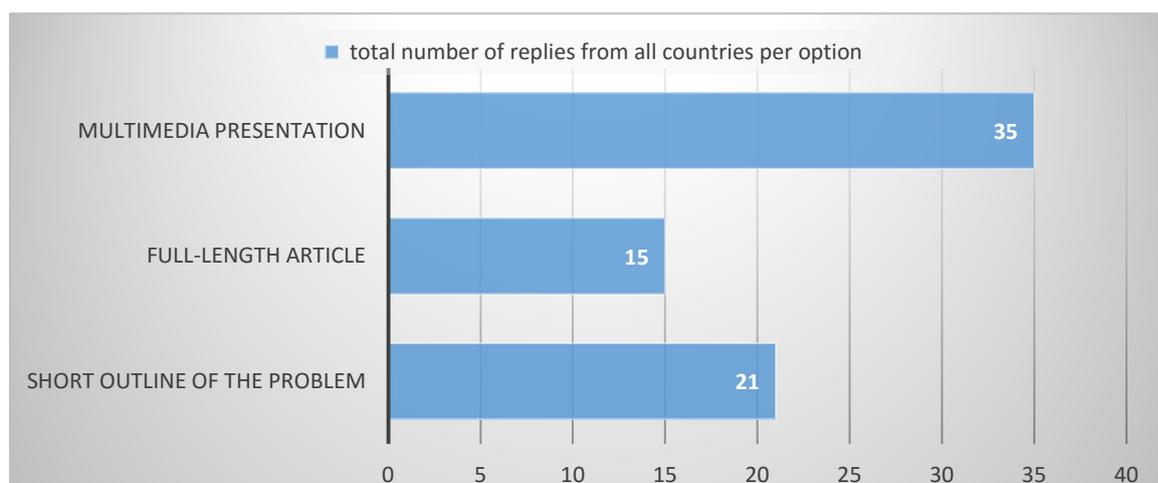


13. What type of nature observation is most important for your teaching and the school curriculum?

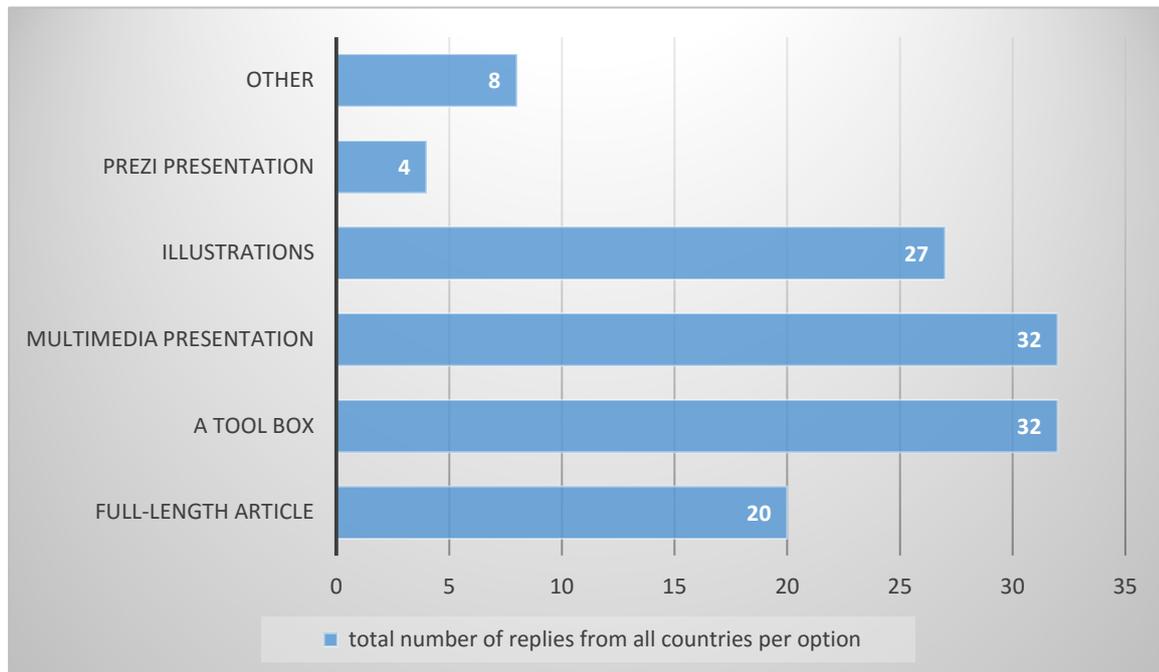
Type of nature observation	number of replies
Animal live (birds, insects)	4
Biological and environmental changes	1
Landscape	1
Plants	3
Physical-chemical properties (weather, air, soil, precipitation)	4
Natural phenomena	1
Meteorological observation / weather	4

Methodology of nature observation	number of replies
Local observation	4
Observations for scientific purposes	1
Field observation	7
Tools of observation (microscope)	2
Nature monitoring	1
Individual observation	2
On-line observation	1
Phenology	3

14. What kind of introductory material would you need in advance for a polar lesson? (you can choose several answers).

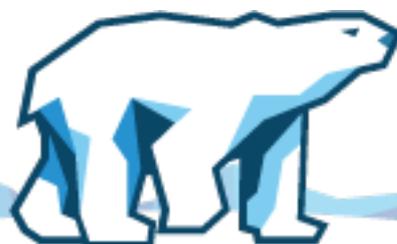


15. Which type of teaching tools do you prefer to use in class? (you can choose several answers).



16. Please indicate a few Arctic themes likely to be of interest to your pupils.

Arctic themes	number of replies
Climate	8
Weather	2
Animals	17
Plants	8
Tundra life	1
Changes in the environment	2
Impacts of Arctic melting	1
Salt density in the world's oceans	1
The Polar ice role on earth	1
The new world map after the polar ice melted	1
Northern lights	4
Rise of temperature due to CO2	1



Animal migrations	1
Phenology	1
Can penguins meet a polar bear	1
The origin of glaciers	2
Ocean wildlife	1
Food chain in the Arctic Ocean	1
Minimum & maximum temperatures	3
Sky observation	1
Physical and chemical reactions in low temperatures	1
Chemical composition of water	1
Scientific research in the Arctic	2
Man in the Arctic	4
Physical and chemical reactions at the North and South Pole	1
Life in an Arctic research station	2
Pollution and protection of the environment	2
Different shades of white	1
Size and depth of glaciers	1
Melting of glaciers	1
History of polar research	1
Polar nights	1

3.2 Analysis of responses to the survey – descriptive part

In this subsection analysis of the teachers' answers are presented. The results of the survey are here presented globally, but include information on the differences per country.

The survey has revealed high interest in EDU-ARCTIC in all of the countries participating in the enquiry (100%). The majority of teachers responding to the questions came from higher secondary schools (57%). Only responses from Norway and France came from teachers of lower secondary schools in the majority. As to the participation of vocational schools, only Polish schools were involved.

EDU-ARCTIC online lessons can be performed in regular teaching hours (32 answers), voluntary extra classes (29 answers), compulsory extra classes (10 answers) or extra-

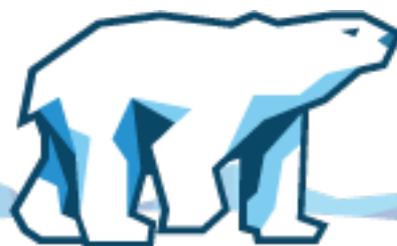


curricular classes (3 answers). Half of the schools are ready to use the EDU-ARCTIC program during 5 to 10 hours per school year. Over 20% of responders declared their possibility to use the program during less than 5 hours or during 11 to 20 hours. Only 5% of teachers are ready to conduct the program during more than 20 hours. There are slight differences between countries: in Norway, Poland and the Faroe Islands a majority of teachers is ready to use the program from 5 up to 20 hours, in France from 5 to 10 hours per school year. Almost the half of responders (46%) declared that the program could be offered to 3 or more groups of students in their schools. It may result in increasing the total number of students benefiting from the program. The EDU-ARCTIC program may be proposed most readily during extra-curricular activities (24 replies). It could also be realized during Geography (19 replies) and Biology classes (18 replies), followed by Physics (15 replies), Natural Science (13 replies) and Chemistry (12 replies). This is probably due to the fact that science is taught as one subject in Polish schools (main responders) only for pupils, who are generally not interested in STEM classes.

The use of English is seen mainly as a bit of a challenge or even a serious challenge, but the schools are ready to tackle the problem. 24% of the responders consider that English is not a problem for their students. Schools from Northern Europe have least trouble with English. For 25% of the French schools and 23% of Polish schools, English is seen as a major problem, but only a very small number of Polish schools declare that they cannot use English-language source materials.

Most responders have never participated in online lessons (52%) or have done it only a few times (41%). 7% of them declared frequent participation in webinars of various kinds. No significant differences among countries emerge as to the question of online lesson participation. Most teachers require information on the organization of an online lesson to be provided 2-3 weeks in advance.

A majority of pupils have geographical knowledge about the Arctic acquired at school (64%). 24% of responders declared that their students have limited knowledge about natural phenomena in the Arctic. Teachers asked about potential themes to be presented in the program, suggested physical and chemical properties (weather, air, soil, precipitation), meteorological observations, animals and plants. Participants in general wish to work with themes connected with the local context. Field observation as a part of educational activities is also often mentioned. Regarding introductory methods, visual approaches such as PowerPoint, illustrations or tool boxes are preferred, supported by short outlines of problems (concerning the list of preferred subjects, see point 13).



4. Remarks and recommendations for implementation

Basing on the results of the survey, the following recommendations for the program's development and implementation have been suggested:

- 1) A majority of replies to the survey come from higher secondary schools. It is to be hoped that more lower secondary schools, esp. from Northern and Western Europe, will be attracted by the program.
- 2) Given the fact that online lessons will be offered largely during voluntary extra classes, pupils' motivation needs to be stimulated by additional activities (e.g. the Arctic competitions).
- 3) It is to be noted that interest in Arctic physics and chemistry appears a little lower than to Geography and Biology. This merits some attention.
- 4) Activities and online lessons need to take into account the English-language difficulties that a majority of schools consider a challenge (facilitate access by using visual material as far as possible).
- 5) Taking into account the lack of experience of the majority of schools in participation in online lessons, special attention should be paid to this problem during the Educator Fora and elsewhere. Having some testing webinars for teachers only could be also a good opportunity.
- 6) The varying degree of willingness among pupils to participate actively in discussions should also be taken into account.
- 7) Given the relatively sound geographical knowledge of pupils suggested by the survey, attention should be focused on less well-known but nonetheless important subjects such as Biology, changes and human impact on the Arctic, global impact of Arctic changes. Interestingly enough, these latter subjects were mentioned mostly by responders from the Arctic countries only.
- 8) As to methodology, quite a few replies stress the interest of active participation of pupils by way of individual observation or as a group.

