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CLIMATE CHANGE CONCERN AND COMMUNICATION PATTERNS WITHIN YOUNG PEOPLE AND THEIR PARENTS

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Abstract: Environmental education is a crucial starting point for environmentally friendly behaviour and raising awareness. Opposite of adults, children in the pre-adolescent and adolescent period are capable of accepting specific models of environmental behaviour. Adopting environmentally friendly lifestyle is a safe pathway to sustainable development. Since the children still do not have any perception of climate change (CC), a proper education could yield in intergenerational knowledge transfer and rising awareness on CC among elders. This research was conducted in several phases: Phase I- a preliminary survey that was provided among elementary school children (7-14y) and their parents with the primary goal to examine their perception on persona knowledge, awareness, concerns and communication patterns on C. Phase II included educational workshops on CC and the renewable sources of energy, and Phase III was a final survey that has the main goal to examine the effects of previous activities. The result indicated that both children and parents have a high-level perception of personal knowledge. Also, children think that their parent also has a high level of expertise on CC while the perceptions on peers knowledge are quite the opposite. Answers that indicate mutual communication among children and parents showed different results. From the children's point of view, the lack of communication is revealed, while parents perceive that communication is good. Finally, after the workshops and education, the final survey indicated that communication among children and parents had been improved, but communication among peers seems to deteriorate:

Keywords: Environmental perception, Intergenerational knowledge transfer, Communication, Environmental education

INTRODUCTION

The development of industry and the growth of the population, climate change becomes more evident and intense, so the combat against climate change today is one of the priorities in political agenda of the international community, which is reflected in many international conventions and agreements [1], [2], [3].

The decisions of individuals in terms of changing life habits can have the effect of mitigating the impact of climate change, but solving this problem on a global level requires global action. Political ideologies of individuals and worldviews may have a negative impact on solving this problem because they lead people to ignore risks, so it is very important to direct climate change communication efforts towards integrating scientific knowledge into political ideologies and worldviews [4].

One way to encourage climate change mitigation actions is effective communication of climate change science. This way, it influences the building/making positive attitudes of the public regarding the legitimacy of the science of climate change, the ability of individuals to contribute to solving problems, as well as the

adverse effects of not taking actions aimed at adaptation and mitigation actions [5].

When one talks about environmental education to shape attitudes and eventually change behaviour, children are often the target group. The main reason is that attitudes about environmental problems begin to develop at an early age, and already formed attitudes are difficult to change. Studies have shown that environmental attitude and behaviour of children increases until the age of about 10-12 years when it begins to decline until young adulthood, i.e. in the period between 13 and 18 years it rises again [6], [7].

Despite the widespread belief that parents are the ones who transfer knowledge to children and shape their attitudes, it has been shown that there is a two-way influence among parents and children and that communication between children and adults can play a significant role in evolving understanding of climate changes. Children may be able to overcome anti-reflexive tendencies of adults through intergenerational learning in the context of climate change. However, the impact of children on parents is not yet well-evaluated, and it is not known to what extent children influence their parent's consciousness and behavior through things they learn in school and take home [5], [8], [9].

In this paper the results obtained within the project "Development and application of the model for raising intergeneration awareness on environmental behavior, environmental protection and climate change in the Autonomous Province of Vojvodina" that is financially supported by Provincial Secretariat for science and technological development (No.142-451-2524/2019-02.).

The project was provided during the period of July 2019-August 2020 in several and had several phases that included preliminary survey that had a goal to take a insight in general situation on awareness and knowledge on climate changes among pupils and their parents, creative workshops and final survey to evaluate the effects of education. In this paper only a part of the research will be presented that refers on adolescent perception and their peer communication as well as the communication with adults (mostly parent) on climate change issues.

MATERIALS AND METHODS

To reach defined goals of the Project, research was provided in different parts of Vojvodina province among elementary school pupils (7-14y and their parents).

Research was provided in several phases. Phase I includes preliminary activity: consultation with teachers, preparation of workshops and definition a preliminary survey that has a goal to insight into the basic perception and knowledge on CC among participant. Phase II included workshops that has a goal to educate pupils on CC courses and consequences and the importance of using the renewable energy as CC mitigation process.

The survey contained two groups of questions: general and specific questions. General group covered questions on age, gender [10], education [11], questions with attention to analyze conceptual approaches to the problem of climate change [12]. Also, this group included questions regarding personal views on climate change, their religious commitment as well as nationality.

Comparative view of the questions in preliminary and final survey is presented in Table 1. Most of the questions have a choice of the answers that was suitable for age structure: Some of the questions are formulated as a dummy variable (for gender) or an interval level variable (for age). Some question included a statement, with which participants could agree, disagree, or neither on a 5-point scale (i.e. Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree), and some of the questions implied the option for participants to formulate their answer.

The questions that included free/opinion answers were revised and systematized into groups that included the most frequently represented answers.

Table (1) The group of questions that refers to personal knowledge and concern on CC

Younger pupils I-IV grade (7-10y)	Older pupils V-VIII grade (11-14y)	Parents
Do you know that ice is melting on the North Pole?	Where have you heard about CC?	
Do you know why ice is melting?	I know a lot of about CC.	
Do you know whose responsibility is that?	I think that CC will cause a lot of problems in future.	
Are you concerning because ice is melting?	I am concerned about CC issue.	

Table (2) The group of question that refers to peer communication and parents' communication

Participants	I survey	II survey
Younger pupils I-IV grade (7-10y)	Have you heard your parents talk about climate change?	
	With whom do you talk about CC?	To whom you talked most about what have you learned on workshops about climate changes and renewable energy sources?
		What did you learn your parents/grandparents about CC?
Older pupils V-VIII grade (11-14y)	My parents know a lot about CC.	
	Our family talk very often about CC.	Our family now talk more often about CC.
	With whom do you talk about CC?	To whom you talked most about what have you learned on workshops about climate changes and renewable energy sources?
	Most of my friend know a lot about CC.	
	I talk with my friends about CC.	
Parents	Our family talk very often about CC.	Our family now talk more often about CC.
	My child is interested in discussion on CC.	My child is now more interested in discussion on CC.
		Workshops have improved my child's knowledge on CC.
		After workshops my child have improved my knowledge and awareness on CC.

RESULTS AND DISCUSSION

Participant's profile

In the preliminary survey participated with 300 pupils (age 7-15) and 294 parents. Majority of parents (74%) were in age range from 25-31. Great share (58%) of parents has academic degree (B.Sc, M. Sc and Ph. D degree) mostly in engineering and pedagogy.

Final survey was provided online because of lockdown due the Covid-10 pandemic, resulted in lower share of participants in the final survey: 159 pupils and 144 parents.

PRELIMINARY SURVEY RESULTS

Personal perception on knowledge and awareness on CC issue

As a first step, in preliminary survey, personal perception on CC was examined (Table 1). For younger pupils, a simple question was asked: "Do you know that Ice is melting on the North Pole?" We concluded that younger pupils are aware of ice melting because the majority (65%) answered that they know about this issue. Older pupils (11-14y) were asked same question: "Have you heard about CC?" Half (50%) of older pupils answered that the CC is one of the topics that they learn in school, and 29% stated that the media (tv, internet and radio) was the main source of this information about CC. Opposite, 56% parents stated that they are informed on CC by media, and 22% stated that they learned about CC in school.

Since the pupils, nevertheless their age, are informed and know something about CC, next step was to examine their personal perception of knowledge about CC issue. Young pupils were asked "Do you know why ice is melting?" According to their answers we concluded that they are not sure about the causes of this phenomenon because only 12% of answers indicated knowledge ("Because of global warming" and "Because of climate changes"). The rest of the pupil did not give the satisfying answers that indicate their knowledge. Additionally, more that 51% young pupils know that the human's activity made this change.

Personal perception of knowledge about CC issue among older pupils and parents was examined with the direct statement "I know a lot of about CC". Answers indicated that 49% of older pupil positively answered (I agree 43% and I totally agree 6%). Still, share of pupils that negatively answered (I do not agree 17%, I do not agree at all 2%) and those who does not have any opinion on this topic (29%) is not negligible. So, the personal perception is polarized between the pupils whose personal perception on CC knowledge high and those who are not. Parents are confident in their knowledge on climate change. More than 82% of parents stated that their knowledge on CC is particularly good.

When we speak about concern on CC issue, younger pupils showed significant concern. More than 77% of them answered that they concerned about ice melting. Personal concern on CC, among older pupils and parents was examined through two questions: "I am concerned about CC issue" and "I think that CC will cause a lot of problems in future" (Table 1). Results of answers (Figure 1) showed that 45% percent pupils showed

their concern on CC (I agree 30% and I totally agree 15%). Still, 27% answered that they do not agree with the statement “I am worried about CC issue “, and 28% of pupils stated that they do not have opinion. Answers on statements „I think that CC will cause a lot of problems in future” indicated similar results. Most of the older pupils (58%) are aware of the CC seriousness, but 20% of them stated that they do not find that CC will cause a lot of problems in future, and 23% of them do not have opinion. To examine parents concern on CC, the same two questions were asked. Results indicated that parents more concerned on cc issue then children (Figure 1).

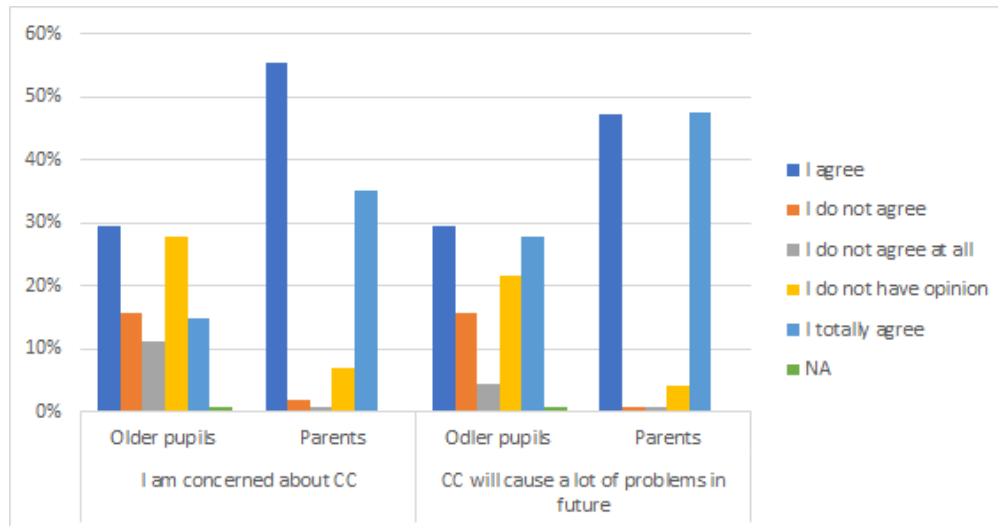


Figure (1) Answers: “I am concerned about CC” and “CC will cause a lot of problems in future” (Pupils (10-14y) and parents)

After the preliminary survey, a set of educational workshops on CC and renewable energy sources, were provided among all the pupils. Furthermore, after the education an online survey was provided to examine the communication improvement between parents and children.

Mutual communication on CC among parents/pupils and among peers was also examined. Questions that were asked in preliminary and final survey are presented in Table 2. In comparison to the preliminary survey, in final survey some of the questions were modified and some of them remained the same (Table 2).

Younger pupils were asked: “With whom do you talk about CC?” Literally, lack of communication was indicated. Share of 54% young pupils stated that they do not talk at all with parents/grandparent about CC. Still, 23% pupils stated that they have communication and most of them (22%) with their mothers (Figure 2). Older pupils were asked how often they talk on CC issue with their parents/grandparents. Answers indicated that, although older pupils have higher level of knowledge, they do not talk on this topic very often with their parents and grandparents. Similarly, like at young pupils, among older pupils the communication is more frequent with mothers (36%), with fathers (25%) (see Figure 2).

Results of final survey showed a positive trend and improved communication among parents and children. We recorded higher percentage of positive answers about communication. Also, a significant reduction of answers “we do not talk about CC at all” (see Figure 2).

Another proof of improved communication was reflected through the answers of younger pupils that were asked: „What did you learn from your parents/grandparents about CC? All the pupils respond to this question giving us the conclusion that they have informed their parent about workshops topics.

Pupils’ perception on parents’ knowledge on CC issue was examined (Table 2). According to their answers, 49% pupils think that their parents have a lot of knowledge on CC issue (I Agree 34% and I totally agree 15%), 21% have an opposite opinion (I do not agree 13% and I do not agree at all 9%), and 29% of them do not have an opinion at all. In Final survey we discovered that percent of positive answers increased giving that 72% pupils agreed with this statement (Figure 3).

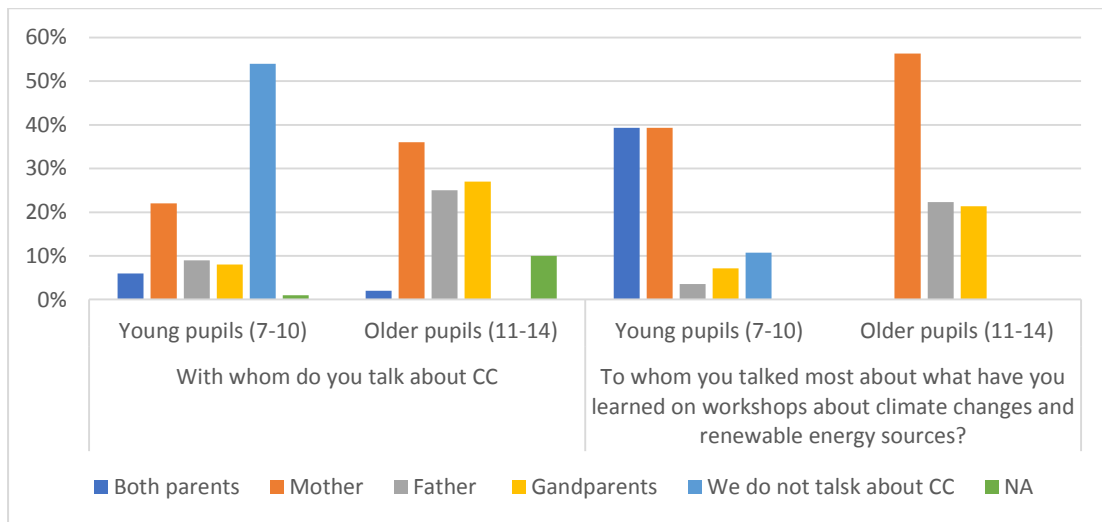


Figure (2) Answers: “With whom do you talk about CC?” and “To whom you talked most about what have you learned on workshops about climate changes and renewable energy sources?” (Pupils (7-14y))

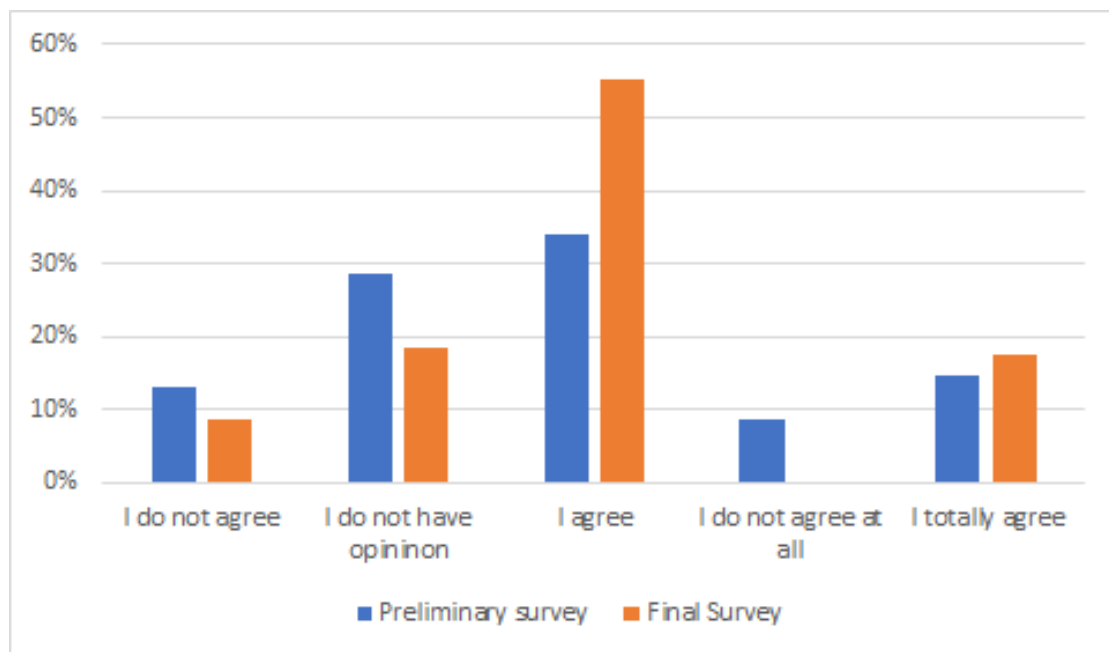


Figure (3) Answers: “My parents know a lot about CC” (Pupils 10-14y)

The presence of communication was also examined among parents, who were asked several questions (Table 2).

Opposite of pupils, results showed that parents think that they often talk with their kids on CC issue. Namely, statement “We talk about CC very often in our family” indicated that parents positively answered 69% (I agree 62%, and I totally agree 7%), and 20% answered that they do not agree with this statement in preliminary survey. Parents were also asked about how they agree with the statement “My child is very interested in CC issue”. Most of the parents (65%) positively answered. Only 10% answered that they do not agree with above statement (Figure 4). In final survey, we asked parents on their perception of workshops effects on mutual communication.

Results showed that parents do not think that provided educational workshop have improved their communication. This is quite expected because the parents expressed high level communication in preliminary survey (Figure 4).

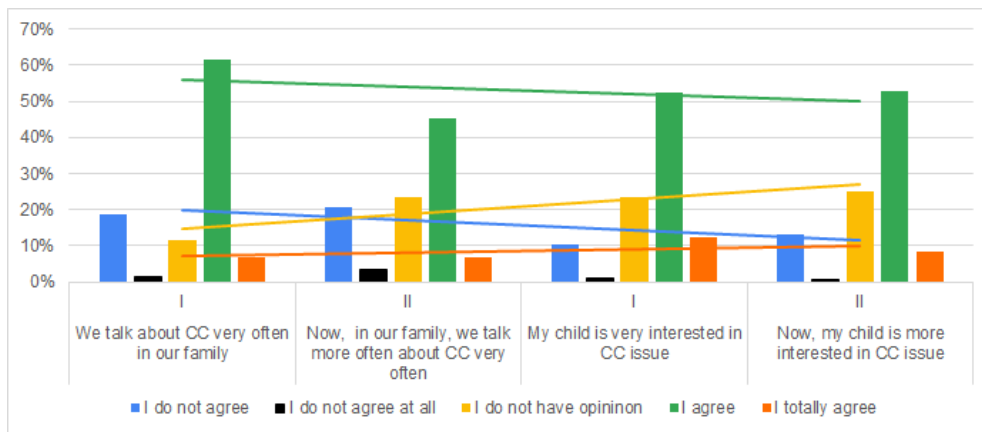


Figure (4) Answers: “We talk about CC very often in our family” and “My child is interested in CC issue” (Parents)

Finally, when they were asked about the workshop’s effects on children’s knowledge, parents responded positively. More than 80% answers were positive to improved knowledge both in parents and children that is a proof that they had conversation about CC (Figure 5).

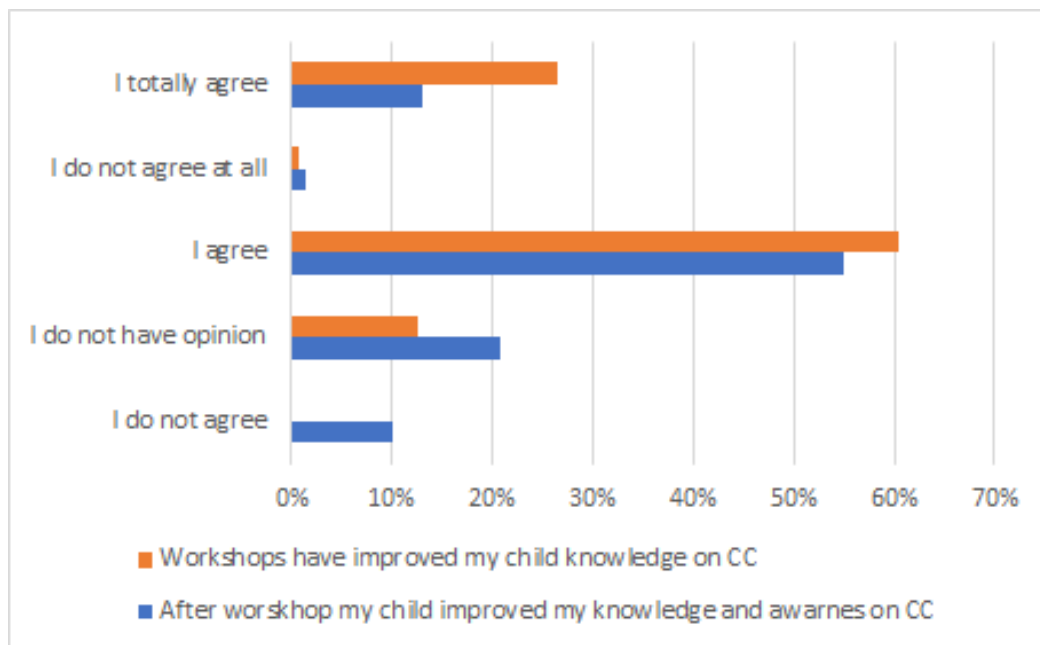


Figure (5) Answers: „After workshop my child improved my knowledge and awareness on CC“ and „Workshops have improved my child knowledge on CC“ (Parents)

Additionally, older pupils were asked about perception of knowledge on CC of their peers, as well as their mutual communication about this topic.

In preliminary survey it is identified that 35% of older pupils do not agree that their friends know a lot of CC issue. Only 27% think that their peers have certain knowledge, and great share of pupils (31%) do not have opinion at all about peer’s knowledge. After the education, final survey showed some improvement. Namely, the percent of negative answers were much lower (18%), and percent of those who thinks that their friend know about CC was slightly higher (30%) (see Figure 6).

Lack of communication among older pupils was identified, as well. Share 61% (I do not agree 35% and I do not agree at all 24%) pupils did not agree with the statement: “I talk with my friends about CC”. Only 17% answered positively on this statement. Great share of pupils does not have opinion at all. In final survey we identified that peer’s communication was much worst in comparison to the situation before workshops because 68% pupils answered negatively to this statement (Figure 6).

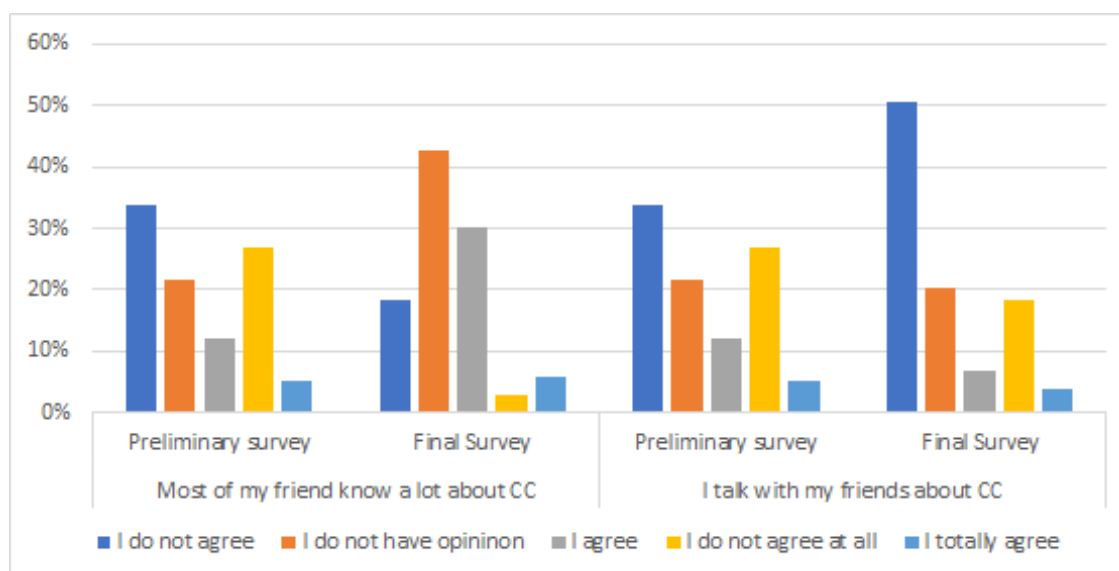


Figure (6) Answers: “Most of my friend have knowledge on CC” and I talk with my friends about CC” (Pupils (11-14y))

CONCLUSION

Development of the model and curriculum of intergenerational knowledge transfer in the Project, showed that there is a great potential to improve knowledge and awareness on climate change. In order to do so, it is necessary to make an impact on three generations at the same time. Therefore, in the long run, it is necessary to promote continuing education on climate change, beyond planned curricula, which include practical examples, work and solving specific problems, which encourages their active involvement and thinking. This approach enables raising awareness and levels of knowledge in a completely different, faster and more efficient way, beyond our education system requirements.

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