Trainers Support
Algorithmic Thinking

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Algorithmic Thinking for Migrants Teachers Education
2021-1-EL01-KA210-ADU-000035033

Survey for teachers

Final Report

Partners: LabSTEM (Greece), InProgress (Italy)

The main aim of the proposed questionnaire was the research the readiness and perception of adult teachers in Greece and Italy as far as the Algorithmic Thinking in intercultural education concerns. The survey took place between the period of 18.04.2022 and 06.06.2022.

1. Teachers' characteristics

In total, the questionnaire has been answered by 36 persons of whom 13 (36%) was males and 23 (64%) were females. The majority of the participants were between 36 and 55 years old (22% between 36-45 and 39% between 46-55 respectively), while the 8% between 25-35 and 31% over the 55.
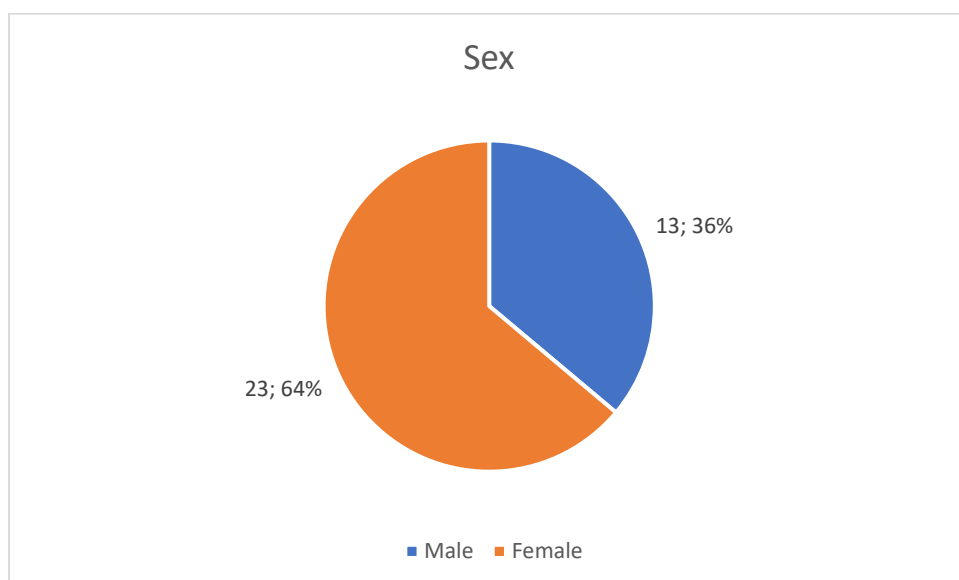

Figure 1 64% are female and 36% male

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Ages

3; 8%

11; 31%

8; 22%

14; 39%
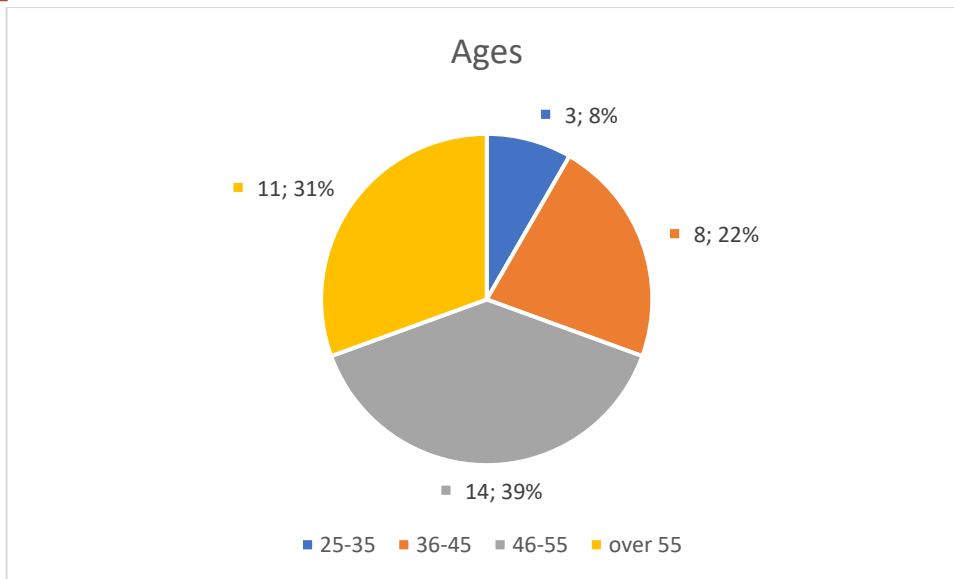
■ 25-35 ■ 36-45 ■ 46-55 ■ over 55

Figure 2 Ages diagram

The majority of the participants were teachers with more than 10 years of working experience. Greece and Italy are still very strict with new teachers hiring due to the previous economic crisis. Thus, 81% of them have more than 10 years of working experience while 11% less than 3 years and 8% between 4-9 years.
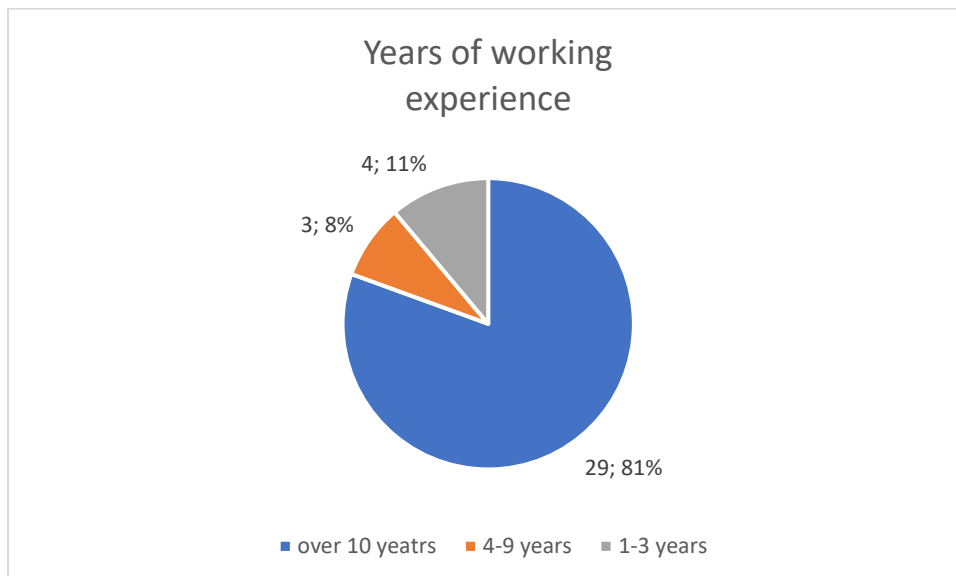
Years of working experience

4; 11%

3; 8%

29; 81%

■ over 10 yeatrs ■ 4-9 years ■ 1-3 years

Figure 3 Years of working experience

Another important characteristic is that the 53% of them are teaching at Primary and Secondary Sector (19 teachers) while the 8% (3 teachers) at NGO structures and 39% (14 teachers) working at training centers.
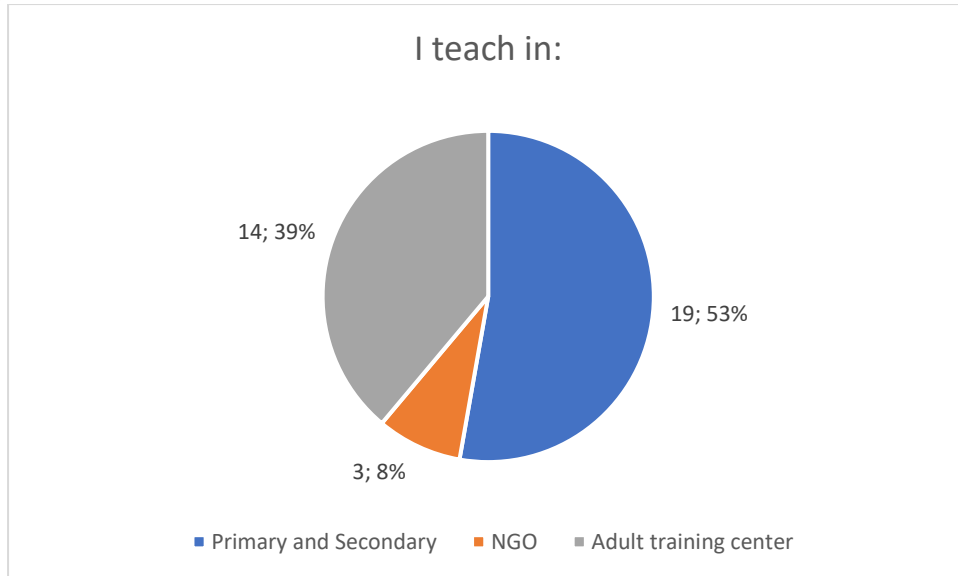
Figure 4 53% teach at Primary and Secondary Sector

Another characteristic is that most of the participants are STEM teachers (64%) while non-STEM teachers are the rest 36%.
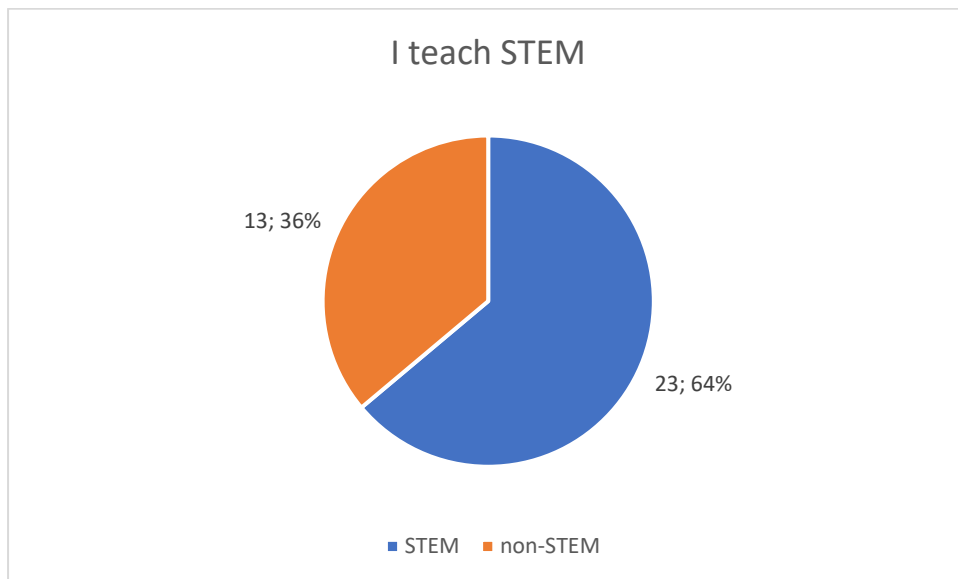

Figure 5 participants are equally divided to STEM and non-STEM teachers

2. Theoretical and practical knowledges

This part is related with teachers aware about the Algorithmic Thinking theoretically.

1.1	Problem-solving techniques	0%	29%	51%	20%

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1.2	Problem-solving skills and competence.	0%	29%	46%	26%
1.3	Algorithm meaning	26%	31%	6%	37%
1.4	Algorithm notation	29%	29%	9%	32%
1.5	Algorithmic Thinking	24%	35%	12%	29%
1.6	Practical aspects of building problem solutions in education.	15%	41%	18%	26%
1.7	Modern approach to Algorithmic Thinking.	30%	40%	15%	15%

The above table shows the percentages of each answer separately. As a whole picture, it seems that the majority have a good knowledge of how to solve problems but they don't know how to systematically depict or represent the solving procedure. They have no good knowledge of the meaning and importance of algorithms (questions 1.3, 1.4, 1.5, 1.6, 1.7). If we take into account that 64% of participants are STEM teachers, we easily understand that they definitely needs support on the algorithmic topic and the way they can use it into the classroom.
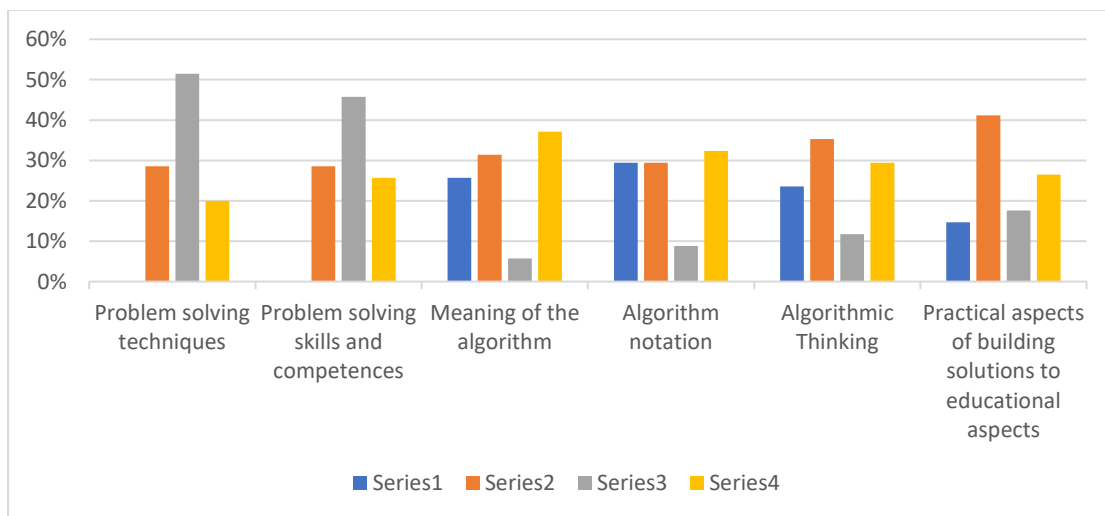

Figure 6 How prepared teachers are on algorithmic thinking topic

3. Algorithmic Thinking in Teacher Practice

This section is about the teacher's ability on how to perform activities about algorithmic thinking or problem-solving topic.

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39% deem that to teach to students how to analyze problem requirements is easy enough, 17% that is difficult while the rest 44% is neutral.
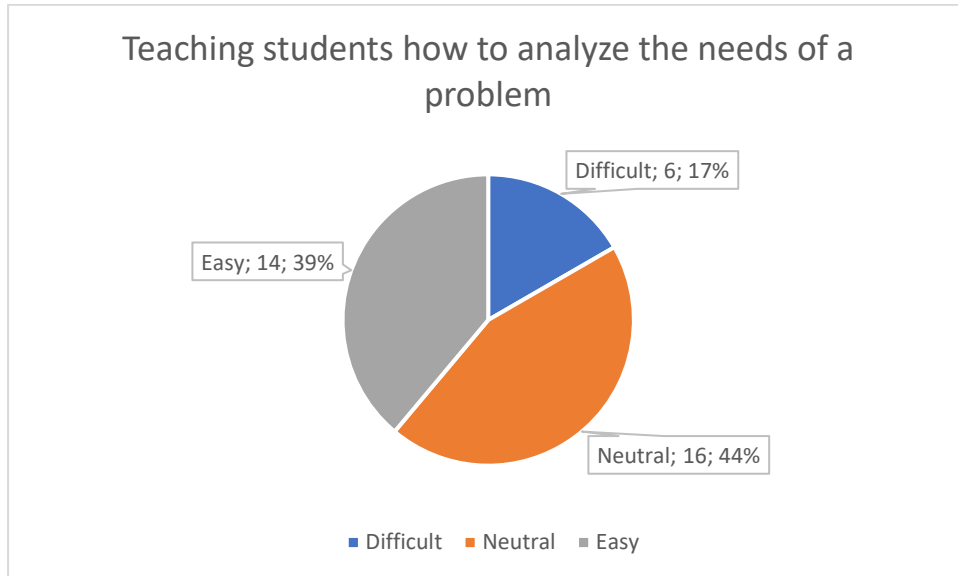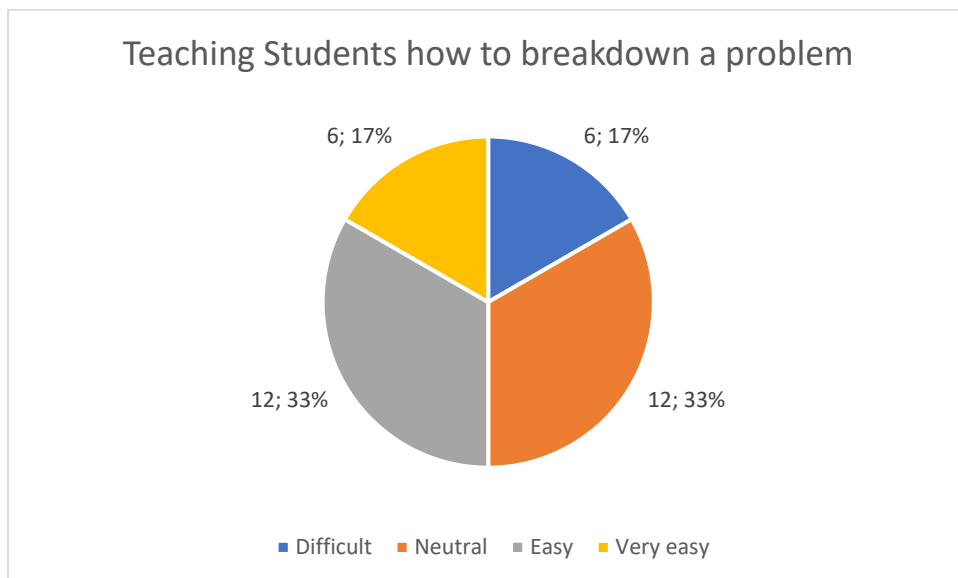

Figure 7 Analyze problem requirements
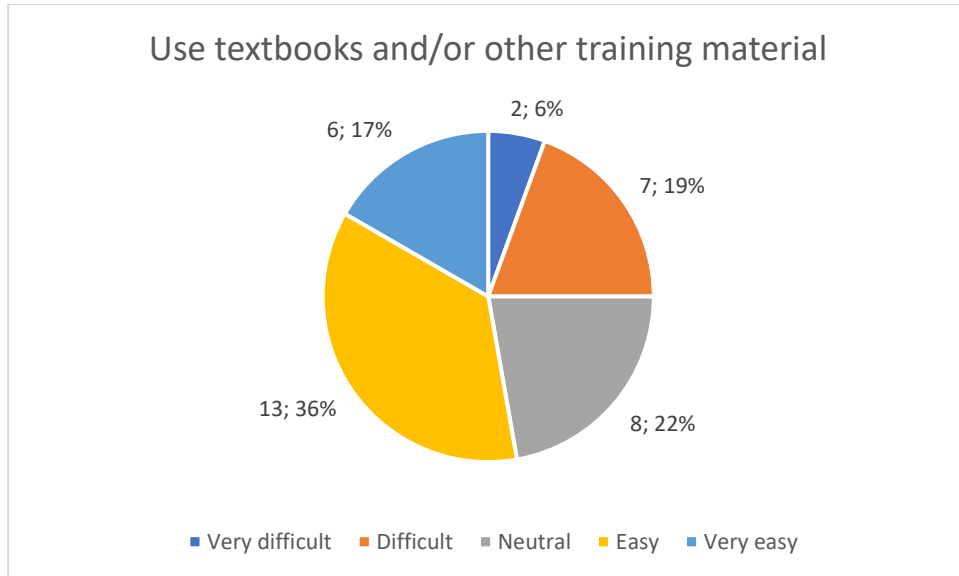
66% stated that to teach to students how to decompose a problem to smaller and easy understandable parts is neutral and easy (33%+33%) while the rest 34% (17% and 17%) is difficult and very easy respectively.

53% stated that is easy and very easy to use textbooks or/and other training material concerning the problem-solving topics, while 22% neutral and 19% that is difficult.

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Use textbooks and/or other training material

2; 6%

6; 17%

7; 19%

13; 36%

8; 22%

- Very difficult
- Difficult
- Neutral
- Easy
- Very easy

The 25% of participants absolutely understand what Algorithmic Thinking is and 19% quite enough. The rest 56% have no idea (or a little – which practically means nothing) of what is Algorithmic thinking.
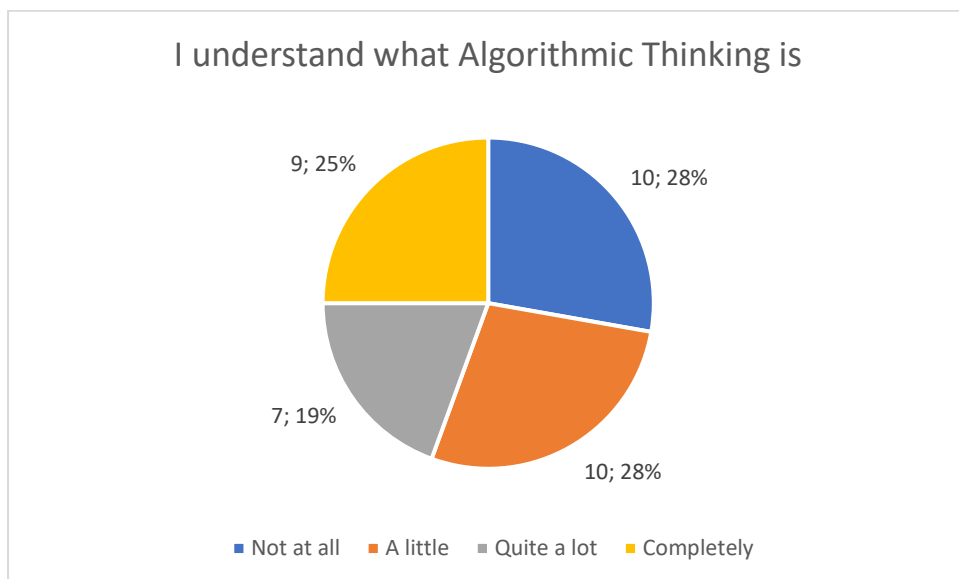
I understand what Algorithmic Thinking is

9; 25%

10; 28%

7; 19%

10; 28%

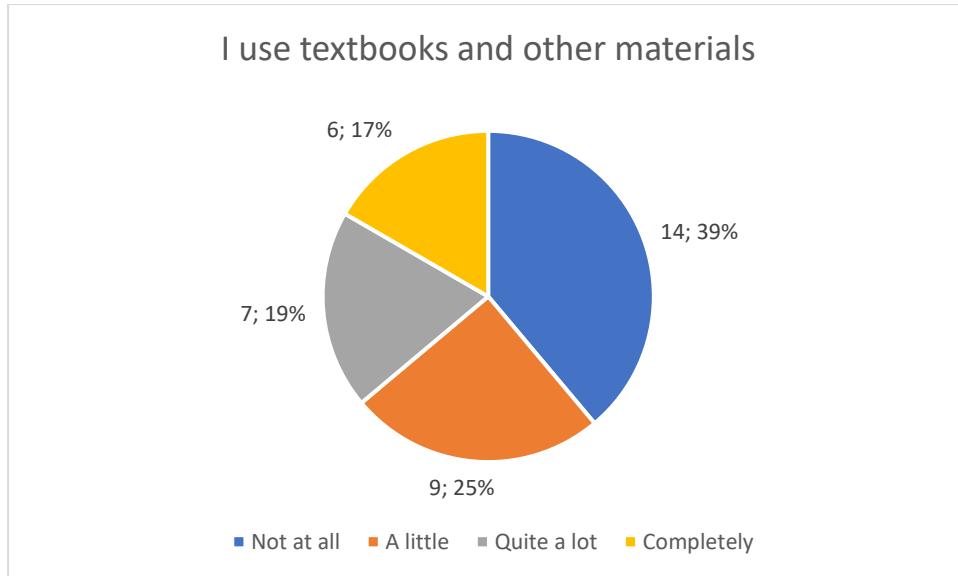- Not at all
- A little
- Quite a lot
- Completely

Figure 8 Who understands what Algorithmic Thinking is

The next question shows that the majority of the participants (39% + 25%) do not use textbooks and/or other material to support teaching algorithmic thinking in my classroom practice, while the rest 36% quite a lot and completely.

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I use textbooks and other materials

6; 17%

14; 39%

7; 19%

9; 25%

■ Not at all ■ A little ■ Quite a lot ■ Completely

Next, the majority 67% believe that Algorithmic Thinking competence is a skill important for their professional development while the rest 33% they don't care.
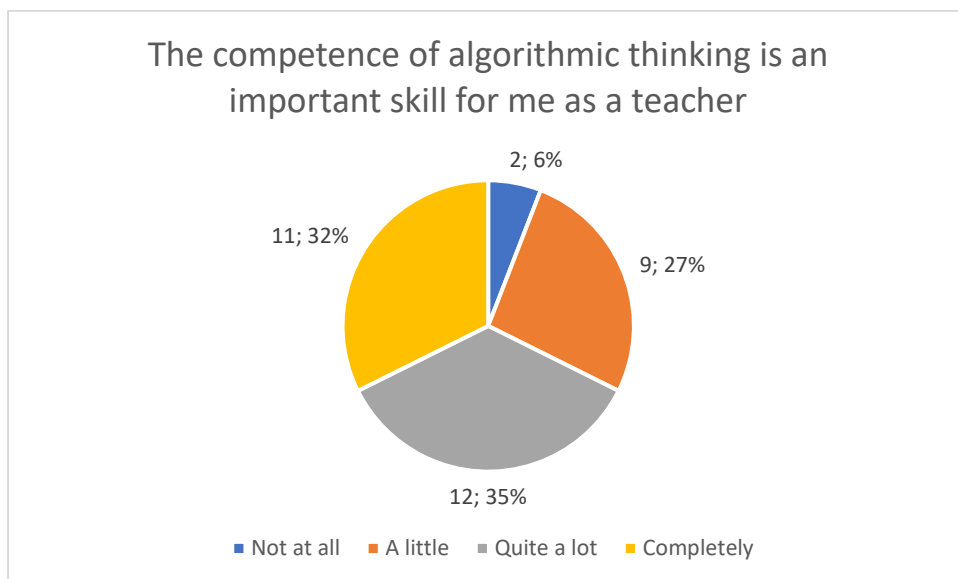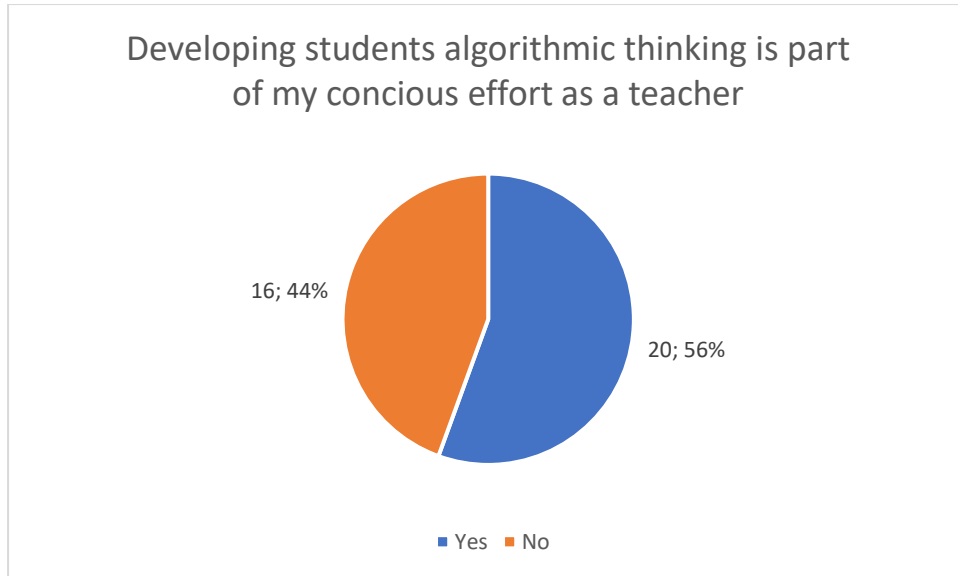
The competence of algorithmic thinking is an important skill for me as a teacher

2; 6%

11; 32%

9; 27%

12; 35%

■ Not at all ■ A little ■ Quite a lot ■ Completely

Figure 9 67% believe that Algorithmic Thinking competence is a skill important

The next question is quite interesting because it shows that despite 64% of them are STEM teachers the 56% of them believe that developing students' Algorithmic Thinking is a part of their conscious effort as a teacher.

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**Developing students algorithmic thinking is part
of my concious effort as a teacher**

16; 44%

20; 56%

■ Yes ■ No

As a continuation of the previous question, 58% stated that Algorithmic Thinking could sometimes help students to understand better the lessons taught by them while 36% always. This shows that the majority is not sure about the importance of Algorithmic Thinking.
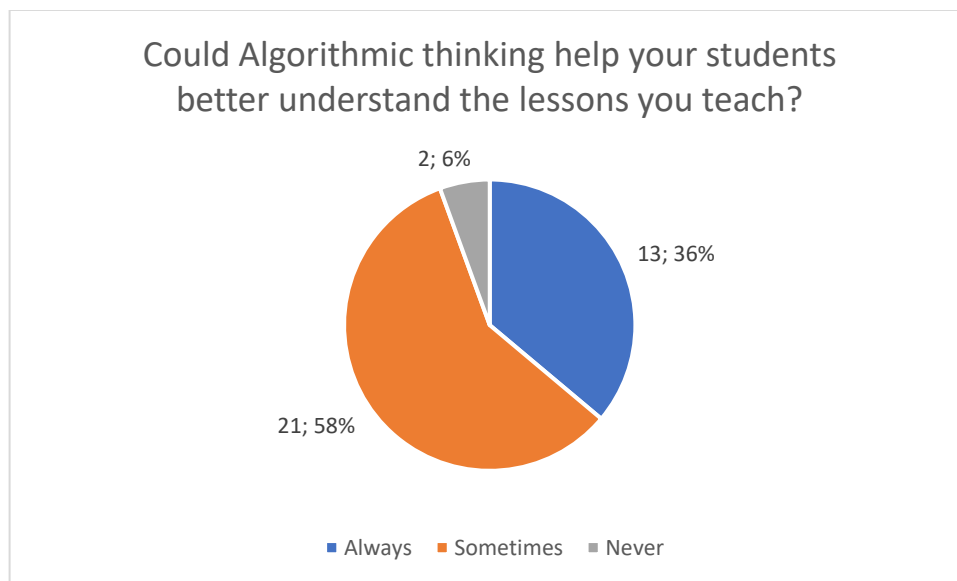
**Could Algorithmic thinking help your students
better understand the lessons you teach?**

2; 6%

13; 36%

21; 58%

■ Always ■ Sometimes ■ Never

Figure 10 Algorithmic Thinking could sometimes help students to understand better the lessons taught by them

4. Intercultural Education

This section is about the teachers' intercultural skills.

48% of asked teachers replied that to defend and protect the dignity and human rights of people regardless of their cultural affiliations is easy and very easy, while the rest 52% is neutral and difficult.

Defend and protect the dignity and human rights regardless of their cultural affiliations

6; 17%   7; 19%

11; 31%

12; 33%

■ Difficult   ■ Neutral   ■ Easy   ■ Very easy
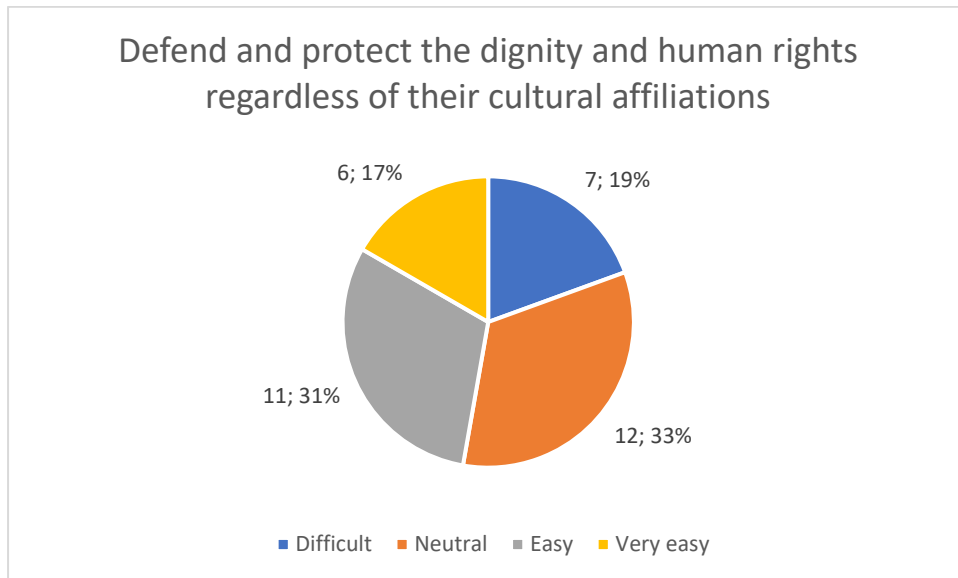
Teachers stated that know and respect the cultural values and religious beliefs of others cultures.

I know and respect the cultural values and relegious beliefs of other cultures

3; 8%

10; 28%

23; 64%

■ A little   ■ Quite a lot   ■ Completely

Figure 11 know and respect the cultural values and religious beliefs of others cultures.

The majority of 66% feel confident when interacting with people from different cultures while the rest 34% a little.

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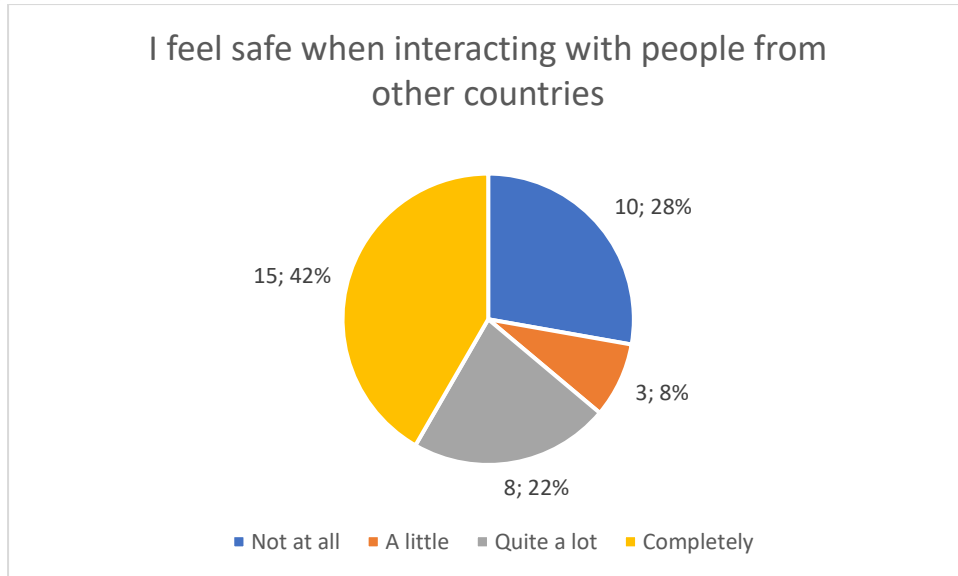## I feel safe when interacting with people from other countries

Figure 12 The majority of 66% feel confident when interacting with people from different cultures

31% believe that the knowledge about different cultures and the importance of intercultural communication is provided sufficiently in schools/training centers, while the rest 69% don't

I believe that knowledge of different culture and the importance of intercultural communication is sufficiently provided in schools/training centres
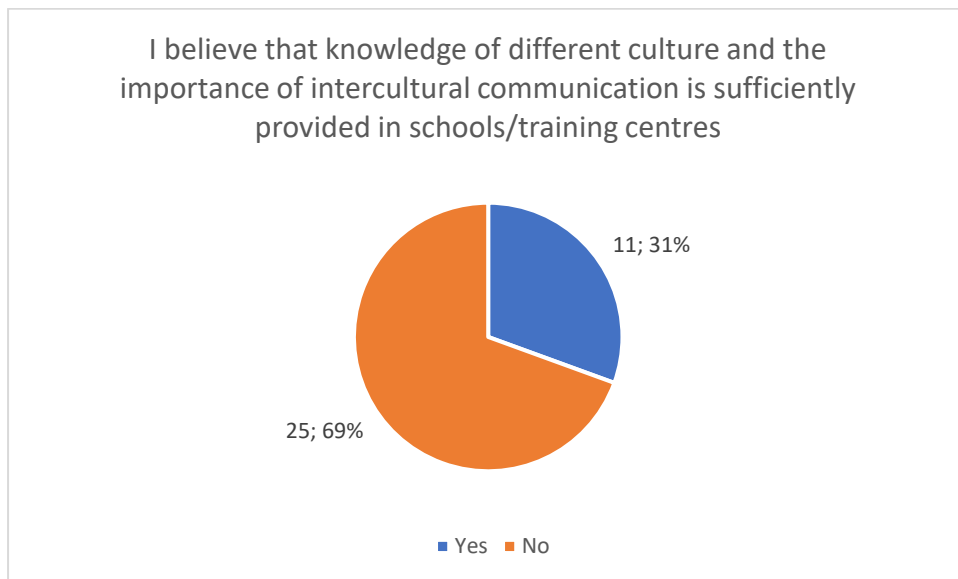

Figure 13 31% believe that the knowledge about different cultures and the importance of intercultural communication is provided sufficiently in schools/training centers

Comments

- One stated that Algorithm is an international language that could join all people!
- I found the wording of the questions unclear
- I don't know algorithmic thinking

Conclusions

The main aim of this survey was to find out if and to what extent adult trainers incorporate the Algorithmic Thinking principles and guidelines in their learning material design and teaching. We found out that STEM teachers are more familiar with the field of algorithmic thinking while non-STEM teachers ask for specific training. They have no idea of what and how they can apply algorithmic thinking in the classroom, thus trainees with different cultures (intercultural education) are not educated in this field. As a consequence, they have difficulties in the labour market and their social incorporation.

We definitely have to take into account all the above findings and design a Handbook that will help adult immigrants/refuges trainers to utilize Algorithmic Thinking principles into their teaching procedure and subsequently transmit their knowledge to trainees.