

Survey report

Answers to the online questionnaire

<https://forms.gle/7vGb2SL33h5izn8D7>

Education In Progress Italy

Introduction

The evaluation questionnaire for the "algorithmic thinking" project was mainly administered to teachers working in the field of adult education to understand when this topic is known to them. The survey took place between the period of 18.04.2022 and 06.06.2022.

SESSION 1: Teachers Description

In total, the questionnaire has been answered by 16 persons, of whom 4 (25%) were males and 12 (75%) were females (Figure 1). The majority of the participants were over the age of 50 years old (62.5%), while 25% between 45-50, the 6.3% between 35-40 and 6.3% between 30-35 years old (details in Figure 2).

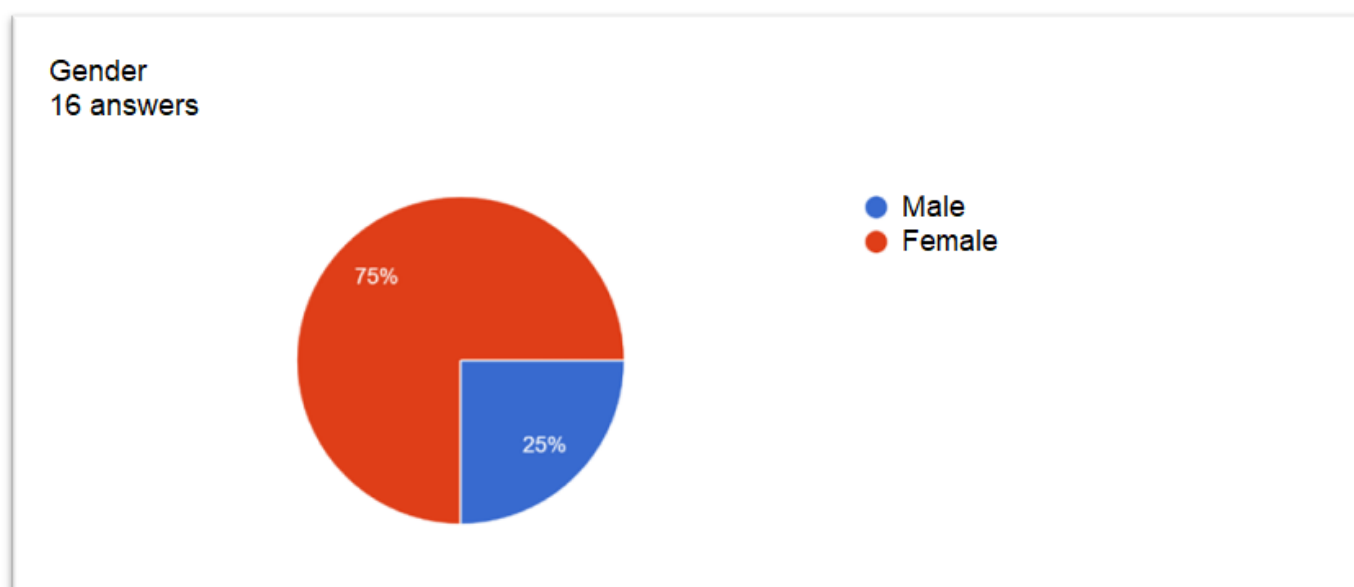


Figure 1, Gender: 75% female, 25% male.

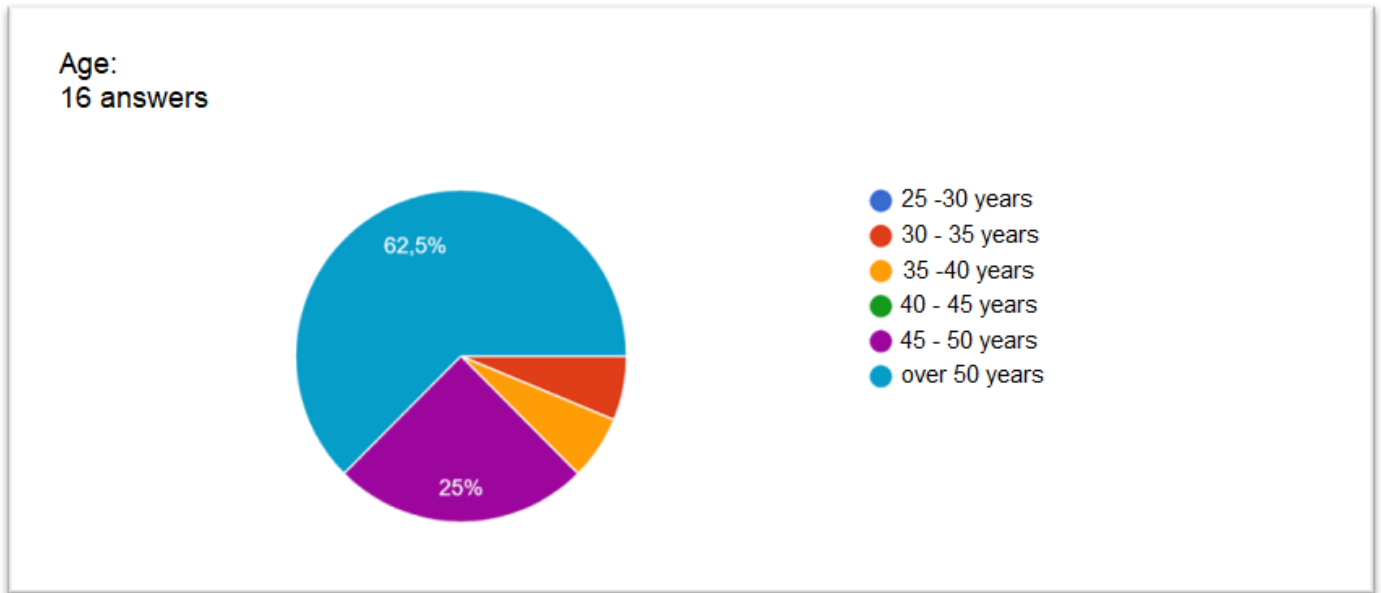


Figure 2. Age: 62.5% over 50 years old, 25% between 45-50, 6.3% between 35-40 years, 6.3% between 30-35 years.

The majority of the participants were teachers with more than 10 years of working experience (75%). In Italy, the recruitment of new teachers is proceeding, albeit a little slowly, also because many of the permanent teachers have not yet reached retirement age. An increase in new hires is expected in the coming years (more details in Figure 3).

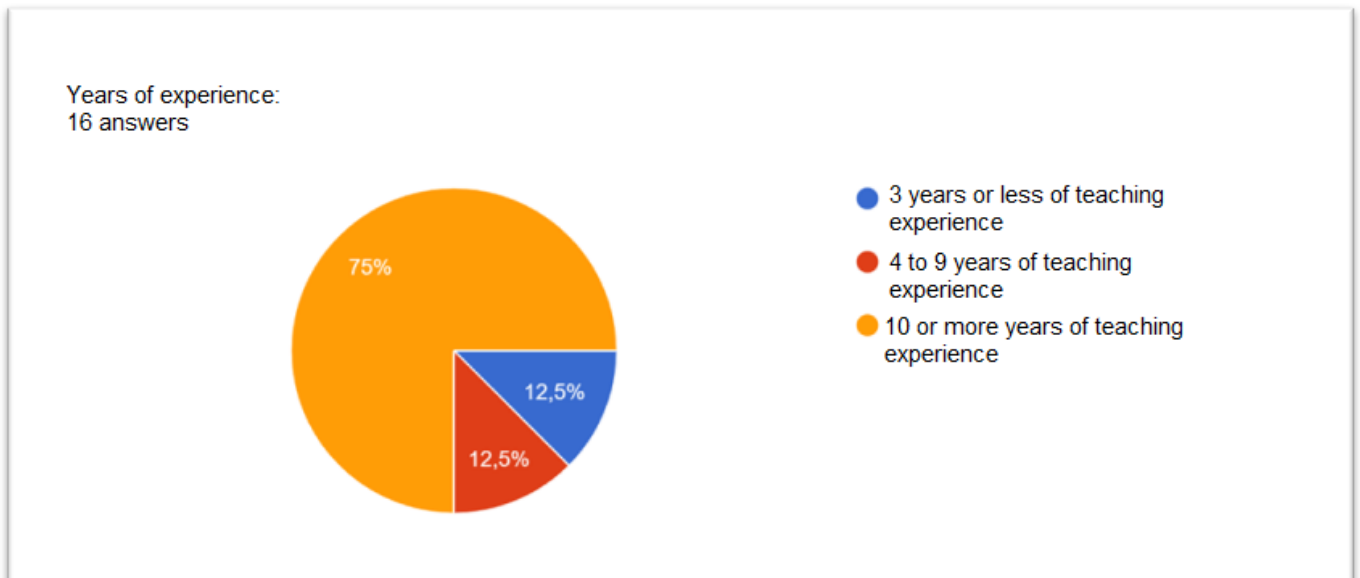


Figure 3. Years of experience: 75% 10 or more years of teaching experience, 12.5% 4 to 9 years of teaching experience, 12.5% 3 years or less of teaching experience.

We took longer to collect the minimum number of questionnaires because we administered it to a specific target of teachers (teachers in adult training centers) to be able to have results more in line with the project. In fact, 75% of teachers work in Adult training center (Figure 4).

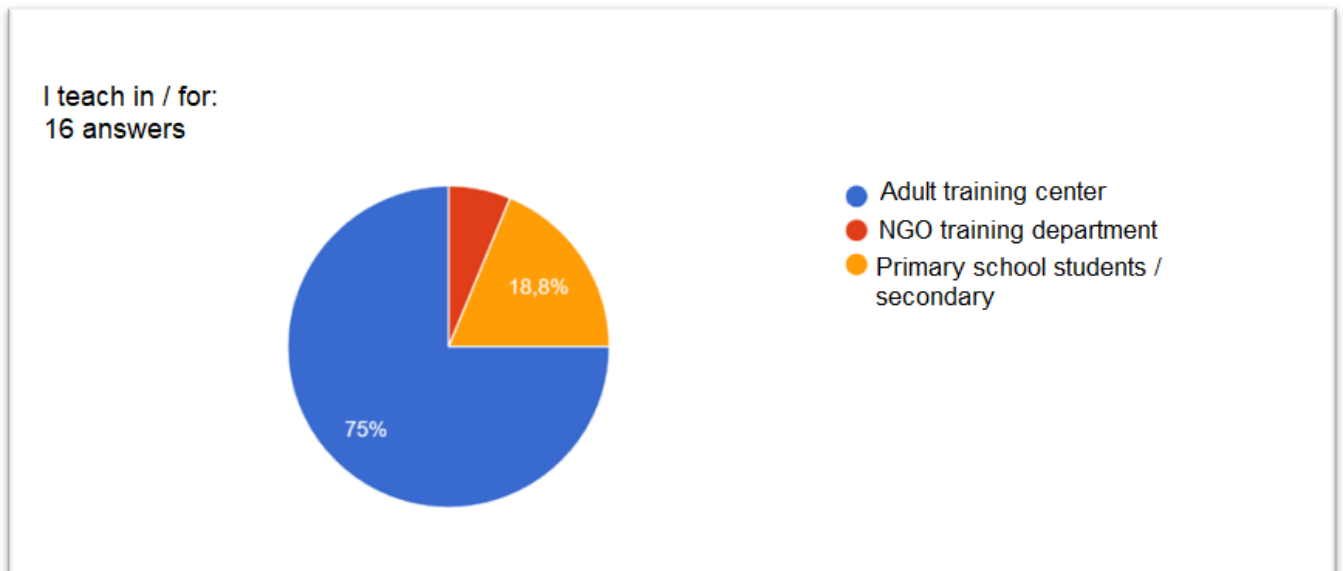


Figure 4. I teach in /for: 75% in the Adult training center; 18.8% in Primary school students / secondary; 6.3% in the NGO training department.

Another important finding concerns the type of teachers who answered the questionnaire. Having administered the questionnaire especially to teachers who do not have a specialization in mathematics or engineering has allowed us to have more significant data on the knowledge of algorithmic thinking (it is more likely that teachers with a degree in science know algorithmic thinking than others). For more details look figure 5.

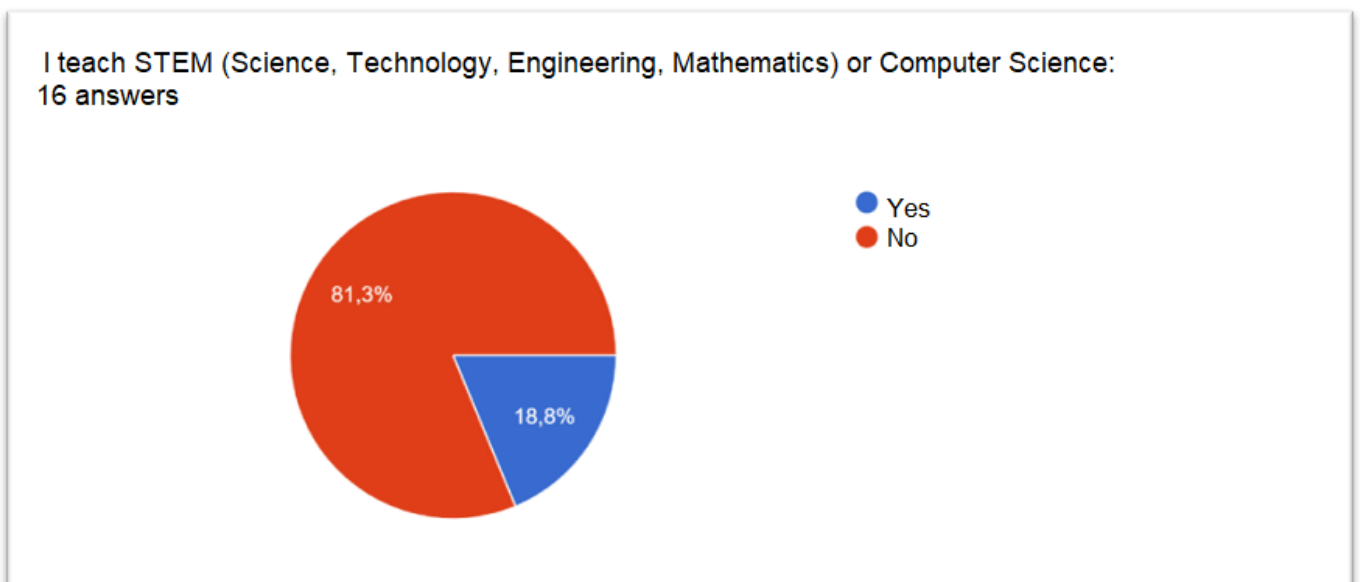


Figure 5. I teach STEM (Science, Technology, Engineering, Mathematics) or Computer Science: 81.3 % NO, 18.8% yes.

SESSION 2: Theoretical and practical knowledges

This part is related to teachers being aware about Algorithmic Thinking theoretically (Figure 6). From the graph we can understand that all the teachers interviewed know at least briefly the techniques of problem-solving, but the majority instead do not know the meaning of algorithmic notion nor would they be able to explain what algorithmic thinking is (only two teachers out of 16 know what it means notion algorithmic and algorithmic thinking). However, we believe that this result is consistent with the academic preparation of the teachers interviewed, and further confirms the importance of the results of this project, which could also reach teachers who are not familiar with algorithmic thinking.

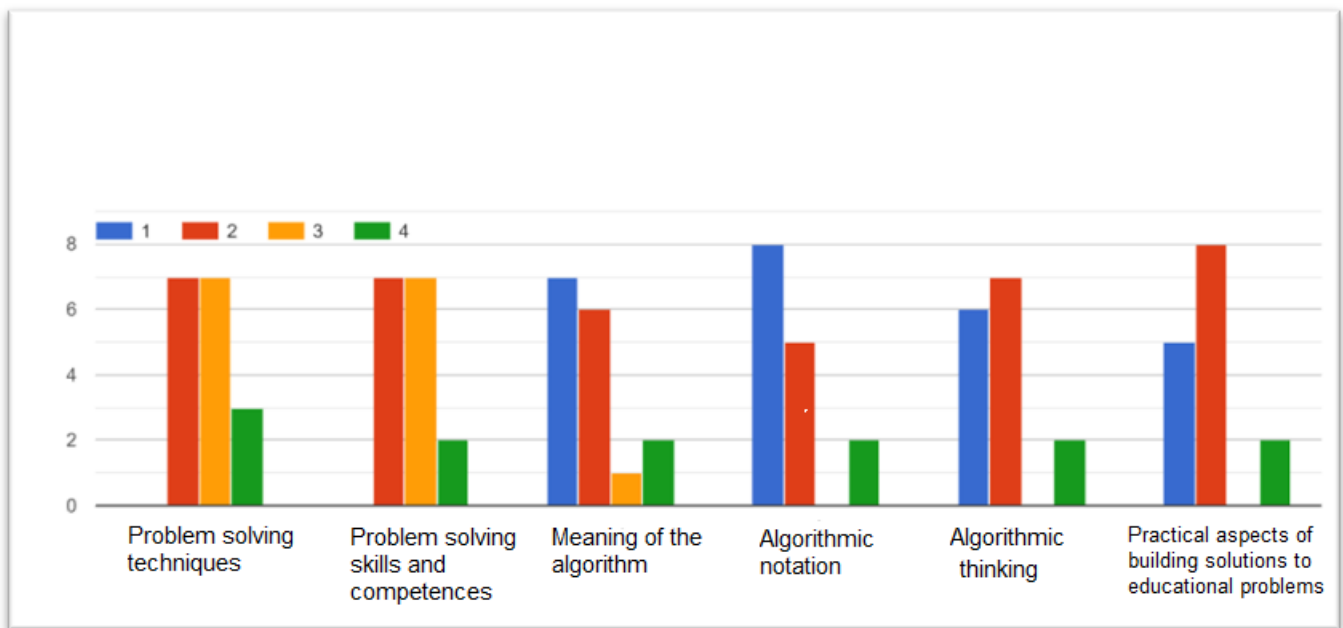


Figure 6. How prepared teachers are on algorithmic thinking topics.

SESSION 3: Algorithmic Thinking in Teacher Practice

This section is about the teacher's ability to carry out activities on algorithmic thinking or on the topic of problem solving. In particular, teachers were asked how easy it would be for them to carry out certain teaching activities on their own. In general, a fairly large percentage of teachers, nearly 40%, said they had difficulty teaching their pupils to identify, analyze and solve a problem.

This is also due to the fact that most of the students they teach are adult migrants or children who have recently arrived in Italy. Or, another reason is that teachers don't have a thorough understanding of algorithmic thinking techniques. Let's see in detail the different results for each question.

To the first question of the session, "how easy do you think it is to teach students how to analyze the needs of a problem on your own?" 37.5 % of teachers replied that they find this action difficult, while only 25% of them do this easy (Figure 7).

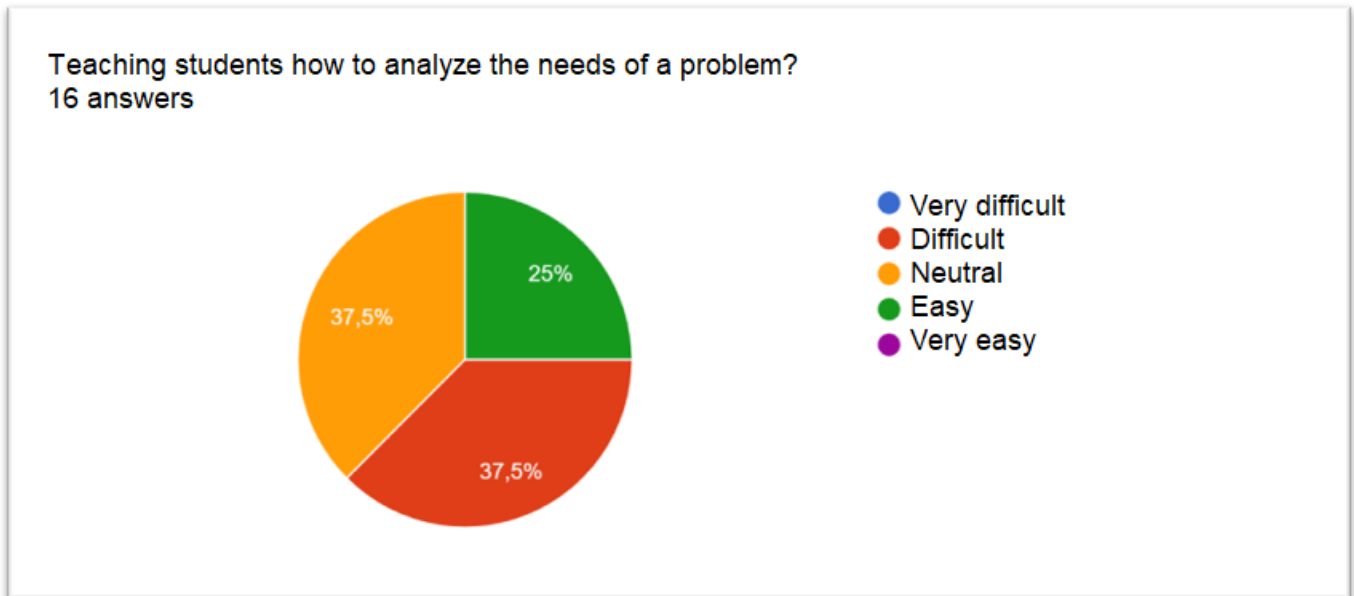


Figure 7. Teaching students how to analyze the needs of a problem? 37.5 % is Difficult; 37.5 % is neutral. 25 % is easy.

The teachers gave the same answers to the question about knowing how to break down a problem into smaller and easily understandable parts (details in figure 8).

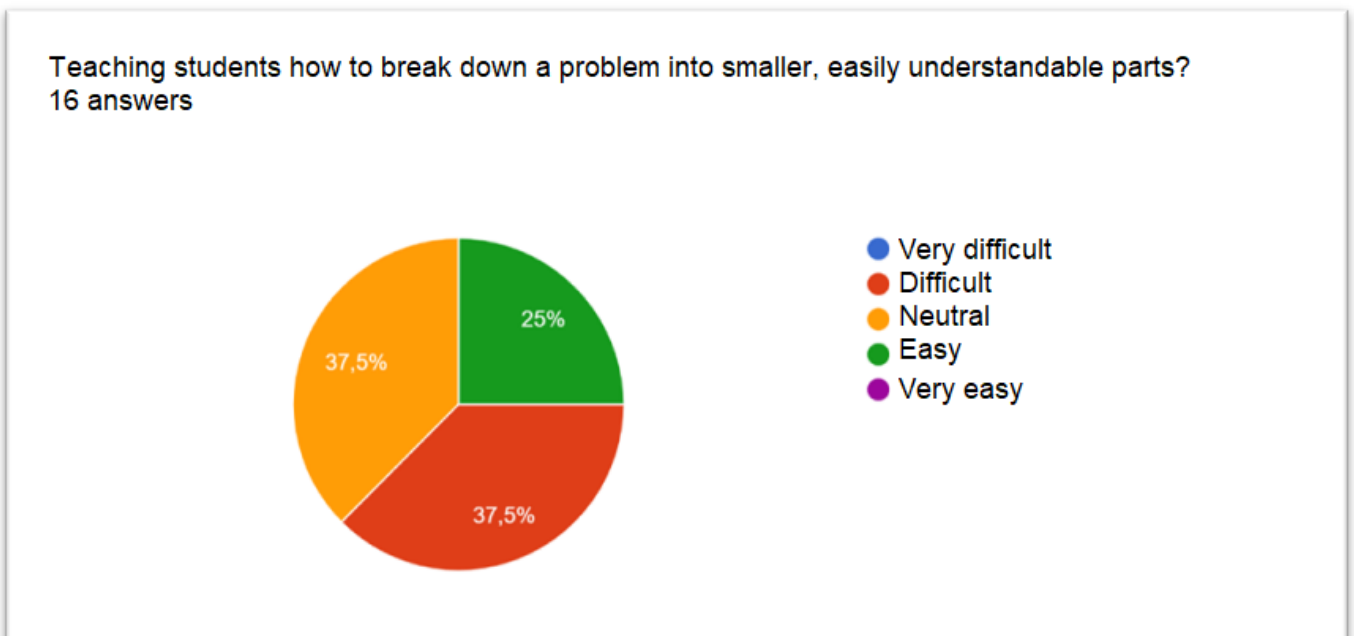


Figure 8. Teaching students how to break down a problem into smaller, easily understandable parts? 37.5 % is Difficult; 37.5 % is neutral. 25 % is easy.

When asked how to teach students how to design a detailed solution to problems, only 4 teachers out of 16 replied that this activity is easy for them (3 answers) and very easy (1 answer). Once again, practical difficulties arise for teachers regarding solution processing techniques (Figure 9).

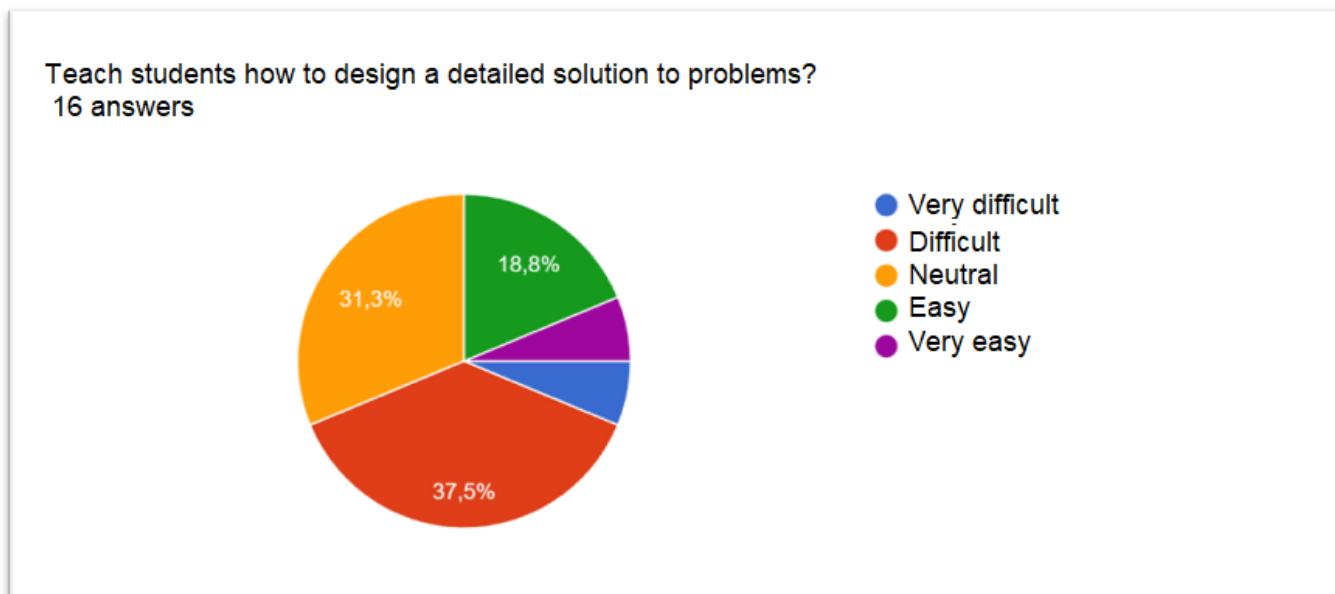


Figure 9. Teaching students how to break down a problem into smaller, easily understandable parts? 6.3 % is very difficult; 37.5 % is difficult; 31.3 % is neutral; 18.8 % is easy; 6.3 % is very easy.

Practical difficulties also emerged in using textbooks and / or other training material related to problem solving topics: 37.5% of teachers found it difficult, while 37.5% found it neutral (Figure 10).

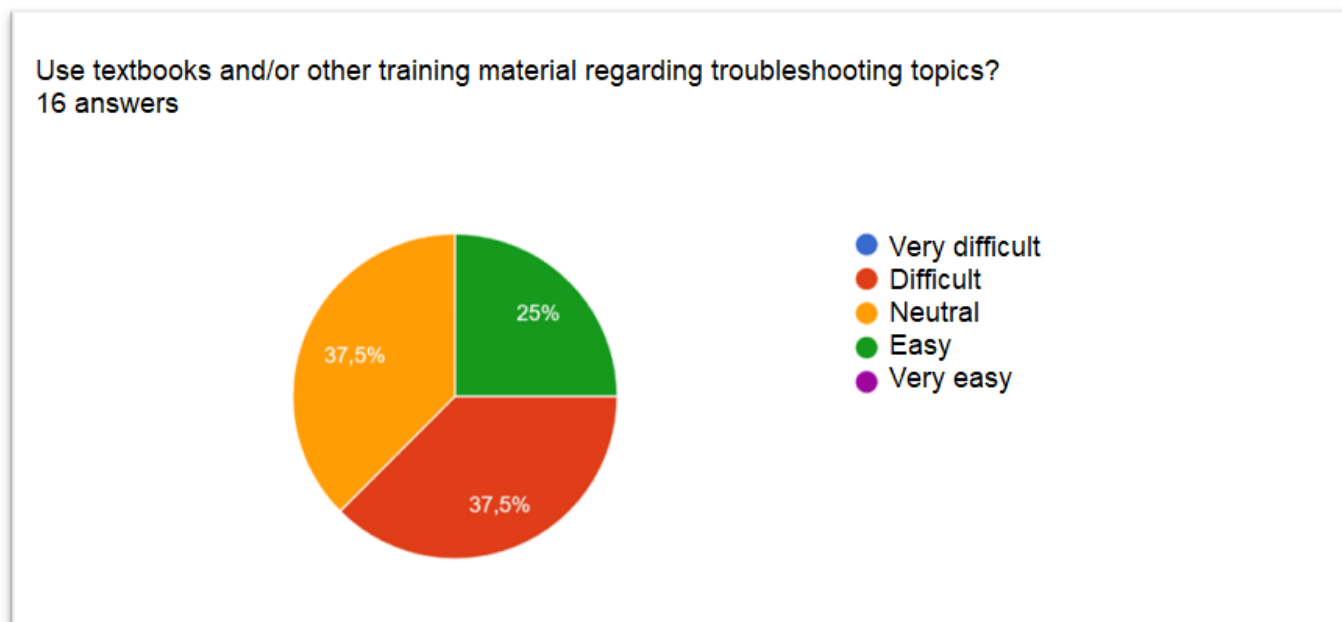


Figure 10. Use textbooks and/or other training material regarding troubleshooting topics? 37.5 % is difficult; 37.5 % is neutral; 25 % is easy.

It is equally difficult for most teachers to "Defend and protect the dignity and human rights of people regardless of their cultural affiliations": this action is easy only for 12.5% of them, while it is very easy for 18.8% (Figure 11).

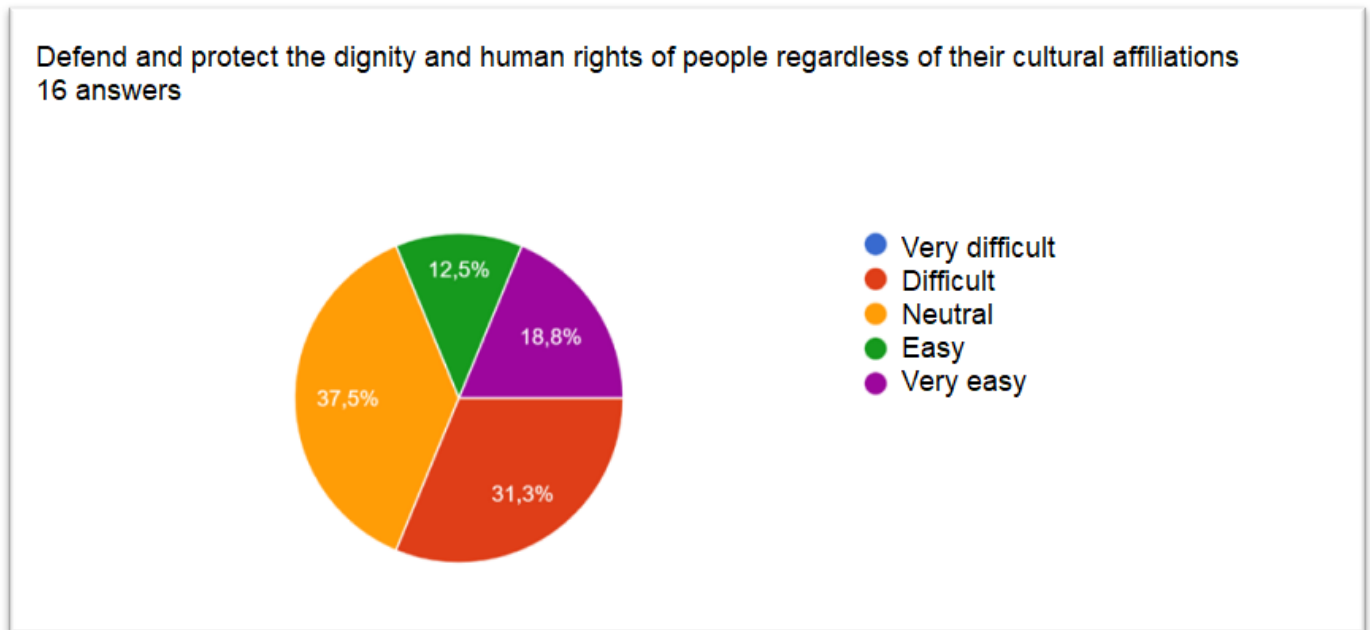


Figure 11. *Defend and protect the dignity and human rights of people regardless of their cultural affiliations. 31.3 % is difficult; 37.5 % is neutral; 12.5% is easy; 18.8% is very easy.*

Intercultural education:

In the last part of section 3 we investigated the intercultural skills of teachers: many of the questions made it clear to us what teachers think about algorithmic thinking and what their intercultural values are, all useful data for the preparation of our lessons.

At the central question of the questionnaire, namely "I understand what algorithmic thinking is", it emerged, as can be seen in Figure 12, that half of the teachers who participated in the survey did not have the slightest idea of what algorithmic thinking is (many of them have shown us this ignorance even in person, and are interested in more).

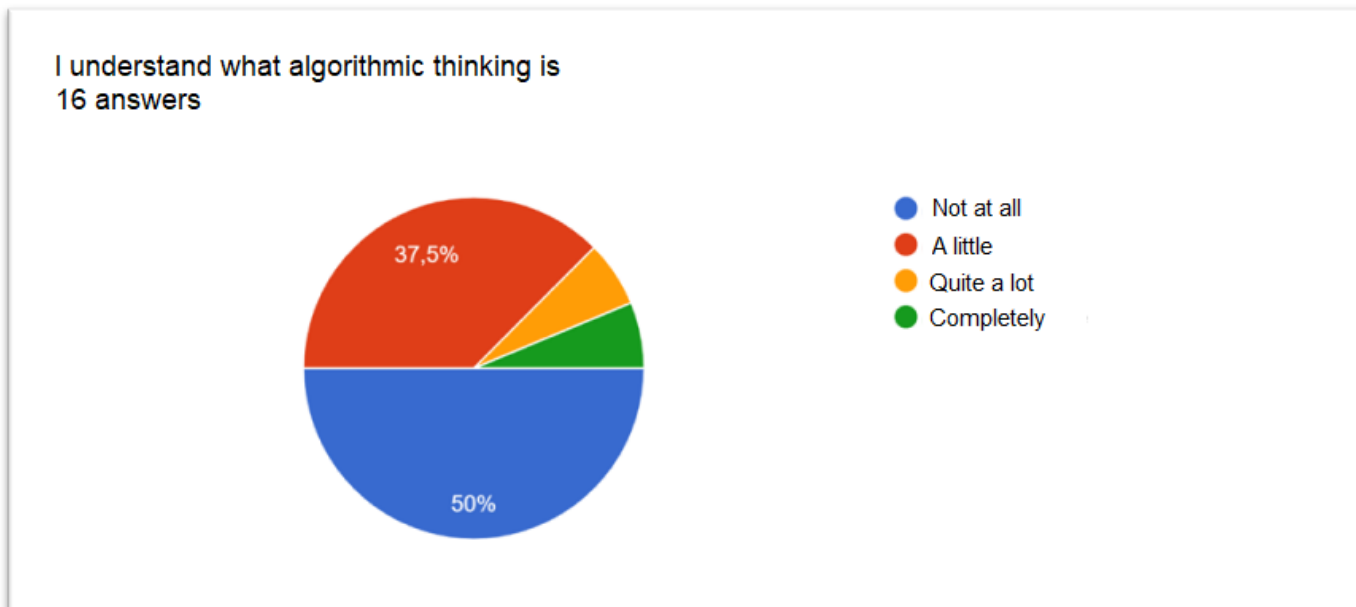


Figure 12. I understand what algorithmic thinking is. 50 % not at all; 37.5 % a little; 6.3 % quite a lot; 6.3% completely.

Intuitively, the next question also demonstrates how most of them (56.3 %) do not use textbooks and / or other material to support teaching algorithmic thinking in practice with their pupils (details in figure 13).

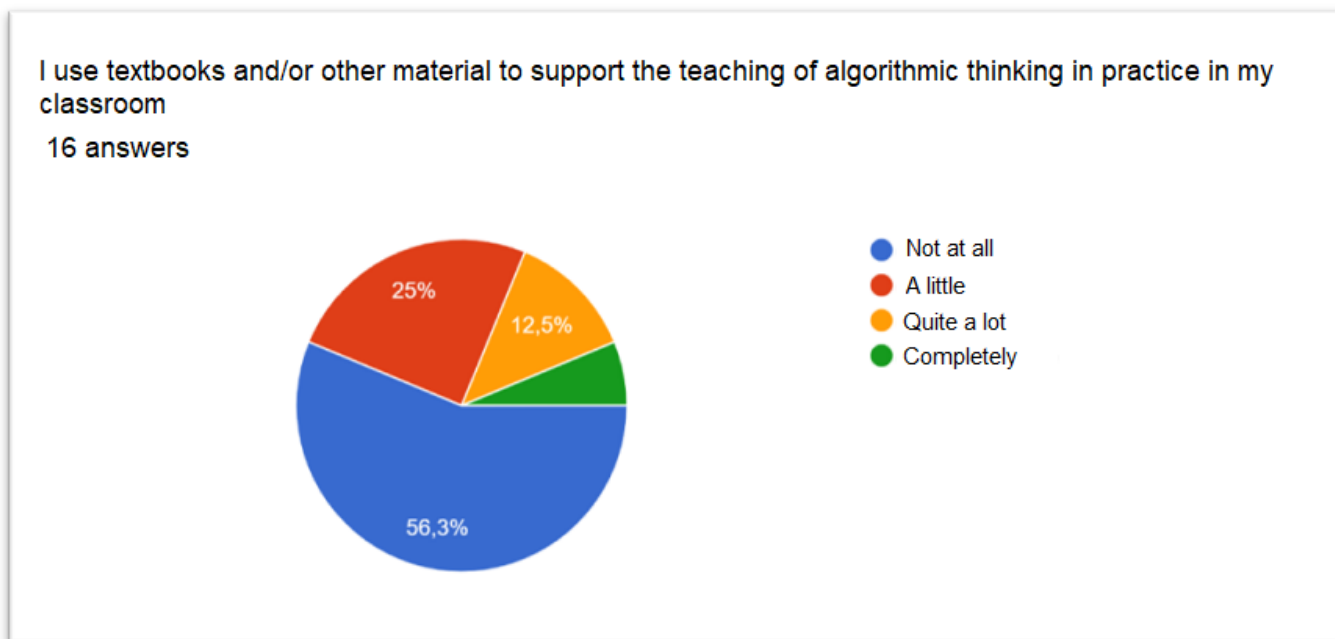


Figure 13. I use textbooks and/or other material to support the teaching of algorithmic thinking in practice in my classroom.. 56.3 % not at all; 25 % a little; 12.5 % quite a lot; 6.3% completely.

Rather positive data concerned the relationship of teachers with pupils and people of different cultures: these data do not surprise us because most of the teachers interviewed teach in adult training centers attended by people from all over the world. In fact, all the teachers know and respect the different cultures and religions, some completely (68.8%) some at least a little (12.5%). More explanations are provided by Figures 14 and 15.

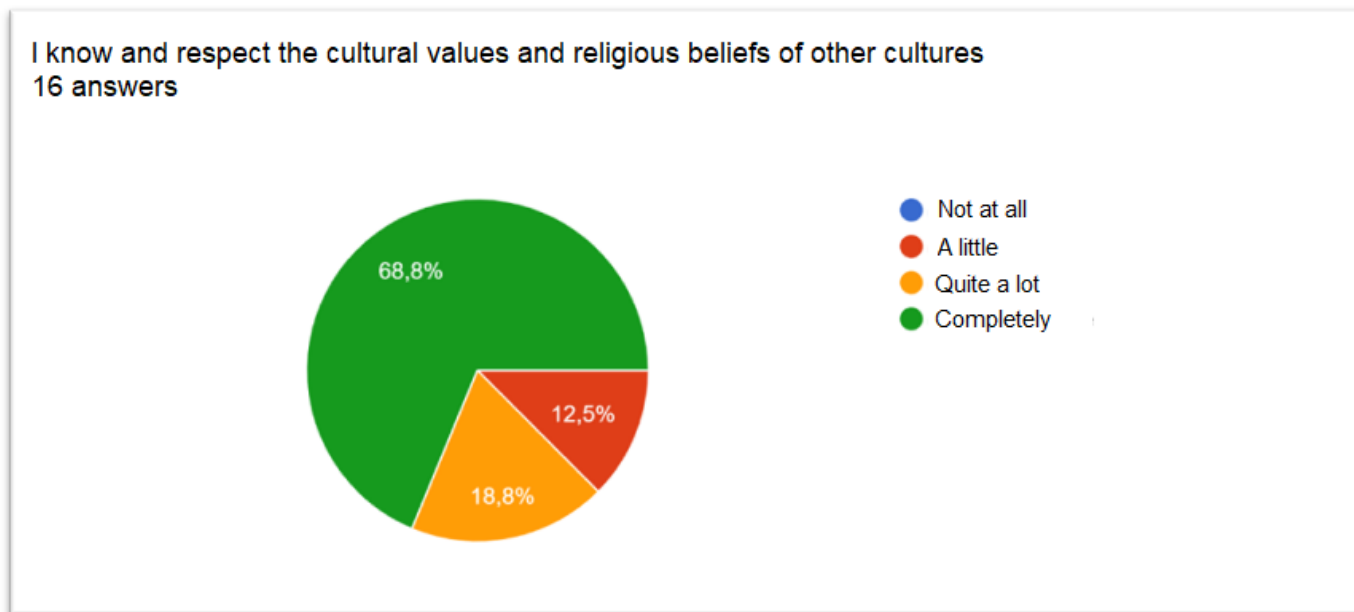


Figure 14. I know and respect the cultural values and religious beliefs of other cultures. 68.8 % completely; 18.8 % quite a lot; 12.5 % a little.

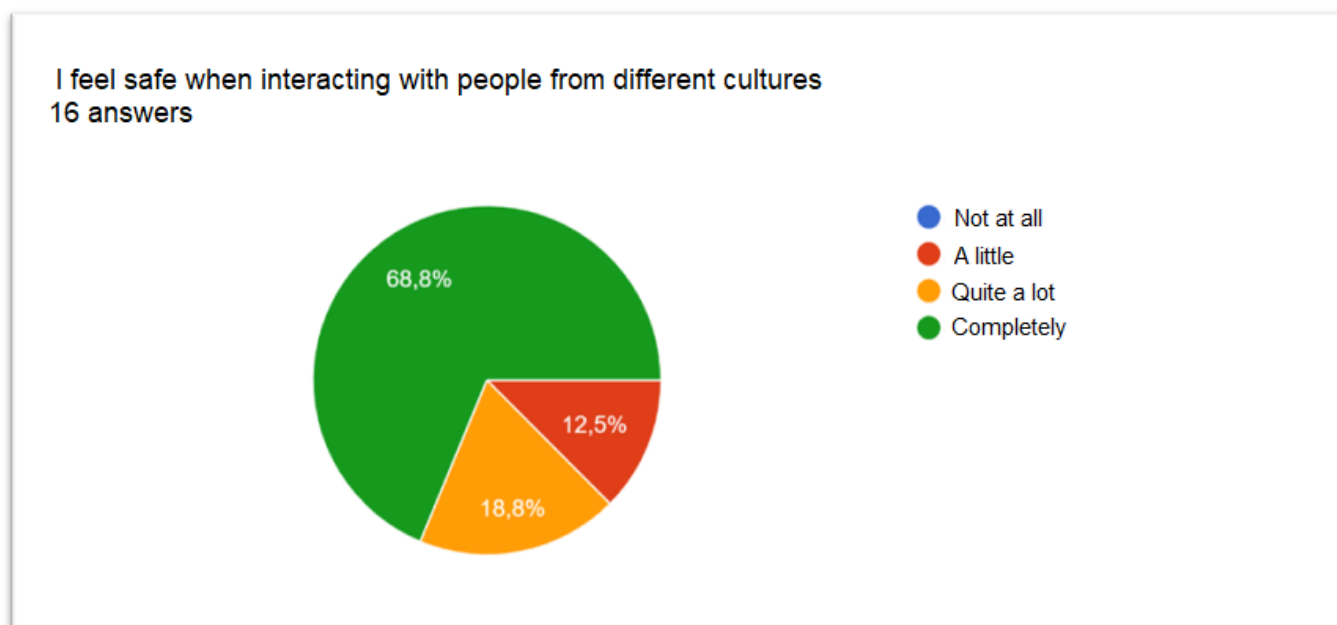


Figure 15. I feel safe when interacting with people from different cultures. 68.8 % completely; 18.8 % quite a lot; 12.5 % a little.

As Figure 16 demonstrates, although many teachers are unfamiliar with algorithmic thinking, they understand that it could be a useful skill for them in the classroom, at least somewhat (37.5 % a little, 43.5% quite a lot).

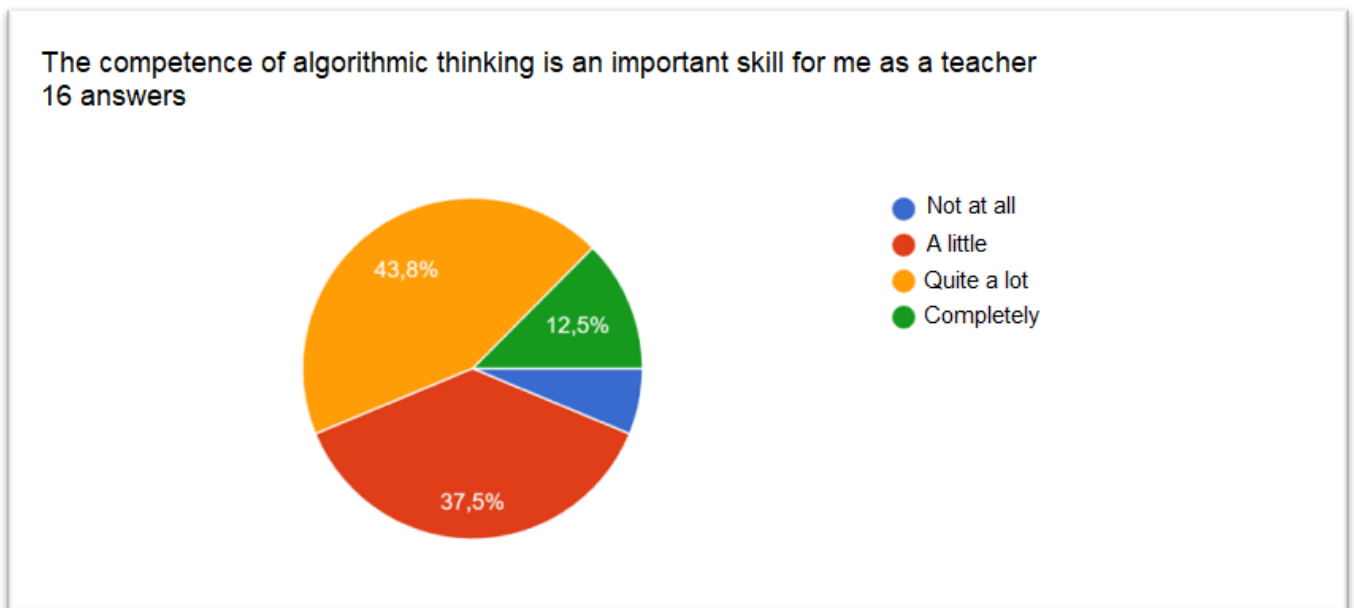


Figure 16. *The competence of algorithmic thinking is an important skill for me as a teacher.*

Over 60% of teachers believe that the school should do more to foster intercultural communication (Figure 17).

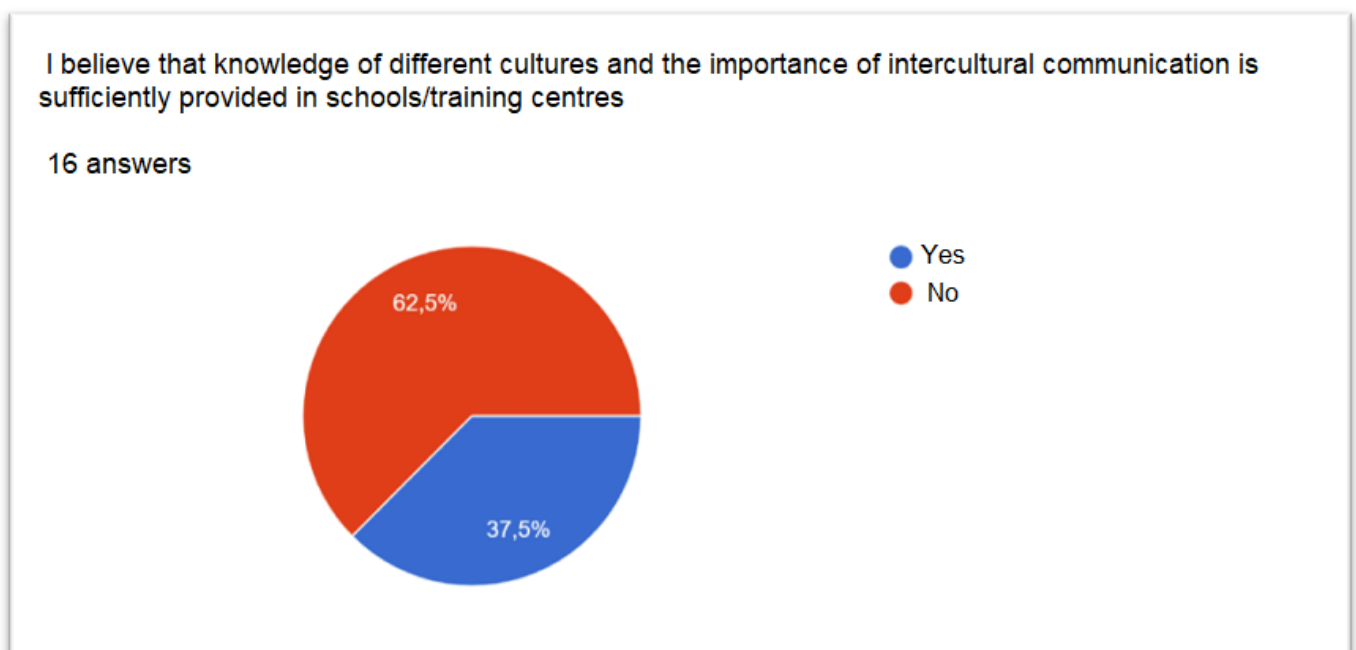


Figure 17. *I believe that knowledge of different cultures and the importance of intercultural communication is sufficiently provided in schools/training centres.*

Lacking the preparation and knowledge of the algorithmic subject matter, for most teachers developing students' algorithmic thinking is not part of their conscious effort as a teacher. Only 37.5% answered yes (Figure 18).

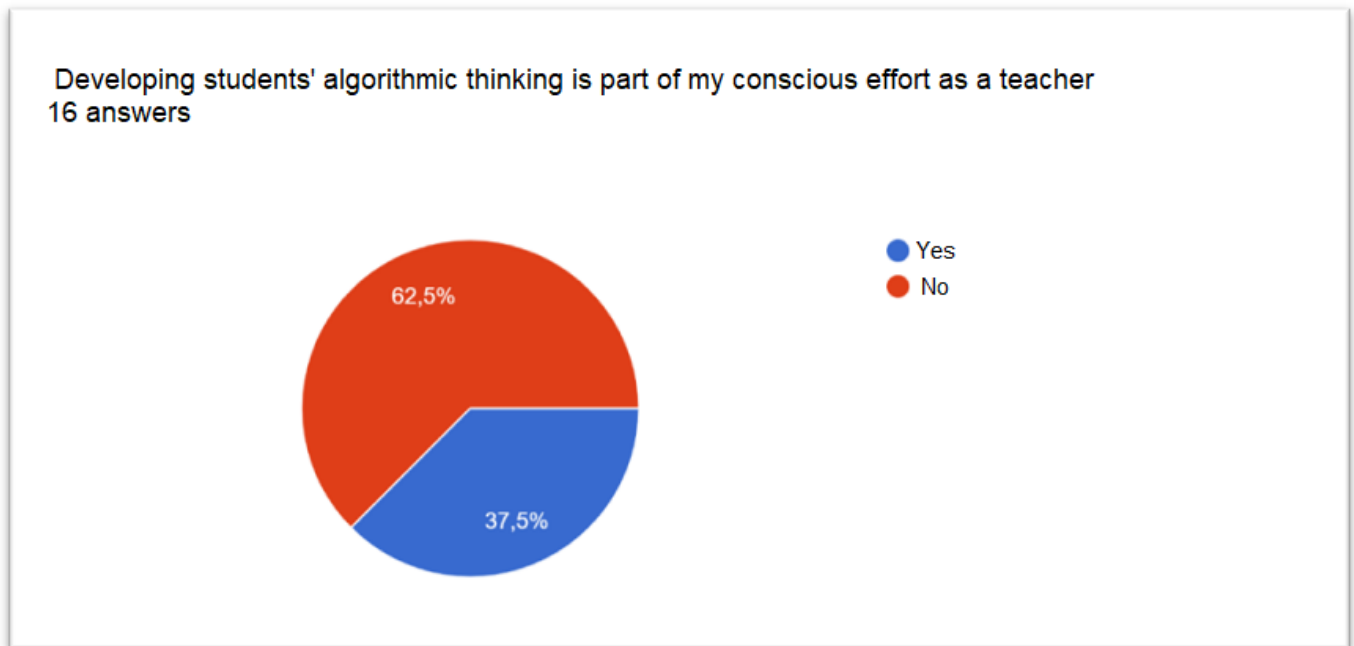


Figure 18. Developing students' algorithmic thinking is part of my conscious effort as a teacher. 62.5% No; 37.5% Yes.

Finally, to the last question "Algorithmic thinking could help your students better understand your lessons?", the teachers responded positively to the usefulness of algorithmic thinking in the classroom, even if they believe that it depends on the cases (Figure 19).

Could algorithmic thinking help your students better understand the lessons you teach?
16 answers

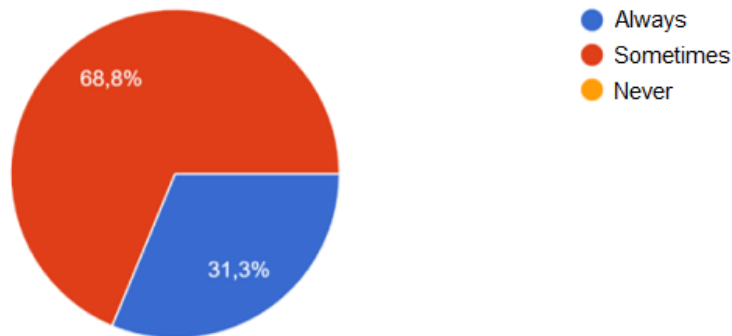


Figure 19. Algorithmic thinking could help your students better understand the lesson you teach? 68.8% Sometimes; 31.3% Always.

Comments:

We had two main comments: one teacher found the wording of the questions unclear, while another stated that she was unfamiliar with algorithmic thinking.