Transnational meeting and Workshop#1

General overview

The CT&MathABLE project partners convened for a transnational meeting and teacher workshop in Bodrum, Turkey, from April 22-26, 2024. The meeting involved 18 partners from various countries, including Lithuania, Slovenia, Hungary, Sweden, Spain, Finland, and Turkey. Discussions centered on disseminating computational thinking (CT) concepts through teacher training and developing a learning path for CT and Algebraic Thinking (AT).

Transnational Meeting Highlights

- **Day 1:** İsmail Güven introduced the Turkish education system, followed by Arnold Pears' presentation on the Learning Path for CT and AT. Discussions on selected activities and quality assurance were led by Pál György Sarmasági and Javier Bilbao.
- **Day 2:** Daranee Lehtonen and Pekka Räsänen discussed the implementation of assessment instruments and Pilot 1 study results. Dissemination issues were addressed by Arnold Pears and Mamerta Ralytė.
- **Day 3:** Finalization of CT and AT Learning Paths and management of WP1 were discussed. Partners shared updates on computational thinking curricula in their respective countries, with Valentina Dagienė facilitating the discussions.

Teacher Workshop Details

The workshop took place at two schools in Bodrum: BİLSEM on April 24 and 26, and TED Bodrum on April 25, 2024, with 33 teachers participating.

- **Day 1:** Introduction to the project, followed by Filiz Kalelioğlu's session on the basics of CT and hands-on activities.
- **Day 2:** Tuğba Öztürk discussed integrating CT in education. Teachers engaged in tasks related to COMATH's CT section and provided feedback.
- **Day 3:** Ebru Aylar conducted a session on AT. Teachers completed tasks on COMATH's AT section and shared their opinions. Data collection and surveys captured teachers' experiences and feedback.

Teachers' Workshop Experience

Seventeen teachers shared their feedback through surveys, revealing a diverse group with varying teaching backgrounds and experiences.

Survey Results:

- **Organization:** The training program and objectives received high marks, despite some delays due to an extended science fair held in the school.
- **Instructors:** Teachers were generally satisfied with the instructors' knowledge and teaching skills, although one assessment expert rated them lower.
- **Content:** The content was well-received, though the quality of visual aids was noted as an area needing improvement.
- **Methodology:** The workshop balanced theory and practice effectively, but some teachers felt the time allocated was insufficient.
- **Results:** Most teachers felt the workshop met its objectives, enhanced their skills, and improved their understanding of CT and AT.

Open-Ended Feedback: Teachers appreciated learning about the role of computational thinking in education, the potential of COMATH tests for identifying gifted learners, and the value of exchanging ideas. One suggestion was to schedule future workshops at the end of the academic term to minimize conflicts with teaching commitments.

Overall, the workshop was positively received, with teachers expressing a desire for more detailed work on the subjects covered.

Target groups

Project partners and anyone interested in the project.

Keywords

Transnational meeting, teacher workshop, computational thinking, algebraic thinking

Transnational Meeting

CT&MathABLE project partners had the transnational meeting on 22-23-24 April 2024 in Bodrum/Turkey. 18 partners joined the meeting from Lithuania, Slovenia, Hungary, Sweden, Spain, Finland, and Turkey. Partners discussed about dissemination of CT concepts through teacher training and learning Path on Computational Thinking & Algebraic Thinking.

On the first day of the meeting, İsmail Güven gave a welcoming speech and introduced the partners to the Turkish education system. Then, Arnold Pears gave a presentation on Learning Path on Computational Thinking & Algebraic Thinking. Discussions continued on the selected activities of the learning path for computational thinking and algebraic thinking, which were led by Pál György Sarmasági. Javier Bilbao reported on Quality Assurance. On the second day, the implementation of the assessment instrument and the results of the Pilot 1 study were discussed by Daranee Lehtonen and Pekka Räsänen. Project dissemination issues were dealt with by Arnold Pears and Mamerta Ralytė. On the third day, CT and AT Learning Paths – activities were finalized, and Management of WP1 was discussed. All partners then talked about informatics / computational thinking curricula updates in their countries. Valentina Dagienė supported all of the discussions, recapped, and finalized.

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Teacher Workshop

The teacher workshop took place in two schools in Bodrum at BİLSEM on the 24 and 26 April 2024 and at TED Bodrum on the 25 April 2024. 33 teachers attended the workshop.

Teachers, workshop instructors and some partners visiting at BİLSEM School

Teachers and workshop instructors at TED Bodrum

On the first day of the workshop, the project was introduced to the teachers. Then, Filiz Kalelioğlu ran the workshop on the basics of Computational thinking (CT) and did hands-on activities. On the second day, Tuğba Öztürk, whose expertise is in CT, discussed the integration of CT in education in the morning session, and in the afternoon session, the teachers did the tasks on COMATH's CT section. Then, data collection took place to obtain their opinion about the CT in COMATH. On the third day, Ebru Aylar, whose expertise is in Mathematics education and CT, taught teachers about Algebraic Thinking (AT) in the morning session. In the afternoon session, teachers did the tasks on COMATH's AT section. On the last day, data collection took place to obtain their opinion about the AT in COMATH. Teachers also answered the survey questions on COMATH and their workshop experience.

Teachers' workshop experience
Seventeen teachers shared their experiences in the survey. Here are the demographics of the teachers:

Survey results show that a significant number of the teachers are class teachers (6 out of 18). There are also math, science, English, computing and art educators in the workshop.

Table 1. *Subjects of the teachers*

Subject	Frequency
Class teaching	6
Math	3
Science	3
English	2
Computing Education	1
Art	1
Assessment and evaluation expert	1

Two of the teachers, who responded to the survey, are from Ankara, and the rest of the teachers live in Bodrum in Turkey. Their teaching experience varies from 5 years to more than 20 years. Teachers' views on different aspects of the workshop are presented in the following sections: a) organisation, b) instructors, c) content of the workshop, d) methodology, and e) results. Then, their opinions are reported based on open-ended questions.

Teachers are asked to rank the evaluate the aforementioned aspects according to this scale:
- o NO (Not Observed)
- o NI (Needs Improvement) = Performance is less than expectations
- o S (Satisfactory) = Performance meets the expectations
- o G (Good) = Performance exceeds the expectations
- o E (Excellent) = Performance exceeds the expectations significantly higher

A-) Organisation of the workshop
Teachers are asked to answer questions on the timing and objectives of the workshop. Table 2 summarises their responses.

Table 2. *Organizational aspects of the workshop*

Organisation		Frequency
The training programme was received in due time	E	10
	G	3
	S	4
Clearness of training objectives	E	11
	G	4
	S	2

Regarding the training programme received in due time, 10 teachers responded as Excellent, 3 teachers responded as Good, and 4 teachers responded as Satisfactory. A possible reason for G and S responses could be the extended science fair at BİLSEM school. During the workshop, there was a science fair at BİLSEM schools, and the finishing time of the fair was extended, causing a delay in the start of the workshop. Although the instructors and organizers were present prior to the workshop, the team had to wait for the end of the fair.

The teachers were asked to evaluate the clarity of training objectives. 11 teachers responded as Excellent, 4 teachers responded as Good, and 2 teachers responded as Satisfactory. A possible reason for G and S responses could be the heterogeneity of the teachers' disciplines and teaching grades. Since they come from different backgrounds, this might have prevented them from understanding the common core of the workshop. Additionally, they do not have prior knowledge of CT and AT, which may make it difficult for them to understand the objectives of the workshop.

B) Instructors

Teachers are asked to answer questions on instructors' knowledge of subject matter, teaching skills/expertise, maintaining participant interest, soliciting and reinforcing participation, responding to participant needs, using examples/analogies, checking participant comprehension/questioning, and clarifying/amplifying important points. Table 3 summarises their responses.

Table 3. *Opinions of the teachers about the instructors*

Instructors	Frequency				
	NO	NI	S	G	E
Knowledge of subject matter	0	0	1	4	12
Teaching skills/expertise	0	0	1	4	12
Maintained participant interest	0	1	3	2	11
Solicited and reinforced participation	0	2	0	5	10
Response to participant needs	0	0	2	5	10
Used examples/analogies	0	2	0	3	12
Checked participant comprehension	0	0	1	5	11
Clarified/amplified important points	0	0	1	4	12

Overall, it is seen that teachers feel satisfied with the instructors' variety of skills. In the survey, one teacher, whose expertise is in Assessment and Evaluation, ranks the instructors lower than other teachers in all items. This is the reason why there are "Needs Improvement" and "Satisfactory" responses in every item. The expectations of the teacher could be different than the shared expectations and aims of the workshop.

C) Content of the workshop
Teachers are asked to answer questions on the content of the workshop in the following dimensions: organized/easy to follow, appropriateness of training topics, accuracy of training contents, instructional quality of training material, quality of visual aids, and relevance to the professional profile. Table 4 summarises their responses.

Table 4. *Opinions of the teachers on the content of the workshop*

Content	NO	NI	S	G	E
Organized/easy to follow	0	0	2	4	11
Appropriateness of training topics	0	0	2	4	11
Accuracy of training contents	0	0	2	3	12
Instructional quality of training material	0	0	3	5	9
Quality of visual aids	0	1	2	5	9
Relevance with professional profile	0	0	1	4	12

Overall, it is seen that teachers feel satisfied with the content of the workshop. Once again, the same teacher, whose expertise is in assessment and evaluation, ranks lower than the other teachers in this section. Apart from him, teachers seem happy with the content in almost all dimensions. Upon closer examination, it is observed that the quality of the visual aids receives the lowest scores, indicating that the visual aids should have been better as teaching content.

D) Methodology
Teachers are asked to answer questions on the method of the workshop in the following dimensions: supporting learning, balancing between theory and practice, time allocated to training, and effectiveness of training environment (e.g., lighting, seating, supplies). Table 5 summarises their responses.

Table 5. *Opinions of the teachers on the methodology of the workshops*

Methodology	NO	NI	S	G	E
The adopted approach supported my learning	0	0	2	4	11
Balance between theory and practice	0	0	2	8	7
Time allocated to training	0	1	3	6	7
Effectiveness of training environment	0	1	1	4	11

Upon reviewing the responses of the teachers, it is evident that they generally feel satisfied with the adapted methodology. The workshop successfully establishes a balance between theory and practice. However, regarding the time allocated to the workshop, it is observed that teachers responded below their average for other items. A few of the teachers needed to leave the workshop early due to their commitments. Additionally, some teachers were not familiar with the content. Furthermore, during the workshop, the teachers wished to discuss the topics for a longer duration; however, due to the limited time, not all of them had the opportunity to speak. These factors could be the reasons why the teachers might have found the time limited.

In terms of the effectiveness of the training environment, computer labs were used at the workshop. Interestingly, teachers from TED College, a private school, are not satisfied with the learning environment (responded as NI & S), whereas the learning environments at TED, including the computer lab, where the second day of the workshop took place, are above the average of Turkish schools.

E) Results

Teachers are asked to answer questions regarding the results of the workshop in the following dimensions: achievement of objectives, skills and competencies, and understanding of training contents. Table 6 summarises their responses.

Table 6. *Results of the workshop*

Results	NO	NI	S	G	E
Training objectives achieved	0	1	3	3	10
Increased skills and competences	0	2	1	6	8
Understanding of training contents	0	0	1	8	8

Upon reviewing the responses of the teachers, it is found that 13 out of 17 teachers believe that the workshop achieved its objectives at an excellent or good level. Similarly, 14 teachers feel that the workshop enhanced their skills and competencies to an excellent or good level. Likewise, 16 teachers indicate that the workshop provided them with an understanding of the training contents. These results demonstrate that the workshop successfully met its goals.

In open-ended questions, teachers are asked to provide their thoughts on the most interesting aspects of the workshop and to share their overall comments about the workshop.
Here are some comments of the teachers about what attracted their attention about the workshop:

"*I learnt about the place of computational thinking in education. This is an innovative approach*."
"*COMATH test can work for selection of gifted learners*".
"*Exchanging experiences and sharing ideas through discussions were very effective*".
"*The workshop was organised based on our needs. I would like to work in detail on the subject*".

In terms of their overall comments, 13 teachers provided feedback on the workshop, all of which was positive. One teacher suggested changing the timing of the workshop to the end of the academic term. This adjustment would allow her to fully attend all sessions without interruptions from her teaching commitments.