



## TeaEdu4CT project Newsletter 4 July, 2021

Dear newsletter readers, subscribers and followers of TeaEdu4CT project,

Since the start of the international project *Future Teachers Education: Computational Thinking and STEAM* (TeaEdu4CT) (Erasmus+ 2019-1-LT01-KA203-060767) in October, 2019, the planned Project activities have been going on, in spite of the difficulties caused by announced in March, 2020 pandemic of COVID-19 and quarantine, which has been renewed and continued throughout late autumn and winter and until the end of June of 2021. We are glad that from beginning of July, 2021, the closing of the quarantine was announced.

The 4<sup>th</sup> TeaEdu4CT project Newsletter will inform you about the progress made in the Project since February, 2021. We will continue with the series of "TeaEdu4CT Consortium Introduced" and will complete it, inform about the project news and the latest developments.

Your TeaEdu4CT team

### CONTENT

---

1. About the TeaEdu4CT Project
  2. The Project Consortium Introduced (continued)
  3. TeaEdu4CT Project News and Latest Developments
  4. Project partner activities: Training school for CT and STEM (C1 & C2) at Vilnius University
- 

### 1. About TeaEdu4ST project

Computational Thinking (CT), the main focus of the project, is considered to be an integrative skill to be addressed within the STEAM model. The emphasis is put on the primary role of computational models in modern research-oriented education. Such computational models, in addition to the existing educational physical environment and specific content laboratories, provide an opportunity for digital experiments and simulations. Then, in order to develop, implement, and study practical solutions based on computational models that include both technical and social aspects, students should have additional skills that allow them to

develop or implement solutions in a highly digitised educational environment, such as decomposing and generalising skills and skills to automate, algorithmize, calculate, and design. The project focuses on curriculum development activities for the education and training of future teachers. Future teachers are the main target group, which is involved in STEAM education, particularly those, who are concerned with CT aspects and appropriate curriculum development, as well as future teachers of preschool institutions (kindergartens), primary schools, lower and upper secondary schools of various subjects including foreign languages, arts and humanities. The other target group – university teachers involved in STEAM education and in particular those concerned with CT aspects and appropriate curriculum development and implementation. Within the project, each project partner is responsible for the whole or a part of the curriculum module in accordance with its best competences, together constituting an integral set of curriculum modules focused on CT and STEAM.

## **2. The Project Consortium Introduced (continued)**

There are eight leading European universities in computer science education, CT and STEAM education and two research centres involved in TeaEdu4CT project. In this Newsletter we would like to introduce to our readers and followers the remaining three of them.

### **2.1 CARDET - Centre for the Advancement of Research & Development in Educational Technology**

CARDET (Centre for the Advancement of Research & Development in Educational Technology) is an independent, non-profit, non-governmental, research and development organization based in Cyprus, with partners around the world. CARDET has collaborated with organizations, governments, international agencies, and corporations in Asia, Europe, and the USA. The CARDET team has successfully completed more than 200 projects in more than 40 countries, reaching out to more than a million people. CARDET team is composed of world experts who have global expertise in designing and implementing projects. CARDET is ISO 9001 certified for quality in management, research, and education services.

CARDET is one of the leading research and development centres in the Mediterranean region with global expertise in project design and implementation, capacity building, and e-learning. CARDET is one of the premier education and innovation organizations in Cyprus with extensive experience developing and implementing education programmes for education. It is equipped with a core team of qualified researchers, trainers, project managers, learning designers, ICT developers and graphic designers engaged in innovative curriculum design and development in a variety of sectors both for Face-to-Face and Online Environments learning. CARDET works closely with the University of Nicosia, and has access to all its facilities. CARDET is independently affiliated with universities and institutions from around the world, such as the Yale University and the International Council of Educational Media. CARDET has completed numerous projects relating to the development of capacity building and planning in education and VET, youth support, adult learning, literacies, digital tools, eLearning, educational technology and robotics, and social integration of marginalised groups.

The team of CARDET strives to offer the highest quality services to benefit society, it actively collaborates with local and international organizations, public and private bodies, and across diverse disciplines in designing solutions for local and global challenges. **Its mission** is to

inspire next generation education, promote research, innovation and development through evidence-based practices, cutting-edge research and empowered people. Its objectives are to foster systemic, systematic and sustainable development; develop education and training solutions for diverse contexts and clients; advance basic and applied research across disciplines; develop partnerships and collaborations across the globe; study media literacy, visual literacy, social media and impact of ICT in education and society; inspire innovation, entrepreneurship, leadership and social change (<https://www.cardet.org/who-we-are/about>).

Dr. Maria Solomou, working as General Project Coordinator and Instructional Designer at CARDET, is one of the team actively involved in the project. She is also a Learning Scientist on online learning and digital games at the Cyprus University of Technology. She has a Ph.D. in Learning Sciences and Instructional Systems Technologies from Indiana University - Bloomington, U.S.A. She has core expertise in online and game-based learning, and in particular the pedagogical design of interactive trajectories within online, social spaces, 2D and 3D, for learning and professional development. Maria is involved in the design of face-to-face, blended, and online courses in various sectors of learning and entrepreneurship, as well as in matters of strategic management and development

In this project CARDET, as participating partner, is involved in the design and development of two Modules: *Educational environments for CT: design and aspects of integration (IO 8)* and *Technological, pedagogical and instructional design aspects of teaching CT for STEAM (IO 10)*.

## **2.2 Tallinn University (TLU)**

Tallinn University (TLU) is the third largest public university in Estonia with 6500 students in 6 schools. Tallinn University is a partner in 14 European Union regional programme projects and coordinates one of them, titled Learning Layers. TLU also participates in the EU Horizon 2020 framework programme both as a partner and as a coordinator. The university has agreements with 43 partner universities in 21 countries and more than 490 Erasmus+ partnership agreements; TLU is a member of four international networks of higher education institutions, and its researchers and lecturers actively contribute to the activities of their professional networks.

The Centre for Educational Technology (CET), established in 1998 is an interdisciplinary R&D unit within the School of Digital Technologies of TLU. International staff of CET (25 in total) consists of 14 full-time researchers, 6 software developers, 4 post-doc researchers, some part-time employees and a group of postgraduate students. The main research projects in CET are related to development of the next-generation distributed learning environments involving interoperable social software tools. TLU School of Digital Technologies has established partnerships with leading Estonian software companies (Skype Estonia, Nortal, NetGroup, ProEkspert), and also with the main open-source based learning technology providers in the Baltic Sea region (JukuLab OÜ in Estonia, MediaMaisteri OY in Finland).

CET has developed the main educational portal in Estonia (Koolielu.ee) and several widely used online learning environments (VIKO, IVA, eDidaktikum, LeMill.net, EduFeedr, Digital Mirror), leading the research and development in Estonia on digital competence and digital innovation in schools in general. CET was responsible for piloting SELFIE and DigCompEduSAT in Estonia. CET is actively participating in Estonian E-university consortium, E-VET consortium and national networks of primary and secondary schools,

which allows to pilot and validate the project outcomes on the national level. Key interests: digital learning ecosystems, digital competence, technology-enhanced assessment, digital maturity of schools, metadata and repositories of digital learning resources, pedagogy-driven design of tools and systems for technology-enhanced learning, empirical validation of innovative pedagogical models, competency management with e-portfolio, semantic web technologies for learning analytics (<http://www.tlu.ee/en/tallinn-university/>).

Mart Laanpere, involved in this project, is a senior researcher at CET, PhD in educational science, MSc in Educational & Training Systems Design (University of Twente, the Netherlands). He is head of Informatics Teacher Education MA programme at TLU (has been teaching didactics of informatics since 1998) and the chairman of the national curriculum committee for school informatics. He has participated in a number of R&D projects in the field of educational technology. His main focus in research is conceptual design and analysis of affordances of technology-enhanced learning systems and tools, assessment of digital competence of teachers and digital maturity of schools.

Tallinn University has been represented in the world university rankings since 2019. Tallinn University is represented in two of the world's most well-known rankings – the QS World University Rankings (QS WUR) and Times Higher Education World University Rankings (THE WUR). Tallinn University is ranked 801-1000 in both the rankings which means the University is among the top 5% of the world's universities. Read more about [TU ranking positions](#).

In this project Tallinn University, as a leading partner, in cooperation with Ankara University, CESIE and CARDET organisations has developed the Module 10 (IO 10): *Technological, pedagogical and instructional aspects of teaching CT for STEAM*.

### **2.3 Radboud University (RU)**

Radboud University (RU) is a broad, internationally oriented research university in the Netherlands. Its academic expertise is closely related to important societal issues. The research of the Faculty of Science is embedded in six interdisciplinary institutes with stakeholders in our society, which results in the ability of fundamental and applied sciences to strengthen one another. The scientific activities of the Department of Science Education concern general STEM educational themes such as learning by design, digital literacy, responsible citizenship education, assessment and formative evaluation, and science teachers' pedagogical content knowledge (PCK). Furthermore, the department addresses topic-specific pedagogies for, e.g., algorithms, programming and classical mechanics.

Elsevier's ranking of the best study programmes of 2020 puts Radboud University in the second place among the best comprehensive universities in the Netherlands. According to the Dutch university information guide Keuzegids Universiteiten 2020 (for Bachelor's programmes), Radboud University is the best traditional, general university in the Netherlands. Two programmes have received a Top Programme designation, nine programmes are deemed the best in their field by the Keuzegids. In the Keuzegids Masters 2021 eleven Radboud University master's programs score above average. There are about 18,000 universities worldwide participating in International rankings. Radboud University is one of the leading group. Go to [more information about international rankings](#). Since 2019, Radboud University has joined the THE Europe Teaching Ranking that compares universities based on their performance in the field of education. RU scored a 24th place in a field of 258 universities.

**Nobel Prize for Physics** was awarded to Professor Andre Geim and Professor Konstantin Novoselov, both are connected to the Radboud University. They have been awarded the Nobel Prize for Physics in 2010 for the discovery of graphene, the thinnest material in the world. They have explored the material in the High Field Magnet Laboratory in Nijmegen and got essential help from professor Mikhail Katsnelson, theoretical physicist at Radboud University. 13 scientists from Radboud University have won the Spinoza Prize, also known as the ‘Dutch Nobel Prize’. The most recent were Wilhelm Huck and Mihai Netea in 2016.

Erik Barendsen, a professor of Science Education at Radboud University, involved in this project, his research interests include computing and STEM education, in particular programming education, computational thinking, design-based teaching and learning, and teachers’ professional knowledge including pedagogical content knowledge (PCK). Erik Barendsen is the director of the Institute for Computing and Information Sciences (iCIS), which was established to improve the fundamentals of software development via formal, mathematically founded theories, methods and tools. He plays a prominent role in national curriculum development with respect to primary and secondary computing education, both as chair of the Computer Science Curriculum Committee and as expert advisor in the national curriculum revision on digital literacy. Erik Barendsen is an associate editor of *Computer Science Education* and a member of the editorial board of *Informatics in Education*.

RU is a leading project partner responsible for development of two modules: Module 2 (IO 2): *General Introduction of Computational Thinking: a basic module suitable for all teachers* and Module 5 (IO 5): *CT for STEM prospective teachers: specific features, approaches and practical solutions*.

### **3. TeaEdu4CT Project News and Latest Developments**

After completion of reviewing stage (09-2020 - 01-2021) during which internal and external evaluation of developed modules have taken place, the TeaEdu4CT project has entered the Piloting stage, the pilot implementation of the developed modules on CT. The goal is to test the developed 10 modules and each of all 10 project partners have to organize the pilot implementation of two modules. After the completion of piloting and evaluation of it the final improvement of the modules will be made, based on results of internal evaluation of piloting, using the piloting evaluation instruments.

**Module piloting.** During the discussion of the approaching piloting of the modules, planned to be conducted in spring semester of 2021, there was the concern of partners regarding the difficulties of piloting in spring expressed. Each module has to be piloted in two institutions for pre-service groups of 20-30 students. Due to unfavourable COVID -19 pandemic situation in project partner countries, it was decided the piloting period to extend into the autumn semester of 2021.

**Module translation into national languages.** The other concern - additional time was needed for translation/localisation of 2 (to be piloted) modules into national languages. According to the project timeline the translation was planned to be done in February –May of 2022, actually after the end of piloting stage, so the corrections in the time line had to be made. Additional time was also needed for translation of piloting evaluation instruments developed in English

(Annex E (for university professors) and Annex F (for students). The national languages of the project partners are as follows: Lithuanian, Estonian, Turkish, Swedish, Dutch, Finnish, Italian, Greek, German and Austrian German. Leading partners, who are responsible for module(s) development and piloting, are translating these modules into their national languages. Besides some partner institutions have chosen to translate more than two modules into their national languages (see the information in the last column of Table 1). For instance, Vilnius University responsible for the 1<sup>st</sup> Module/ Intellectual Output (IO 1) will translate into Lithuanian IO 1 and also IO 2, IO 4, IO 5, IO 6 and IO 8.

**Table1. TeaEdu4CT Modules/Intellectual Outputs Piloting and Translation**

ID	Output Title	Leading & Piloting	Translation/Piloting
<b>IO1</b>	<b>Framework for the support of the modules: CT&amp;STEM for future teacher education</b>	<b>P1 – VU – Lithuania</b>	P4 – ANKU - Turkey P5 – TLU – Estonia
<b>IO2</b>	<b>General Introduction of Computational Thinking: a basic module suitable for all teachers</b>	<b>P8 – RU– Netherlands</b>	P1 – VU - Lithuania P3 – KTH - Sweden
<b>IO3</b>	<b>CT for pre-school (kindergarten) prospective teachers: specific features, approaches and practical solutions</b>	<b>P4 – ANKU – Turkey</b>	P5 – TLU - Estonia P9 – UPB - Germany
<b>IO4</b>	<b>CT for primary education prospective teachers: specific features, approaches and practical solutions</b>	<b>P9 – UPB - Germany</b>	P1 – VU - Lithuania P6 – CESIE – Italy P10 – CARDET - Cyprus
<b>IO5</b>	<b>CT for STEM prospective teachers: specific features, approaches and practical solutions</b>	<b>P8 – RU – Netherlands</b>	P1 – VU - Lithuania P3 – KTH - Sweden
<b>IO6</b>	<b>CT for informatics (computing) prospective teachers: specific features, approaches and practical solutions</b>	<b>P7 – TUW – Austria</b>	P1 – VU - Lithuania P9 – UPB - Germany
<b>IO7</b>	<b>CT for languages, arts and humanities prospective teachers: specific features, approaches and practical solutions</b>	<b>P4 – ANKU – Turkey</b>	P6 – CESIE - Italy P2 – UTU - Finland
<b>IO8</b>	<b>Educational environments for CT: design and aspects of integration</b>	<b>P2 – UTU – Finland</b>	P1 – VU - Lithuania P5 – TLU - Estonia P10 – CARDET - Cyprus
<b>IO9</b>	<b>Using Constructivism, and Project and Challenge Driven Pedagogy for learning Computational Thinking</b>	<b>P3 – KTH – Sweden</b>	P6 – CESIE - Italy P8 – RU - Netherlands
<b>IO10</b>	<b>Technological, pedagogical and instructional design aspects of teaching CT for STEAM</b>	<b>P5 – TLU – Estonia</b>	P6 – CESIE – Italy P7 – TUW – Austria

**Dissemination of project results.** In parallel with piloting and translation, there are other activities going on within the TeaEdu4CT project, namely, the *Dissemination of project results*

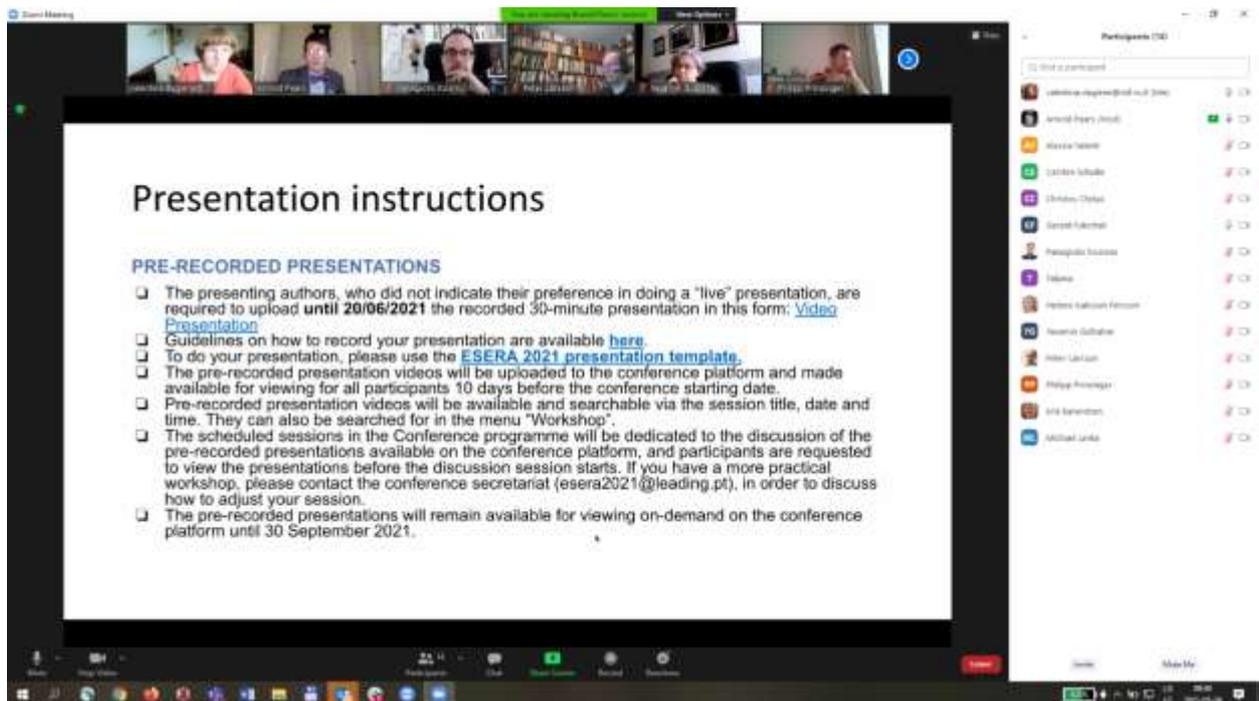
and *Learning, Teaching and Training activities* C1-C2. Project partners have used for dissemination of project activities and events in the conferences of the year of 2021:

1) CTE-STEM 2021: *Fifth APSCE International Conference on Computational Thinking and STEM Education*, June 2-4, 2021 (<https://cte-stem2021.nie.edu.sg/>) in Singapore.

2) The 26th annual conference on *Innovation and Technology in Computer Science Education* (ITiCSE). ITiCSE 2021 was hosted by project partner Paderborn University in Paderborn, Germany, June the 26th and July the 1st, 2021 (<https://iticse.acm.org/>).

The preparation is in process for participation at ESERA (*European Science Education and Research Association*) 2021, an online conference organized by the University of Minho, Braga, Portugal (30 August - 3 September, 2021)

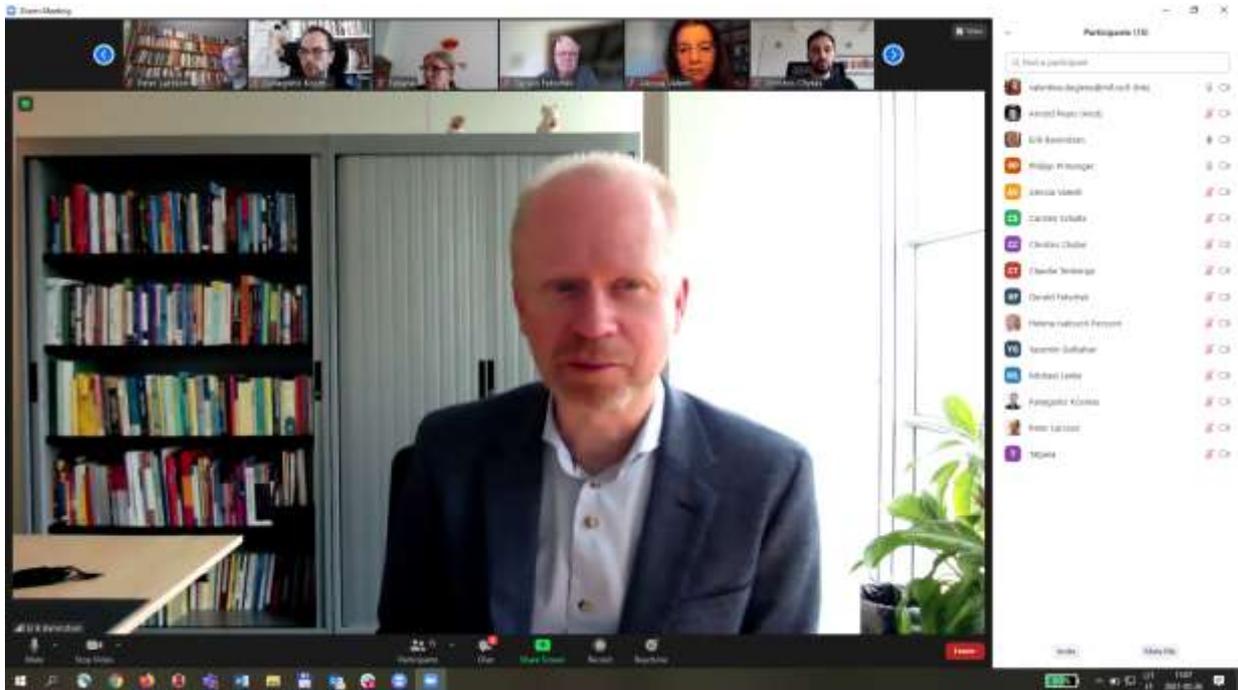
(<https://www.esera.org/33-conference/830-esera-conference-2021-praga-portugal>).



Screen shot: the fragment from Arnold Pears (KTH) presentation about project dissemination activities planned for ESERA conference (11th online partner meeting).

As it is an online conference, there are the video recordings of paper presentation and of the workshop made, presenting project activities.

Following the developed project Dissemination plan and set dissemination goals at the same 11<sup>th</sup> online partner meeting Erik Barendsen from RU has presented the ideas for online international conference *on Informatics in School: Situation, Evaluation and Problems* – ISSEP 2021 to be held in November, 2021, in the Netherlands.



Screen shot: fragment of Erik Barendsen (RU) presentation about upcoming ISSEP conference.

Partners discussed ideas for dissemination of the TeaEdu4CT project outcomes at ISSEP 2021. It was agreed to have a panel discussion and to organize a one-day conference and workshop for teachers.

## **5. Project partner activities: Training school for CT and STEM (C1 & C2) at Vilnius University**

Learning, Teaching and Training activities (C1-C2) of TeaEdu4CT project have a double focus, the dissemination of project results and organisation of intensive training programmes for pre-service teachers and HE teachers.

The goal of *The Intensive Programme for Higher Education Learners (C1)* is to introduce the TeaEdu4CT project aims, outcomes and modules developed for students studying at HEIs (from VU and project partner Universities) to become school teachers, so as to train their computational thinking skills and demonstrate the practical possibilities and ways of development of CT skills in school.

Project partners from different countries will participate in C2 activity of *Invited Teachers at Higher Education Intensive Study Programmes* for the staff of VU and representatives of project partner institutions.

Learning, Teaching, Training Activities C1-C2 (*Intensive programme for HE learners and Invited Teachers at HE Intensive Study programme*) are scheduled for **September 13-17, 2021** and will take place at Vilnius University Faculty of Philosophy. For more information write to: [valentina.dagiene@mif.vu.lt](mailto:valentina.dagiene@mif.vu.lt)