



**Technology
Education
Today**

Teacher Workshops 2017

Programme

06—07 November 2017

University of Duisburg-Essen

Center of Excellence for Technology Education

Essen, Germany

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1 Welcome

Welcome to the CETE Teacher Workshops 2017!

The Center of Excellence for Technology Education Network (CETE) is a research association, consisting of leading, academic research institutions within the sector of Technology Education. The teacher workshops, which are funded by the German Academic Exchange Service (DAAD), offer different workshops, professional exchange and networking in the field of Technology Education as well as all sections of STEM subjects.

The workshops support connecting teachers cross-nationally and interdisciplinary by establishing opportunities to participate in discussions as well as sharing ideas and experiences. These workshops are aimed to train teachers and students who develop teaching materials and those who embed it in their classrooms. CETE network and international keynote speakers introduce into the current state of Technology Education and show the implementation on concrete materials.

We are looking forward to welcome you in Essen!

Yours

CETE-Team



2 Programme

Monday, 06. November 2017			
12:00-12:30	Registration <i>Room S06 S01 G-Lab II (A49)</i>		
12:30-12:45	Opening & Introduction <i>Room S06 S01 XX</i>		
12:45-13:45	Keynote I – Professional Teacher Training <i>Speaker: Prof. Dr. Uwe Pfenning</i> <i>Room S06 S01 XX</i>		
13:45-14:00	Coffee Break		
14:00-16:00	Workshop 1- Writing Tools <i>Leader: Prof. Dr. Heike Blümer</i> <i>Level: Primary</i> <i>Room S06 S01 XX</i>	Workshop 2 - Smart Energy <i>Leader: Joachim Zimmermann</i> <i>Level: Secondary I-II</i> <i>RoomS06 S01 XX</i>	Workshop 3 – Pro Wood Part I <i>Leader: Prof. Dr. Claudia Tenberge</i> <i>Level: Primary/Secondary I-II</i> <i>RoomS06 S01 XX</i>
16:00-16:15	Coffee Break		
16:15-18:15	Workshop 4 – Energy in the MobiLab <i>Leader: Manuel Haselhofer</i> <i>Level: Primary</i> <i>Room S06 S01 XX</i>	Workshop 5 – Designing Our Tomorrow <i>Leader: Thorsten Fritz</i> <i>Level: Secondary I-II</i> <i>Room: S06 S01 XX</i>	Workshop 3 – Pro Wood Part II <i>Leader: Prof. Dr. Claudia Tenberge</i> <i>Level: Primary/Secondary I-II</i> <i>RoomS06 S01 XX</i>
19:00	Dinner		

Tuesday, 7. November 2017

9:00-10:00	Keynote II – <i>Speaker: N.N.</i> <i>Room S06 S01 XX</i>		
10:00-10:15	Coffee Break		
10:15-12:15	Workshop 6 – Problem Solving <i>Leader: Annika Gooß</i> <i>Level: Primary</i> <i>Room S06 S01 XX</i>	Workshop 7 – 3D printing in the classroom <i>Leader: Prof. Dr. Fletcher & Tatiana Esau</i> <i>Level: Secondary I-II</i> <i>Room S06 S01 XX</i>	Workshop 3 – Pro Wood Part III <i>Leader: Prof. Dr. Claudia Tenberge</i> <i>Level: Primary/ Secondary I-II</i> <i>RoomS06 S01 XX</i>
12:15-13:15	Lunch Break		
13:15-15:15	Workshop 8 – STEM in Elementary Education <i>Leader: Marion Krewitt</i> <i>Level: Elementary</i> <i>Room S06 S01 XX</i>	Workshop 9 – Concept and Application of the Learning Platform “COSITO” <i>Leader: Prof. Dr. Frank Bünning</i> <i>Level: Secondary I-II</i> <i>Room S06 S01 XX</i>	Workshop 3 – Pro Wood Part IV <i>Leader: Prof. Dr. Claudia Tenberge</i> <i>Level: Primary/ Secondary I-II</i> <i>RoomS06 S01 XX</i>
15:15	Farewell		

3 Workshops

Workshop 1: Writing Tools

06. November 2017, 14:00-16:00, Room S06 S01 XX, Level: Primary

Leader: Prof. Dr. Heike Blümer

(details coming soon)

Workshop 2: Smart Energy– Data processing

06. November 2017, 14:00– 16:00, Room S06 S01 XX, Level: Primary

Leader: Joachim Zimmermann

Smart-Phone, Smart-TV, Smart-Watch, Smart-Home... terms which shape our daily life. Thanks to digitisation, modern home appliances can communicate with another. Everything appears to become increasingly 'smart': devices adapt themselves to the users' needs. Smart assistance for the household like *Amazon Echo* or *LG Hub Robot* are not only able to answer simple questions. Furthermore, they create a profile for every user which is saved in a cloud and can be adapted any time. Energy provision itself is adapted more and more to the users' needs. Moreover, energy provision develops from a centralised to a decentralised energy supply. Due to this development, energy grids transform into intelligent electricity grids, into so-called SmartGrids. The energy technology makes use of such 'smart' systems, which manage energy transformation, provision and storage.

How can this technological progress of an increasing digitised and 'smart' energy technology be educationally reduced for the compulsory school? This workshop deals with partial aspects of energy transformation, storage and (smart) provision. As a simple single household has turned from an only consuming to an also producing one, we also consider it as a part of the 'smart' system.

Workshop 3: Teachwood, Pro Wood Part I, II, III & IV

06. November 2017, 14:00–16:00, 16:15– 18:15; 07. November 10:15-12:15, 13:15-15:15, Room S06 S01 XX, Level: Primary

Leader: Prof. Dr. Claudia Tenberge

Teachwood is a long-time tested further education for the implementation of

"professionell handling of woodworking tools and the material wood" and "solving technical tasks" in primary schools. The training course includes:

- train the necessary skills in practical handling of woodworking tools
- concrete organizational and content-related ideas for the design of teaching on topics related to wood and problem-solving technical tasks (e.g. presentation of a curriculum, didactic-methodological notes, tested and elaborated teaching examples, student worksheets as well as organizational support)
- joint planning of the didactic-methodical design of a teaching unit based on this contents
- notes on the practical implementation in your own classroom

Workshop 4: Energy in the MobiLab

06. November 2017, 16:15– 18:15, Room S06 S01 XX, Level: Primary

Leader: Manuel Haselhofer

The participants of the workshop discuss concepts of energy and check out hands-on-experiments to that topic. The experiments are designed to develop two energy key concepts: energy forms and transformation. The experiments are part of MobiLab, an educational mobile laboratory. The University of Applied Science FHNW developed MobiLab as a service for use in schools and teacher development (Primary and early Secondary I level). Among other topics, the workshop addresses the challenge of developing teaching modules focused on the concept of energy that are both scientifically correct and tailored to the cognitive development of children. Potential and limits of energy in STEM- lectures are introduced and discussed in the workshop. Due to the hands-on nature of this workshop, the number of participants is limited.

Workshop 5: Designing Our Tomorrow (DOT)

06. November 2017, 16:15– 18:15, Room S06 S01 XX, Level: Secondary I-II

Leader: Thorsten Fritz

Designing our Tomorrow ("DOT") is a joint project of the Department of Engineering and the Faculty of Education at the University of Cambridge,

which introduces new resources designed to inspire the next generation of engineers by bringing authentic engineering challenges into the classroom. DOT creates a different atmosphere for learning and encourages teamwork and innovation. The students shall gain analytical skills in problem spotting and problem solving skills, like thinking about problems in a multi-dimensional way rather than in a linear input-output manner. The implementation of this project is widespread and it increases the number of students that pursue careers in science and engineering significantly.

Workshop 6: Problem Solving– an Example with Gliders

07. November 2017, 14:00– 16:00, Room S06 S01 XX, Level: Primary

Leader: Annika Gooß

Problem solving is one of the main approaches in Technology Education in primary schools due to its essential element: “identifying and productive solving of technical problems with processes of problem finding, practical acting, discovering, constructing, optimising and evaluating” (GDSU 2013, 63). Through practical problem-solving children can understand the manmade world, involving using and discovering scientific concepts and skills in conjunction with design-and-make activities. Teachers’ support is an influential factor on students’ learning processes, especially in early childhood and particular crucial in open and problem based learning environments.

The workshop focusses on problem solving processes in the primary schools (3rd, 4th classes) using the example of constructing gliders. After some hands-ons, conditions and challenges would be discussed with regard to appropriate support of problem solving processes.

Workshop 7: 3D-printing in the classroom

16. June 2017, 15:45– 17:45, Room S06 S01 XX, Level: Secondary I-II

Leader: Prof. Dr. Stefan Fletcher & Tatiana Esau

The workshop introduces the basic principles of 3-D printing as well as the presentation of implementation examples for lessons. The focus is on the independent design and production of a component with the 3-D printing process.

Workshop 8: STEM in Elementary Education

07. November 2017, 13:15– 15:15, Room S06 S01 XX, Level: Elementary

Leader: Marion Krewitt

The term scientific literacy occupies a central position within the STEM subjects. Scientific literacy deals with the ability to apply scientific knowledge to everyday life. It is about how to make and understand decisions which affect personal, professional or community issues. It is generally accepted that scientific literacy is among the important goals of education in modern societies. Not only since the first PISA results have been published have nursery schools got an educational mandate. Scientific –technical education has ever since its place in the daily routine of the 0-6 year olds. Starting with the question of the necessity and the purpose of early scientific-technical education we will focus on the role of the kindergarden teachers in such educational arrangements in this workshop. The practical realization of research projects with young children and the pros and cons of free and guided activities will also be addressed in our workshop. Together we will work on criteria to select appropriate experiments for 0-6 year olds. To conclude, the participants of this workshop will have the opportunity to conduct different experiments on the topic “water”.

Workshop 9: Concept and Application of the Learning Platform “COSITO”

07. November 2017, 13:15– 15:15, Room S06 S01 XX, Level: Secondary I-II

Leader: Prof. Dr. Frank Bünning

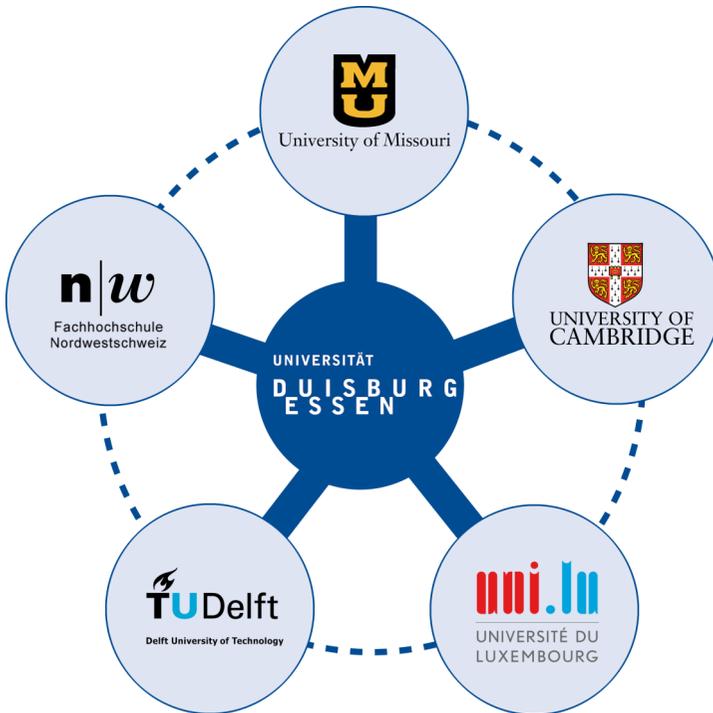
The lacking interested of youngsters in industrialized countries challenges methodical class design. In order to raise the attractiveness of S&T teaching needs a shift in paradigm: away from science and technology orientation towards every-day -questions and every-day relevance. The possibility to design, modify and alter technology technological needs to enjoy a higher priority. Curiosity, originality, and creativity have to be inspired and need to be given more attention. The relevance of exemplary and problem-oriented contents has to be addressed. An encyclopedic content structure has to be objected. Considering these challenges, the Chair of Technology Education at Magdeburg University has developed a learning platform based on the concept of Anchored Instruction (co. *Cognition and Technology Group at Vanderbilt*, 1997). In dependence on the research of the Cognition and Technology Group at Vanderbilt, the Chair of Technology Education at Otto-von-Guericke-University Magdeburg has developed a learning platform called “CoSiTo” (a compound of Cognition + Situated Learning + Tool). The learning

platform is consistent with constructivist theories. It emphasizes generative learning anchored in meaningful contexts.

The learning platform “CoSiTo” is for students to develop an appreciation of technology as realistic part of their world and everyday problem solving. The assumption is that students will come to see technology as something interesting and useful and that it more importantly offers relevant occupational opportunities.

The workshop will explain the underlying design principles of the platform “CoSiTo” and provide hands-on phases to work with the platform.

4 Information about CETE



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