TA TEACHERS
CONFERENCE 2012

**Bringing Creativity and Thinking Skills
into the Educational Process**
Riga, 14-15 September 2012

Conference Programme

Abstracts and Extended Summaries

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Welcome from the Organising Committee

We are pleased to welcome you to the first international TA Teachers conference, and to welcome you to Riga and Latvia.

This is the first large international conference on teaching thinking in Latvia that brings together delegates from 20 countries who will be speaking on various aspects of developing creativity and thinking skills of learners. We would like to thank all of the speakers who have sent their proposals to this conference and made it a truly international event.

Although the main focus of the conference is the Thinking Approach to teaching and learning, we have done our best to attract colleagues working with various approaches and coming from different educational traditions. We believe that such an approach is not only beneficial for the delegates but is also extremely useful for presenters who can learn from each other. We would like this dialogue to grow into establishing the European network for teaching thinking – please see more information on p. 57-59.

The programme also has several social events, including the welcome reception at the conference hotel on Friday, a guided walking tour of Riga Old Town on Saturday, the conference gala dinner on the top floor of FG Royal hotel giving you a magnificent view of the Freedom Monument, the park and the Latvian National Opera, and a selection of guided tours on Sunday after the conference. More information about each of this can be obtained at the registration desk.

Finally, we would like to thank our main sponsor, the Nordic Council of Ministers, whose support through the Nordplus Programme was essential for making this conference possible. Our special thanks to all the members of the Organising Committee for the invaluable contribution to this event.

Once again, welcome to Riga and we wish you a very fruitful conference.

Edgar Lasevich
Conference Chair

Dr. Alexander Sokol
Head of the Organising Committee

Conference Programme

Friday, 14 Sep

09:00 – 12:00	Pre-Conference Tutorials *(separate registration required)*

Tutorial 1. The Theory of Inventive Problem Solving & Its Potential for Education.
Dr. Alexander Sokol, TA Group, Latvia.

Tutorial 2. Problem Centred Education in the Primary School.
Dr. Alla Nesterenko, Teacher Training and Re-Qualification Academy, Moscow, Russia.

10:00 – 12:30	**Registration for Delegates**
12:30 – 13:30	**Lunch**
13:30 – 16:00	**Plenary Sessions**
16:00 – 16:30	**Coffee Break**
16:30 – 18:30	**Plenary Sessions**
19:00	**Welcome Reception** (hotel restaurant)

Sat, 15 Sep

09:00 – 10:30	**Work in Sections**

Section A. Development of Creativity & Thinking in Language Education
Section B. Development of Creativity & Thinking in Science & Maths
Section C. Development of Creativity & Thinking in Pre-Primary and Primary School
Section D. Research on Teaching Thinking

10:30 – 11:00	**Coffee break**
11:00 – 12:30	**Work in sections**

Section A. Development of Creativity & Thinking in Language Education
Section B. Development of Creativity & Thinking in Science & Maths
Section C. Development of Creativity & Thinking in Pre-Primary and Primary School
Section D. Research on Teaching Thinking

12:30 – 14:00	**Lunch**

Conference Programme

14:00 – 15:30   **Work in sections**

Section A. Development of Creativity & Thinking in Language Education
Section E. Thinking Across School
Section F. Thinking Based Lessons. **Tutorial by Carol McGuinness, UK, Tania Santiago, Spain & Robert Swartz, USA**
Section G. Thinking at Home (in Latvian)

15:30 – 16:00   **Coffee break**

16:00 – 17:30   **Work in sections**

Section A. Development of Creativity & Thinking in Language Education
Section E. Thinking Across School
Section F. Thinking Based Lessons. **Tutorial by Carol McGuinness, UK, Tania Santiago, Spain & Robert Swartz, USA**
Section G. Thinking at Home (in Latvian)

18:00   **Old Riga. Walking Tour** *(free for the delegates)*

20:00   **Conference Dinner** *(separate registration)*

Sun, 16 Sep

       Excursions *(separate registration)*

Pre-Conference Tutorials

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Friday, 14 September

08:30 – 09:00   **Registration for Pre-Conference Tutorials**

09:00 – 12:00   **Pre-Conference Tutorials**

Tutorial 1. *Room "Abava"*.
The Theory of Inventive Problem Solving & Its Potential for Education.
Dr Alexander Sokol, TA Group, Latvia.

As the topics of creativity and thinking are gaining popularity, more and more people become aware of critical thinking, Philosophy for Children, various techniques developed by Dr. de Bono and other approaches. The Theory of Inventive Problem Solving (TRIZ) developed by Genrich Altshuller in the second part of the XXth century is less known in the educational context. Although this theory has been effectively used for practical problem solving across domains for several decades, still few people are aware of its potential for education. This tutorial will be useful for those interested in learning more about TRIZ and how it can contribute to developing one's creativity and thinking skills. Examples from various disciplines and for various age groups of learners will be offered, therefore the tutorial is open not only to teachers but also parents, researchers, managers, policy makers and other groups of participants.

The tutorial will be facilitated by Dr. Alexander Sokol, academic director of TA Group, Latvia

Tutorial 2. *Room "Venta"*.
Problem Centred Education in the Primary School.
Dr. Nesterenko, Teacher Training and Re-Qualification Academy, Moscow, Russia.

The tutorial deals with using the tools from the General Theory of Powerful Thinking based on the Theory of Inventive Problem Solving (OTSM-TRIZ) in various subjects. We will consider some problems characteristic of the educational process and then test OTSM-TRIZ models as a means for obtaining solutions. During the tutorial, you will learn how the same tools (models, technologies) could be presented in various subjects (maths, language, literature, biology). We will concentrate on the domain-free properties of the teaching tools and their specific application in each particular subject. Age specific characteristics of using the tools will also be considered. The participants will have an opportunity to test some teaching tools, such us constructors for building exercises and training games with various banks of objects.

The tutorial will be facilitated by Dr. Alla Nesterenko, Teacher Training & Re-Qualification Academy, Moscow, Russia

12:30 – 13:30   **LUNCH BREAK**

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Plenary Sessions

Friday, 14 September
Room "Lielupe"

13:30 – 13:45   **Official Opening.** Welcome from the Ministry of Education & Culture, Riga City Council and Nordic Council of Ministers

13:45 – 14:30   Dr. Alexander Sokol, TA Group, Latvia.
Towards Helping Teachers Introduce Thinking in the Classroom

While administrators, researchers and policy documents call for the need to bring more thinking into the classroom, many teachers believe that thinking has always been present in their lessons. One of the factors contributing to this extremely different vision of the situation is understanding of a thinking task. In this talk, I will propose the definition of a thinking task as used in the context of the Thinking Approach to teaching and learning. I will also outline the framework we have used for helping teachers bring these thinking tasks into their classrooms and some of the lessons we have learned. The presentation can be seen as an umbrella talk for many of our colleagues' accounts of their experience with the Thinking Approach shared at this conference.

14:30 – 15:00   Irina Buchinska, Daugavpis Russian Lyceum, Latvia.
The Teacher's Notes on Learners' Banks.

A learner-centered approach with a learner autonomy as one of its key principles has taken an important place in modern teaching/learning process. Developing learner's problem-solving and thinking skills, in our view, is a significant part of learner autonomy. Very important questions for teachers are how to shape or re-shape their way of teaching to ensure the development of both learner autonomy and thinking simultaneously with learning the subject content, what materials to use and what procedures to apply. This talk aims at presenting the experience of this integration at the EFL lessons in Daugavpils Russian Lyceum, Latvia. Work with such learning tool as Learner's Banks will be discussed during the talk.

15:00 – 15:30   Susan Granlund, Kirkonkylä Primary School, Finland.
Integrating the Thinking Approach into the Primary English classroom. How and Why?

The aim of this presentation is to show some ways in which typical tasks in the primary English (EFL) classroom can be adapted to become more creative problem-solving activities which advance not only the pupils' language learning skills, but also their thinking skills. I aim to give examples of games, tasks and projects done, which show how I have been using the Thinking Task Framework, a tool to help teachers plan and implement thinking lessons, discussing also how my pupils have reacted and what the outcomes have been.

Plenary Sessions

Friday, 14 September
Room "Lielupe"

15:30 – 16:00   Deirdre Jennings, Vilnius International School, Lithuania.
Introducing Thinking Skills in Maths and Science.

Many students and teachers have experienced science as a subject requiring a massive memory where information content, rather than processes and skills, was the focus. However, we live in an information age where it is simply not possible to keep up with and retain all the information, old and new. The requirement now is that each person can be able to search for, identify, manipulate and manage information to solve challenges. TRIZ is an excellent basis for training young minds in learning about and applying thinking models such as ENV. I worked with middle school students aged 11-15, adapting some of their lesson cycles and tasks to incorporate thinking tools and their uses. I learned that a) middle-school students are well able to learn about thinking models, b) some models which I was applying in the science classroom were applicable across the full range of subjects i.e. the skills and processes which the students developed are general and transferrable and c) the skills learned gave better access to answering higher order type questions such as analysing, evaluating and creating.

16:00 – 16:30   COFFEE BREAK

16:30 – 17:00   Dr. Alla Nesterenko, Teacher Training & Re-Qualification Academy, Moscow, Russia. **Problem-Centred Education: Goals, Structure, Results.**

This talk will introduce you to the Problem-Centred Education (PCE) based on OTSM-TRIZ. I will describe the reasons for developing this approach, as well as discuss its goals, structure and components (models and procedures). The PCE tools will be demonstrated through examples from various disciplines: language, literature, science, and maths. We will consider how the system of tools for dealing with problems should be designed and how various tasks for learning to use the tools can be easily developed. Possible approaches to evaluation and assessment, as well as some aspects of teacher education, will also be discussed.

17:00 – 17:30   Tania Santiago, Colegio Ayalde, Loiu, Spain & Robert Swartz, National Canter for Teaching Thinking, USA. **Thinking-Based Learning: Teaching Students to Become Skillful Thinkers and Learners**

When teachers teach students to become skillful thinkers by *infusing instruction in thinking skills into content instruction* the results are dramatic: vastly improved content learning and the development of quality thinking habits. When we add to this the prompted explicit manifestation of appropriate habits of mind this enhances these results manyfold. This process, the proficient and strategic application to the regular content curriculum of appropriate Thinking Skills enhanced by productive Habits of Mind to develop thoughtful decisions, arguments, and other creative and critical products, is what we call "Thinking-Based Learning". In our experience TBL is the most powerful educational technique that teachers can practice. It can help us to achieve the highest standards in our quest for knowing and understanding, and for acting wisely based on this knowledge and understanding. In this presentation we will illustrate a variety of important tools that teachers use in TBL lessons, for example thinking strategy maps, specially designed graphic organizers, metacognitive structures, and collaborative thinking strategies. We will do this by showing examples of infusion lessons that teachers k – 12 in the USA, Spain, and Chile have developed and taught successfully in their classrooms. We will also illustrate the use of special lesson planning organizers that highlight the important ingredients in such TBL lessons.

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Plenary Sessions

Friday, 14 September
Room "Lielupe"

17:30 – 18:00   Prof. Carol McGuinness, Queen's University Belfast, Nothern Ireland.
A Metacognitively-Rich Pedagogy for Thinking Classrooms

The concept of a metacognitively-rich pedagogy emerged from classroom research and development work with primary school teachers in Northern Ireland, who had adopted an infusion approach to teaching thinking. Frameworks and classroom strategies were developed with teachers to enhance children's thinking across-the-curriculum. A particular focus was on the analyses of classroom dialogue and interactions that helped the pupils to 'go metacognitive'. Video recordings of thinking lessons were conducted with a sample of 21 teachers who were teaching 8-9 year old children. Analyses of the videos showed that the meaning of 'metacognitively-rich' goes beyond cognition and language to include both the social and physical resources – and indeed the values – in the classroom. The paper will illustrate the concept through examples of classroom practices, classroom artifacts, and classroom dialogue.

18:00 – 18:30   Dr. Johannes Theiner. The president of the European Parents' Association.
The Parental Role in Fostering a Child's Creativity & Thinking Skills

2009 was declared the "European Year of Creativity and Innovation". Hardly any valuable concepts were delivered although the importance of the topic was generally accepted.

Developing the individuals' thinking skills seems to offer a superior approach. Could not education provide better development of these? Formal school systems might become able but it will take long time to transform their traditional concepts. Informal and non-formal learning provide alternative routes.

Parents as "Primary Educators of their Children" have to play a crucial role in the development of their child. The adjustment to the individual child's needs and talents provides the most effective and motivating learning space

EPA entered an exciting and promising partnership with the project "Parents As Successful teacherS". This combines EPA's core-paradigm with the concept of "Active Thinking" to provide plurilingualism. These three important aspects integrate to individual development according to the challenges of a global world.

Section A. Development of Creativity & Thinking in Language Education

Saturday, 15 September - Room "Amata"

Chair persons: Irina Buchinska, Daugavpils Russian Lyceum and Susan Granlund, Kirkonkylä School, Finland

09:00 – 09:40   Irina Buchinska, Daugavpils Russian Lyceum, Latvia. **Motivated and Successful Writers at the EFL Classroom.**

Teaching writing has always been an obligatory and one of the most difficult skills to teach in the EFL classroom. There are many ways and methods how to teach learners to write well. But still many learners find it difficult and uninteresting. It is true; writing is a challenging task which requires from the learner a range of skills going beyond just linguistic ones.

A good text, successfully fulfilling its communicative function, is a complex system, so in TA (Thinking Approach) we view writing as a problem solving activity. This approach gives room and provides a necessary context for introducing and practising thinking models (OTSM) thus learning, applying and developing learners' thinking skills alongside with their language skills. While working with their texts learners systematically organise their conclusions on HOW to write a text, check and modify these conclusions, building their individual algorithms.

09:40 – 10:05   Natalia Kovilina, Daugavpils Russian Lyceum, Latvia & Marina Bagrova, Riga Herder School, Latvia. **Thinking Approach Elements at the Russian Language Lessons.**

The talk will present the use of the Thinking Approach (TA) for developing public speaking skills at the Russian language lessons. I will explain the reason for dealing with this area and demonstrate how language and thinking skills of learners can be tackled simultaneously at the native language lessons. I will then show how the main elements of the Research Technology of the TA were transformed to help the students to prepare presentations in the native language. In the end, I will share the experience of using the Thinking Task Framework for various stages of our work: the choice of topic, formulation of the goal, selection of arguments and examples, etc.

10:05 – 10:30   Renata Jonina, Riga Secondary School No. 13, Latvia. **Moving towards professionalism in developing inventive thinking: reflecting on difficulties and possible mistakes**

The modern world places a strong demand on educating creative learners who are „capable to do", capable to solve problems and innovate. In this context, I consider teaching for inventive thinking to be one of the best ways how a teacher can meet this demand. However, at a closer look it turns out to be not so straightforwardly easy to implement this kind of teaching and to bridge theory and my beliefs about how we should teach with my everyday practice. Even though, the teacher might have a strong motivation and a certain theoretical preparation, there are difficulties and mistakes waiting at the initial stage of the professional way that one has to be aware of if (s)he wishes to develop his/her expertise in teaching for inventive thinking. The talk is aimed at presenting the colleagues with the experienced difficulties and possible mistakes on introducing the inventive thinking dimension in a secondary school language classroom.

10:30 – 11:00   **COFFEE BREAK**

Section A. Development of Creativity & Thinking in Language Education

Saturday, 15 September - Room "Amata"

11:00 – 11:45   Alexander Sokol, TA Group, Latvia.
Parallel Learning of Grammar.

This talk is for those who believe that explicit learning of grammar can be useful. We will see that if a certain approach is followed, learning grammar does not contradict modern language teaching methodology and can be dealt with both communicatively and in a task-based fashion. Participants will be introduced to the parallel portfolio based learning of grammar developed within the Thinking Approach to language teaching and learning for pupils aged 10 and older. We will see how and why the approach can be useful for developing the linguistic competence of pupils and at the same time contributing to developing their thinking skills in the context of learning grammar.

11:45 – 12:30   Susan Granlund & Anni Savisaari, Kirkonkylä Primary School, Finland.
Creativity Through Point of View Tasks.

This workshop will present thinking tasks and projects carried out in English (EFL) and in the mother tongue, in which primary school children have been introduced to looking at things from new points of view. We will show how we introduced the topics, led the children to be able to see the familar from unfamilair angles, and helped them to produce creative work on the basis of this. We will invite the audience to try out the steps of the tasks themselves, in order to better understand how they work and how they can be organised,as well as seeing what problems may come up, and how it feels to be the learner in such lessons.

12:30 – 14:00   **LUNCH BREAK**

14:00 – 14:45   Marija Nikolajeva, Teacher of Chinese, Latvia.
Focus on Keys, or Maximum Chinese at a Minimum Price.

The presenter believes that creativity in language learning means the ability to look from different viewpoints, to find new ways of learning and to try new ways of using the language. These abilities represent types of linguistic problems. Creativity relies heavily on thinking which stands for selecting appropriate ways of solving linguistic problems. For beginners the skill to identify and use keys is crucial because it gives the feeling of control over the language and increases self-confidence and motivation. The presenter's approach reflects the idea that a teacher is a facilitator of learning, the one who teaches both language and language learning techniques. The aim of the workshop is to stress the importance of the noticing ability of a learner and to inspire teachers of different languages to create similar exercises for working with spelling, suffixes, particles, auxiliaries, word order etc. by demonstrating tasks of working with key elements.

Section A. Development of Creativity & Thinking in Language Education

Saturday, 15 September - Room "Amata"

14:45-15:30   Ana Torres. Polytechnic Institute of Santarém, Portugal. **Web 2.0 Possibilities for Developing Learners Thinking Skills.**

Some times people have no conscience and don't value the thinking skills that they employ when solving problems, just become aware of the importance of thinking when it leads to wrong solutions due to blockage or preconceived ideas. The tools needed for the acquisition, development and transfer of knowledge are the focus of thinking skills and allow the learners to transform information into knowledge.

Assuming that the purpose of the information society and knowledge is to make people more independent through the use of technology is important to have awareness that technology doesn't, by itself, lead to success, but the most important aspects are how technology is designed, used and appropriate.

Develop technological literacy and promote citizenship functional involve three ways in which thinking skills emerge: 1) through supporting dynamic and multiple representations of information; 2) through intuitive software that can be used as an organizing resource of autonomy, discussion and exploration of ideas; and 3) using networks to engage directly in knowledge development with others.

Wix, as a web 2.0 tool, appears to be a good option for the apply of the creative thinking skills by the construction of a digital content because it allows to incorporate multimedia, supporting dynamic and multiple representations of information to meet the new digital roles of citizens.

With this workshop we will work with participants in a methodology hands on. This tool allow create our own website in a easy way. Participants don't need to be a web designer, or multimedia experts, just have to choose a Wix template and customize it according to needs with the easy way drag & drop Wix editor and without any programming knowledge.

15:30 – 16:00   **COFFEE BREAK**

16:00 – 16:30   Sharon Ahlquist. Kristianstad University, Sweden.
                   Storyline **and the Young Language Learner Classroom.**

Creativity and thinking lie at the heart of the *Storyline* approach. A fictive world is created in the classroom, with learners taking on the roles of characters in a story. The story, based on curriculum content and integrating practical skills and theoretical knowledge, develops as the learners work together in small groups on open key questions. This presentation is based on the findings of a five-week study in which a class of Swedish 11-13 year olds became families moving into a newly-built street in a fictive English town. Among other things they took part in a project to live in a more sustainable way. Drawing on their knowledge of sustainability, the learners spoke, wrote, listened and read in English, motivated by meaningful, varied tasks which required critical thinking. The results of the study showed that *Storyline* offers significant benefits for the learning of English as a second/foreign language.

Section A. Development of Creativity & Thinking in Language Education

16:30 – 17:00   Merve Elbirlik Tülek and Nazan Özçınar Sirel, Özyeğin University, Turkey.
Moving Pictures: The Power of Images to Boost Learner Creativity and Motivation

This workshop presentation offers a refreshing approach to using images in the classroom and its positive effects on learner curiosity and motivation through a variety of activities. The workshop presentation shows how the use of images can move and motivate learners and enhance their overall learning experience and contribute to their critical thinking skills through the use free speaking, writing and grammar activities. In this workshop, participants will have the opportunity to experience a number of activities accompanied by pictures and have the chance to evaluate them.

Section B. Development of Creativity & Thinking in Science and Maths

09:00 – 09:35   Deirdre Jennings, Vilnius Interational School, Lithuania.
Teaching and Learning Through the Thinking Approach.

We live in an information age where it is simply not possible to keep up with and retain all the information, old and new. The requirement now is that each person can be able to search for, identify, manipulate and manage information to solve challenges. Students need to be able to analyse, evaluate their own work, peers work and even information sources, they need to be able to create among other things lab reports, original investigations and effective tools for evaluating work and sources. TRIZ is an excellent basis for training young minds in learning about and applying thinking models such as ENV to these kinds of tasks. I worked with middle school students aged 11-15, adapting some of their lesson cycles and tasks to incorporate thinking tools and their uses. I learned that a) middle-school students are well able to learn about thinking models, b) some models which I was applying in the science classroom were applicable across the full range of subjects i.e. the skills and processes which the students developed are general and transferrable and c) the skills learned gave better access to answering higher order type questions (according to the widely accpeted Bloom's taxonomy) such as analysing, evaluating and creating.

Section B. Development of Creativity & Thinking in Science and Maths

Saturday, 15 September - Room "Abava"

09:35 - 10:10 Alla Nesterenko, Teacher Training and Re-Qualification Academy, Moscow, Russia. **Developing Research Skills in Maths Lessons.**

This talk is focused on presenting specific tools for teaching students how to examine and define properties of mathematical objects, independently construct mathematical concepts, develop formulae and derive patterns. The presentation is based on materials of a Maths teacher Galina Belova and her colleagues, primary school teachers.

10:10 - 10:30 Willem Bustraan, Amsterdam University of Applied Sciences, Netherlands. **Science & Art, a Perfect Combination to Promote Creative and Logical Thinking.**

The scientist as well as the artist creates models of the experienced world. The creative cognitive process in both cultures, science and arts is based on imagination and metaphorical language. The experience of art as well as the scientific thinking process starts with observation and interpretation of sensoric perception. Interpretation is influenced by preconceived opinion. We will inform you about the design principles for a science methodology course for student-teachers. We combined art and science activities to challenge students' imagination and metaphorical thinking and at the same time to confront them with their prejudices. We will show and discuss some examples of lesson materials for lower secondary school pupils designed by the student-teachers during the methodology course. We will elaborate on the students' opinions and experiences and on the first experiences in lower secondary schools.

10:30 – 11:00 **COFFEE BREAK**

11:00 – 11:25 Krishnakali Gupta. International School of Bergen, Norway. **An Overview of Thinking Tools in Science.**

In my experience, teaching of science has been all about delivering content and developing skills and testing for overall understanding. Applying exactly the same methods, students emerge with different levels of competence. Some of them demonstrate high levels of creativity and are able to successfully approach the scientific process of learning that they take away and use in future. However, a vast majority take away nothing but some hazy unclear ideas. There have been several attempts at addressing these concerns in the teaching of science at schools. The fundamental reason that drove me to the Thinking Approach was its claim that there is a way that EVERY student could become a creative thinker. I was looking for specific ways to equip them with methods that would take away the uncertain aspects of science and make predictions more and more precise. Through the course of the two years that I spent working with the team at Thinking Approach, I delved into some tools that are useful in making every student creative in class room and outside. The ENV model proved to be extremely useful, simple and effective in helping my students develop a strategy of work. The other model, Theory of contradiction is useful when students/learners come up against roadblocks. The multiscreen model is complex but could be very useful in creating overviews and perspectives as also focussing on progress and evolution. My understanding of the tools grew out of working with my students in the age groups 12- 16 at the International School of Bergen, as a teacher of science.

Section B. Development of Creativity & Thinking in Science and Maths

Saturday, 15 September - Room "Abava"

11:25-11:45 Sergei Modestov, Saint-Petersburg State University of Service and Economics. **Using the Theory of Inventive Problem Solving (TRIZ) on Biology & Ecology Lessons.**

Modern TRIZ has gained experience in solving different pedagogical problems. It is clear that introducing TRIZ to school lessons is a way to increase effectiveness of the pedagogical process. School teachers can use TRIZ on their lessons in several ways:

- To teach TRIZ to students or to teach some elements of TRIZ "as it is".

- To include in their syllabi some TRIZ tools and methods based on the content of the syllabi.

- These can be special tasks and methods of solving these tasks.

- These can also be methods of task creation.

- To use some elements of the course Creative Imagination Development.

- To include some creative ("TRIZ-made") tasks in the syllabus and offer students to solve those tasks using non-TRIZ tools: method of focal objects, brainstorming, morphological analysis etc.

My presentation is focused on making and using creative TRIZ-based tasks on biology and ecology lessons.

11:45-12:10 Willem Bustraan, Amsterdam University of Applied Sciences, Netherlands. **Learning by Design. A Methodology to Stimulate Pupils' Thinking**

Many pupils in lower secondary school (age 11 to 15) dislike science lessons. They lack (or they think they do) the cognitive abilities to understand the abstract concepts and to learn how to reason in a logical (scientific) way. Quite often science teaching means that pupils are confronted with products of science: facts, concepts, laws and formulas. Hardly any time is devoted to develop pupils' scientific reasoning skills and a positive attitude towards science as a human activity. We challenged teachers, student-teachers and teacher educators to design together science projects based on a *Learning by Design* concept. We will show how we tried to motivate pupils via a design process: they construct an object. They use their own object to do experiments and by discussions and presentations they develop their thinking skills on planning, visualization of ideas, asking questions, conducting experiments, analyzing data, preparing presentation.

Section B. Development of Creativity & Thinking in Science and Maths

Saturday, 15 September - Room "Abava"

12:10-12:30   Austra Reihenova. Riga State Gymnasium No. 3, Latvia. **Students' Mathematical Abilities and Thinking.**

The aim of this research is to study students' mathematical ability to think and how to determine it. The reaserch contains three parts:

1. Mathematical testing method – different mathematical problem solution and analysis. Identification of students' thinking;
2. Defining Pupils' mathematical ability and creation of the human logarithmical spiral using well known scientist and student astrological data.

Pedagogical-psychological characteristics of the highest and the human consciousness, mind, thinking and brain, using cosmology and quantum physics.

Section C. Development of Creativity & Thinking in Pre-Primary and Primary School

Saturday, 15 September - Room "Venta"

Chair: Kirsi Urmson, Rauma Primary School, Finland

09:00 – 09:25   Kirsi Urmson, Rauma Primary School, Finland. **Thinking in the Primary School**

The learning results in Finnish schools are good but the pupils lack motivation according to PISA studies. This could mean that Finnish teachers are not using the full learning capacity of the pupils and are underestimating their skills. Could the teachers change this by adding more challenge into teaching? The aim of this presentation is to share some ways how a primary teacher can start using the Thinking Task Framework in adding creativity and thinking skills in teaching. The examples are from Science and Finnish language in grades 3 and 4. The focus is on creating the challenge and finding a red thread to follow both for the teacher and for the pupils. The biggest change from normal classroom activities is building projects which will ensure more time and room for developing thinking skills.

Section C. Development of Creativity & Thinking in Pre-Primary and Primary School

Saturday, 15 September - Room "Venta"

09:25 – 09:50   Giedre Joudyte, Vilnius International School, Lithuania.
Recognising Learning in Play.

As a pre-school teacher, I am always looking for ways to improve my teaching and broaden the range of learning play/experiences in my toolbox. When making my first steps in introducing thinking, I took the available tasks and tried to use them with my pre-school children. This approach did not work! It led, on my part, to more research and experimentation with activities and games for the children. In this talk, I will reflect on my experience, describe what I did, why some tasks could not work and what I learned as a result. I will also share the approach I currently use.

09:50 – 10:30   Kurt Teugels, Primary School Teacher, Belgium.
Using 'Six Thinking Hats' for Structural and Creative Thinking.

Using the method of 'Six Thinking Hats', created by Professor Edward De Bono (a leading autority in the world on the field of creative thinking), helps children and adults to think on a very structural and creative way. You give with this method every person an easy and understandable skill to make the (creative) thinking process more high quality. You can use this method one two ways. You can use it as 'management' thinking tool in your organization. It brings better and more powerful thinking by the participants in a constructive way with more chances for results in a shorter time. Apart from a 'management' thinking tool, you can use 'The Six Thinking Hats' also in classroom as a powerful (creative) thinking tool in several lessons, especially lessons focused on (creative) thinking. In this workshop we will focus more on the second part, the powerful classroom thinking skill.

10:30 – 11:00   **COFFEE BREAK**

11:00 – 11:25   Ann S. Pihlgren, Stockholm University, Sweden.
Socrates in the Classroom.

Socratic seminars have been practiced by educators as a supplement to classroom teaching. However, how the effects are achieved has not been thoroughly investigated. This study is an analysis of seminars conducted over three years with children five to sixteen years old. The students' group interaction was analyzed closely through a phenomenological approach. The analysis focused on how the seminar culture was taught and learned and shows that the skilled participants shifted their interaction towards an "inquiring" dialogue, and that the rhetorical power changed to a more cooperative communication. The students' learning proceeded through stages, partly different from the anticipated ideal. The facilitator's ability to handle rule breaking, and to create a safe environment for intellectual exploration, was significant. The findings show that "silent" moves like gestures and glances helped maintain a productive and egalitarian culture. The participants developed their thinking skills over time, evolving from relativism to critical examination.

Section C. Development of Creativity & Thinking in Pre-Primary and Primary School

Saturday, 15 September - Room "Venta"

11:25 – 11:50   Susanna Massa, primary school teacher, PhD student, Università degli Studi di Roma Tre, Italy. **Philosophy for Children in an Italian Primary.**

This paper focuses on Philosophy for Children, a worldwide educational movement first introduced and developed in the USA by M. Lipman in the 1960s. It is based on the ideas of J. Dewey (1966) who argued for the need to educate pupils for democracy by engaging pupils' interest and teaching from real-life contexts, and on Vygotsky's socio-constructivist ideas (1934). In Italy it is a new approach and there weren't much experiences. In Philosophy for Children, the group develops as a community of enquiry, which engages in the formulation and exploration of questions. Questions and dialogue are central to develop pupils' thinking skills, their confidence to speak and listen, and their respect of other people's viewpoints. I completed a philosophical project in 2008, my hypothesis was to analyze the connection between the philosophy for children and the creative and divergent thinking.

11:50-12:30   Meeli Pandis, SOS Children`s Villages International, Estonia and Klaire Sinisalu, Merivälja School, Tallinn, Estonia. **Playing for Learning. Estonian Reading Association`s Innovative Education Projects.**

NGO Estonian Reading Association (EstRA, www.lugemisyging.ee) has gained rich experience in conducting literacy and wider education projects during its 20 years of existence.

In the workshop we will provide examples and activities from 3 EstRA projects what are concentrated on creating supporting and motivating learning environment and playful and creative activities for pre-school and elementary school children. Those methods are successfully tested in practice by the number of kindergarten, primary and special education teachers including presenters.

„The Reading Nest", "More Parents Associated for Learning" and "Reading Games" projects will be presented by introducing practical methods and materials developing children`s creativity, problem solving and thinking skills in a child friendly playful way.

In a workshop we make participants to play physical, brain and reading games and learn in the process.

Section D. Research on Teaching Thinking

Saturday, 15 September - Room "Gauja"

Chairperson: David Oget, LGECO lab. at INSA of Strasbourg, France.

09:00 – 09:30   Silvy Penne, Oslo and Akershus University College of Applied Sciences, Norway. **Cross-disciplinary Approaches: Thinking and Learning in Mathematics and Mother Tongue.**

Taking a cross-disciplinary approach (mathematics and Norwegian / mother tongue) we discuss how meta thinking on three different levels enhance learning: awareness of discourses, awareness of genres and awareness of modes of thought. Taking a phenomenological perspective, we draw on Bruner's 'two modes of thought'; on the distinction between syntagmatic and paradigmatic thinking. We discuss similarities and differences in teaching and learning the two subjects. Further, we also discuss how pupils position themselves with regard to identity and affinity in the learning context. Our study is based on data from earlier classroom research in the two subjects with a focus on socio-cultural aspects of discourse in the classroom, and on data from ongoing research based on interviews with pupils in upper secondary school.

09:30 – 10:00   Oget D., Cavallucci D. , Sonntag M., Audran J., LGECO lab. at INSA of Strasbourg, France. **Evaluation of the Efficiency of Using Educational Computing Tools for Increasing the Inventive Thinking skills of French Engineers**

French engineering schools can be analysed by the filter of inventive thinking. This paper aims to show whether the introduction of IT skills in learning the TRIZ produce benefits for developing thinking skills. We focus on active and inventive learning. We will determine the educational and pedagogical context and then describe the experience. At the end, we will offer a possible answer to the question in order to let open the discussion with the audience.

10:00 – 10:30   Sylvia Truman, Regent's College London, UK. **Designing Creative-Collaborative Learning Tasks in Secondary Education Classrooms.**

A question that has gained widespread interest is 'how can learning tasks be structured to encourage creative thinking in the classroom?' This paper adopts the stance of drawing upon theories of learning and creativity to encourage creative thinking in the classroom. A number of scholars have suggested that the processes of 'learning' and 'creativity' are inextricably linked. Extending upon this, a generative framework is presented which exists as a design support tool for planning creative learning experiences in secondary education. This framework can be instantiated for designing lesson plans and in the design of e-learning technologies.

10:30 – 11:00 COFFEE BREAK

Section D. Research on Teaching Thinking

Saturday, 15 September - Room "Gauja"

11:00-11:30   Liga Roke & Emils Kalis. Riga Teacher Training and Educational Management Academy, Latvia. **Adaptation of Tests of Creative Thinking – Drawing Production in Latvia: Results, Correlates, Perspectives.**

Tests for Creative Thinking – Drawing Production is considered as an alternative method to widely accepted creative thinking testing with divergent thinking tests elaborated by E. P. Torrance (1967; 2007). TCT-DP assesses creative potential as an ability to generate new ideas, make connections, look at things from another prospective and cross the boundaries. It is suitable for most age and ability groups and has been mainly used in Europe. This study explored the possibility of implementing TCT-DP among students in Latvia. Results from a TCT-DP field study of 250 Latvian students from 9th grade were obtained. The presentation includes steps taken to adapt TCT-DP in Latvian culture: test translation, test implementation, training of testing experts, scoring and achieving high inter-rater reliability, score interpretation. Moreover, the correlation of test results with academic achievements was made. Findings provide useful information for teachers and school administrators about possibilities of testing creativity with reliable and valid instrument and possibilities to reveal the strengths of student s creative potential.

Section E. Thinking Across School

Saturday, 15 September - Room "Abava"

Chairperson: Gillian Boniface, International School of Bergen, Norway.

14:00 – 14:45   Gillian Boniface, International School of Bergen, Norway.
Thinking Approach in the Visual Arts Lessons.

Within education there is long tradition of teaching analytical skills in languages, but the transference of these to the arts is a relatively unexplored field. In addition the use of the work creativity can be quite controversial. What does it mean to be creative? How do we measure something that is so subjective? And who decides whether piece of art work is creative or not?

In this presentation I will explore the question of whether or not it is possible to teach creativity, and to what extend the Thinking approach can help teachers who wish to teach creativity through critical thinking. Using actual student work, I hope to show how it is possible to deploy the Thinking Approach framework to create whole units of work, as well as to individualized tasks, and to provide educators with examples to try in their own classrooms.

Section E. Thinking Across School

Saturday, 15 September - Room "Abava"

14:45 – 15:30   Kirsi Urmson, Rauma Primary School, Finland. **Thinking Approach Helping to Plan a Creative Learning Environment in Teacher Training. Experiences from Working with the Teacher Trainees in Rauman Normaalikoulu (Turku University)**

Finnish trainee teachers practice in teacher training schools where they are tutored by qualified and experienced class and university teachers. The aim is that they develop their pedagogical skills and become well prepared for the future needs in education. They have a challenge to learn to plan their work so that the learning environment they create will support pupils' ability to cope with the requirements and challenges of the changing world. Using Thinking task Framework gives the trainees a tool to implement thinking skills in a systematic way. One practice out of four opens the path but leaves a lot of questions. This presentation will share the experiences of giving trainees a chance to use the TTF (Thinking Task Framework) in their own teaching practice in the primary level, particularly in Science (environmental studies) and in the Finnish language.

15:30 – 16:00 COFFEE BREAK

16:00 – 16:25   Sergei Modestov. Saint-Petersbourg State University of Service and Economics. **Functional Approach as a Basis of Teachers' Creativity.**

Functional approach can be used in the new technology of pedagogical modeling; it makes introduction of innovative technologies in educational practice easier. The functional approach can increase teachers' creativity, because it makes creation of new educational technologies more available. This presentation will introduce my research on pedagogical functions, ways of finding and implementing them in the classroom.

16:25 – 16:50   Paul Kenna, Belle Vue Park Primary School & Brett Millott, Richmond Primary School. **Self-Organised Learning Environment: S.O.L.E.**

Paul Kenna and Brett Millott are both Primary School Principals in Melbourne Australia. Since 2010 they have been collaborating with Professor Sugata Mitra and his associates from the University of Newcastle in the United Kingdom. Professor Mitra is well known for his research and findings from the Hole in the Wall project, which have laid the foundation for the development of Self Organized Learning Environments.

Paul and Brett have been trialing and refining the SOLE strategies at their schools for the past eighteen months. Their investigations have been based on the theoretical and practical components of student driven learning, and how SOLE can be used to integrate system requirements and individual enquiry. Their research thus far, has indicated that SOLE is a strategy that provides a platform for the development of learners who demonstrate creativity, curiosity and independence.

Section E. Thinking Across School

Saturday, 15 September - Room "Abava"

16:50 – 17:30   Ann S. Pihlgren, Stockholm University, Sweden.
Socratic Seminar Workshop.

In thoughtful discussions, the teacher puts questions to promote inquiry. The goal is the students' cooperative dialogue, to teach the students how to develop and enrich their thinking and their understanding of central ideas in different subject areas. The Socratic seminar can be carried out from pre-school to the university and the workshop invites educators interested at all school levels. The rationales and steps of the Socratic dialogue as a pedagogical method will be briefly presented and the participants will take part in a Socratic seminar, a structured discussion with a text or a picture as a common reference point and including two or more key ideas or concepts. The workshop will provide participants with an opportunity to ask questions and to discuss the seminars as promoters of language skills, thinking skills, social skills and character, the positive outcome of recurrent seminars in classrooms, shown by research.

Section F. Thinking Based Lessons

Saturday, 15 September - Room "Venta"

14:00 – 15:30   Carol McGuinness, Queen's University Belfast, Nothern Ireland & Tania Santiago, Teacher, Colegio Ayalde, Loiu, Spain & Robert Swartz, National Canter for Teaching Thinking, USA. **Thinking Based Lessons. Workshop on Infusing Instruction in Thinking into Content Instruction.**

This workshop will focus on classroom practice for effectively infusing instruction in critical and creative thinking into content instruction. We will do this by demonstrating such lessons and analyzing their structure and techniques. Participants will be given the opportunity to develop their own ideas for such lessons that they can teach using their own curriculum content.

15:30 – 16:00   **COFFEE BREAK**

16:00 – 17:30   Carol McGuinness, Queen's University Belfast, Nothern Ireland & Tania Santiago, Teacher, Colegio Ayalde, Loiu, Spain & Robert Swartz, National Canter for Teaching Thinking, USA. **Thinking Based Lessons. Workshop on Infusing Instruction in Thing into Content Instruction.**

Section G. Thinking at Home

Saturday, 15 September - Room "Gauja"

Chairperson: Ingrida Murashkovska, Latvia

(Please note that most presentations in this section will be in Latvian)

14:00 – 14:15   Johannes Theiner, European Parents' Association, Austria.
Parents' Role in Education of Children. (EN)

14:15 – 15:00   Alla Nesterenko, Teacher Training and Re-Qualification Academy, Moscow, Russia.
Solving Problems with Children. Workshop. (RU)

15:00 – 15:30   Ingrida Murashkovska, Primary School Teachers.
Workshop for Children on Developing Thinking Skills. (LV)

15:30 – 16:00   **COFFEE BREAK**

16:00 – 17:00   Ingrida Murashkovska & Edgar Lasevich, TA Group, Latvia.
Using PASS (Parents As Successful teacherS) Project Materials for Developing Language and Thinking Skills of Children. (LV)

17:00 – 17:15   Edgar Lasevich, TA Group, Latvia.
PASS Language Acquisition Principles.

17:15 – 17:30   Ingrida Murashkovska, Edgar Lasevich, TA Group, Latvia. Ivita Mauriņa, Latvian Parents' Movement.
A Round Table with Parents on Further Collaboration in the Field of Developing Children's Thinking Skills. (LV)

Extended Summaries of the Presentations

Alexander Sokol, TA Group, Latvia.
Towards Helping Teachers Introduce Thinking in the Classroom.
Friday. September 14, 13:45 – 14:30, Room "Lielupe" .

When one starts speaking about thinking in the learning process, it immediately becomes obvious that it is necessary to agree on the terms. Understandings of what can be referred to as a thinking task differ dramatically among education professionals. In the context of the Thinking Approach to language teaching and learning, we single out three features of a thinking task:

- the answer / solution is not known to the learner;
- the procedure for arriving at an answer / solution is not obvious to the learner;
- ways of dealing with a given type of task become one of the key outcomes of working on a task.

This definition was our starting point in the international project Bringing Creativity and Thinking into the Educational Process supported by the Nordic Council of Ministers. Our objective was to help education professionals working with various age groups and disciplines to introduce the thinking dimension into their classrooms. The core team of ten teachers coming from four countries worked for two years to develop the framework and test it with various groups of learners. This framework, also referred to as the Thinking Task Framework, is a system of guidelines for teachers who would like to bring more thinking into their classes. Experiences of working with the framework differ, there have been many challenges we have faced but one of the most important conclusions is that the approach works and it can be helpful for both teachers and learners.
This talk will introduce you to the Thinking Task Framework and serve as an umbrella presentation for more specific classroom accounts of our colleagues on both days of the conference.

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Irina Buchinska, Daugavpils Russian Lyceum, Latvia.
The Teacher's Notes on Learners' Banks.
Friday. September 14, 14:30 – 15:00, Room "Lielupe" .

One of the eternal teachers' problems is connected with the choice and organisation of teaching materials. A big variety of course books, various multimedia and Internet resources the teacher can choose from has made this problem even more complicated. What to choose? How to organise? How to use? When to use? Moreover, modern materials should ensure development of autonomous learner skills, thinking skills, researching skills; they should provide individual approach to students, etc. But, what if we, teachers, offer our learners to choose and collect their learning materials themselves? This might sound strange, but I would like to present one of possible ways how this can be implemented. I speak about Learner's Banks. We have been using this type of teaching/learning tool for the last five years in our school.
A learner's bank is a purposefully collected database of authentic samples of certain items with an aim to solve a specific learning problem. It is individual and is collected by learners autonomously. This way of learning organisation provides a high level of thinking challenge and a high degree of novelty the learners should deal with, which ensures a systematic approach to practicing and mastering a wide variety of thinking skills.
The range of items to collect is very large. Speaking about English, it can be a bank of texts, a bank of video clips with presentations, a bank of grammar forms, a bank of vocabulary, etc. Banks as one of the tools of working with learning materials can be used in any other subject as well. During the presentation the focus will be made on the kinds of banks learners work with, on the structure of a bank, on criteria a bank should meet to fulfil its function, on different ways of working with learner's banks in class and the teacher's role in this work , on benefits of this type of work compared with traditional ways of teaching in terms of developing learners' thinking and problem solving skills when working with younger learners (12 -13 years old) and secondary school learners (16 years old).

Susan Granlund, Kirkonkylä Primary School, Finland.
Integrating the Thinking Approach into the Primary English Classroom. How and Why?
Friday. September 14, 15:00 – 15:30, Room "Lielupe" .

In the primary English (EFL) classroom it can be very easy to progress with coursebooks which cover the appropriate subject matter, but which do not necessarily force the pupils to think creatively or to use problem-solving skills. Often exercises are very repetitive and mechanical and the outcomes and ways of doing the tasks are predictable to both teacher and pupils, so that they offer little or no challenge, and cease to motivate after the initial enthusiasm for learning the new language has passed. English language curricula nowadays usually incorporate thinking, learning and study skills, though little guidance is generally given on how to actually implement these systematically.

The Thinking Task Framework acts a tool to help teachers examine their aims in the language classroom and to start developing more challenging tasks and procedures, which push the pupils to improve their linguistic and problem-solving skills simultaneously, as well as helping them to reflect and become more aware of their own learning. If we take a typical,traditional language-learning task and change it by setting it in a very specific context, preferably one relevant to the lives of the learners, we already have a more motivating task. Limitations must then be added to the task, so that the typical answers we would expect from pupils are no longer acceptable. Presenting pupils with tasks they feel unable to do prepares them for the many non-typical problems they are likely to face in real life. The next step is to find, create and/ or learn about tools which can help us to solve such a problem. With the aid of these thinking tools pupils can learn to organise information in such a way that it is relevant to a particular task, they learn to distinguish important from less important information and to move forward. When a task has been attempted, it must be reflected on, and a description of the method of doing the task can be made. This description or algorithm can then be referred to, and improved upon, when doing similar tasks in the future.

I will try to demonstrate how this framework can be used to introduce and practise thinking tools with language learning activities including games and, for example, in functional areas such as describing people and things. Implementing this approach involves the teacher being willing to experiment and take risks in the classroom, trying out new procedures, and moving beyond his or her comfort zone. The needs and responses of the pupils lead the way. So far the experience of trying this out has been positive, with pupils being more motivated ,more willing to accept new challenges and more active and involved in their own language learning.

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Deirdre Jennings, Vilnius International School, Lithuania.
Introducing Thinking Skills in Maths and Science.
Friday. September 14, 15:30 – 16:00, Room "Lielupe" .

I will be demonstrating and discussing a number of thinking skills and tools, which I have tried out with my middle school students, in both maths and science. I will show examples of approaches I used in order to teach those skills, concepts and tools, along with types of reactions to expect, what to look out for and any major pitfalls. Using the TA website I will show a number of tasks that were used in lessons and I will break them down (by student's steps/actions) to show why I label them 'thinking tasks'. On videos you will see discussion and comments from the students which will demonstrate their reaction to these new types of tasks after working with them for some time, as well as a synopsis of a sample lesson. Also discussed will be which types of science topics lend themselves well to these models and why science in general can benefit from a thinking approach.

Extended summaries of the Presentations

Dr. Alla Nesterenko, Teacher Training & Re-Qualification Academy, Moscow, Russia.
Problem-Centred Education: Goals, Structure, Results.
Friday. September 14, 16:30 – 17:00, Room "Lielupe" .

What personal qualities do we want our student to develop as a result of the educational process? The most common answer to this question is that a person should be able to solve the problems that he faces firstly in the educational process, then - in his/her professional work and permanently - in everyday life. Consequently, the problem is not just a tool that allows you to make the learning process more interesting and motivated. The problem is the key element of the educational process, which requires special attention to itself (the classification and development of special tools to identify and resolve problems). And the educational process will be more effective if it is equipped with the tools for learning to deal with problems. Under the problem-centered education we understand such an educational system the content of which includes meta-tools to organize and transform information in order to identify, analyze and solve problems in different fields of knowledge.

The tools of problem-centered education are based on the General Theory of Powerful Thinking (OTSM) and the Theory of Inventive Problem Solving (TRIZ). In these areas of knowledge effective tools and methods for dealing with problems are developed. The author of OTSM - Nikolai Khomenko (1954-2011) created a system of instruments, which is almost ready for full design of teaching methods targeted to training students how to deal with different kinds of problems. Problem-centered learning is still under construction, but a set of tools available at this point of time allows you to systematically build the educational process.

PCE training tools are represented by two large blocks: 1) models and 2) teaching procedures (based on the first one). All PCE models are based on OTSM model "Element – Names of Features – Values of Features", which allows to teach children to describe different objects of the world in a common language and, using the same language, transform and create new objects for solving different problems. The study of the object as a system (a multi-screen scheme model) helps students to highlight the essential features from the standpoint of the problem to be solved. Models aimed at formulating and solving contradictions can negotiate conflicting demands of the system (and define the necessary features).

For each model in the problem-centered education there are training games that allow to introduce the model into the educational process and to ensure its full or partial application in different contexts. We have also developed constructors of exercises for mastering the system of models. Special procedures which allow to develop research skills, and skills necessary for transforming and finding application for the studied objects, as well as creating new objects, are built on the basis of the models.

1. Studying a data bank in order to identify patterns and state cause-effect links allows students to transfer a non-standard problem into a typical one.
2. Studying the data bank in order to obtain the synthesis algorithm allows students to detect a structure of the object (build a model), and then to create their own objects of this type (puzzles, tongue twisters, games, math problems and so on).
3. Systematic study based on the system operator allows students to construct a systematic description of the object through asking questions. It is an important step in mastering research activity.
4. Finally, one of the most important procedures is building a non-standard solution to problems that contain contradictions. It can also be applied to different problems in various subject areas (for example, "reinvention" of the ways of adaptation in biology, analysis of the plot in literature) as well as in interdisciplinary projects ("city of the future", "how to improve school recreation ").

The diagnostic tools are also developed on the basis of PCE-models and procedures. For example, at the end of the school-year the pupils of form 4 demonstrated mastering of object-bank-based study by conducting an independent mini-research of particular bank of Russian words and creating a spelling rule.

Teachers can systematically learn PCE in vocational training, at workshops or through distance learning courses, "The workshop of knowledge" (courses currently exist for teachers of the pilot areas, but in future they will be more widespread). TRIZ and OTSM tools are not easy for mastering, because they are a new type of educational content. But, according to teachers, these tools are interesting and effective.

Extended Summaries of the Presentations

Tania Santiago, Colegio Ayalde, Loiu, Spain & Robert Swartz, National Canter for Teaching Thinking, USA.
Thinking-Based Learning: Teaching Students to Become Skillful Thinkers and Learners
Friday. September 14, 17:00 – 17:30, Room "Lielupe" .

When teachers teach students to become skillful thinkers by infusing instruction in thinking skills into content instruction the results are dramatic: vastly improved content learning and the development of quality thinking habits. When we add to this the prompted explicit manifestation of appropriate habits of mind this enhances these results manyfold. This process, the proficient and strategic application to the regular content curriculum of appropriate Thinking Skills enhanced by productive Habits of Mind to develop thoughtful decisions, arguments, and other creative and critical products, is what we call "Thinking-Based Learning". In our experience TBL is the most powerful educational technique that teachers can practice. It can help us to achieve the highest standards in our quest for knowing and understanding, and for acting wisely based on this knowledge and understanding. In this presentation we will illustrate a variety of important tools that teachers use in TBL lessons, for example thinking strategy maps, specially designed graphic organizers, metacognitive structures, and collaborative thinking strategies. We will do this by showing examples of infusion lessons that teachers k – 12 in the USA, Spain, and Chile have developed and taught successfully in their classrooms. We will also illustrate the use of special lesson planning organizers that highlight the important ingredients in such TBL lessons.

Prof. Carol Mc Guinness, Queen's University Belfast, Nothern Ireland.
A Metacognitively-Rich Pedagogy for Thinking Classrooms
Friday. September 14, 17:30 – 18:00, Room "Lielupe" .

This paper draws on the findings of the ACTS (Activating Children's Thinking Skills) project in Northern Ireland. The main purpose of the ACTS project was to create and develop a pedagogy to improve learning in primary schools, through enhancing children's thinking skills across the curriculum. ACTS adopted an infusion methodology where the goals of enhancing thinking and subject/topic understanding were simultaneously pursued. The theoretical perspective with regard to children's learning focused on the development of their metacognitive capacities - on their ability to become proactive about their learning in terms of planning, monitoring and appraising their thinking.

Video recordings of thinking lessons were conducted with a sample of 21 teachers who were teaching 8-9 year old children. Analyses of the videos showed that the ACTS teachers arranged their classrooms in ways that supported opportunities for children's talk and created conditions for mediating metacognition. They engaged children in cognitively demanding tasks and made thinking more evident in classrooms by developing a vocabulary for talking about thinking and by modelling thinking in more concrete situations. What made good thinking lessons distinctive was that learners were given opportunities to talk about thinking, to jointly construct meaning, to evaluate their thinking and to make connections to contexts both within and outside the curriculum. The evidence from the video recordings was corroborated by teachers' reports about changes in their classroom practices. A larger sample of ninety-four teachers who participated in the ACTS professional development programme completed questionnaires. They reported substantial changes with regard to both the quantity and quality of group work, increases in children's talking and listening, in the quality of questioning and, overall, more pupil involvement and independence. They also reported significant changes in their images of themselves as teachers – an increased awareness of the importance and value of teaching thinking, being more open to alternative approaches and allowing children to be more independent in their learning. As the work progressed, the meaning of metacognitively-rich deepened and we recognized that it had wider implications for social practices and classroom routines than we had first anticipated. To invite pupils 'to review their thinking', 'to think about thinking', 'to reflect on their thinking' is indeed necessary, but it is only part of what characterizes a metacognitively-rich pedagogy. A deeper meaning goes beyond the cognitive to include both the social and physical resources in the classroom, as well the teachers' attitudes and values.

Extended Summaries of the Presentations

Dr. Johannes Theiner. The president of the European Parents' Association.
The Parental Role in Fostering a Child's Creativity & Thinking Skills
Friday. September 14, 18:00 – 18:30, Room "Lielupe" .

''Parents are the Primary Educators of their Children" – this core paradigm of the European Parents' Association is well supported by educational science. Parents themselves are hardly aware of their potential.

School sets rather strict and general rules for the formal learning of the students. Individual needs can be respected to a very limited extent only. Learning outcome is typically assessed according to test-patterns that lead to a narrow "teaching to the test" style.

Informal learning happens at home and can be controlled by the learner to a wide extent. The role of educators is hardly regulated. Parents, siblings, relatives, neighbours … mostly take an inviting and affirming part. A rather playful scenery invites the learning child to develop innovative strategies just driven by its natural curiosity in the beginning – the best conditions to develop active thinking skills individually.

As soon as a child starts nerving with cascades of "Why …"-questions parents determine the development. Are they able to take the challenge and answer questions that will develop into deep philosophical reflections? Are they able to get into a deeper reflective dialogue? Are they turning and start the question-game themselves setting challenges for logical deduction and development of abstract models?

It is fascinating how early children are able to enter into such a discourse! It is disappointing how many adolescents and adults have lost their ability, courage and/or will to ask challenging questions, put arguments together and become innovative.

Non-formal learning opportunities should be offered to make parents aware of these potentials and encourage them to fill their role using their potentials. Entering a lifelong learning process unconsciously may also trigger personal developments in a parent. This empowerment may well lead to personal improvement beyond the parenting.

EPA's contact with PASS – Parents As Successfil teacherS – opened an exciting perspective to realise the core paradigm introduced above to provide both, active thinking skills and plurilingual development. The concept is based on a delicate individual interaction between educator and learner. The PASS-material will offer tools for the parent to observe the child´s development. The learning is still provided in a playful and fun way. Still the child's progress can be described and permanent challenge triggers the progress adapted to the learner's ability and needs.

The PASS-concept provides development of a wide range of the individual's competences. On first glance language learning serves the readiness for the globalised world. But research proved plurilingualism to generally extend cognitive potential. Lingual capacities are the prerequisite to improve logic and dialectic level in discourse and problem solving. The basic concept of PASS directly addresses the thinking skills and will thus provide learning pathways towards active thinking through language acquisition.

PASS provides non-formal and informal pathways of learning as promoted by EQF, the European Qualification Framework. The PASS-material will empower parents to open doors for their children. This kind of delicate interaction has the potential to improve the quality of relation between parents and children. Mutual learning will occur.

Extended Summaries of the Presentations
Section A. Development of Creativity & Thinking in Language Education

Irina Buchinska, Daugavpils Russian Lyceum, Latvia.
Motivated and Successful Writers at the EFL Classroom.
Saturday. September 15, 09:00 – 09:40. Section A. Room "Amata".

Good skills of writing in a foreign language are widely required nowadays. Learners and teachers understand this very well. Why, then, is writing a scary and boring task for many learners? One of the reasons may be that they don't know how to do it successfully.

Two major aspects are important in our vision in developing good writers in the EFL classroom. One is developing learners' thinking skills while teaching writing, as without deep thinking it is difficult to expect a really good piece of writing; another one is involving students into the process of finding and systematically organising the rules of good writing by themselves, building their individual algorithms for creating texts.

To ensure the context for developing thinking skills the task for writing should meet certain criteria, one of which is its novelty for the learners, when learners do not know how to write such type of text. On my lessons before writing a text, learners do a very big preparatory work, when the thinking skills are actually required and developed. During this stage learners have to make several thorough choices in terms of the idea and the function of the text, the reader and the writer of the text, the genre and style of the text, etc. and they have to find the way how to integrate and balance those in a text. This work provides a necessary room for developing a wide repertoire of thinking tools and skills of applying them in different context.

Another direction of developing thinking in the EFL writing class is organising learners' reflection on their work. The result of learners' work is a text and a summary of steps that helped them to create a specific text. Gradually, after working with a series of different texts, learners are expected to create a general algorithm for writing any text they need.

During our workshop the presenter will offer the participants to compare and evaluate different tasks for writing to see the difference between traditional tasks and more challenging thinking tasks to see which ones provide more potential and context for developing thinking and creative skills, which ensure a better final result. Practical ways how to organize work on thinking skills development, its steps, problems, and challenges the learners and teachers face and how to cope with them will be discussed. There will be presented the ways how to help students build their own algorithms for producing texts of different styles, for different functions, aims, audience, etc.

The participants will see samples of learners' works (13 year old learners and 18 year old learners) and discuss them.

I hope that the outcome for the participants will be a new vision and approach to making this process more exciting, interesting, motivating and successful.

Natalia Kovilina, Daugavpils Russian Lyceum, Latvia & Marina Bagrova, Riga Herder School, Latvia.
Thinking Approach Elements at the Russian Language Lessons.
Saturday. September 15, 09:40 – 10:05. Section A. Room "Amata".

Nowadays in Latvia, many students make 5-6 oral presentations in different subjects every school year.

What do such presentations teach students? Apparently, they are improving the skills of finding and selecting information, presenting it in front of the audience, answering questions, listening to other speakers, and so on. Some teachers consider preparation of visuals helps learners develop creative skills.

What is the aim of students' presentations? Most students would say that their aim is to tell about something depending on the school subject. It is doubtful though that students will ever make presentations like this after finishing school.

Are students able to cope with presentation related tasks? Yes, they are and they usually do it without difficulties. Unfortunately, it indicates that the learning potential of such presentations is not very large. The learning potential can be increased if we ask students to choose a topic in such a way that they are required to prove something as a result of their presentation. When first introduced to the task defined in this way, my 14-15 year old students found it very challenging. As a result, the task gave them much more opportunities for creativity. According to the Thinking Task Framework, what we did was increasing room for thinking.

During all preparatory work the students worked in the area of unknown, in conditions of uncertainty and novelty, they didn't know how to complete the given task. In order to choose the aim of the presentation it was necessary to work out the criteria of a good aim. The next step was to learn to achieve the aim. The students used banks of speaking presentations to define criteria for strong arguments and examples.

After each stage, the students evaluated the results of their work, basing on the criteria that had been worked out. After the presentation in class the students did self-evaluation to summarise what had helped them prepare for the presentation, what should be changed when doing presentation in the future. Materials of the Research Technology of the Thinking Approach were taken as a basis of this work. Substantial preparatory work helped to develop skills of not only oral, but also written speech in the native language.

During the work on the oral presentations the students found out that to convince, to reason, to support something by an example is the basis of a good answer in any lesson, as well as the basis of an argumentative, persuasive essay. This proves that the system of the work done by the students helps them develop general learning skills. In addition, the students learned to work in the context of the unknown, complete tasks that are new for them and required and therefore fostered their thinking.

Extended Summaries of the Presentations
Section A. Development of Creativity & Thinking in Language Education

Alexander Sokol, TA Group, Latvia.
Parallel Learning of Grammar.
Saturday. September 15, 11:00 – 11:45. Section A. Room "Amata".

One of the key problems of teaching grammar in the primary classroom is connected with getting pupils to learn and apply rules before they have acquired the structures. This is mainly caused by the fact that teachers feel the pressure of time and believe that they cannot afford to spend a lot of time on playing with structures as this seems just a step towards correct use of forms - something which is seen as the aim of teaching   grammar.

As a result, learners are offered exercises that require the choice of a correct structure and this is assessed by the teacher as a measure of success. Learners do their best to learn for the test and then quickly forget most of it afterwards as there is a new test coming up and new things to be remembered. In other words, acquisition often does not take place.

The analysis of normative documents shows that the problem can be easily solved. If one tries to make a list of what grammar is to be acquired by learners over the period of 3-4 years, e.g. from the age of 10 to 13 and defines it in a functional fashion (e.g., speaking about the past, describing objects, etc.), the list is relatively short. This is easy to explain as the 'topics' tend to repeat from year to year. A possible solution offered within the Thinking Approach to language teaching and learning is to deal with several grammar topics in a parallel fashion over an extended period of time. It means that a pupil aged 10 would start working on, say, ways of describing objects in English at the age of 10 and continue doing it for about two years. This means that the stage of choosing between various structures (use) will take place long after the beginning of dealing with the topic and pupils will have had enough time to play with structures and acquire them before working on the rules. Assessment of initial stages will also be based on a non-rule based approach, e.g. pupils' ability to notice various structures, recognise them, see parameters that can be the basis of future rules, etc.

Moreover, learners will be dealing with various large grammar questions such as describing objects or speaking about different past at the same time. A specially designed grammar portfolio is used as a tool for helping the learner organise his/her work and serve as a basis for organising learning over an extended period of time.

The proposed approach to learning grammar is purely inquiry based, and thus it gives room for developing learners' thinking skills along with learning grammar. Moreover, thanks to the addition of the functional component, grammar as such is dealt with communicatively and in a task-based fashion. During the talk, we will look at examples of materials and see how both language and thinking are catered for in the proposed approach.

Extended Summaries of the Presentations
Section A. Development of Creativity & Thinking in Language Education

Renata Jonina, Riga Secondary School No. 13, Latvia.
Moving Towards Professionalism in Developing Inventive Thinking: Reflecting on Difficulties and Possible Mistakes
Saturday. September 15, 10:05 – 10:30. Section A. Room "Amata".

Having started a full time teaching as a novice teacher in 2011 and being interested in the development of *inventive thinking skills* of learners, I decided to try to implement the Thinking Approach to language teaching and learning (TA) in my secondary school English language classroom.

The TA is based on the General Theory of Powerful Thinking based on the Theory of Inventive problem solving (OTSM-TRIZ) and offers educational technologies which allow for the simultaneous development of thinking and language skills of learners. I was interested in the practical aspects of how it is possible to develop learners' inventive thinking skills while working with grammar and how to help my students learn to find their own language problems and to learn to solve them.

Therefore, during this one year I was trying to integrate the work with the Grammar and Self-study Technologies offered by the Thinking Approach into my work with the secondary school students (forms 10-11, aged 17-18). I was documenting my experience in a diary which allowed analysing it and outlining difficulties and possible mistakes which shaped themselves as a result of this one year experience.

During this talk, I will share specific conclusions that I drew from my practical attempt to introduce inventive thinking dimension into my lessons and will outline possible solutions to the difficulties that I faced. I intend to structure my talk as a comparison between what the theory 'says' should be done, what I did in my practice, what difficulties I faced as a result and what a possible solution for solving the problems could be offered. I consider that when starting their professional development for inventive thinking every teacher is facing similar difficulties, thus, the conclusions drawn can serve as a practical guide of what a teacher should be aware of if (s)he decides to follow the path I took. In the context of my talk I refer to inventive thinking as *an ability to solve non-typical problems (i.e. problems for which no solution exists or is not known to the problem-solver) in various domains avoiding a large number of trials and errors.*

Susan Granlund & Anni Savisaari, Kirkonkylä Primary School, Finland.
Creativity Through Point of View Tasks.
Saturday. September 15, 11:45 – 12:30. Section A. Room "Amata".

In many cases a good way of making a task into a thinking challenge is to change the point of view, by for example changing the narrator, environment, audience or purpose of the task.

The focus of this workshop will be on demonstrating how we have tried to use thinking skills and models to help primary school children, in different subjects (EFL and mother tongue classes) to appreciate what is involved in seeing the familiar from new points of view. Our subject content aims have been different, in English review of vocabulary, reading, writing and speaking skills; in the mother tongue literature and text analysis and criticism, as well as exploring different media. We will show how in these different contexts pupils can be helped to see that changes in one aspect of, for example, a story, will inevitably lead to changes in other features too, and how these can be predicted and evaluated. The new points of view we offered our learners have been, for example, on a simple level, in the English class, making an advert for selling a pet in a very particular, unfamiliar context, and in the mother tongue class, looking at a familiar book through the eyes of a film director. How could we adapt a short excerpt from the book to make a scene in a film? Another example is that of looking at familiar fairy tales, retelling them from the point of view of a particular character and then making the new stories into sketches for a particular audience, in this case for younger classes in the school. All of these tasks are demanding, problem-solving activities for young learners. By helping them to think through the situations and by offering them suitable thinking tools, we can help them to improve their thinking skills and, in the longer term, help them to apply some of the models and procedures to solving problems in real life. We will attempt to make clear the challenges we offered our learners at each stage and to give the audience a chance to try out, in pairs and groups, the tasks themselves, and also to attempt building the tools we expected our learners to build, in order to help them with these challenges. We will then be able to discuss with the audience the challenges we as teachers were faced with and how we dealt with them. Finally we can show some of the work our pupils produced and discuss with the audience possible ways of evaluating this kind of work, so that the results can be used to improve similar tasks in the future.

Extended Summaries of the Presentations
Section A. Development of Creativity & Thinking in Language Education

Marija Nikolajeva, Teacher of Chinese, Latvia.
Focus on Keys, or Maximum Chinese at a Minimum Price.
Saturday. September 15, 14:00 – 14:45. Section A. Room "Amata".

Chinese is often regarded as a language for talented learners. The stereotypes become barriers for many students until they start analyzing how they learn. The **aim of this workshop** is to show the stages which a language learner goes through at the beginning of the study process and to stress the importance of improving the learner's ability to notice elements of a language.

The tasks are aimed at the development of creativity in learners. **Creativity** is a complex of three interdependent abilities: to look from different points of view, to invent new ways of learning and to produce new things on the basis of the acquired knowledge. These abilities represent types of linguistic problems and therefore creativity is impossible without thinking.

Learning a language means solving linguistic problems. It is crucial that a learner sees what aspects form the problem in order to find the solution. The number and the order of steps on the way to the solution determine how successfully the learner will do the task. So the teacher should help the learner identify appropriate steps. Thus, **thinking** refers to the conscious selection of steps and series of steps in order to solve problems in the most efficient way.

The presenter believes that the first stage of developing a learner's creativity and thinking is to teach the learner to identify and use key elements to orient in a discourse. The lower the level, the more necessity to rely on keys, therefore, the **presenter's teaching approach** aims at developing in her learners the habit of analyzing all elements in the input to identify potential keys. This is often achieved by asking students questions instead of answering their questions directly.

The learners of Chinese strongly feel that being successful means being able to work simultaneously with different types of keys – graphical, phonetic, lexical, grammatical, contextual. This requires the learner to develop sets of algorithms for both pure and mixed types of keys. Discussions of algorithms in the classroom are very useful for students.

During the workshop, after a short introduction the audience will be given the following tasks to work out algorithms of dealing with keys and evaluating this approach:

3. sorting Chinese characters – to understand the principles of character formation;
4. guessing word meanings – to understand the principles of word formation;
5. translating texts from Chinese – to understand the sentence structure;
6. developing algorithms for each of the tasks – to explicate on the processes of working with keys.

Hopefully, the teachers of other languages will acquire new ideas for teaching various elements of the languages, such as spelling, suffixes, auxiliaries, particles, prepositions, word order etc. Questions will be answered during and at the end of the workshop.

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Ana Torres. Polytechnic Institute of Santarém, Portugal.
Web 2.0 Possibilities for Developing Learners Thinking Skills.
Saturday. September 15, 14:45 – 15:30. Section A. Room "Amata".

Participants will be given a practical demonstration of how to create and share a digital content in Wix. After the practical demonstration participants will have a hands-on opportunity to work with the tools and actually begin creating their own digital contents and share them in the web.

The steps of this workshop will be:

1. Presentation of FormLab (learning management system).
2. Registration and login in FormLab and Wix.com
3. Start the construction of digital content, in Wix, that can be transferred to any area of knowledge.
4. Exposure of tools options: text, picture, audio and video.
5. Apply the media tools provided by Wix to optimize the communication process.
6. Sharing products among participants in the LMS FormLab.
7. Considerations and evaluation of the possible applications of the tool in the development of thinking skills

To support the workshop will be developed a course with materials, information about each tool used, examples of all strategies shared, and materials that participants can use for development activities. This course will be available to participants to continue the discussion after the workshop.

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Sharon Ahlquist. Kristianstad University, Sweden.
***Storyline* and the Young Language Learner Classroom.**
Saturday. September 15, 16:00 – 16:30. Section A. Room "Amata".

Storyline was developed in Scotland in the 1960s as a response to the requirement for interdisciplinary teaching in the primary curriculum. Based on social constructivist principles, the starting point for all work is what the learners know. Today the approach is well-established in first-language contexts in many parts of the world, at all levels of education, but less so in second language teaching.

This is somewhat surprising given that *Storyline* has much in common with task-based education. One difference is that *Storyline* tasks, which are linked to curriculum content, are situated within a narrative, which develops over for a number of weeks. Learner creativity involves using imagination, rationale thinking, background knowledge and practical skills to solve problems which arise in the story.

The research literature on young language learners provides theoretical support for *Storyline*. For instance, young learners are considered to learn best when their emotions are engaged in experiences with which they can identify, when they are required to think in tasks which they perceive to be meaningful and when these tasks are varied, utilizing all the learners' senses.

Working with *Storyline* as a teacher trainer for 12 years, the word I hear most often from adults and children alike is `fun´. I wanted to investigate what aspects of *Storyline* were especially popular with young learners and what impact working with a *Storyline* topic had on their English language development. That study is the focus of my presentation.

Extended Summaries of the Presentations
Section A. Development of Creativity & Thinking in Language Education

Sharon Ahlquist. Kristianstad University, Sweden.
Storyline **and the Young Language Learner Classroom**.
Saturday. September 15, 16:00 – 16:30. Section A. Room "Amata".

The theme of the topic was sustainable development, the aim to consolidate grammatical structure and lexis with which the learners were familiar, and to introduce the lexis of sustainability. For example, taking part in a project to live in a more sustainable way, the family members attended a climate lecture in English (based on content already studied in Swedish), wrote a diary of a typical day, analysed it to show where they harmed the environment, then produced a collage illustrating this.

Situated in a sociocultural theoretical framework, the study used: observation notes, questionnaires, learner and teacher interviews, learner journals and texts and some video recording. The findings showed group and practical work to be the most popular aspects, and development in all skills, which in different ways can be linked to increased motivation. Reasons given for improvements in listening included that it was `important information´; writing was `fun´. This word occurs throughout the data, often used by the learners to explain why they made an effort. Regarding speaking, some noted they were `braver´ now.

Storyline topics can be based on textbook chapters – the *family* for younger learners, with a focus on everyday lexis such as personal description, or *tourism*, for instance, for older ones. *Storyline* might introduce a subject, which is then worked with in a more traditional way (the textbook), or it might consolidate a subject already worked with. Learners in my study rated highly the fact that they did not use a textbook, which shows that knowledge of *Storyline* is an important addition to a language teacher's repertoire.

Merve Elbirlik Tülek and Nazan Özçınar Sirel, Özyeğin University, Turkey.
Moving Pictures: The power of Images to Boost Learner Creativity and Motivation.
Saturday. September 15, 16:30 – 17:00. Section A. Room "Amata".

This workshop presentation will begin with a brief introduction about our teaching context and how images have helped us so far. Then, it will go on with practical ideas and activities that are practised in our context which have created some space for our students to express themselves and improve their critical thinking skills by making use pictures or images while doing grammar, free speaking and writing activities which instructors can use at various levels with various age groups. The importance of using pictures or images cannot be ignored in the ELT world, whether this is at primary level or university level. Using visuals is an effective vehicle to entertain and de-stress students as they are acquiring certain grammatical skills or doing speaking or writing activities. It is vital that the teacher will have the learners move and supply them with plenty of visual stimulus so that they are motivated and interested. Mumford (2008, 40) for example states that "all teachers have access to pictures, however, and these can be a quick and easy way to bring other places and other people into the class. With imagination, pictures can be an extremely flexible resource." In this workshop, we would like to share and exchange our ideas of using pictures or images in our classes. When these activities were applied at prep level, a change in students' level of motivation and willingness to participate were identified which will also be elucidated.

Deirdre Jennings, Vilnius Interational School, Lithuania.
Teaching and Learning Through the Thinking Approach.
Saturday. September 15, 09:00 – 09:35. Section B. Room "Abava".

I will be asking participants to work through a number of tasks which will demonstrate the following;

- the thinking skills and models you can 'easily' use in your classroom
- how to introduce them to your students
- student created rubrics (with examples from my own groups)
- how I looked for and identified curriculum content which would be appropriate
- how you can adapt or manipulate curriculum material to facilitate the use of thinking concepts - subject curricula are very often in the manner of 'stuff' your students must eventually 'know' i.e. recall of information (which is Bloom's level 1)
- how I designed and redesigned the tasks
- horrible mistakes I made

  I will also discuss;

- essential agreements with you students or how to stay quiet while your students struggle with the task and knowing when to intervene
- how students responded to the tasks
- what were the outputs of the students during and following the tasks
- what to do when students find the task too easy or too difficult
- what to do if it all 'goes wrong'
- how I assessed their progression in thinking skills

  During the tasks in which you will be participating, questions are not only very welcome but an essential part of the process, so please ASK away!

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Alla Nesterenko, Teacher Training and Re-Qualification Academy, Moscow, Russia.
Developing Research Skills in Maths Lessons.
Saturday. September 15, 09:35 – 10:10. Section B. Room "Abava".

In recent years, goals of the mathematical education have changed dramatically. Today it is not so important to teach students how to count quickly and to give them specific algorithms for solving standard mathematical problems. It is much more important to teach them to examine patterns, to develop and prove formulae, to construct local mathematical theories. A universal approach to the study of object features which is used in OTSM-TRIZ pedagogy is perfectly suitable to be used for teaching mathematics. It allows to give students specific tools which help them to derive mathematical patterns independently.

During the presentation I will demonstrate examples of mathematical banks and research works that our teachers conduct with primary and secondary school students.

Willem Bustraan, Amsterdam University of Applied Sciences, Netherlands.
Science & Art, a Perfect Combination to Promote Creative and Logical Thinking.
Saturday. September 15, 10:10 – 10:30. Section B. Room "Abava".

Human beings experience the world around them by receiving signals through their senses. We all construct meaning ourselfs and the result of our constructive thinking process is not objective but is influenced by our prejudices and preceived opinion. By experiencing the phenomenae around us, both the natural world and the artificial world, we build models of our own reality and we formulate opinions! Many philosophers, Bacon-Descartes-Kant emphasized the importance of human personal subjectivity during the interpretation of the sensa-data.

The first step in the scientific endeavour is observation followed by perception, then imagination comes in. In science we visualize the phenomenae and the concepts of the natural world.

For the artist imagination is part of the creative process as well. Science and Art are commonly considered as two separate cultures, which differ in both tongue and value. However, while the material artifacts produced by science and art are markedly different, the creative cognitive process of their construction is closely related – both cultures use a metaphorical language, which sharpens perception of details and enhances awareness of structure.

We designed a science methodology course for student-teachers to challenge their imagination and metaphorical thinking and at the same time to improve their understanding of scientific concepts. As a starting-point for course material and activities we focused on the phenomenon of *Colour in Art and Science.*

In the learning activities we emphasized the two cultures of science and art. We grounded the courseon Karl Poppers (1972,1979) model of the three worlds: the physical world, the mental world and the constructed world. Learning activities emphasize the connections and transformations between the three worlds. Students were confronted with paintings and scientific models of reality and they were invited to compare their experiences and ideas with their fellows. In science as well as in art the concrete experience and the confrontation with the abstract model, scientific or artistic, will stimulate people to use their imagination and to develop a metaphorical language. The result is a growing awareness of the mental activity and the thinking process.

During the course students were asked to design lesson materials for lower secondary school pupils. Parts of the lesson materials have been used by science teachers in their own school.

The first experiences in class are promising and we expect this might lead to a more integrated understanding of man and nature. Maybe such an approach, which resonates science's creative and metaphorical voice, will help alleviate some of the antagonism many people have (and sometimes even take pride in) towards the technical and impersonal language of science. And maybe, just maybe, this will re-open a path of communication, one of common tongue and value, between the two cultures, a path that will lead to a more integrated understanding of man and nature.

Krishnakali Gupta. International School of Bergen, Norway.
An Overview of Thinking Tools in Science
Saturday. September 15, 11:00 – 11:25. Section B. Room "Abava".

The significant contribution of the TA is to halt blind repetitive work and introduce interruption or even disruption whereby students are encouraged to go over exactly what they are trying to do at metacognitive level as well as take an overview of the problem. With every pause comes the process of reflection and resetting of the path, as it were. It could be as simple as redefining or even rephrasing the original problem.

The whole process has a rhythm or cycle that is meant to reduce arbitrariness, remove vagueness and altogether rid the learning process of random discoveries. The learner creates an algorithm which is a step by step system of carrying out specific tasks. The models, ENV, theory of contradiction and multiscreen, are useful in creating this algorithm.

In my presentation I would like to share some classroom experiences whereby these tools could be applied effectively. For students of Science, the scientific method is used to investigate the natural world. One of the demands of designing meaningful laboratory experiments is to ascertain the variables.

The ENV model is particularly effective in focussing on variables. The ENV model may be applied repeatedly in the algorithm building to successively refine the algorithm. An algorithm created for one particular investigation might be used for several experiments or tweaked for a slightly different outcome.

The theory of contradiction is useful to break out of a set pattern of thinking and build solutions to seemingly impossible problems. It is particularly useful in innovation.

The multi screen model projects an overview of scientific progress not simply in chronological order but a more dynamic organic process of causal relationships that propel the growth of knowledge. Studied this way it is easy to see how the interplay of tensions in the broader world of super systems impacts growth of subsystems. Again this provides an opportunity to travel in time not only into the past, but the future as well and make accurate predictions. It would allow us to look at questions like how and why the lifetime of a machine has become so short or what would take the place of iron and steel in the material world or even how people would interact in future societies.

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Extended Summaries of the Presentations
Section B. Development of Creativity & Thinking in Science & Maths

Sergei Modestov, Saint-Petersburg State University of Service and Economics.
Using the Theory of Inventive Problem Solving (TRIZ) on Biology & Ecology Lessons.
Saturday. September 15, 11:25 – 11:45. Section B. Room "Abava".

TRIZ methods are now available. Any interested teacher can find information about them on many web-sites, so let's concentrate on specific questions of using TRIZ on school lessons – using and making creative tasks. Using creative task is one of a TRIZ-based pedagogical technology well suited for school practice.

A creative task has the following characteristics: unclear, fuzzy conditions; contradiction in the task conditions; several answers. In a process of solving such a type of task students can get many related answers.

Inclusion of the creative tasks in your syllabus can have the following positive effects.

1. To consolidate, to "fix" knowledge by using it for solving a creative task.
2. To demonstrate the beauty of natural sciences. Creative tasks and their answers are good examples of graceful thoughts.
3. To develop individual abilities and creative talents of students.
4. To develop skills of information searching and processing.
5. To develop cognitive interest by positive emotions which students feel in the process of solving creative tasks. The joy of creativity is one of the best stimulators for studying.
6. To capture students' attention.

Let me introduce a new term - a model is a limited part of teaching material, a logically complete fragment of a teaching course. A simple technology to make a creative task.

This technology offers five types of possible creative tasks, which are arranged in the order of increasing complexity. It allows a teacher to make some creative tasks out of any interesting examples.

1. To recognize a model in a task condition.

Some typical task formulations: a) name the model used in some examples, b) choose the right propositions corresponding to the model, c) apply the model to complete the sentence.

2. To use a model directly.

Some typical task formulations: a) use the model and get a result (some results), b) find a mistake in the application of a model, c) give your examples for the model.

3. To use several models without hints – when, where or how to use each of them: a) get maximum answers using any of the learnt models, b) make a new task when you are given the correct answer.

4. To solve the tasks which require application of biological effects (phenomena).

5. Research tasks: a) generalize the data, make a conclusion, b) compare some models, some answers.

Willem Bustraan, Amsterdam University of Applied Sciences, Netherlands.
Learning by Design. A Methodology to Stimulate Pupils' Thinking.
Saturday. September 15, 11:45 – 12:10. Section B. Room "Abava".

For pupils between 11 and 15 years it is rather difficult to think in a formal way and to really understand the abstract models of science. In teaching, science is often presented as a black box. Pupils are typically confronted with only the results of scientific research. They are not given any insight into what is actually happening in the black box, which is the often tedious process of formulating and testing theories. Pupils typically consider theories not as provisional solutions to problems, but rather as facts that are simply gathered from nature by scientists.

To give our pupils a more adequate and complete picture of science we introduced an approach according to *the model of learning by design*. In this model we try to make science as concrete as possible for the pupils by introducing into the curriculum a design process. We ask the pupils to design and make a real object, a product. During about 6 project weeks (3-4 hours a week) the pupils design and make a product. Half of the time they work in the so called technological workplace and half of the time they investigate and they do experimental work. The experimental work, most of the time guided by worksheets, will give the pupils information how to improve or change their final product. Time for reflection and plenary discussions has been planned during the week.

The project "learning by design" is very structured and five characteristics are emphasized: a design task, the design process, the investigation and experimental part, reflection, the presentation and final test. Important is that the design task and the related investigations are really meaningful to the pupils, so they are motivated not only to make something but also to improve their product and to understand what they are doing. At the same time we expect from them they can explain the scientific concepts in relation to the final product, so we ask them to write a short text and to explain to others the scientific background of their product. During a LBD-course the development of thinking skills is emphasized: planning, visualization of ideas, asking questions to investigate, conducting experiments, analyzing data, preparing presentation.

Teachers involved in the learning by design approach meet a few challenges. The pupils like to work with all kind of tools to make a product as beautiful as they can and it is sometimes rather difficult to tell them it is time for investigations. The writing process needs a lot of support from the teacher and language is for a large group of pupils a problem. But to see so many pupils active and proud is for teachers the reason to continue and to try to improve the methodology. To find a balance between hands-on – and minds-on activities is a challenge for teachers interested in developing thinking skills with their pupils.

Austra Reihenova. Riga State Gymnasium No. 3, Latvia.
Students' Mathematical Abilities and Thinking.
Saturday. September 15, 12:10 – 12:30. Section B. Room "Abava".

In the following research the author has examined mathematical abilities of different high school students, using different testing methods and analyzing data. it is obvious that the thinking evolves over the years. It needs to be trained to increase the ability. It becomes more rational. People have so different ways of thinking and various depths of thinking based on three main obstacles: universal intention; family and the genetic material provided by it; the person itself. Studying and analyzing horoscopes of great scientists the author came to conclusion that most of the genius minds were born during the period from winter solstice to summer solstice, but it does not mean that all geniuses have been born only during this period. Change of seasons affect person's character, as well as levels of activity, way of thinking and general behavior.

Research contains charts so it can be easier seen and used for analyzing the ratio of mathematical skills someone has when they are born, as well as how these skills will develop during their life. From the chart it can be read how long would the information gathering period long, what will be the period used for giving knowledge back, what is the chart of a talented mathematician or what is the chart of a genius.

Analyzing cosmograms of my students the author has come up to conclusion that those students who attend to maths contests mainly do not have a talent in maths, but they possess the ability to make logical judgements and conclusions. Along with the „sports" frenzy, the desire to show off allows these students to achieve great results. Most of them will later work in fields that require mathematical skills and knowledge, e.g., architecture, engineering, programming, but only a few will choose to become a mathematician. If someone decides to choose the suggestion made by their family members or their school and will devote themselves for maths studying, we will never see an excited, creative mathematician full with ideas who would provide maths science with new theories and ideas.

Extended Summaries of the Presentations
Section C. Development of Creativity & Thinking in Pre-Primary and Primary School

Kirsi Urmson, Rauma Primary School, Finland.
Thinking in the Primary School
Saturday. September 15, 09:00 – 09:25. Section C. Room "Venta".

The school curricula set aims and outline content but don't provide a lot of instruction in methods for achieving the aims. Teachers have methodological freedom. Teacher guidebooks don't help in teaching thinking systematically. They rather give so many tips that the teacher gets lost in them and the main focus, to create a learning environment which gives the pupils possibilities to learn the necessary skills for the future, is lost. Problem-based learning has become popular in tertiary level education in Finland but it is not a systematic part of primary teacher education. The learning results in Finnish schools are good but the pupils lack motivation according to PISA studies. I interpret this result as a sign that teachers might lack the ability to set challenging enough tasks in contexts which are familiar and meaningful for the pupils. This could mean that Finnish teachers are not using the full learning capacity of the pupils and are underestimating their skills. Could the teachers change this by adding more challenge into their teaching?

Aims are always important and Thinking Task Framework puts a special emphasis on setting aims. The thinking aims are more difficult to set in the beginning. They need to tell us about the skills we are learning. SMART aims: specific, measurable, achievable, realistic and time bound will help. Defining the function in a very concrete way will help to plan the tasks. Using the TTF means also selecting; the process in the classroom takes time and the decisions on content have to be made. The teacher chooses the main content. Even if some things are dropped out, new issues arise while projects get started.

In this presentation I will give examples from my own teaching of challenges that could be used in language, science, geography and biology. The examples show how sorting tasks and point of view tasks have been used. I also want to share an example of using a thinking tool (ENV – Element – Name of Feature – Value of Feature) to make the pupils more aware of social and behavioral aspects of the classroom. Assessment in different forms also by the pupils is part of our curriculum. In thinking approach it is present all the time. The projects have been quite short because I don't teach many lessons in my class on my own due to the fact that my school is a teacher training school. The examples are from grades 3 and 4.

Giedre Joudyte, Vilnius International School, Lithuania.
Recognising Learning in Play.
Saturday. September 15, 09:25 – 09:50. Section C. Room "Venta".

One of the competencies we want to develop in our preschool, according to the learner profile is becoming a Thinker. This means:

- o   Developing theories
- o   Making connections
- o   Sorting/classifying
- o   Showing interest in big ideas

According to the theory of constructivism, children are natural investigators and the role of the teacher is to provide age-appropriate tools for exploring.

While participating in the Bringing Creativity and Thinking Skills project I have been working with children from 2 to 6 years old. This is the best age to start. However, according to Piaget the cognitive development of children between 2 and 6 is in the 'Intuitive Thought' development stage. When I started to work I forgot about this. I was giving sorting tasks to 3 year olds and asking them to make as many groups as they can. They couldn't of course simply because at this age they can make 2 groups: for example; big and small, red and yellow (objects).

Similarly certain complex variables, such as volume, are very hard for children to grasp or understand. In a familiar experiment with 2 differently shaped glasses (tall/skinny and short/wide) each containing the same amount of water, though I explained it to the children more than 100 times the children's observations were always the same – "teacher look he has more juice" (in the tall glass).

The same happened when I tried to create thinking tasks. I had an idea, that my class will be able to solve problems with contradictions - if I need to go to the beach and I have a big bag of things and it is too heavy, what should I take with me and what should I leave behind?? From all the options - hats, sunglasses, water etc. the children picked up binoculars - "why do we need the binoculars on the beach?" - "because I like it"!!

So I finally changed my approach and with the starting point of "I like it, this is mine and I want it", I started to introduce the ENV model to the children. The main aim through the year was to show the children that different things can have many values: that pencils are not just pencils for drawing, they can be a magic wand in a game, they can be a hero from a story etc. (depending on their assigned function).

For children aged 2- 6 our job is to broaden their thinking and to help them to see the same object in different systems, situations and used for different purposes.

After trying out some more successful creative tasks - painting a tree without painting tools and making a flower for a friend without using paper (usually in my class, after asking to create something, children are taking a paper and drawing) I am finally moving towards a better understanding of creativity and thinking, but there still a long way to go.

Extended Summaries of the Presentations
Section C. Development of Creativity & Thinking in Pre-Primary and Primary School

Kurt Teugels, Primary School Teacher, Belgium.
Using 'Six Thinking Hats' for Structural and Creative Thinking.
Saturday. September 15, 09:50 – 10:30. Section C. Room "Venta".

Early in the 1980s Dr. Edward de Bono invented the '*Six Thinking Hats'* method. The method is a framework for thinking. It requires students (and teachers), to extend their way of thinking about a topic by wearing a range of different 'thinking'hats. The six hats represent six modes of thinking and are directions to think rather than labels for thinking. That is, the hats are used proactively rather than reactively. Students will use the 'Six Thinking Hats' to:

1. Discuss topics, 2. Solve problems, 3. Explore alternatives, 4. Reach decisions, 5. Research, organise and write reports, 6. Brainstorming

The 'Six Thinking Hats' at a glance:

- White hat thinking identifies the facts and details of a topic, the neutral information.
- Black hat thinking examines the problems associated with a topic, the critical thinking.
- Yellow hat thinking focuses on the positive aspects and the benefits of a topic.
- Red hat thinking looks at a topic from the point of view of emotions, feelings and intuition
- Green hat thinking requires creativeness, imagination and lateral thinking about a topic, it is searching for new ideas and alternatives
- Blue hat thinking focuses on reflection, metacognition (thinking about the thinking that is required), and the need to understand the big picture. It gives an overview of the thinking process and asks for a discussion.

What is its purpose?

Students learn to reflect on their thinking and to recognise that different thinking is required in different learning situations, students give an instrument to think 'out of the box', to be creative. In the workshop we first give a short theoretical interpretation of the content. This will be done with a short video where doctor Edward The Bono takes the word himself supplemented by a short presentation of some important rules for using the method of the hats. After that the participants take part in a few examples of thinking sessions where the technique of the 'Six Thinking Hats' tool is clearly used followed by a short discussion. The accent off the examples will lay on the green hat were specific creativity is asked from the children.
After exploring the method of the 'Six Thinking Hats' every participant shall discover that everyone can think 'out of the box' and can be creative. The method of the 'Six Thinking Hats' gives everyone an instrument, a handheld for (creative) thinking. It is very difficult to measure the results on an exact and mathematical way but using this technique gives certainly more results in a shorter time without forms of discussion during the thinking process. After the session the participants receive a map with a theoretical guideline and more practical applications on the use of 'Six Thinking Hats'. In the workshop we first give a short theoretical interpretation of the content. This will be done with a short video where doctor Edward The Bono takes the word himself supplemented by a short presentation of some important rules for using the method of the hats. After that the participants take part in a few examples of thinking sessions where the technique of the 'Six Thinking Hats' tool is clearly used followed by a short discussion. The accent off the examples will lay on the green hat were specific creativity is asked from the children. After exploring the method of the 'Six Thinking Hats' every participant shall discover that everyone can think 'out of the box' and can be creative. The method of the 'Six Thinking Hats' gives everyone an instrument, a handheld for (creative) thinking. It is very difficult to measure the results on an exact and mathematical way but using this technique gives certainly more results in a shorter time without forms of discussion during the thinking process.

After the session the participants receive a map with a theoretical guideline and more practical applications on the use of 'Six Thinking Hats'.

Extended Summaries of the Presentations
Section C. Development of Creativity & Thinking in Pre-Primary and Primary School

Ann S. Pihlgren, Stockholm University, Sweden.
Socrates in the Classroom.
Saturday. September 15, 11:00 – 11:25. Section C. Room "Venta".

Socratic seminars have been practiced by educators as a supplement to classroom teaching. However, how the effects are achieved has not been thoroughly investigated. This study is an analysis of seminars conducted over three years with children five to sixteen years old. The following questions were put:

- How are goals and effects of the Socratic dialogues described in literature? How are Socratic seminars described as a method in literature?
- How do the seminars differ from other types of classroom dialogues? How are the effects of Socratic dialogues achieved? What critical events and actions threaten the seminar? How do participants develop and protect the seminar culture?

In the literature study different traditions on Socratic interlocution were reviewed and analyzed from the rationales that guide the methodology of the different Socratic traditions. Two historic movements have contributed with relevant ideas about learning and thinking: the progressive pedagogy in Europe and the USA, and the Bildung/bildning movement in Germany and Scandinavia. By controlling some contextual and methodological factors the seminars will supposedly achieve positive effects and the Socratic traditions independently describe a set of similar, relatively simple methodological steps. The central ideas are that one learns to think by cooperating and using language and that this will result in intellectual and moral development, and will prepare all citizens to participate in political planning and decision making. The methodology in the Socratic seminars presupposes that learning is interactive. The individual will test and search interpersonally in cooperative interaction but will also test his/her interactive experiences intrapersonally, in an internal, cognitive process.

16 videotaped seminars with groups of children age five to sixteen, participating in dialogues for three years, were videotaped and the interplay was transcribed in the seminar study. Body language, direction of glances, and verbal group interaction were analyzed closely through a phenomenological approach. The analysis focused on how the seminar culture was taught and understood, and if the intended methodology was important. Elliot W. Eisner's "educational connoisseurship" and "educational criticism" were used when analyzing. The study shows that the skilled participants changed their interaction from conversation to an inquiring dialogue, and that the distribution of power in the classroom changed in favor of a more polyphonic and cooperative interaction if the facilitator and the participants realized and accepted the important element of the game and how these were learnt. The younger children were more dependent on a close interaction with the adult facilitator, but participants of all ages were able to philosophize and improve this from practice. The skilled participants shifted their interaction towards an "inquiring" dialogue, and the rhetorical power changed to a more cooperative communication. The students' learning proceeded through stages, partly different from the anticipated ideal. The facilitator's ability to handle rule breaking, and to create a safe environment for intellectual exploration, was significant. The findings show that "silent" moves like gestures and glances helped maintain a productive and egalitarian culture. The participants developed their thinking skills over time, evolving from relativism to critical examination.

Extended Summaries of the Presentations
Section C. Development of Creativity & Thinking in Pre-Primary and Primary School

Susanna Massa, primary school teacher, PhD student, Università degli Studi di Roma Tre, Italy.
Philosophy for Children in an Italian Primary.
Saturday. September 15, 11:25 – 11:50. Section C. Room "Venta".

The participants were a group of 18 children I had chosen to take part in my philosophical project. I used the creative assessment pack (Williams, 1993), an instrument which is self-scoring and measures the cognitive thought factors of fluency, flexibility, elaboration, originality, vocabulary, and comprehension. It is a test pack consisting of two group-administered instruments: the Divergent Thinking test (Forms A and B) based on children' drawings and the Creative Personality test based on 50 sentences about behaviors to which each child can respond using one of four choices (I always do it, I never do it, I sometimes do it, I don't know about it). A third instrument, The Williams Scale, is a rating instrument based on 48 sentences and 4 open questions concerning children' behaviors but is designed specifically for teachers and parents of the children. Teachers and parents should respond to each of the 48 sentences using one of 3 options (often, sometimes, rarely) which best reflects the frequency with which the child demonstrates the behavior in question.

I tested the children before and after carrying out my philosophical project. The first instruments I used in pre-test were forms A and B of the divergent thinking test which were given to each student. Each form has 12 frames that contain some lines or outlines and using these as a starting point the student is required to draw interesting objects and figures. After completing their drawings, the children had to invent an original and interesting title to put below their pictures. I asked the children to fill in the form regarding the creative personality test. These were the instruments I used for the pre-test while I gave the Williams Scale test to one of the teachers in that classroom and a second copy to the parents.

Analyzing the data from the pre-test about creative thinking, I found out that in this particular classroom most of the children had either an average or low level. After doing the philosophy for children activities, I tested the students' creative thinking again and I noticed that the overall level of students situated in the average category had not changed but there were however changes in the other two categories. In the post test the number of students below average decreased and the number of students above the average increased. This represents an overall improvement following the philosophical activities.

I also tested the children's divergent thinking and comparing the pre and post- test, I observed some changes. There were increases in the overall number of students who were average and above average, and there was a corresponding decrease in the number of below average children. Again this represents a clear improvement after the activities.

The Williams Scale results show that teachers and parents have similar judgments about each child, but sometimes parents seem to have a better opinion about the children's behavior.

Extended Summaries of the Presentations
Section C. Development of Creativity & Thinking in Pre-Primary and Primary School

Meeli Pandis, SOS Children`s Villages International, Estonia and Klaire Sinisalu, Merivälja School, Tallinn, Estonia.
Playing for Learning. Estonian Reading Association`s Innovative education projects.
Saturday. September 15, 10:50 – 12:30. Section C. Room "Venta".

Civic initiatives provide good results in a number of spheres including innovation in education environment and teaching methods bybringing creativity and thinking skills into the process. NGO Estonian Reading Association (EstRA, www.lugemisyging.ee) has gained rich experience in conducting literacy and wider education projects during its 20 years of existence. In the workshop we will provide examples and activities from 3 EstRA projects what are concentrated on creating supporting and motivating learning environment and playful and creative activities for pre-school and elementary school children. Those methods are successfully tested in practice by the number of kindergarten, primary and special education teachers including presenters. Following EstRA projects will be presented by introducing practical methods and materials developing children`s creativity, problem solving and thinking skills in a child friendly playful way:

Project "Reading Nest"

Project objective is to design an environment in kindergartens, schools and libraries where children can read in an enjoyable and safe atmosphere and engage in activities, promote creativity of both children and teachers, and foster collaboration between home and community. Project has increased the interest among children towards books and reading, improved thinking and learning skills, social skills and creativity. Project has undergone a "snowball effect" – more and more teachers establishing Reading Nests under supervision of project mentors. The project won an European Award of Innovative Literacy Project of International Reading Association (www.reading.org) in 2006.

Project More Parents Associated for Learning (MorePALhttp://morepal.org)

It is a Grundtvig 1 - European Cooperation Project aimed to empower European parents to be more actively involved in their children's education by bringing parents, students, siblings, teachers, adult tutors and community organisations together in enjoyable creative and challenging activities. In workshop we are concentrating in play and games usage approach of the project. Games are important for developing physical, intellectual, moral and aesthetic qualities. Playing with others teaches how to interact with people, value others, solve problems and ourselves. Playing brain games together can help form positive attitudes to learning. Supported by parents, children can learn how to solve problems, to communicate better and to develop thinking and learning abilities. Physical games improve motor skills, increase understanding of sportsmanship and improve speed and dexterity. The rules teach how to manage behavior and help to develop confidence and self respect. Playing reminds adults of their own childhood and gives an opportunity to teach games from previous generations.

Project „Reading Games"

The project aims to provide interesting educational tools for children, parents and teachers in the form of board games and facilitate the development and shaping of children's reading skills. Two reading games competitions for teachers were held in 2005 and 2010. Four collections of Reading Games have been published since 2004 by Koolibri Publishers. Further collections will be compiled. The games in these collections gained recognition of specialists from Tallinn University, the University of Tartu, the Association of Teachers of the Native Language, the Estonian Speech Therapists' Union.

Silvy Penne, Oslo and Akershus University College of Applied Sciences, Norway.
Cross-Disciplinary Approaches: Thinking and Learning in Mathematics and Mother Tongue.
Saturday. September 15, 09:00 – 09:30. Section D. Room "Gauja".

Cross curricular activities are focused in International Education. We therefore see a need to explore through our two subjects, Norwegian and mathematics, the didactic challenge within this field. What are the obvious differences and what are the similarities. This will be the focus of our presentation and we discuss cross-curricularity in a literacy perspective. Our argument is presented on three levels which together build on the perspective of meta-language. First we consider the level of discourse primarily concerning cultural relations and communities of meaning, for example subject-related communities. The next level is genre, concerning both common cultural texts and practices and how meanings are framed in linguistic forms. Finally, we consider arguments regarding the modes of thought which underpin subject-specific learning. Conclusively we discuss these levels from aspects of pupils' identity in the learning process.

A discourse is a kind of 'community of meaning', of ways of thinking to understand the world or a part of the world. Discourse gives meaning, feeling of inclusion and identity, for example in the profession of teaching. Within a discourse, some frames may be obvious while others are in motion, formulated by Gee as "identity kits" (p. 701).

Genres are part of discourses but in a wider perspective of learning. From a literacy perspective, we suggest that it is crucial to separate genres as important didactical markers. We claim that as pupils meet few demands with regard to awareness about genres, meta awareness will rarely occur.

Oget D., Cavallucci D. , Sonntag M., Audran J., LGECO lab. at INSA of Strasbourg, France.
Evaluation of the Efficiency of Using Educational Computing Tools for Increasing the Inventive Thinking Skills of French Engineers.
Saturday. September 15, 09:30 – 10:00. Section D. Room "Gauja".

Thinking skills approaches insist on meta-cognition activities: to think in conscious to achieve certain purposes (Fischer) and also on critical and creative thinking (Ruggiero 1993). The English curriculum identifies 5 thinking skills dimensions (DfEE 1999). We will focus on creative thinking. If creativity has to take part in an effective education (Grainger 2006), the efficiency of the learning process of creativity is less often evocated.

The efficiency of learning inventing thinking can rely on thinking frame. Among the three components of thinking frame (Perkins, 1986), we have decided to focus on the first step, the acquisition of inventive thinking skills. Internalisation and transfer can also be related to efficiency of learning but will not be addressed in this paper. Should we "teach the learner the frame directly" or "the learner might invent it autonomously"? In this context, we question the use of computer tools putting that using computer develop autonomy and autonomy as a component for efficiency of inventive learning. To answer this question, we used a data collected in a French graduate school of sciences and arts. The data incorporates information about projects leaded by students to solve technical inventive problems in mechanical, plasticization and mechatronics engineering. Those projects was integrated in a course on learning the TRIZ during the last year of learning.

The projects leaded during five academic years (2006-2010) have been evaluated according the acquisition of specific knowledge (laws, multiscreen scheme, matrix, solution concept) and linked to the progressive introduction of computing solutions in the learning. The results show a clear link between the pedagogy, the introduction of computing solutions and the acquisition of thinking skills.

Extended Summaries of the Presentations
Section D. Research on Teaching Thinking

Sylvia Truman, Regent's College London, UK.
Designing Creative-Collaborative Learning Tasks in Secondary Education Classrooms.
Saturday. September 15, 10:00 – 10:30. Section D. Room "Gauja".

This paper reports upon a study which focused on facilitating collaborative creativity in a music composition task. In particular, this paper draws together theoretical routes from learning and creativity theory. The study investigated the similarities between the two processes and based upon this a generate framework for creative learning is presented. This framework exists as a design support tool to assist with the design of creative learning experiences within the classroom. In this instance it is applied to the domain of a collaborative music composition task and was used to inform the design of SoundScape.

SoundScape was designed to explore the research hypotheses driving the study. The hypotheses focused upon explicitly supporting the preparation phase of the creative processes using music technology and using visual metaphors to specify music. The findings hold a number of implications for the design of meaningful and engaging learning experiences through considering aspects of the creative process.

Drawing upon these theoretical insights, a framework has been developed focusing upon creativity in education. The framework is presented in the form of a generative framework, which exists as a design support tool to assist with the design of lesson support materials and the design of educational technologies. The framework assists the design of creative educational experiences for the classroom by providing scaffolding for supporting materials in terms of the six white component boxes of the framework.

Wallas's four-stage model has been adapted as the fundamental basis for this generative framework, with the processes of preparation, generation and evaluation represented laterally across the framework. The vertical dimensions reflect individual (denoted here as personal) and social components of creativity. The social level refers to others, peers and society and personal levels reflect explicit and tacit levels of thinking.

To demonstrate the application for the framework is was instantiated for the instance of collaborative music composition. Music composition program and lesson plans were designed in accordance with the framework.

Ninety six school children participated with this study, all eleven years of age. The study was conducted over a month and with one pair of students at a time to allow participants to work free from distraction. Four test conditions were used, only one that fully supported the instantiation of the framework.

An analysis of the results show significant differences in: time spent on task, level of engagement with the task and student's level of confidence with the task. Findings from the study also indicate that preparation is a crucial element of the creative process and that the use of visual imagery is a useful tool for learning, especially where the imagery used is consistent with real-world artifacts.

Extended Summaries of the Presentations
Section D. Research on Teaching Thinking

Liga Roke & Emils Kalis. Riga Teacher Training and Educational Management Academy, Latvia.
Adaptation of Tests of Creative Thinking – Drawing Production in Latvia: Results, Correlates, Perspectives.
Saturday. September 15, 11:00 – 11:30. Section D. Room "Gauja".

Facilitating the development of creativity is nowadays marked with overall agreement about its role in student s successful learning and education that fosters students creativity and creative talents. Recognizing the need to stimulate creativity through education, one of the critical tasks is to have instruments which measure students creativity. Therefore the issue of creativity tests adaptation in Latvia becomes very topical since its practical focus and possibilities for different implications –measuring the effect of new educational programs and activities, diagnosing the strengths of students creative potential and providing their development.

TCT-DP is one of the recently published creativity tests developed for measurement of creative thinking and creative potential in general. It should be considered as an alternative method to widely accepted divergent thinking tests elaborated by E. P. Torrance (1967; 2007) which have several weaknesses including insufficient validity and complicated measuring procedure. TCT-DP was developed by H. Jellen and K. Urban in 1986 in Germany. It is an image production test, stimulating test takers to think in unique ways, use their imagination and make new connections. It is based not only on divergent thinking testing principles but involves also principles of gestal psychology. It can be used with test-takers of 4-95 years age. Child is asked to draw two pictures which are afterwards assessed in 14 categories by test experts.

The adaptation procedure included translation, test agents training and afterwards – administration of tests to 250 9th grade students from 11 schools in Latvia, over a period of two months in the autumn of year 2011. 500 pictures were produced, two from each student (A and B form). Three well trained professional graders, psychologists, evaluated each picture in each of 14 criteria. Calculation regarding were made and high inter-rater reliability between three graders was achieved. Inter-rater reliability is essential in the assessment of picture-type creativity tests were no a single correct answer is possible.

The obtained results were compared with the mean creativity scores in Germany and other countries where the tests is already adapted, and also compared between genders. The conclusions about test applicability in Latvia were made and it was found to be valuable, reliable and valid instrument for use of creativity testing and assessing students creative potential. The results of TCT – DP were correlated with the data of academic achievement of students (average marks) and they reveal important conclusions regarding the possible limitations of manifestation of creative potential through the traditional assessment principles in school.

Gillian Boniface, International School of Bergen, Norway.
Thinking Approach in the Visual Arts Lessons.
Saturday. September 15, 14:00 – 14:45. Section E. Room "Abava".

In recent years there has been a change in the direction that art education has taken. There is an increasing emphasis towards expression of creativity and a move away from pictorial representation. While there is, and always will be an important focus on skills, it is no longer enough to have a high level of skills, in order to be successful in Visual art. Students must also be able to analyse existing art works, and incorporate elements of these into their own art work in increasingly creative and meaningful ways. For both students, and teachers, this provides new challenges in teaching and learning.

Some students find it easy to produce work that is well executed and original. They have ideas and opinions and can use their skills to transform these ideas into successful, creative, pieces of art seemingly effortlessly. However, in a universal art programme where we believe in the value of art education for all, how do you teach these seemingly elusive skills to teenagers? How do you teach them to understand the way that artists manipulate the elements of art? And is it even possible to teach then to be creative? It was these questions that led me to the thinking approach, to see if following the framework could be a concrete way to teach these skills and raise levels of creativity for the average student.

I have work with this project now for two years and implemented the thinking approach with units of work aimed at the entire class and specific aspects of projects that perhaps only one or two students were working on. I have found that the framework can be used for both these approaches and having a structured formula to follow helps both the student and the teacher. The student is more able to break things down then apply the knowledge they have gained in a new setting, and as a teacher I am more able to stay focused on what specifically it is they need to learn in order to be able to achieve this. It has not been an easy process, and I feel that it is only now that I am more confident in applying the TA framework to my teaching, but it is an approach that I believe will benefit students, and even if it may not develop their creativity to an equivalent level to those for whom creativity comes naturally, it at least gives them a thorough grounding in analytical thinking, and a chance to push the bounds of their art work to a creative level that they were not aware that they had.

Extended Summaries of the Presentations
Section E. Thinking Across School

Kirsi Urmson, Rauma Primary School, Finland. Thinking Approach Helping to Plan a Creative Learning Environment in Teacher Training. Experiences from Working with the Teacher Trainees in Rauman Normaalikoulu (Turku University).
Saturday. September 15, 14:45 – 15:30. Section E. Room "Abava".

It is easy to lecture and prepare material but more challenging to plan the teaching so that pupils also learn thinking skills. Very often teaching thinking is only a side product and not the main focus. This might be the result of not having a systematic approach. There are studies about Finnish school children's interest level and motivation. It could be higher. Aren't the teachers organizing their teaching so that there are enough challenges for the pupils? Do we still want them to memorize matters and answer questions which don't give room for any new ideas?

Using the Thinking Task Framework gives teacher trainees a tool to help them to visualize teaching from the skills point of view instead of the factual point of view. It helps them to build a learning environment where there is more room for thinking. They become more creative as teachers: sustain uncertainty, play with new ideas and also accept mistakes as a vital part in learning thinking skills. The Finnish curriculum gives teachers a free hand to choose the teaching methods. The curriculum for the trainees emphasizes that the trainees need to understand and think what the skills that the pupils need in future are. Teachers can't work through one day at a time but they have to be able to look into the future, visualize the future needs.

The trainees in my class 2011-12 have been planning their teaching by writing down questions which they found important for developing their teaching skills. They wrote a portfolio during their practice and tried to answer these questions. They also wrote down a problem or a question on the teaching topic they were given. There was not to be a straight answer to it.

This different point of view into teaching, taking into account the thinking skills has been very challenging but also rewarding for them. They could see the importance of learning thinking skills but found it difficult to acquire enough information on the approach as they had so many other studies at the same time . There was a limited amount of tuition and part of it deals with practical matters of the practice. The ones who reached deeper understanding were helping the beginners. In this presentation I will show the instruction the trainees were given, how they managed to get thinking approach in their plans and also share some feedback they gave.

There are problems and the outcomes were not always great but according to the trainees something changed in their thinking and they will question more the ready-made teaching material available.

Extended Summaries of the Presentations
Section E. Thinking Across School

Sergei Modestov. Saint-Petersbourg State University of Service and Economics.
Functional Approach as a Basis of Teachers' Creativity.
Saturday. September 15, 16:00 – 16:25. Section E. Room "Abava".

Active formation of knowledge or emotions requires three stages. We can see these stages in different spheres: literature, drama, religious activities, music. All these stages can have different names, but they are similar:

1. inception: overture, introduction.
2. new material: culmination, main part, theme.
3. fixation: finale, coda, conclusion.

The reason is the inertness of the human mind. Any kind of education or training is an attempt to put something new to one's mind, therefore, we have firstly to prepare consciousness (and sub-consciousness), open it, then put in a new model (studying material), then close it back.

Any lesson has 4 stages, which do not depend on the content of this lesson. These stages were formulated by Adolf Disterveg, German scientist-pedagogue of 18th century.

1. The beginning and actualization of previous knowledge.
2. Explanation of new material.
3. Fixation ("domestication" – G. I. Schukina) of new knowledge.
4. Giving home task, end of the lesson.

So, it is obvious, that pedagogical process includes some fixed elements. The first one is stages. Understanding of this fact allowed me to start the research of pedagogical functions as a base of educational technologies. In my work, pedagogical functions are looked upon as educator's actions, composing a lesson, class, training, etc. It is some kind of a form, and study material is the content which is filling this form. Examples of functions include the following: make a contact with an audience, explain new material, fix or consolidate new material, etc.

The way of implementing these functions is a pedagogical technique. It is obvious, that one function can be implemented in many specific ways, which depend on resources of a class, an audience, a room and so on. Therefore we can assume that a lot of pedagogical techniques exist. I began to collect them and in 2004 the collection transformed into a Bank of pedagogical techniques. Now the Bank includes about 200 techniques; the number of them increases little by little.

Pedagogical technique is the smallest element of the educational technology, performing a specific pedagogical function. So, the function "Check how knowledge is being built" can be realized by a few techniques, for example, the technique "Make questions about the material". This technique also exists in several variants, which can be described as a sequence: make questions, make a system of questions aimed at …, complete a theme, etc.

Such understanding of educational process opens up the possibility to increase the effectiveness of teachers' creativity. I will also discuss ways of finding pedagogical techniques.

Extended Summaries of the Presentations
Section E. Thinking Across School

Paul Kenna, Belle Vue Park Primary School & Brett Millott, Richmond Primary School.
Self-Organised Learning Environment: S.O.L.E.
Saturday. September 15, 16:25 – 16:50. Section E. Room "Abava".

In their presentation Self Organised Learning Environments Paul Kenna and Brett Millott will make theoretical and practical links between the SOLE strategy and the development of 21st Century learners. In particular they outline how SOLE allows student to harness their creativity to develop their own individualised learning methodology, and to apply this in a way that supports deeper thinking and higher level questioning. Through practice and reflection, students build the necessary skills to discover their own answers, formulate their own questions and apply their knowledge across a variety of contexts.

Their presentation is highly relevant for classroom teachers as well as educators in leadership positions. It will provide background information on the genesis of the S.O.L.E. strategy and outlines how it has been successfully adapted, developed & refined with staff over the past two years. SOLE can be successfully utilised across the curriculum and is not subject specific. The research has focused on students in years 3-8 (8 to 14 years of age) and trials have involved a range of students from a variety of backgrounds.

Information about the structure of a S.O.L.E. session, lesson protocols and learning sequences will be provided. Participants will learn a strategy which successfully allows the integration of system content requirements and student led inquiry. Video excerpts are used which capture elements of the strategy featuring students and teachers discussing the many positive outcomes stemming from the process. There are also video vignettes of actual lessons to provide a thorough contextual overview.

The presenters will establish links which outline where the strategy sits within contemporary research. They will articulate how the strategy supports the research of Professor John Hattie; and how the principles of the Harvard's' Project Zero research are at the foundations of SOLE.

The work has brought about significant positive learning outcomes for the students which have been measured over time. The evidence has included:

- reliable & consistent evidence of readers at all levels accessing curriculum content & becoming more active learners:
- positive outcomes in terms of student recall of knowledge based on pre and post testing;
- observational evidence of students self-organising and collaborating, resulting in increased student engagement:
- consistently better than expected outcomes on rich assessment tasks across all curriculum areas:
- observational and empirical feedback from teachers on positive impacts on student behaviours, and
- Longitudinal data from Professor Mitra's original research will also be provided.

In conclusion; to quote Sugata Mitras' book "Beyond the Hole in the Wall"

"*Two school principals from Melbourne Australia – Brett Millott and Paul Kenna – have picked up the method and have taken the idea of SOLE far beyond what I was doing. Instead of making a SOLE an alternative to schools they have found ways to integrate the new methodology into regular schooling – something I could never do.*"

Ann S. Pihlgren, Stockholm University, Sweden.
Socratic Seminar Workshop.
Saturday. September 15, 16:50 – 17:30. Section E. Room "Abava".

Thoughtful discussion as a school activity is being explored by methods like the Socratic seminar, philosophy for/with children, and deliberative dialogues. In these discussions, the teacher puts questions to promote inquiry and foster critical thinking, but the goal is the students' cooperative dialogue. The purpose of seminars is not to give the student an opportunity of free and uncontrolled chatting but to teach the students how to develop and enrich their thinking. If this training of intellectual habits is to take place, the culture will have to foster and promote an open disposition.

The educational philosopher Mortimer J. Adler suggests that all teaching activities must involve three complementary approaches to ensure that learning will take place: acquisition of organized knowledge, development of intellectual skills, and enlarged understanding of ideas and values by exploring/creating. The three columns suggest three different approaches for the teacher. In the first column, the teacher introduces the students to a body of factual knowledge, in the second the teacher coaches them in the intellectual skills necessary to manipulate and apply knowledge. The third column is a creative and investigating part of the learning process. If the student is to grasp the character and soul of the subject taught, he/she must on every level of understanding be given the opportunity to explore the central ideas in the area but also to create. This can be done by activities like painting, composing, designing, inventing, and by thoughtful dialogue, as a means for the student to be able to investigate and critically analyze central ideas, and as an opportunity to, with thoughts and in cooperation with others, present and evoke ideas. In the third column the teacher becomes a "mid-wife", facilitating the student's exploring or creating by asking evocative questions, but not planning the outcome of the discussion or of creativity.

The Socratic seminar can be carried out in pre-school as well as in secondary school and at the university and the workshop invites educators interested in all school levels. In this workshop, the rationales and the steps of the Socratic dialogue as a pedagogical method will be briefly presented and the participants will take part in a Socratic seminar, a structured discussion focused on a text or a picture serving as a common reference point and including at least two or more key ideas or concepts. The kinds of discussions that occur within the Seminar are characterized by having open-ended questions, using textual references to support ideas, producing rigorous, intellectual dialogue, examining challenging and ambiguous texts, and fostering open participation. In this way, the seminars work as a process of taking participants from simple comprehension and recall, through analysis and synthesis, finally reaching a deeper understanding of the ideas through evaluation and creative thinking. The workshop will also give participants opportunity to ask questions and to discuss the seminars as a promoter of language skills, thinking skills, social skills and character in the classroom, which are the positive outcome of recurrent seminars shown by research.

Extended Summaries of the Presentations
Section E. Thinking Based Lessons
## Tutorials by Carol McGuinness, Tania Santialo & Robert Swartz.

Carol McGuinness, Queen's University Belfast, Nothern Ireland & Tania Santiago, Teacher, Colegio Ayalde, Loiu, Spain & Robert Swartz, National Canter for Teaching Thinking, USA.
Thinking Based Lessons. Workshop on Infusing Instruction in Thinking into Content Instruction.
Saturday. September 15, 14:00 – 15:30 & 16:00 – 17:30. Section E. Room "Venta".

This workshop will focus on classroom practice for effectively infusing instruction in critical and creative thinking into content instruction. We will do this by demonstrating such lessons and analyzing their structure and techniques. Participants will be given the opportunity to develop their own ideas for such lessons that they can teach using their own curriculum content.

The result of such "Thinking-Based Learning" lessons is two-fold, reflecting dual curricular objectives: the development of more skillful thinking, and deep content understanding/learning. Participants will be given the opportunity to develop their own ideas for similar lessons that they might teach using what we show as models.
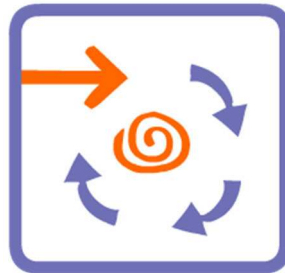
TA GROUP
Teacher Education & Consultancy

www.ta-group.eu

Dealing professionally with teaching thinking we are glad to invite you to take part in our **Residential & Academic Courses**, **Workshops & Seminars** which are organised for various groups of education professionals interested in the development of learners' creativity and thinking skills.

RESIDENTIAL COURSES

All our residential courses are included in the Comenius/Grundtvig catalogue of the European Commission and are **eligible for funding that covers all costs** associated with them.

You can find video excerpts from the previous courses on our **YouTube channel**: **http://www.youtube.com/user/thinkingapproach**

- Creativity & Thinking Skills in Language Education
- Problem Management & Effective Education Based on TRIZ
- Creativity & Key Competences of Children Aged 3-10 through OTSM-TRIZ
- Teaching Russian in Europe: Development of Creativity and Thinking Skills of Learners
- Bringing Creativity and Thinking into Education

ACADEMIC COURSES

We can deliver academic courses for bachelor, master and doctoral level students, as well as various professional programmes. You can see a sample list of courses below. We would also be happy to **develop a course tailored to the needs of your institution**.

- Introduction to the Thinking Approach to Language Teaching and Learning
- Introduction to the Theory of Inventive Problem Solving (TRIZ)
- Thinking in Education

CONSULTANCY
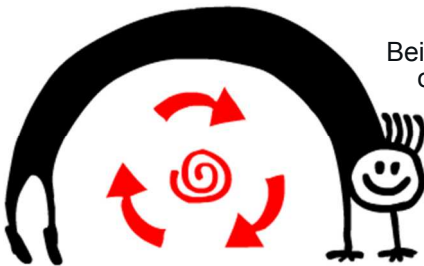
Being involved in professional project management and evaluation since 2005 we offer consultancy in **education project management**, where we help organisations at all stages of project work. We have developed and coordinated three large international projects. Our experts have also worked as consultants in project evaluation for the European Commission.

We also offer consultancy in building effective learning systems and **teaching thinking**, which is the main focus of our work in education.

SEMINARS & WORKSHOPS

We regularly run seminars and workshops for various groups of education professionals. These can be **events starting from one-two hours to a week long courses**. We are always happy to share our experience on various aspects of developing creativity and thinking skills. Please contact us for a list of possible workshop titles. We would also be happy to develop a specific course tailored to the needs of your organisation.

Contact us directly or check our website for further details:
info@ta-group.eu
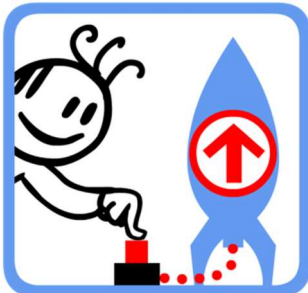www.ta-group.eu

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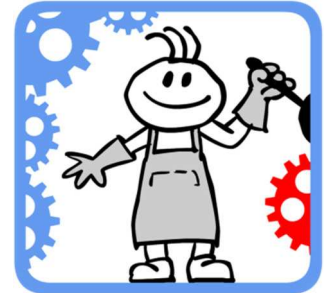29486240

CONFERENCE 2012 EPA

Conference invitation

**A Path for the Learning Family:
Parents as Providers
of Early Language Learning
and Development of Thinking**

*Austria, Vienna
on November 16-17, 2012*

DISCOVER
the ways to introduce a foreign language
and simultaneously develop thinking skills
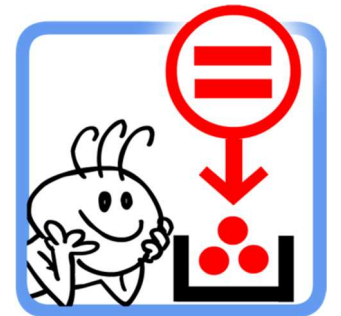of 4-6 year old children in a family context.

MEET
multilingual European families.

JOIN
the community of parents
involved in the education of their children

at
www.ta-parents.eu

Parents As Successful teacherS

Summer schools for teachers in Latvia and Finland –

expression of interest

Free summer schools for teachers from the Baltic and Nordic Regions.

Would you like your learners to be more creative?

Do you think they would benefit from better learning and thinking skills?

Are you interested in bringing real life tasks into your classroom?

TA Teachers will be holding a series of summer schools for Baltic-Nordic teachers throughout academic years 2012/2013 and 2013/2014. The workshops will take place in Latvia and Finland. The number of places is limited. If you would like to take part, please send an email saying a few words about yourself and your interest in the topic to info@ta-group.eu

Teaching thinking network –
expression of interest

The topic of teaching thinking is becoming more and more popular across Europe. Various initiatives exist and a number of activities are taking place on a regular basis. At the same time, there is little communication among various experts involved in teaching thinking. The impact of thinking related events at the European level is still minimal. Some activities are rather commercial in nature and are therefore inaccessible to many representatives of the European educational community.

TA Group are looking for partners to launch a European project aiming to address the above problems and launch a pan-European teaching thinking network. If the idea appeals to you and you represent an organisation already involved in teaching thinking or wishing to contribute to the field, please let us know about yourself.

Contact details: info@ta-group.eu

for your notes:

for your notes:

for your notes:

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NORDPLUS
Horizontal