A framework for bringing TRIZ based education for creative thinking to the wider audience

Dr. Alexander Sokol
TA Group, alexander.sokol@ta-group.eu

Edgar Lasevich
TA Group, edgar.lasevich@ta-group.eu

Renata Jonina
TA Group, renata.ionina@ta-group.eu

A few words about the authors

Alexander Sokol

Edgar Lasevich

Renata Jonina

Apologies for not being able to talk to you in person.
Feel free to contact us at info@ta-group.eu

w.ta-group.eu

HINKING APPROACH GROUP

THINKING SKILLS BASED ON TRIZ

TA Group is an **educational company** that provides services in the field of **development of thinking skills** of various groups of learners. We run **teacher education** seminars and workshops, **develop thinking oriented materials** and curricula and help organisations introduce the **thinking dimension** in their work.

search...

Upcoming events

29 April: **Deadline** for grant applications for residential courses

All upcoming events

Get in touch:

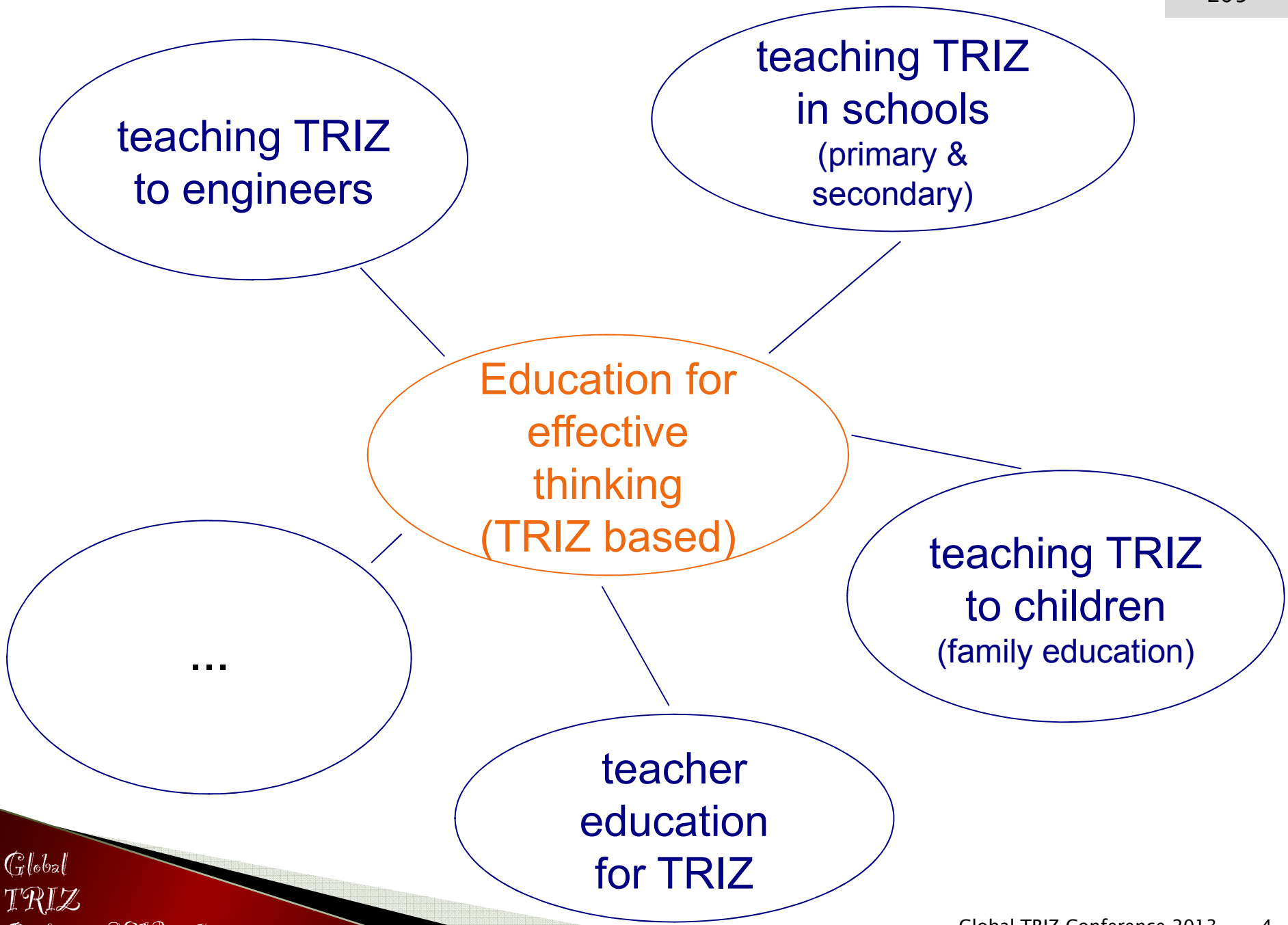
Share your ideas or questions with us **online** or **phone**.

00371-29486240

thinking in education
(especially language education)

Our educational projects are connected with various aspects of developing one's thinking:

- Thinking Approach
- PASS
- TA for Teachers
- Innovations in Teaching Russian
- New Learners


teaching TRIZ to engineers
teaching TRIZ in schools (primary & secondary)
Education for effective thinking (TRIZ based)
teaching TRIZ to children (family education)
...
teacher education for TRIZ

Background information

- Why TRIZ?
  - Instrumentality
  - Scope
- Why infusion?
  - No room in curriculum for a separate course
  - Infusion is more effective than stand alone (Wegerif, 2002 & 2004)

Infusing TRIZ: three approaches

Subject matter used for teaching TRIZ	TRIZ through biology, physics, etc. (eg Modestov, Timokhov)
TRIZ used for enhancing subject matter	TRIZ helps us to learn biology, physics, etc. (eg Kamin, Florescu)
Integration of TRIZ and subject matter	Competence development in TRIZ and biology, physics, etc. - both are equally important! (eg Nesterenko, Sokol)

Only the last one qualifies as real infusion

The three approaches: pros & cons

Subject matter used for teaching TRIZ

or

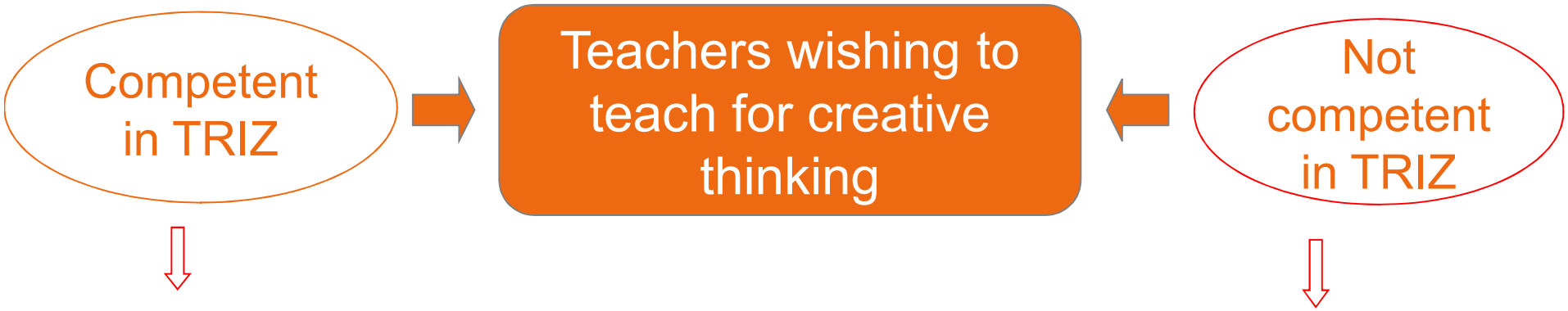
TRIZ used for enhancing subject matter

One aspect always suffers: subject matter or TRIZ

Integration of TRIZ and subject matter

Yes... but
How can teachers do it?
New requirements:
a different organisation of content,
competence in TRIZ, etc.

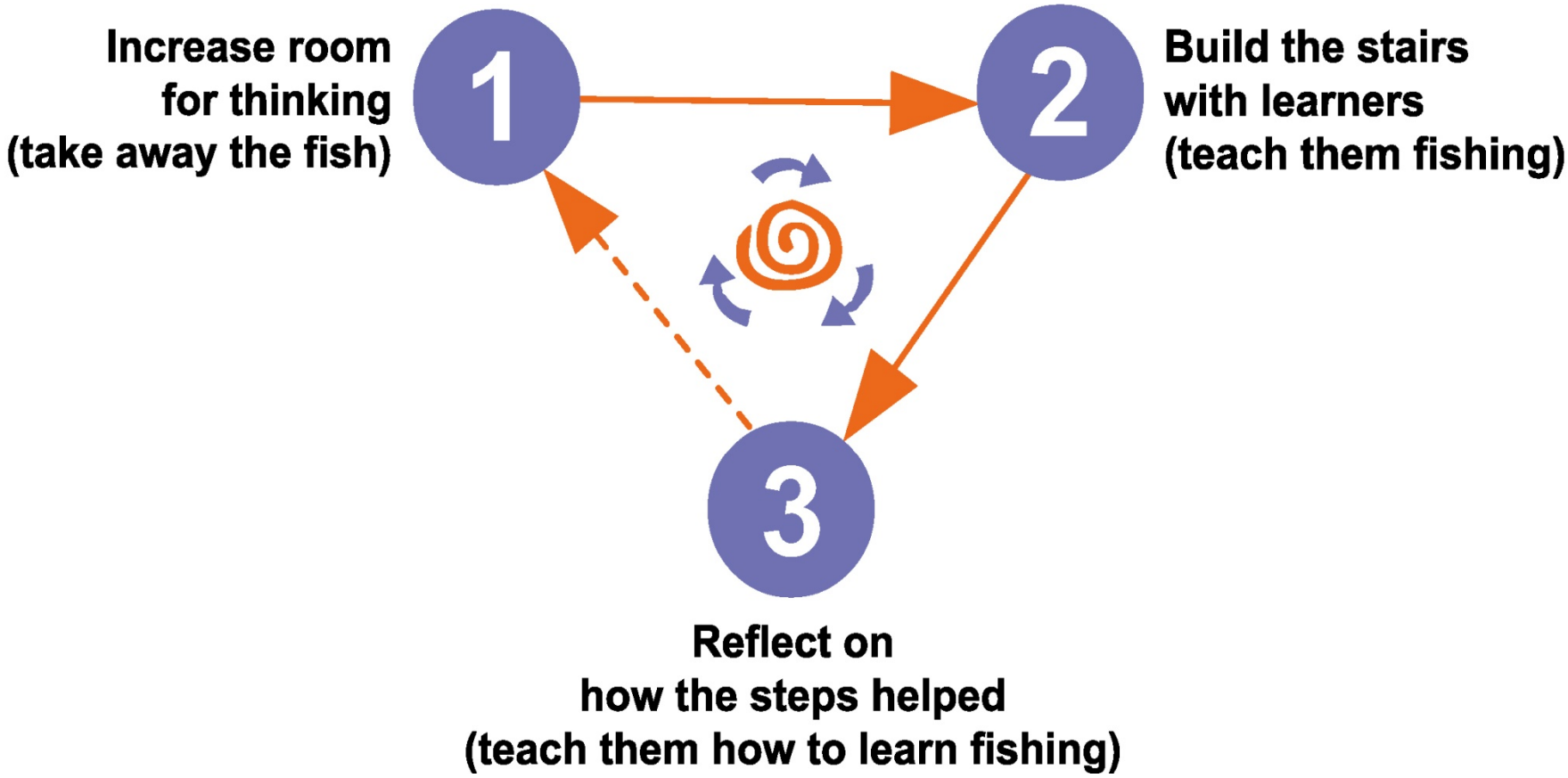
Creative thinking through TRIZ: contradiction to resolve



to be able to integrate its body of knowledge with the subject matter of the discipline they teach

as it is not part of either pre- or in-service teacher education programmes and most teachers are not aware of TRIZ at all.

Thinking Task Framework



Possible resolution to the contradiction

Thinking Task Framework in Practice: Step 1

Step 1

Respond to the following statements about your classroom or the one you know:

The teacher should ensure that students are able to cope with the task	Yes	No
The task offered to learners should be very clear	Yes	No
It is wrong to offer a task if students have not learned the method yet	Yes	No

STEP 1. Increase the challenge

The teacher ensures that the learners are unable to perform the task on the basis of the previous knowledge or experience.

Thinking Task Framework in Practice: Step 2

Step 2

Respond to the following statements about your classroom or the one you know:

The teacher should give the correct answer when students are stuck	Yes	No
When something is not clear, it is the teachers's task to explain	Yes	No
Any idea is appreciated: the more ideas students have, the better	Yes	No

STEP 2. Build the stairs

The teacher creates the conditions for learners to develop own models / algorithms / strategies for copying with the task. Here is real need for TRIZ is manisfested.

Thinking Task Framework in Practice: Step 3

Step 3

Respond to the following statements about your classroom or the one you know:

When the task is done, learning is over. A new task is needed.	Yes	No
The task is considered done only when new problems don't appear	Yes	No
The key thing about reflection is evaluation of outcomes	Yes	No

STEP 3. Reflect

The teacher gets the learners to reflect on the scope and applicability of the strategies developed by them & forumulate new learning tasks as a result.

Useful analogy

Q: When does an engineer need TRIZ?

A: When the problem is too challenging.

Step 1

Q: What's the difference between using TRIZ as a technique and as a theory?

A: Whether one constructs techniques, strategies & methods when applying TRIZ.

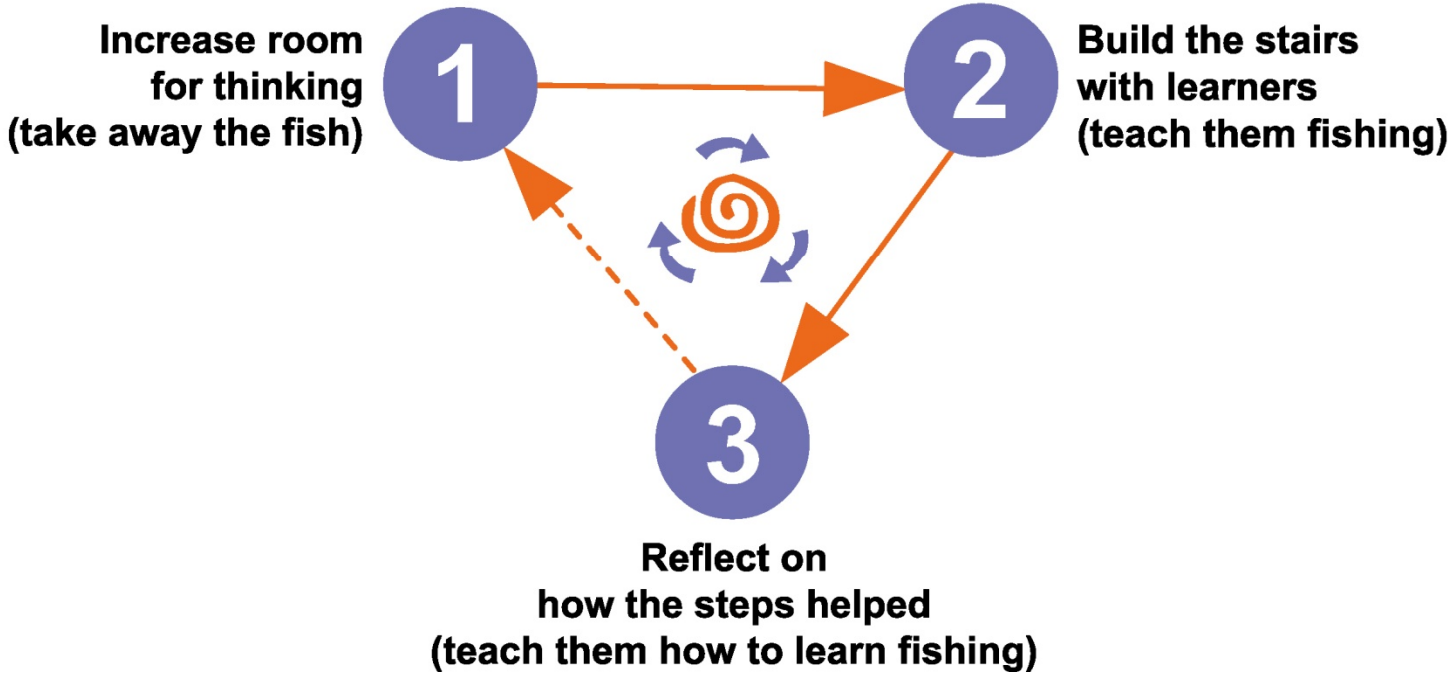
Step 2

Q: What do we do to contribute to the development of TRIZ?

A: Reflect & see how you can improve the algorithm (also a step in ARIZ).

Step 3

Thinking Task Framework



Following the framework, teachers are learning to accept TRIZ like thinking & at the same time develop the need for deeper understanding of the theory.

Thinking Task Framework: evaluation

Teachers

- piloted with a group of about 30 teachers from Finland, Norway, Latvia & Lithuania

Parents

- embedded in PASS materials for parents (language & thinking in the family), thus piloted with over 1000 families around world.

Academic

Joined PhD project between the University of Latvia & the University of Strasbourg studying the efficacy of the Thinking Task Framework.

Initial lessons learned

(consider when implementing in your context!)

- **Teachers significantly improve** both in terms of the amount of thinking they bring to the classroom & their own reflective competence.
- A **period of change** required for becoming a thinking teacher is **at least one-two years**.
- Efficacy is increased when **several teachers** from an institution **are taking part and** there is **regularity** in their work with the facilitator (face-to-face or online).

How can I benefit from it?

Individual	Parent – use with your children (www.ta-parents.eu) Teacher – use in your teaching (www.ta-teachers.eu)
Schools	Use the framework, report online, get feedback. Order a course, collaborate on materials / curriculum development.
University	Replicate the study, research in your context. Order a course, collaborate on materials / curriculum development.
Policy maker	Systemic support in integrating TRIZ based thinking across the curriculum. Order a course for heads, curriculum developers, etc.

Thank you for participation!

Questions are welcome!

Contact us at info@ta-group.eu

References & useful links

- www.ta-teachers.eu - teachers using and reflecting on the framework
- www.ta-parents.eu - materials for parents based on the framework
- Modestov, S. A collection of creative problems on biology and ecology, Spb, Akcidents, 1998. (in Russian)
- Timokhov, V. A collection of creative problems on biology, ecology & TRIZ, Spb, TRIZ-Chance, 1996. (in Russian)
- florescu.ucoz.ru – materials of R.Florescu
- Kamin, A. DIY Physics, Kharkov, 1996 (in Russian)
- Nesterenko, A. Belova, G. (2010) Knowledge Workshop: the tools of the problem-centred education based on OTSM-TRIZ (in Russian). Moscow: Effektivniye obrazovatelnie technologii. CD-ROM.
- Sokol, A. Development of Inventive Thinking in Language Education. Unpublished PhD Thesis, University of Latvia and the University of Strasbourg, 2008.