MTA-SZTE
Science Education
Research Group

This good practice was funded by the
Content Pedagogy Research Program of the
Hungarian Academy of Sciences.

Science Fair – Projects under the magnifying glass

Six teams have participated the StarT project launched by the LUMA Centre Finland, realizing six projects. The teams were supported by two research groups of the University of Szeged: the MTA-SZTE Science Education Research Group and the Szeged Center for Research on Learning and Instruction. The teachers coordinating the projects have been maintaining professional relations with the research groups for several years; they took part in the development of online diagnostic tools for the assessment of scientific knowledge and participated in international projects such as PRIMAS and SAILS which aim to promote inquiry-based education. They are currently participating in the Content Pedagogy Research Program of the Hungarian Academy of Sciences as part of the research group aiming to improve scientific thinking. They want to integrate the elements of activity-based teaching methods (e.g. project-based, inquiry-based, and problem-based methods) in their everyday teaching practice; thus acting as a bridge between the theory and practice of teaching.

Project managers maintained regular contact with each other and the researchers through the Internet as well as personal meetings throughout the realization of the projects. They presented their results and shared their experiences with their fellows and the public at the Science Fair. Besides being an opportunity to build networks between teachers, the fair also allowed teachers to reach teachers in training, who also attended the fair. These university students collected information as part of their project "Projects under the magnifying glass."

The Science Fair

Date: 15 February 2017 **Time:** 15.00-17.00

Location: Arany János Primary School, Szeged.
(This primary school was also one of the six participants; their project is "A bird-friendly garden.")

Preparatory works

- We sent out invitations to the primary schools and high schools of Szeged; inviting teachers and their students.
- Each team made a presentation where they described the main points and characteristics of their projects. They designed their own stand, made posters and came up with simple activities or puzzles related to their project that the visitors could try and solve.
- The university students began working on their project "Projects under the magnifying glass" in January 2017 as part of their methodology course, under the guidance of the professor teaching the methodology of teaching biology and chemistry. As future teachers, their aim was to learn as much as possible about the application of the project method in practice. They formed three groups, each assigned to the projects done by one age group. The groups came up with a set of questions related to the projects to which they would seek the answers at the fair.

The Science Fair

Program

Opening Speech, Introduction of the StarT Project

Ágnes Kissné Gera headmistress
Arany János Primary School Szeged

Benő Csapó professor
Institute of Education Department of Learning and Instruction
University of Szeged;
Center for Research on Learning and Instruction

Erzsébet Korom associate professor
Institute of Education Department of Learning and Instruction
University of Szeged;
MTA-SZTE Science Education Research Group

Introduction of the projects

The mathematics of the chestnut
Szivárvány Kindergarten Kistelek (4–5 year olds),
project manager: Éva Virágné Szűcs

Winter health week
Szivárvány Kindergarten Kistelek (4–5 year olds),
project manager: Csilla Novák

A bird-friendly garden
Arany János Primary School Szeged (grade 3–4th and 6–7th),
project manager: Ágnes Kissné Gera

Mysteries of the multifaceted forest
Teacher Training Primary and Grammar School (grade 2–4th),
project manager: Judit Özvegy

Adapting? Or effecting change?
Alternative Secondary School of Economics Budapest (grade 9th),
project managers: Ágota Somogyi and Zsuzsa Nádasdi

In search of Vitamin C
Teacher Training Primary and Grammar School (grade 10th),
project manager: Veronika Németh

Activities and puzzles at the teams' stands

First, each team (teachers and students) presented their project in 10-10 minutes, using a presentation. Then, visitors could join various activities related to the projects' theme. There was something for all ages.

For example:

- memory games, puzzles, deciding whether certain foods are healthy or unhealthy, putting in order the pictures depicting the steps of making rosehip tea or chamomile tea
- observing tiny creatures with a microscope
- visualizing the complex food chains connecting various plants, animals, etc.
- planting and propagating herbs
- making a decorative bird feeder from a pinecone
- detecting vitamin C in pharmaceutical products via test-tube experiments (Explanation: if we add drops of iodine solution to a solution of starch and vitamin C it causes the solution to turn blue. However, the blue coloration keeps disappearing until the very last ascorbic acid-molecule disappears from the system. Then, there is no more vitamin C to react with the iodine and cause it to transform into iodide, so the blue coloration it does not disappear.
- a discussion about Albert Szent-Györgyi, the Nobel-prize winning scientist

Besides these activities, the science fair was also an opportunity for teachers and prospective teachers to talk to the teachers at the stands, and to have a discussion about their ideas and experiences. The teachers in training made interviews with the teachers and kindergarten teachers as well as the students who participated in the projects.

120 people participated in the event: 25 teachers and their 60 students, 11 parents, 18 teachers in training, 6 researchers.


A C-VITAMIN NYOMÁBAN
SZTE Gyakorló Gimnázium és Általános Iskola
Németh Veronika
A felfedezés pillanatában
Séta Alberttel
Sinen vagyunk az egészséges élet felé!
Kísérletezés tengerimalac társaságában
Kutatás gőzerővel
Haladás az egészség sugár útján
Az eredmények kézzelfoghatóak

Reflections

Project managers:

"My students were very nice and welcoming to visitors who came to see our stand. They were able to explain how the method used to detect vitamin C works, and this was a positive experience for them, which is a huge gain. I did not have to interfere at all, I could remain in the background. I learned that I can count on the independence of the children."

"The children enjoyed the science fair a lot. It was interesting to learn about the other teams' projects. I especially liked the one about forest animals and the one about vitamin C – we would like to try out the latter someday."

"As kindergarten teachers, it was a great pleasure to be here and present our work at this event."

Researchers:

"Organizing a fair is a great way to promote natural sciences, and a good opportunity to bring together teachers, teachers in training, and researchers. We should organize more events like this."

"It was great to see the finished projects together. The teachers could learn about different methods and ideas from each other. Primary school students had an opportunity to try in practice what they have learned in theory. Children were curious and enthusiastic. You couldn't even get near certain stands because of the crowd. The event was also a great opportunity for students, who could talk to teachers and students, and see how theory can be applied in practice. They could get an insight into how the teacher's role differs at various levels of education from kindergarten to high school."

"During the StarT project, a diverse team was formed. Participants were in a close professional cooperation, and everyone worked dedicatedly. They supported each other with inspiration and ideas."

A teacher who attended the event:

"I really enjoyed the bustle, the wonderful atmosphere. I think the fair had something interesting for all age groups. There should be more similar events where students can learn while having fun, and teachers can learn about new ideas."

Students who attended the event:

"I had a lot of fun; the high school students were really nice and their experiments were interesting. My favourite activity was building a bird feeder because it can be used to decorate the garden and feed the birds. I also learned that if we start feeding birds, we should refill feeders regularly, or else the birds will die." – a 4th-grade student

"For me, the most interesting part of the science fair was the detection of vitamin C. They put iodine in different fruit juices. When the fruit juice turned blue, there was no vitamin C left in it. I discovered, as did Albert Szent-Györgyi, that paprika contains the most vitamin C." – a 4th-grade student

"I really liked this fair. There were many great things, like the vitamin C experiment or planting cuttings. I had a bit of difficulty sticking the seeds we previously dipped in gelatine on the pinecone. I really enjoyed watching unicellular fungi through a microscope." – a 3rd-grade student

"We had a lot of fun because we met other kids who were older and more experienced than us. I liked the fair because we could see many interesting things, and learn about things we've never heard of before, or were interested in or liked. We could learn a lot from the older kids, for example, how to make a good presentation or conduct an experiment. Since many people were interested in our project about composting, we could also learn from presenting our own work. We saw a lot of interesting things, we learned a lot during the time we spent there. It was definitely worth going." – a 7th-grade student

Students participating in the projects:

"It was great to see so many people interested in our vitamin C-experiment. I didn't regret joining this program." – a 9th-grade student

"I would never have thought this was going to be such a large-scale event" – a 9th-grade student

"Primary school students were surprisingly curious and open-minded. I was able to explain our experiment to them and I saw how excited they were to tell their parents what they had seen." – a 9th-grade student

"It was great that we could reach so many people, and that the protection of the environment is important to others, too." – a 10th-grade student

Teachers in training:

Their experiences and reflections can be found in their project diary.