



Kiitos osallistumisestasi Biophilian *The Nordic Knowledge Train*-hankkeen tiedeleiripäivään Heurekaassa. Autat meitä keräämään arvokasta kokemusta vastaamalla seuraaviin kysymyksiin:

1. Mikä innostaa sinua tieteen, taiteen ja teknologian yhdistämisessä opetuksessa?
2. Millaisia haasteita mielestäsi oppiainerajat ylittävässä opetuksessa on?
3. Millaisia mahdollisuuksia ja haasteita koulun ulkopuolisten oppimisympäristöjen käytössä osana perusopetusta on?
4. Miten koulut voisivat käyttää tiedekeskuksia opetuksessa?
5. Millainen kokemus Heurekan tiedeleiripäivään osallistuminen oli?

Kiitos, voit jatkaa paperin toiselle puolelle tarvittaessa. Vastauksen voit jättää anonymina.



### Free translation of the questionnaire into English:

Thank you for participating in The Teachers' Science Camp Day by Biophilia *The Nordic Knowledge Train* project at Heureka. Please help us to collect the valuable experiences by answering to these following questions:

1. What inspires you in the combining of science, art and technology in teaching?
2. What you consider to be the challenges in multidisciplinary teaching?
3. What do you see as the possibilities and challenges in using informal learning environments as part of the school learning?
4. In which way could the schools use science centers in learning and teaching?
5. What was it like to participate in Heureka Science Camp Day?

Thank you for your answers. You can fill the form anonymously.

**Here are the answers of the teachers' freely translated:**

**1. What inspires you in the combining of science, art and technology in teaching?**

The apparent potential it has in motivating pupils, finding the joy in learning and creating the concrete school experiences. The future innovations are born out of these elements!

The phenomenon of every day life does not have disciplinary borders, so why should the phenomenon be studied that way.

Holistic view of a human being, knowledge and learning.

Perhaps the first thing that comes to my mind is that by combining these things it is possible to offer meaningful and memorable learning entireties and experiences.

The possibilities.

To make teaching more modern, since teaching is still very old fashioned. The creativity.

The fact that they are not separate things but complete each other.

These are the means to get students engaged by doing and solving problems. Not just to stay still and passively receive information, but actually doing.

The so called hard science subjects have a lot to give to the arts. Mathematics, chemistry and physics are already in themselves beautiful, but they can also be used in creating music or painting etc. For example Fibonacci, the color-work in chemistry etc.

The possibilities in involving the creativity to teaching. The motivating aspect. Not so strong structure. The sense of autonomy.

The versatility, the starting from the phenomenon.

The versatile possibilities. The possibility to be creative, to reach new solutions. These three things are already combined in the real life so why not in school as well.

The idea that one remembers things better when it is in connection to something else.

I enjoy myself to get to know the content of other subjects. I do believe that also the student would be excited if there would be courses that combine many different subjects.

The experientiality, the understanding of the world and nature, new innovations.

The teaching methods are very visually orientated. Learning by doing is fun and the students have a very active role.

It is useful in general to combine subjects and it is a nice way to deal with different things when teaching. The world is not divided into boxes.

Multiple nice ways of learning things.

Variability, creating the bigger pictures.

It makes the teaching more variable, gives more points of views, it is learning of phenomenon.

They are a part of everyday life, not some separate entities of life. School has traditionally been about different disciplines. Now it will be about entity and that makes almost anything possible.

## 2. What you consider to be the challenges in multidisciplinary teaching?

In the grades from 1 to 6 (7-12 year olds) it is only the creativity of the teacher. In the higher grades it is the issue of the school timetables and the co-operation of the teachers. In the gymnasium there are also the final exams.

There is not so much ready material.

Not to forget to teach the basic things and that the things learned will not be vague.

That it would not be just superficial learning.

Finding the shared time for planning.

The old boundaries between different subjects, the curriculum, wages.

The school is still strictly organized according to different subjects and also the curriculum dictates the content and goals of different subjects.

To organize it takes planning and that takes time.

If the teachers doesn't know exactly what he or she is doing, then it is in danger of becoming just messing around. The goals have to be clear: why we are doing this.

If one gets lost with the subject. It takes flexibility and skill to react to the unexpected.

In upper elementary school it is the resources and the timetables.

The school book publishers are always behind, there is not enough money in the schools (to get good equipment).

How to handle the subjects with the traditional way according to that specific branch of science.

There is this possibility that things being learnt will fall apart and become too thin. That the students will remember only the irrelevant things.

The only clear challenge I can see is to find the shared time to plan.

As a teacher of a certain subject I don't see myself as an expert on other subjects so there would have to be co-operating (timetables).

The students with lower or fewer skills are in danger to not get out all the benefit.

To keep up with the timetable and targets of different subjects set out in curriculum. It can be practically impossible to make a timetable for multi-disciplinary teaching.

The organizing, sharing the responsibilities with different teachers and taking care of that the contents set out in the curriculum are achieved.

The change it has compared to the earlier practise and to pay enough attention to all the subjects.

It can get confusing when organized badly and the reason why the students have been doing what they have been doing is not clear. Also it is very important to keep the aim in mind: to focus on the content, not the method. It is the thread that one issue is then being studied in all the classes.

To overcome your own prejudice and habits. Sometimes you simply run out of ideas.

### **3. What do you see as the possibilities and challenges in using informal learning environments as part of the school learning?**

Challenges: To get enough supervisors to come with us, the money, the restlessness or unreality of the difficult students. Possibilities: Experientialism, concreteness, inspiring, the changes of the dynamic as the milieu changes.

It is a challenge to plan out the transitions from one place to another. The possibilities in Finland in the capital region are splendid.

Challenges: The practical arrangements, transitions from place to place, safety and concreteness. Possibilities: the attachment to this world, broad possibilities, the inspiring essence.

Great possibilities to make teaching versatile and to inspire and offer knowledge.

The lack of money.

The expenses and timetables. Perhaps being absent from other classes. To get teaching inspiring and variable.

The practicalities.

Possibilities: Motivation, the authentic learning environment, such as nature for example, child can use in her or his own life things that was learned.

The trips, lack of resource. It takes time to get to know the environment. The little knowledge of the possibilities the environments have. One learns to see the learning situation differently. To get rid of the routines. Getting excited. The phenomenon learning. The versatility in learning.

Resources (money and time) are the challenges and the possibilities are inspiring environments, expertise.

The big class sizes, there is not enough money to travel from one place to another.

Possibilities: the connection between school and the rest of the life and environments. Challenges: The practicalities: time resources and safety etc.

The finance and to find the right places.

By planning it could be done a lot, but that takes time and co-operating with other teachers and flexibility. I think the best way to learn is by doing and participating.

The challenges are the location and time.

It takes time to plan and there should be time to deal with the visit beforehand and afterwards. The visit should be made to be meaningful!

The possibilities are endless, co-operating should be sorted out. The challenges may be the expenses and responsibilities.

The transitions are always problematic: not to spend the time that should be spent in learning in travelling. There are great possibilities! There should only be well functioning practises.

Possibilities: variability, inspiring, learning new things in an interesting way. Challenges: The resources.

It is a possibility that an expert on some field can give something else to students that school can't provide.

Possibilities: There is a vast knowledge in the outside school learning environments, knowledge that school can't provide. Challenges: Money! Distances.

#### **4. In wich way could the schools use science centers in learning and teaching?**

The experts from the science center could come to visit in schools and have workshops there. The excursions to the science center (we went to Heureka with my class and we were in the exhibitions,

we saw a science theatre performance, visited planetarium and we made a learning videos of this trip). By producing web material (inspired by those we have built for example a color spinning top).

The visits to Heureka, the web material.

In teaching some precise subject, not everything in general, but often and precise things.

Visitations, workshops.

By visiting.

Visitations (for both parties). To get tips to the teaching.

As a support of the teaching with the basic things. Pre interaction, interaction, post interaction; to deepening this in the science center. To deepening the understanding.

To take the ideas to school environment. To give excitement to the students.

Looking the phenomenon from many angles.

To get ideas and materials to school teaching. The visits.

To take advantage of the know-how and the premises, ideas for lab etc.

For example after a term, as a composing element.

We could use Heureka more if our gymnasium would situate closer.

For example workshops for the students, school visits, experts coming to schools, theme days.

It could be tested what the students have learnt.

Visiting days, web materials, the science centers could produce more materials also for schools.

The co-operation would be important but it is difficult to come up with the practises especially when there is a big distance.

To co-operate and use the knowledge that science centers have, to deepening the things taught at school.

At least in the teaching of natural sciences.

If only there was the money we could do many things. We have to collect the money from parents and that puts the children to very unequal positions. Pop up-visits are good , as are web visits for example via Skype.

## 5. What was it like to participate in Heureka Science Camp Day?

It was a nice experience for myself. I also got a lot of concrete ideas to try out with my fourth graders. It lived up my expectations, Thank You!

It was a good experience about how to use the learning by doing pedagogy in practise. Only the lecture at 14 o'clock was a bit boring.

It was fun. Inspiring, useful! Versatile. Good ideas to use in own teaching.

Nice and cosy. Well organized. Cosy. Fun and inspiring! Inspiring. Thank you!

Just great. The lecture about coding and the chemistry lab were genuinely useful.

You got to participate, it teaches you a lot to get to do by yourself, you get more intimate sight about the activity. You get motivation, excitement and ideas to your own teaching.

Inspiring! I got a lot of knowledge and ideas to my teaching.

Truly inspiring!

Really positive. Good ideas for the concrete teaching and an understanding of how to use Heureka in your teaching.

Very good material to inspire with.

Good experience. I am a gymnasium teacher myself and I was a bit reserved about what will this be, but I was very gladly surprised.

A positive experience, gave new ideas to my own teaching.

If I would have to give it a grade in the scale from 1-10 it would be a 10.

Nice. Good workshops and it was nice to be in the role of a child.

Really nice. It didn't have much repetition with earlier visits.

Very positive experience! Well organized and interesting and useful issues.

It was very good! Interesting workshops and the lecture about coding was really useful. An inspiring day, thank you!

Very positive and interesting.