

The Knowledge Train-activities and report

HEUREKA The Finnish Science Centre

1. The year 2015

- a) HEUREKA prepared the Whispering Moon workshop that was Biophilia inspired and targeted to the 7-13-year olds. The workshop combines the scientific side of lunar phases with the emotions that could be experienced with the different phases of moon. In the end the feelings are expressed to others through music. Can we guess the feelings others are trying to express? The music is composed with iPads in small groups of 2-4. The workshop was a part of the summer science camp program where it was participated by over a thousand children.
- b) The workshop continued in autumn as a part of The Science Opera, collaboration between the Finnish National Opera and HEUREKA. There were two 20 minutes opera performances each day taking place in the physics exhibition area. The libretto was especially written to this environment and was inspired by the physics of sound.

The Science Opera took place between the 28th of September and the 6th of October. After each performance there were two 45 minutes workshops running alongside, each with proximately 20-24 children attending. This concept was very well received. At weekdays it was attended by school children, but during the weekends all age groups were participating, mainly families with children in all ages. There were salary fees and part time staff and piano rent and lighting costs.

- c) The pilot groups from schools were invited to participate the Whispering Moon workshops. They were given free entrance. There was also one class from Kauniainen/Grankulla, (the Biophilia school) that could participate to the Science Opera as well.
- d) The workshop was translated both in English and Swedish and contributed to the partners in the Knowledge Train. By the February 2016 it has been tried out at least in some extend with some of the participating partners in the project.
- e) There were two meetings of the train conductors this year. One was in Copenhagen in April and one in Vantaa, HEUREKA in October. One person from HEUREKA travelled to Copenhagen to attend the meeting. HEUREKA hosted the two day-meeting in October. The lunch and dinner were offered to the participants.

The main distribution of the budget for 2015 consisted of these different activities mentioned above. Especially they were the writing, facilitating, preparing (material, the rent

of the workshop rooms and salary fee costs) and marketing of the workshop and opera. There also were the salary fees of producing the collaboration and the translation of the workshop. Also in the year 2015 there were travelling costs. In the end of the year 2015 the actualized finances spent was 7123 euros. This does not include the salary fees.

In 2015 had also been planned to produce another workshop, dealing with light, but it was not yet accomplished. This will happen in the beginning of the year 2016.

2. The year 2016

- a) The workshop called The House of Light was developed and carried out with over 1200 children. First it was a part of the Winter Science Camps in HEUREKA on February 22nd -25th. There were 81 children from the age of 7 to 13 participating. Then it was a part of the Summer Science Camps where it reached almost 1000 children. We continued with the workshop in the Autumn Science Camps in the week 42 where we had 67 children participating.

We also took the workshop to Reykjavik where approximately 60 children of different ages got to experience the workshop. This was such a nice cooperation and gave us new horizons. During all these workshops in different places and with different ages, we really got the feeling that the workshop is pretty engaging and there are different sides to it in the spirit of STEAM.

This workshop was also translated into English and Swedish and distributed to the project participants. It is also available for anyone to check out since it is on the HEUREKA's website. Also the Whispering Moon-workshop is distributed on the site. The content of the workshops is evident on the site, so it is not explained here.

- b) For HEUREKA the emphasis in the spring 2016 was on the teachers' education. We wanted to get Finnish teachers to try out the STEAM-method in their own work in schools and also to try out the science center environment as an inspiration for their own work and the possible visits to HEUREKA.

We organized the Teacher's Night event, that was free of charge for teachers, on March the 3rd. We had Jarkko Mylläri (from Biophilia) and teacher Minna Matikainen from Kauniainen (Grankulla) Myllymäki school to share some examples on how to use new technology and also how to combine art and science teaching in their experiences. There was a lot of teachers around and they found very helpful the concrete examples on using different applications. Some of them were applications to help to work together in the class or especially to work in some other location than school building. Biophilia was introduced mostly on the "teacher's tool" level, but Jarkko and Minna told that they had 10 tablets in their school for music teaching only. This was why and how they had been inspired to use Biophilia.

There were many Biophilia-teachers from the Swedish speaking schools attending the evening in HEUREKA as well.

There were discussions also between HEUREKA and Jarkko and Minna to invite Minna's 5th graders to the science center. The idea was that the kids would go around in small groups and they'd film with 360 degrees camera "the kids' point of view in HEUREKA". Jarkko would be the technical support. These videos would then be downloaded on HEUREKA's web page. That would have been interesting to see how the kids see HEUREKA, what they found interesting and how they'd interpreted things. This would have also been an artistic work. This plan never actualized, but Minna's class did participate in the Science Opera performance and workshop in HEUREKA in March.

There was also another event for teachers that was free of charge as well. We organized a Teacher's Science Camp Day in HEUREKA on the May 21st. It was Saturday so the teachers could be there the whole day. 28 teachers signed up, and 23 of them did participate. They were from different schools; from elementary school to gymnasium. We wanted to offer the teachers this teachers' day with workshops on the theme of inter-disciplinary teaching: Art subjects and innovation as the means to teach science and technology. The teachers were very excited when being able to participate themselves to these workshops usually available only for kids. We had even constructed the day the same way as we would for our Science Camps. The day started at ten in the morning and ended at three o'clock in the afternoon. We worked in two groups and there were workshops in the laboratory, innovation game and two workshops, one of them being the Whispering Moon-workshop developed in the TKT-project. In the end of the day there was an expert on coding giving an inspiring presentation on how to teach coding. This is a very hot topic in Finland at the moment and many teachers got concrete ideas to use in school. They were also treated with a warm lunch, thanks for the project. After the event they were handed out the materials (texts) so they could try it all out with their pupils. The day was a success and we are very much hoping to be able to do this again in near future. There is the feedback of the teachers attached. It was collected at the event in the shape of A4-questionary. The day did raise some questions to think about: How could we as a science center support teachers in their work that tends to get more and more inter-disciplinary? How do they find the content of HEUREKA to meet the needs of school education? How could we overcome the problem of geographical distance? How could we in general have a better cooperation with the teachers in learning?

- c) Because The National Opera wanted to continue the unique collaboration of The Science Opera and the concept was very well received, there were performances and workshops also in the March 2016 in HEUREKA. There were ten performances during 8th-17th of March.

- d) In October we travelled to Reykjavik to attend the final meetings of The Knowledge Train-project and Biophilia as well. The trip was very good especially in the sense of collaboration with the other Nordic partners. We had a showcase in the Biophilia-seminar where we could give examples of the science educational stuff we have been doing in this project. HEUREKA had a video of The Science Opera, examples of the houses with a led and a bulb light and different kinds of meters to test their differences with. There was also a possibility to build automatons. We also visited one school and had The House of Light-workshop with approximately 60 children. One workshop was 90 minutes. The children as well as the teachers and we enjoyed this day tremendously. We also got the urge to try out reach more with one simple workshop as then the materials could be brought in couple of suitcases and that would make it much easier.

- e) HEUREKA was planning to collaborate with a school in Espoo where there are classes for children with special needs. They are using Biophilia app in their classes. The group supposed to attend STEAM-inspired workshop in HEUREKA but that never actualized. Instead they visited HEUREKA. We are still hoping to do some participating work with them in the future.

- f) There was an idea to have the carousel of exchange in the 2016. It would have been an exchange of ideas, workshops and experiences between the participants of the project. It would have been ideal to get to travel and give workshop with light materials transported to another Nordic region. And also to receive an exchange to HEUREKA. This never actualized, but we are hoping that this could be developed in a near future in another project.

3. The finances

The main distribution of the budget consists of these different activities mentioned above. Mainly these are the salary fees and material costs for the planning, marketing and executing the workshops and the teachers' material as well as the costs of travelling. There is also the writing, facilitating, preparing (material and salary fee costs) of the workshops and collaboration as well as the translation of the workshops. The more detailed account of finances is attached.