

## Developing twenty-first century skills

### Insights from an intensive interdisciplinary workshop Mosaic of Life

The Baltic Sea, one of the world's largest semi-enclosed seas, which, with its very low salinity and quasi-isolation from the big oceans cannot decide whether it is a sea or a large lake. This geologically-unique environment supports an even more surprising and delicate marine ecosystem, where a complex community of fishes, marine mammals and important microscopic organisms creates a magical mosaic of life. Humans have enjoyed the abundance of life in the Baltic Sea for thousands of years, and major Scandinavian and Baltic cities have oriented themselves towards this geo-ecosystem in order to develop and seek ecological, economical and cultural inspiration and wealth. The 'Mosaic of Life' workshop aimed at going beyond the obvious in examining the meaning of the Baltic Sea by gathering together a selection of young, creative minds from different backgrounds ranging from the arts and economics to geology and life sciences. This intensive workshop was designed as a unique training opportunity to develop essential twenty-first century skills - to introduce and develop creative, critical and interdisciplinary thinking and collaborative teamwork, as well as to foster a visual and scientific literacy, using project-based learning and hands-on activities. Our final goal has been to be inspired by the resulting connections, differences and unifying concepts, creating innovative, interdisciplinary projects which would look further than the sea - further than the eye can see and further into the future.

#### **The need for creativity and interdisciplinarity in twenty-first century projects**

Even if most of today's artistic, scientific and, more generally human challenges are not confined to a single discipline, most higher education programmes pay relatively little attention to the interfaces between disciplines, and possible fruitful exchanges of

ideas. University curricula tend to be highly specific, reaching deeply into each subject, but providing little training on how to work with people from different backgrounds. The lack of interdisciplinary communication skills makes it more and more difficult to collaborate on interdisciplinary projects. Differences in jargon and methodology increasingly isolate the different disciplines, even though their goals are converging and becoming more interdependent. However, once the language and stereotype barriers are removed, bringing people from very different backgrounds together often triggers new ideas and broadens the horizons. A commonly-shared aspect of the exploration of knowledge is creativity, an essential skill for artists, researchers and innovators alike. Yet, in traditional education, creativity is often considered to be something innate and is rarely learned and developed during the course of studies, even in arts faculties.

#### **The Mosaic of Life workshop: developing creativity and collaborative skills in an interdisciplinary setting**

The Mosaic of Life workshop brought together students from very different academic backgrounds to practise their creativity and develop several important meta-skills, such as the delivery of oral, written and graphic presentations, brainstorming, giving and receiving feedback and critical thinking. One of the goals of working together was to gradually overcome differences in jargon and methodologies, and appreciate the value that different approaches can bring. The workshop aimed at identifying and exploring more deeply common interests and ideas through creative, collaborative teamwork. The final products of the workshop were three interdisciplinary projects,

each of which took the form of a proposal focused on the Baltic Sea. To develop each project and prepare a written project proposal, as well as a team presentation of the project, the participants used the tools and methodologies introduced during the training part of the workshop.

### **Arts and sciences students in the pursuit of new ideas about the Baltic Sea**

The participants in the Mosaic of Life workshop were ten international Bachelor's, Master's and PhD students from the natural and human sciences and arts. The participants included two students from an interdisciplinary, biology-oriented bachelor's programme, a PhD student in anthropology, a master's student in future studies, a former bachelor's student in geography, two students in photography and three design students. The workshop was mediated by a teacher and postdoctoral researcher in biology and education, and a PhD student in marine sciences. Even though the majority of participants were from Finland (7 out of 12 participants), the workshop had an international aspect with participants hailing from Russia, Mexico, Romania, Croatia and Italy.

### **The scenery of the Finnish Archipelago of Turku as a source of inspiration and isolation**

The workshop took place at the Seili Island Marine Station of the University of Turku on Seili Island where we spent five days in an isolated, but stimulating environment. Seili Island is located in the Turku Archipelago (Finland) and offers beautiful landscapes and a fascinating history. Being dedicated to the isolation of leprosy patients from the 1620s to 1785, when it was repurposed as a psychiatric facility until 1962, the buildings on the island still display signs of those years of seclusion. Today, the same buildings are used for scientific research into the Baltic

Sea's ecology and the unique environment of the archipelago.

### **Developing twenty-first century skills while proposing solutions to real-world challenges**

This five-day workshop was divided into a training phase (three days) and a project development phase (two days). The training phase consisted of several team-building and creativity exercises, performed in groups of various sizes, or individually. Methods included different forms of brainstorming, theatre improvisation, observation exercises and change in perspective exercises. The exercises were based on several established approaches, which were modified for the specific use in this workshop (for more information, please see the references below). Examples of two specially designed activities can be found in the Boxes 1 and 2. In addition to training sessions, the participants had the opportunity to interact with two guest speakers: the Director of the Archipelago Research Institute, Ilppo Vuorinen, and one of the coordinators of the Baltic University Programme Network (BUP), Ea Blomqvist; both researchers in marine biology. These meetings allowed the participants of the workshop to deepen their knowledge of marine biology, the Baltic Sea environment and sustainability. At the same time, the participants had the opportunity to be inspired by these passionate and interdisciplinary researchers.



Fanni Uusitalo

Participants in the Mosaic of Life workshop at Seili Island.

### Box 1. INTRODUCING YOURSELF USING RANDOM IMAGES

This is an ice-breaker activity for smaller groups (8-15 people) which helps participants get to know each other in a creative and speedy way.

Participants form a circle and each one receives a magazine (weekly/monthly magazines with pictures work best). Each participant has 60-90 seconds to leaf through the magazine and find one picture which represents him or her in some way. When the time is up, each magazine needs to be passed on their left to the next participant. In that way, each participant receives a magazine from a person on his or her right side. The process is repeated until all magazines circle through and each participant has in front of them 8-15 'random' images from different magazines.

The participants then take time to arrange their pictures on a piece of A3 paper to make a collage of the random pictures. Each participant presents themselves in 60 seconds using a collage as a visual aid.

This activity allows the participants to introduce themselves in an unconventional way. At the same time, it's an opportunity to exercise creativity, time-management and presentation skills. This short activity (45-90 min depending on the group size) requires very little preparation and easily available low-cost material (magazines, A3 paper, scissors and glue).



Introductory posters of all participants on display in the seminar room of Seili Island Marine Station.

### Box 2. POSTER SWAPPING

The main goal of this activity is to understand the difficulty of visual communication in expressing ideas that seem to be clear and obvious. Often when we spend a lot of time working on a specific project, we forget to put the focus on milestones or details that may be necessary for the understanding of our ideas and instead we communicate misleading information.

The activity is performed in three teams of 3-5 people who have previously defined a project or an idea. Mosaic of Life participants developed their projects through theatre improvisation and the use of random words. The first step is to draw up a poster representing the defined project or idea. Each team is allowed to draw a scheme, cartoons or steps in the project, graphs, maps or any other visual sign, excepting the use of written words, numbers or by drawing arrows. The second step is to swap the posters between teams (team 1 gives their poster to team 2, which gives their poster to team 3, which gives theirs to team 1). Without consulting the original team for an explanation of the idea, each team needs to interpret the visual cues and add the keywords, numbers and arrows that should help gain an understanding of the idea presented on the poster. The third step is to swap the poster once again (in same direction as previously described). This time each team decides on the title of the poster, based on the visuals and keywords provided by the two previous teams. After a brief period of discussion, the final challenge is to present the poster to other teams. After the presentations, each team is invited to ask questions and add comments about the discussed projects, with a special emphasis on the original idea and possible modifications which have occurred, as well as the role of clear visual, written and oral presentations.

This low-cost activity requires sheets of paper and markers for the creation of posters and usually takes 1h 30 min (each step 15 min, 10 min presentations and 15 min discussion).



Poster presentation and feedback session.

## Box 3.

**INTERDISCIPLINARY PROJECT PROPOSALS****From discovering values to affecting actions regarding the environmental state of the Baltic Sea**

This international project aims at quantifying the true values of people in the Baltic Sea region and assessing how these values can be changed through immediate, interactive and fun feedback regarding changes in lifestyle which facilitate sustainability. The project would bring together universities and communities from all the countries surrounding the Baltic Sea and would use modern technology (smartphone apps and online information) to assist communities in adopting values which support more sustainable lifestyles around the Baltic Sea.

**Switch off the waste tap!**

Focusing on reducing pollution in the Baltic Sea region, this project wants to educate its inhabitants about plastic waste and to encourage communities to collect, minimize, reuse and recycle plastic waste. The project consists of international-level workshops which bring together researchers, activists, artists and citizens in a shared aim of raising awareness of pollution in the Baltic Sea and to form an international network of pollution-conscious citizens.

**Can toxin-resistant fish benefit healthcare?**

Based on scientific research on living organisms' adaptations to changing environments, this project aims at detecting toxin-resistant fish species, understanding their adaptation to toxic environments and finding uses for those adaptations in healthcare and medicine. This scientific project will bring together scientists from wide-ranging fields to explore how a fundamental biological process (such as adaptations of species in the heavily polluted Baltic Sea) can help mankind develop better practical approaches or adaptations towards the toxic environment we might be facing in the future.

More information of the project proposals on the Mosaic of Life website.



Results of a brainstorming session: disciplines and approaches that examine the Baltic Sea.

The project development phase consisted of team formation and team development of interdisciplinary projects. The participants self-organized groups trying to maximize intra-group diversity, while creating three balanced teams. Project topics were very open – the only requirements were that the project should be related to the Baltic Sea and should involve at least two disciplines/approaches.

During the project development phase, teams used the knowledge and skills acquired during the training phase of the workshop. They applied brainstorming techniques and mind-mapping to generate ideas, communication skills and negotiation to agree on the projects' goals; and written and oral presentation skills to convey the ideas to other teams. Despite the initial goal of practising collaborative online document writing using GoogleDocs, as well as searching for relevant background information online, we had to improvise with offline modes due to an internet connection failure at Seili Island during the latter stages of the workshop. This situation proved to be an unexpected learning opportunity. The teams had to develop the ideas and gather the information by talking to the inhabitants of the island, exploring the Archipelago Research Institute and discussing with the marine biologists, searching for relevant information in the library and relying on their own intuition and previous experiences.

The final results were three innovative, interdisciplinary project proposals (see Box 3 for summaries), which were successfully presented by the teams at the 2013 Aboagora Symposium. The highly interdisciplinary audience reacted very positively to the project proposals and supported the continuation of Mosaic of Life training for the future.

### Human adventure into the twenty-first century projects and actions

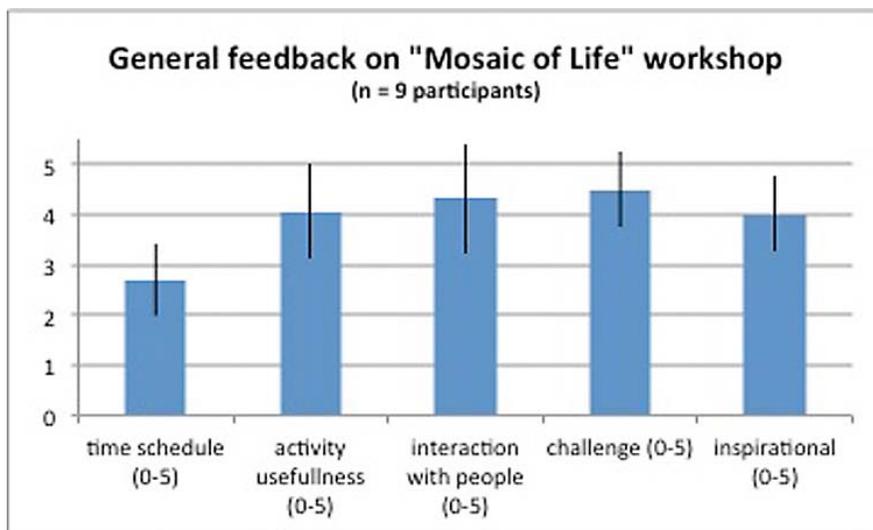
Intensive training workshops such as the Mosaic of Life often bring up various social challenges. A demanding schedule, shifting worldviews, the need to be productive and close interaction between participants from different cultures undeniably puts a lot of pressure on every participant. The Mosaic of Life was a human adventure; an intensive period of learning about each other and about oneself, discovering how to learn and one's preferred personal working styles.

The feedback received from the participants was positive and rich in suggestions. Most of the students commented on how difficult it was to step out of their comfort zones, but they also pointed out how useful it would be to apply the skills developed during the workshop in their future studies and work. The workshop activities have been challenging for most of the participants, but at the same time, the participants said they felt inspired. The demanding time schedule and the intensity of the workshop was noted by all participants – they reported not being used to this rhythm, but mostly agreed that working intensely for a short period of time allows for more material to be addressed and helps develop deeper interactions among participants. We acknowledge the feedback that an extra day would be needed for finishing the final projects, and suggest 6- or 7-day workshops in the future.

A particularly interesting comment we received concerns the importance of creativity training for arts and sciences students. According to some participants, arts students are 'expected' to already be creative and are not trained to develop creativity further in humanities departments.

A similar situation is found in many science programmes, where the students are in general expected to learn facts, while other essential research skills, such as creativity and innovation, are rarely taught or reinforced through official training. We would therefore like to appeal to the curriculum developers of arts and sciences programmes to consider implementing skills development sessions, through workshops such as the Mosaic of Life, and throughout the curriculum by implementing open, project-based activities. The students should play an active role in shaping such programmes which would help them to develop the skills needed for their future careers. In addition to participants' feedback, we were excited to see the transformation of participants into responsible, aware and more creative individuals. They showed an immense capacity to learn from each other, to work in very diverse teams and to guide the teams into the development of innovative projects. They became more mature in their visions, have shown they are open to new ideas and have also learned how to communicate more effectively. We hope this experience would allow them to become empowered change-makers and leaders in their disciplines, while keeping a broad view of opportunities on the horizon.

This workshop was just the beginning of a journey towards mastering essential skills for the future: we introduced creative thinking, problem-solving, collaborative work, cross-disciplinary and cross-cultural communication, global awareness, leadership and responsibility. We hope the participants will be able to develop these skills further, through their



General feedback on the Mosaic of Life workshop. Participants were asked to rate the workshop from 0 (lowest grade) to 5 (highest grade) in five different aspects.

personal and work projects, as well as teach these skills to others and in that way maximize the effect of this intensive training. Our hope is that the students who have participated in this workshop will continue to maintain their international and interdisciplinary network. To enhance the interaction and to keep track of the activities and the experiences developed during the workshop we have launched a website: the Mosaic of Life.

The Mosaic of Life workshop was a pilot project evolved from the Interdisciplinary Research Project Workshop developed at the Center for Research and Interdisciplinarity in Paris, France. The original workshop aims at developing an interdisciplinary scientific research project. In the Mosaic of Life we developed a programme which facilitated fruitful interactions between more diverse participants and which focussed on developing a broad project connecting two disciplines/approaches. As this experience had shown, intensive workshops, such as the Mosaic of Life, are a meaningful way to gather and develop interdisciplinary communities, strengthen social interactions and promote community actions in areas ranging from environment and health, to society and economy.

### Acknowledgements

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