

Hackathons for education

Good practice collected by Comparative Research Network e.V.

Hackathons - startups meet teaching

In 1999 a group of ten developers in Calgary faced legal problems on export regulations for software. They decided to meet for a day in order to 'hack' in a themed 'marathon' the issue and improve *their software*. This moment is widely referred to as the birth of 'Hackathons'. Hackathon is an event for developing software in small groups which last from half a day *until* a week. Programmers, designers (graphics, interface, etc.), people with specialized knowledge about the specific requirements and organizational talents work together or compete in order to find solutions. Hackathons are used in technical companies to find and solve problems in a creative way in small teams contain out of participants from different departments.

Still Hackathons are not limited to start-up or tech companies, they are more and more understood as *self-organized* learning events, where learners can improve existing knowledge, gain new skills and share their knowledge in an open, non-formal approach with others. As Hackathons are centered *on* a specific problem, participants from various backgrounds and fields of expertise can

contribute and create together innovative solutions.

The German state of North Rhine-Westphalia is specifically using Hackathons. Browsing through the Internet one can find the Hackathon 'digitalization of education' in Dortmund, the 'Hack for your education' in Düsseldorf or the 'Ruhrgebiets-Hackathons'. The main goal is to improve digital skills, entrepreneurship, creativity, innovation and team work among young learners.

What is done?

The first step in order to organize a Hackathon is to define and announce a specific theme. It can be broad topics like 'welcome refugees' or more specific ones like 'digitalization in our school'. The topic has to be *announced* between a month and up *to two* weeks before the event. The organizer should ensure that a platform for creating teams is provided. The platform can be anything from plane flipcharts to specialized group chats. The organizer should provide as well space, Internet and catering during the Hackathon. A further crucial task is to announce and keep a strict timeframe for the Hackathon with clear deadlines but as well prizes for the best solutions.

After the initiator provided the platform and announced the theme, participants will start to post proposals and *forming teams*. The *initiator* is now in a pure passive supervision function with the main task to keep the time frame. The groups start to formulate problems within the theme, on which they would love to work. The groups are open and may change, disappear or merge with other

groups. The final groups have to register their project at the initiator on a general board, where other participants at the day of the Hackathon can decide to join specific groups.

The approach relies on the self-regulation of the groups. It is just like the concept of 'Bar-Camps' or 'Open Space' quite open and allows individuals to switch groups based on interest.

Based on the theme which the sub-group selected, they start to develop pitches. A pitch is a potential solution to a problem. The solution could be digital or analog. While an analog solution is straight implemented, a digital solution might result in a hack. A hack is an intense process of real programming and coding, which results in apps, software or hardware products, called Code. To code implies to understand a programming language, understand the goal of the team and to experiment and change the approach. The result is open and it might be that a team will not achieve a product.

Teams accomplishing either a hack or an implementable pitch document their results present them at the end of the Hackathons. The audience is voting after the presentation for the best products, which are usually rewarded.

Still not all groups will present after a Hackathon a final solution or product. Those teams might decide to change or withdraw the idea, but more likely they will continue working after the hack.

During Hackathons at Shutterstock in Berlin 35 teams started out of which 18 presented accomplished results after 24 hours and

another 10 continued to work on their projects after the event.

Since when?

Hackathons are *regularly* held since 1999. They became an institution for start-up and software companies but are as well *regularly* used by schools, NGOs, universities and even municipal administrations. The topic range from the before mentioned 'digitalization your education' via 'smart solutions for the environment' to 'helping refugees'.

Target groups, national, international or local focus?

The focus of Hackathons is locally. A Hackathon should result in solutions which help to solve *an* explicit problem on the spot. However, depending on the theme the audience of learners can be international. The Hackathons are open for experts from all fields, since this allows to work on a problem from different perspectives. Every participant should be willing to share their individual skills.

Digital aspects

While the organisation and the outcome of a Hackathon do not have to result in digital products, it is still high likely that it will. The Hackathon helps the initiator to 'harvest' digital, innovative solution to a specific theme. The Hackathon on digitalization schools might end with a digital platform to share teaching documents or in an app helping to improve history class.

The learners who participate in a Hackathon have to know the coding but as well the content they want to use. They have to

develop ideas together, which means to analyze and identify the problems first, they have to work together in a team and 'sell' their ideas to others.

Every organisation, might it be a NGO, school, company or training provider can use a Hackathon not just for education but as well to tackle a problem and working on solutions with a new and if required external viewpoint.

A Hackathon brings people with different perspectives together and let them work intensely on a topic, offering practical and ready to use solutions, still the results are not plan able, leaving the trainer to cope with uncertainty and flexibility.

Strength, weakness and opportunities

Strength

A well done Hackathon provides a number of advantages for a trainer/teacher:

- A Hackathon is relying on team work. Learners will experience intense and focused work in small groups.
- Time and Project management is crucial in a Hackathon. In order to present a product, neat deadline have to be respected and the process have to be well managed.
- Creativity of the learner will be stimulated. In order to find innovative solutions, the teams have to think out of the box, experiment and create.

- Problem solving capacity among learners is increased. This includes learning pragmatism, compromises and a feeling for effectiveness.
- The method is a practical exercise in empowerment and participation. The teams form themselves around a topic identified as a problem from the learners. Instead of discussing the problem, they focus on solutions and actions, giving a practical example of participation.
- Keeping in mind that nowadays education is understood as a lifelong process, self-education and knowledge transfer become crucial. The creation of pitches and hacks relies on those two steps. Learners are intuitively gaining those skills.

Weakness

In order to create a Hackathon the preparation and the provision of a suitable space is important. It might be necessary to initiate a Hackathon with other trainer or organizations in order to generate a sufficient number of participants. The method requires a strict time-keeping while at the same time the initiator should be aware that some teams will have frustration and difficulties and that surprising results might be created. The trainer has to be flexible and be open for such outcomes.

Opportunities

However, the biggest opportunity is the solution orientation of a Hackathon. The initiator will gain a huge number of innovative ideas, approaches and even useable products. The trainer should embrace this

and focus on real problems as a theme. The learners will gain most of the before mentioned skills almost as a by-product. Thus it is advisable to raise their attention on the learning outcomes during the wrap-up.

Hackathon for refugees in Berlin 2015 - a practical example of a Hackathon

In the wake of the refugee crisis in 2015 a group of activists decided that it was time to help. The media famously covered, that most of the refugees relied mostly on their smart phone to escape to security, so the group decided to initiate a Hackathon with the aim to help refugees by match donators with real needs, improving the access to information and existing services and to reduce barriers to integration.

The Hackathon was held at the weekend between 23. - 25. 10. 2015 and more than 300 participants including refugees, helping organizations, grassroots initiatives, public authorities and companies.

It was agreed that all pitches and hacks have to be open access and open source in order to secure that it will improve the everyday life of the target groups.

The Hackathon was initially promoted through wikis and webpages by a group of voluntaries. As a charity event donators had to be acquired, resulting in an increasing coverage in the media.

The Hackathon started with an intense discussion and selection of projects, which should become accomplished. The organizers experienced already here intercultural challenges and adapted the projects to the needs of the refugees. This

initiated a fruitful weekend, where refugees actively participated and a first step towards integration had been made.

Initiated projects featured among others 'Home4refugees', a platform for providing private accommodation for refugees. Interpreter matches volunteer translators with migrants in need, Mapfix is an application based on open street map, providing maps of German cities with the most important infrastructure for the newcomers. They can easily find the nearest doctor, administration office, grocery store or mosque.

Beside the direct help for refugees platforms and services had been created in order to support and coordinate volunteer work. Projects such as bedarfsplanner, helperchain or refugee phrase book help to increase the capacities of helper networks in language, communication and logistics.

Even not all projects had been completed during the weekend, most of them had been completed later and are all available on the code-sharing platform GitHub as open source without cost.

The Hackathon was initially designed for creating local solutions for Berlin, most projects are however nowadays available as well for Germany or even worldwide.

Some pictures <https://www.rbb-online.de/politik/thema/fluechtlinge/berlin/2015/10/refugee-hackathon-berlin.html>