

The Nordic Engineering Hub for a new generation of STEM professionals

Can you imagine the world without engineers? The impact of engineering on how the world functions around us might be difficult to grasp sometimes, even though the discipline of engineering is one of the oldest in the world. Engineering, through its very essence, intends to impact society, whether it is building bridges or creating social media platforms, the intention is to improve the status, grow the economy and protect people and the environment. World without engineering would be a sad world to live in!

Today, the demand for engineers and other STEM professionals is higher than ever. The technological transformation and our adaptation to it merely depends on STEM professionals. But are we able to satisfy the demand side? According to the [2019 Bloomberg Innovation Index](#), only two countries from the Nordic Region (Finland and Sweden) remain at the top 10 of the world's most innovative economies. So, how do we ensure that the education systems in the Nordic Region deliver a new generation of professionals capable of boosting innovation by driving a responsible and meaningful digital shift? The Nordic Engineering Hub (NordEnHub) might be the answer.

NordEnHub is a partnership initiative aiming to become the point of reference on STEM education in the Nordic Region. NordEnHub takes a critical view on the content of STEM education with the aim of modernising and adapting it to the new labour market needs. Additionally, it will define approaches to attract more students with more diverse backgrounds to STEM education and professions. The priorities are also set to create a connected higher education system, which integrates theory with work-based learning through cooperation with industries. Additionally, it will propose strategies for continuous education and the supply of lifelong learning opportunities. The new designed programmes will focus on the acquisition of transversal skills and they will also include flexible and modular course design.

A number of reports show that the current engineering education system does not deliver the engineers that the employers will need tomorrow. In order to propose a new curriculum for 2030, the team from the Royal Institute of Technology in Sweden, KTH and the Aalborg University in Denmark has been conducting an interview-based study disclosing views on how the engineering discipline will develop in the future and what trends will dominate engineering education in 2030. This study focuses on both the content of the education and the pedagogical methods, and it looks upon three major challenges having an impact on the future engineering education: 1) sustainability, 2) digitalization and 3) employability. Especially the first one is considered as a paradigm shift, as the sustainability aspect is a major issue in engineering education for finding solutions to climate change, the north/south relation and achieving Sustainable Development Goals.

The overall preliminary conclusion is that the more science-dominated engineering disciplines, linked to physics, biology and chemistry expect less future change and highly value the basic knowledge in their subject areas. Whereas engineering disciplines such as mechanical and production engineering anticipate huge changes both regarding the content of the education and the pedagogical approaches. In more concrete terms, the preliminary results point to the need for engineering students to practice and learn to apply theoretical knowledge to reality-based problems, which requires collaborative projects with external stakeholders and internships. The findings also point to the necessity for diversification of the learning methods, which means broader use of hybrid and virtual learning, including the use of icebreaking digital tools such as flipped classrooms.

The interviews are expected to be concluded during spring 2020. The final results will be presented at a conference in 2021.

When it comes to the attractiveness of the STEM education, the team from Aalto University in Finland has conducted research on STEM outreach activities carried in the Nordic region. This analysis aims at clarifying what elements contribute to increasing both the attractiveness of STEM among high school students and the effectiveness of university-led STEM outreach activities. Five concrete examples, [Shaking up Tech events](#) in Finland, [Science Advent calendar](#) (Norway), [the House of Science](#) in Sweden, [National Centre for Learning in Science, Technology and Health](#) in Denmark and [project Boxid](#) (Iceland) are in the process of being interviewed in parallel with the in-depth literature study. The main outcome is expected to be a set of guidelines and repository of STEM outreach activities in the Nordic region.

The preliminary results of the NordEnHub were presented today, June 13 at the annual conference of the network of technical universities in the Nordic and Baltic countries, Nordtek in Stockholm.

The NordEnHub consortium includes the Association of Nordic Engineers, ANE the Swedish Royal Institute of Technology, KTH, Aalborg University (Denmark), Reykjavik University (Iceland), Aalto University (Finland), Stavanger University (Norway) and Nordtek.

The activities of the Nordic Engineering Hub are divided into two phases: the first project phase is stretching over three years (September 2018 – September 2021) and is co-financed by the Nordic Council of Ministers, Nordplus and the Erasmus+ Strategic Partnership programme. The second one, post September 2021 entails that the Nordic Engineering Hub has positioned itself as a reliable and self-financing focal point with a larger network of stakeholders.

For more information: www.nordenhub.org