

Bern, 30 April 2018

Recommendations regarding education and digitalisation

The Swiss Academies of Arts and Sciences makes the following recommendations based on the conclusions reached at the symposium #digitale21: The Effects of Digitalization on Training, Learning and Working in the 21st Century, held in Lugano on 8–9 March and 11–13 April 2018:

1. **Promote education and entrepreneurial skills:** Education, social skills, and entrepreneurial skills are the most important elements needed to successfully respond to the challenges presented by digitalisation and innovation. How to deal with digitalisation and the social skills needed to do so (e.g. the abilities to acquire new knowledge and skills, to respond to change, to recover quickly from difficulties, and to manage risk) need to be addressed at all levels and in all stages of life.
2. **Encourage personal responsibility and lifelong learning in the work environment:** People's work, education, and private lives need to be made more compatible. In order to do this, employees and companies must genuinely take responsibility for this matter. Companies need to create incentives—in terms of remuneration, organisation, time, and location—to encourage employees to pursue continuing education. This should involve expanding Switzerland's dual education system to include older employees so they can reposition themselves in the labour market. Educational institutions, companies, and the government need to work together to develop the conditions required to do this. Successful examples can be found in Sweden, Singapore (ABB), and Germany (Audi), where workers whose jobs are to be eliminated have the opportunity to receive additional training through internships so they can reposition themselves. Specific projects which stimulate further development in this area need to be set up, carried out, and expanded in Switzerland with the goal that "no one shall be left behind".
3. **Improve social protection:** Digitalisation, new ways of working, and increasing productivity all pose challenges to our society. Employer and employee organisations need to work together to suggest specific, appropriate measures for improving the social partnership (e.g. offering incentives for continuing education and bridging gaps in social contributions). As moderator, the government plays a key role in facilitating this process.
4. **Increase dialog and awareness:** The lapse in time between the demand for certain work skills and the resulting supply needs to be reduced, and continuing education programmes offered by the private sector need to be more widely recognised. Those involved in business, education, and administration must work together much more closely. In addition, families and schoolchildren need to be made aware of digitalisation's risks and opportunities. More emphasis must be placed on fostering digital literacy, including the ability to evaluate the significance of digital information.
5. **Support teachers in improving their digital skills and teaching methods:** Improving teachers' digital skills must be made a higher priority, particularly for those who are not digital natives. Instead of memorisation and teacher-centred learning, using new teaching and learning methods as well as active, problem-based learning that spans various subject areas can increase creativity and innovation, especially at the higher education level. A guiding principle is to foster "mutual learning for change" across cultures and systems, done in a spirit of generosity. Especially at the upper secondary education level, it is important to provide interactive digital lessons and improve students' knowledge of digital platforms and their ability to navigate them. Learning about robotics and programming is important, even in primary school (see ROTECO: EPFL/ETHZ; AGORA: EPFL/IDSIA).



6. **Improve infrastructure and the learning process:** Not all schools have the infrastructure required for digital learning (e.g. the necessary equipment and WLAN). In addition, there is a need for cantonal and intercantonal online platforms which support students' learning process as well as enhance collaboration among teachers and instructors. In order to create synergies and more cohesiveness throughout Switzerland, it is necessary to encourage the exchange of new solutions between federal structures (e.g. the platform Officina in the canton of Ticino).
7. **Involve the younger generation and support women in STEM areas:** The younger generation needs to be actively involved in and given ownership of decision-making processes (e.g. in youth parliaments, an academy for young academics, research support, and panels). Moreover, projects need to be supported which motivate women to pursue technical professions.
8. **Integrate big data and open science into society:** Big data makes it possible to consolidate and analyse data sets retrieved from different sources. Principles from open data and FAIR data initiatives must be adhered to while still complying with data protection legislation. This requires the appropriate research initiatives and infrastructure. Projects which stimulate further development in this area and use different data sets from a wide range of sources need to be carried out in order to gain deeper insights into this new area of research, particularly regarding data quality requirements. Digitalisation makes it necessary for us to consistently and logically integrate all aspects of open science into every level of data and information.
9. **Influence the digital governance agenda:** Despite a slow start, Switzerland has what is needed to influence digital governance worldwide, especially considering its large network of international organisations. Now is the time to take advantage of this opportunity (see the speech—in German, French, and Italian—by Federal Councillor Ignazio Cassis¹).
10. **Outlook:** We have an organisational culture that brings a high level of stability to our knowledge society. This stability is necessary, because changes are often perceived as threats or risks to our family, school, university, company, governmental, and organisational structures. However, innovation must not be viewed as a disruption—because innovation requires freedom and a positive risk culture. The Swiss Academies of Arts and Sciences are developing ideas for further projects based on these recommendations and our discussion with Federal Councillor Johann Schneider-Ammann. We are seeking to promote a culture of innovation that enables us to enter into the second half of digitalisation with a winning approach.



The **highlight video** with the recommendations and impressions of the event as well as further information can be found at www.digitale21.ch.

¹ <https://www.eda.admin.ch/eda/de/home/das-eda/departementsvorsteher/reden.html/content/eda/de/meta/speeches/2018/4/12/70423>