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National strategy

Strategy for digital growth in Denmark 2018 (Strategi for Danmarks digitale vækst)

The strategy focuses on how Denmark can seize opportunities in relation to the digital transition and hereby create more jobs, growth, and welfare in Denmark.

The government’s vision is that Denmark should be a digital frontrunner. The strategy has three objectives:

- The industry should realise the potential of growth in digitalisation.
- The government should be developing the best conditions for the Industry’s digital transition.
- All Danes should have the necessary tools to manage themselves in the digital transition.

The strategy pinpoints six strategic focus areas:

- Establish a public-private partnership – Digital Hub Denmark – with the purpose of spurring strong network and cooperation within digital technology
- Digital boost of SMEs through the programme SME: Digital
- Digital competences to all Danes
- Data as a driver of growth in the industry
- Agile vocational regulation
- Strengthened IT security in businesses
With regard to young people, the focus on digital competences is particularly relevant. The strategy initiates:

- A technology pact with the participation of public and private partners with the purpose of increasing the number of people interested in STEM, with STEM education, and with STEM employment.
- A four-year research project on technology understanding in primary and lower secondary education.
- The introduction of a new optional course, Technology Understanding, in lower secondary education.
- Digitalisation in VET.
- Digitalisation in adult and continuing training.

For more information on the specific initiatives, please see the section ‘Media literacy and online safety through formal education’ below.

The Ministry of Industry, Business and Financial Affairs is the responsible authority for the strategy. Besides the Minister of Industry, Business and Financial Affairs, a team of ministers is involved in the implementation of the strategy: the minister of higher education and science, minister of education, minister of employment. The team of ministers is responsible for ensuring progress in the implementation of the strategy and for hosting an annual summit for the strategy where the government reports on the status for the implementation of the initiatives. In 2021, the initiatives of the strategy will be evaluated.

There are no major revisions of the strategy.

**Danish cyber and information security strategy 2018-2021 (National strategi for cyber- og informationssikkerhed 2018-2021)**

The Agency for Digitalisation is the responsible coordinating authority.

The following ministries participate in the strategy:

- Ministry of Finance
- Ministry of Foreign Affairs
- Ministry of Defence
- Ministry of Health
- Ministry of Higher Education and Science
- Ministry of Transportation, Building and Housing
- Ministry of Industry, Business and Financial Affairs
- Ministry of Taxation
- Ministry of Education
- The former Ministry of Economy and the Interior
- Ministry of Justice
- Ministry of Environment and Food
- Ministry of Energy, Climate and Utilities

The government will ensure that society can continue to benefit from technological opportunities and that citizens can retain confidence in digital development.

The government will invest 1.5 billion DKK in cyber and information security from 2018 to 2021.
The strategy defines three benchmarks for becoming stronger and more digitally secure as a country:

1. **Everyday safety for citizens and businesses**
   - Creating a national cyber situation centre
   - Minimum requirements for authorities’ work on cyber and information security
   - Regulatory initiatives in the cyber area
   - Monitoring of critical ICT systems in central government
   - Common digital portal for reporting
   - National centre for processing of cases concerning ICT crime
   - Enhanced collaboration on the prevention of ICT-related attacks and enforcement in response to such attacks
   - Higher security for identity documents
   - Improved prioritisation of national ICT infrastructure
   - Secure communication in central government

2. **Better competencies**
   - Digital judgment and digital competencies acquired via the educational system
   - Information portal
   - Research into new technology
   - Corporate partnership to increase ICT security in the Danish business community
   - Collaboration on competence development and the fostering of a security culture in central government
   - Improved awareness drives aimed at citizens and businesses

3. **Joint efforts**
   - Sub-strategies at sectoral level and decentralised cyber security units
   - Cross-sectoral efforts to support cyber and information security in critical sectors
   - Management of suppliers of outsourced ICT services
   - Strengthened national coordination
   - Increased level of involvement in international collaboration
   - Evaluation of the current state of cyber and information security
   - Overview of information worthy of protection
   - Information security architecture
   - National and international efforts to safeguard data ethics and protection of personal data

In relation to young people, the second benchmark of the strategy, better competencies, is particularly relevant. According to the strategy, many young people lack sufficient knowledge about how to protect themselves and others in the Internet, or about which third parties they need to be wary of. In this context, the educational system plays an important role of ensuring that all children and young people are equipped with the tools to navigate in a safe, responsible, and ethical manner when using ICT technology and social media. The Danish government will focus on digital skills in a security perspective starting in primary and lower secondary school, and continuing through to graduation.

The strategy focuses on children’s and young people’s ability to think critically about content on the Internet, the threat presented by fake news, radicalisation, cyberbullying, online fraud, etc.
Initiative 2.1 focuses on digital judgment and digital competencies acquired via the educational system. Joint efforts will be launched throughout the educational system, focusing on raising awareness of security challenges for children, young people, and teachers. Continuing and further education and training programmes will be developed, as well as teaching material and awareness drives on cyber and information security aimed at teachers, pupils, and students.

There are no major revisions of the strategy.

**A stronger and more secure digital Denmark. Digital strategy 2016–2020**

Since 2001, digitalisation in the public sector has been driven by close and binding collaboration between local, regional, and central governments. Over the past 15 years, Denmark has undergone a transition to digital public administration, communication, and services.

The vision of the fifth public sector digitalisation strategy is that public sector digitalisation creates value and growth, provides efficiency improvements, and ensures the Danish population’s confidence in the digital society.

The strategy sets three overall goals and a range of specific initiatives:

- Digital solutions must be easy to understand, quick, and ensure high quality
- A user-friendly and simple digital public sector
- Better use of data and quicker case processing
- Better and more cohesive welfare services
- Public sector digitalisation must provide good conditions for growth
- Better framework for the business community
- Public-sector data as a growth driver
- An efficient utilities sector
- Security and confidence must be in focus at all times
- The public sector protects data
- Robust digital infrastructure
- Digitalisation for everyone

**Regarding young people, the following initiatives are relevant:**

3.1 Cohesive welfare pathways for citizens. Welfare pathways will be analysed. One of the three groups of citizens in focus is unemployed young people on educational programmes. The initiative focuses on how to make welfare pathways more coherent for citizens, for example through data sharing and smoother workflows.

3.4 Digital learning and teaching. Children and young people should benefit from digital learning tools and materials that enhance teaching.

7.5 Secure ID solutions for children and young people. This need applies specifically to the group of 12–15-year-olds who do not yet have a NemID (a common secure login on the Internet) but have an increasing need for digital confidentiality in connection with login to school intranets, etc.

9.1 Digital skills for children and young people. Children and young people must build digital competences and culture to prepare them for the digital reality. Information campaign and teaching
programmes will provide children and young people with digital skills to interact digitally with society.

A steering committee is set up for the Digital Strategy 2016–2020 in order to ensure coordination and ongoing adaptation of the strategy. The steering committee will make sure that central, regional, and local governments realise their goals and milestones for each area.

Each year, a report informs about the progress of each initiative and presents the ongoing results.

In 2018, an evaluation was conducted of the measure “IT in primary and lower secondary education” under initiative 3.4. The evaluation establishes the use of digital teaching material (lærerimidler) and learning platforms, as well as how IT is used in practice at the local schools. Eighty per cent of the responding teachers report that they use digital teaching materials as a natural part of their teaching or are very focused on using IT as much as possible. Furthermore, the teachers report progress regarding differentiation of the teaching and regarding motivating students.

Based on the evaluation, the Ministry of Education (now the Ministry of Children and Education) decided to initiate work on a new national digitalisation strategy within the area of education. For more information about the strategy, see below.

Four analyses of have been conducted of secure ID solutions for children and young people. Based on the analyses, a new children’s ID is part of the economic agreement between the state and municipalities in 2019.

Initiatives supporting media literacy have been conducted in 2016 and 2017, and initiative 9.1 was finalised in 2018. In 2018, teaching material was produced to inspire teachers in primary education and lower and upper secondary education. The material should prepare the students for a digital society. The following four themes were covered in the material: IT security, digital production, digital interaction with the public, and a civil tone in communication with the public. Furthermore, a cooperation with the Danish Broadcasting Corporation was initiated. The cooperation resulted in a series of programmes broadcast on the youth channel DR Ultra.

There are no major revisions/updates of the strategy.

**Digital Strategies concern the authorities at all levels of government.**

**Action plan for technology in education**

- The Ministry of Children and Education’s action plan for technology in education focuses on children, youth, and adults’ technological understanding and aims to improve the use of IT at all levels of the education sector.
- Danish children and young people must be able to produce creatively with technology rather than simply being users. Since technology develops at a high pace, it requires a new focus on strengthening technology at all levels of the education sector.
- The ministry’s action plan for technology in education has two goals:

  **Goal 1:** The technological understanding and digital competencies of Danish children, young people, and adults must be strengthened at all levels of education – empowering them to take part in creating the society of the future.

  **Goal 2:** Denmark must maintain and continuously develop its position of strength regarding the use of IT in education – We must embrace the opportunities of technology as well as be wary of its pitfalls,
making sure everyone becomes as proficient as they can.

**In order to realise the two goals, the action plan includes five focal points:**

1. It is necessary to strengthen the concept of technological understanding in the goals of education as well as the content – making sure that every child, youth, and adult learns to be critical of technology and learns to shape it rather than simply use it.
2. It is necessary to strengthen the competencies of teachers and managerial and educational staff in order to better use IT in classroom education as well as teach the subject Understanding of technology.
3. It is necessary to improve the pedagogical and didactic use of IT in education.
4. It is necessary to continuously develop user-friendly and functional digital infrastructure.
5. It is necessary to increase awareness of data ethics along with a qualified use of data about the pupils and their learning processes.

In higher education, the focus is on developing students’ digital competences rather than online safety. In 2018, the minister of higher education and science launched a call for action: Technological Upgrade in Higher Education. The minister called for experiences, visions, ideas, and input from teachers, students, and education institutions regarding the use of technology in higher education.

Eighty-one inputs from the call for action ([Læring fra arbejdet](1)) identify focus areas for the technological upgrade, such as (list not complete):

- Problems in the digital food chain:
  - The digital competences vary among students from higher educations.
  - The variety complicates the technological upgrade.
  - There is no link between technology education at different education levels and this curbs the progression in digital competences.
  - Lack of technology competences among teachers in primary, secondary, and higher education.
  - The technological agenda needs cooperation and knowledge sharing among education institutions and sectors.
  - More knowledge/research is needed, for instance digital tools, education purposes, and target group.
  - Access to new technologies at the education institutions.

In April 2019, the Ministry of Higher Education and Science launched a national action plan: Digital Competences and Digital Learning – national action plan for higher education ([Digitale kompetencer og digital læring. National handlingsplan for de videregående uddannelser](2)).

The action plan focuses on three areas:

- **Competency development of teachers** [3]: Teachers must be well equipped to boost the students’ digital and technological competences. Forty-five million Danish kroner has been allocated to the development of educational courses that advance technological skills among teachers at all education levels.
- Sharing of experience and knowledge: Establishment of a national knowledge and resource centre, establishment of networks within digital learning technologies and digital competences, and funding of activities that support cooperation and knowledge sharing.
- Barriers and regulations that are not adjusted to a digital reality should be removed: Revision of executive order on examination regulations, and examination of the rules and regulations that
may hinder the use of technological tools.

**Media literacy and online safety through formal education**

Media literacy and online safety in general and vocational upper secondary education has been a focal point for several years.

**In the strategy for the digital growth in Denmark, the following initiatives have been established:**

Media literacy is included in the curriculum in general upper secondary education. A general upper secondary reform introduced digital competencies in all relevant subject curricula in general upper secondary educations from the school year 2017/18. From the school year 2017/2018, a new optional generic subject, Informatics, has been implemented. Informatics is a mandatory part of other subjects but can also be both mandatory or optional as a separate subject, depending on the line of education.

In **STX** [4], the student must choose two of the following subjects at C level: Informatics, Biology, Chemistry, or Natural Geography.

Students who do not follow a science education line must complete one of the following subjects at B level: Biology, Informatics, Chemistry, Natural Geography, or Physics.

In **HHX** [4], students must take Informatics as a mandatory subject at C level.

IT is an optional subject aimed at the HHX education. The subject is only available at A level.

In **HTX** [4], students must take either Communication and IT or Informatics at C level.

Communication and IT is a subject aimed at the HTX education.

**Themes covered in the subject Informatics at C level:**

- Construction/designing of IT systems as a solution to a specific issue/problem
- How IT systems and humans interact
- IT-security, network, and architecture
- Representation and manipulation of data
- Programming
- Innovation
- Interaction design

**Themes covered in the subject IT at A level:**

- Construction/designing of IT systems as a solution to a specific issue/problem
- How IT systems and humans interact
- Digitalisation and business models
- IT security, network, and architecture
- Representation and manipulation of data
- IT governance
- Programming
- Interaction design
- Innovation
Themes covered in the subject Communication and IT at C level:

- Communication theory and media
- Design and visual communication
- Product development and project management
- Ethics, law, and digital behaviour
- Digital tools

In the vocational upper secondary education (EUX [4]), the subject Information Technology is optional from F to C level. Topics addressed in Information Technology at C level:

- IT systems relevant for business
- Data management
- Databases
- Formats of documents
- Information technological processes of change

Besides the optional and mandatory subjects in general and upper secondary education, media literacy is in focus in the education system in the following initiatives/projects:

In the strategy Denmark’s Digital Growth [5], the former government recommended that:

- Vocational education and training: Increased focus on digital and professional competencies in final examinations of vocational education. The content of the exams and the forms in the vocational education programmes should be examined so that they reflect the teaching and to a greater extent support the assessment of students’ digital skills.
- Establishment of a centre for the use of IT in VET.
- The formulation of a science strategy for primary and lower and upper secondary educations.
- With a reform of general upper secondary educations in 2016, all examinations must be digital.

The former government has allocated 18 million DKK to implement the initiatives in the 2018–2021 period.

In Action Plan for Technology in Education, the following measures are initiated:

- Support the access to virtual labs in science for students in primary and lower and upper secondary educations. See section 8.7. [6]
- Experience collection from general upper secondary education institutions using IT and digital learning tools in an innovative way. General upper secondary reform introduced digital competencies in all relevant subject curricula in general upper secondary schools from the school year 2017/18.
- An analysis of the market of digital teaching material for upper secondary educations.
- The establishment of common IT standards for digital learning resources in general upper secondary education (gymnasiet), an analysis of children’s, young people’s, teachers’, and parents’ knowledge of IT security, and good data management.
- Research project running from 2017–2018 investigating how ICT can support professionalism/subject knowledge and how the extent to which students develop the right competencies through digitalisation.
Media literacy in VET programmes:

In the reform of VET programmes in 2015, four goals were established. One of the goals was to develop more desirable study environments with a more coherent education from the beginning to the end, including an increased involvement of the students and the development of a strong VET identity and community. In this regard, online behaviour will be addressed.

Media literacy and online safety is included in the curriculum and is addressed in the VET colleges’ study rules and regulations.

In the core subject (grundfag) Danish [7], students learn to use and understand that digital media contributes to their professional learning. The students learn to make choices actively and critically regarding the use of IT. The students learn to use digital media in communication purposes so that they can enter into global and digital communities in a sound, critical, and ethical manner.

In the core subject (grundfag) Vocational Informatics, students are prepared to meet the demands for digital competences on the labour market. Furthermore, students learn to respond to the digital development’s challenges.

According to the ministerial order on VET programmes (Bekendtgørelse om erhvervsuddannelser [8]), VET colleges can establish rules that also include the students’ behaviour in their spare time, for instance their digital behaviour on social media. The VET colleges can only regulate the students’ spare time when their behaviour has had negative consequences for the study environment, including the order and the social interaction at the VET college.

In preparatory basic education and training (FGU [4]), the use and safe use of digital media is addressed in a broad range of the courses available to the students. Furthermore, IT is integrated as a didactic tool in the teaching in order for the student to acquire digital skills. In some subjects, media literacy is also part of the curriculum.

**Danish:** Media literacy will be in focus in order for the students to manage themselves in a labour market where technology and digitalisation are basic conditions.

**Identity and Citizenship:** In the subject Identity and Citizenship, students acquire skills for suitable and safe behaviour in the digital world. IT will be used in the teaching in order for the student to acquire digital skills, including media literacy.

**Communication and Media:** IT and digital media should be integrated in all topics in order for the teaching to reflect the work and study life that the student will be a part of. IT must be integrated as a professional (fagligt) and didactic tool enabling the student to acquire digital competences and media literacy.

**Technological Understanding:** Technological Understanding is an IT subject in which media literacy plays a vital role. Media literacy and IT are used as a didactic tool but are also at the core of the subject, which means that IT and media literacy are analysed and discussed.

**Pedagogical tools**

On the platform EMU [9], teachers can find inspiration and teaching material about digitalisation, media literacy, and cyber security. The platform presents material for teaching at all levels in the education system, from childcare to adult and continuing training. The platform is managed by the
Ministry for Children and Education.

A new topic on IT cyber-security [10] is available on the platform EMU. The topic was developed as a part of the national cyber and information security strategy (2018-2021). The new topic objective is to ensure that children and young people are able to use online media and new technologies in a safe way. Furthermore, teaching materials are available for all levels of education (primary, preparatory basic training and education, vocational and general upper secondary, and vocational adult education training).

The teaching materials deal with media literacy and resilience toward fake news, hacking, echo chambers, and radicalisation.

The teaching materials consist of:

- Articles with background knowledge for school leaders and teachers
- Lesson plans and activities for all education levels and for several subjects
- Videos

In January 2020, the minister of higher education and science allocated DKK 45 million to strengthen digital competences among teachers at higher education institutions. Children and young people must learn to use technology as well as its pitfalls. Therefore, teachers in higher education institutions play a pivotal role because they educate teachers in primary and secondary education.

In 2016, representatives of students, teachers, and leaders from general and vocational upper secondary education programmes formulated an ethical codex [11] in cooperation with the Ministry for Children, Education and Gender Equality (today, the Ministry for Children and Education). The ethical codex concerns the online sharing of intimate pictures, and the objective is to prevent the online sharing of offensive pictures and videos. The codex consists of seven principles that involve students, teachers, parents, and school leaders.

In the Ministry of Children and Education’s Action Plan for Technology [12], a research project (2017–2019) was initiated testing new methods for using ICT in teaching and how to implement the work with digital competencies in schools.

Vocational education and training: A development project is being implemented with a focus on strengthening teachers' competencies and leadership and organisational matters. The project must contribute to implementing and anchoring a digital pedagogy and didactics in business education.

Digital Start [13] is an interactive education website that supports the pupils’ knowledge about public digital services (www.digitalstart.dk [14]). The material can be used by teachers in formal education and at libraries. The target group is 15–18-year-olds and is developed by the Agency for Digitalisation and Centre for Media Literacy.

Are you ok on the internet? [15]: Teaching material for teachers and pedagogues who work with children and young people with special needs. The material is aimed at children and young people in the 11-15-year age group with cognitive challenges such as ADHD and autism. The objective of the material is to help the target group navigate in a safe manner online. The learning activities are supported by simple games and visual material. The project was funded by the Ministry for Children and Social Affairs (today, the Ministry of Social Affairs and the Interior).

Social star [16]: Teaching material aimed at children and young people in the 11–13-year age group.
The material teaches the target group to navigate online and to take a critical stance to social media, hidden advertising, and product placement among influencers on YouTube.

**Promoting media literacy and online safety through non-formal and informal learning**

The Media Council for Children and Young People (Medierådet for børn og unge) serves as the national awareness centre and represents Denmark in a European context. The council works with young people, educators, parents, authorities, and organisations to inform and advise on children and young people’s life and activity in digital media, including digital security, well-being, competences, and rights. The council is a governmental advisory board.

The Media Council for Children and Young People works within four strategic and thematic frameworks reflecting the challenges and possibilities related to children’s and youths’ media use and online presence:

- **Well-being, social interaction, and citizenship:** Focus on communication, togetherness, and ethics in local and intimate communities and practice of civic rights and freedom of speech in national and international movements online. Potential risks in focus are, for example, cyberbullying, sharing of imagery without consent, shaming, and hate speech.

- **Privacy:** Promote awareness and knowledge on privacy, data protection and human rights in relations to digital footprints, GDPR, and consumer rights. This framework also addresses the challenges of data ethics as to surveillance and control as well as consent and rights.

- **Critical thinking:** Strengthen source criticism and resilience towards dis- and misinformation, manipulation, and conspiracies, and raise awareness of virtual business models and economies, for instance digital marketing, crypto currencies, and skin gambling. The objective is also to illuminate the power of online influencers on blogs, social media, and games.

- **Creative learning and computational empowerment:** The purpose of this framework is to ensure that children and youth become committed and reflective citizens through media production and co-creation, computational thinking, and technical skills. The participant perspective and the individual in focus is essential.

The Media Council for Children and Young People serves as the national awareness centre and runs the [Danish Safer Internet Centre](https://sic.dk) website, partnering with the Centre for Digital Youth Care for the helpline (cyberhus.dk) and Save the Children Denmark for the hotline.

SIC DK is a core knowledge centre in the context of media literacy, child protection, and the rights of the child in the digital environment. The centre has established a broad collaboration with representatives from academic institutions, industry, government bodies, and law enforcement.

SIC DK makes a virtue out of involving experiences and opinions of Danish children and young people. All three partners in SIC DK supports young people’s online life by listening to the young people, involving them, and making relevant resources for them, their parents, and professionals.

SIC DK is a part of the Connecting Europe Facility programme and cooperates with other European Safer Internet centres through the Insafe Network (awareness centres and helplines). INHOPE is the network of hotlines, all working to prevent the spreading of illegal content online.

The helpline [Cyberhus](https://cyberhus.dk) is online counselling for children and young people. The helpline responds
to questions and worries from young people regarding online cases as well as other issues related to youth life.

The hotline, Report it (anmeld det [19]), is a service for anyone who wants to report online sexually abusive pictures and videos of children. The online counselling ‘Erase it’ helps children and young people to delete intimate pictures shared without their consent.

As part of the national strategy for cyber and information security (2018–2021), the following project has been initiated: A campaign for IT security was established in 2018, Mind me: My life, my data. The purpose is to get young people to reflect on where their data ends up and strengthen their knowledge and awareness about possible pitfalls on the Internet and on social media. The campaign has built on young people’s stories and experiences with IT security through a YouTube competition. The campaign has involved movies, a campaign site, and various actions on Instagram and YouTube.

The campaign is aimed in particular at 13–19-year-olds.

Raising awareness about the risks posed by new media

‘Safer Internet Day’, a cross-national event in February initiated by the European Commission. SIC DK takes part in this annual event with a variety of themes and agendas. On Safer Internet Day 2019, the Media Council in Denmark launched a new online magazine, ‘Persondata-hva’-for-noget?’ (‘GDPR-what?’), regarding digital self-defence and digital rights. The material is produced with help from a school class to ensure the child and youth perspective. The material includes a toolbox, film, podcast, board games, and a guide.

On the occasion of European Media Literacy Week in 2019, the Danish Media Council for Children and Young People launched a new free online resource for parent–teacher meetings called ‘Digital Brilliant’ (Digital Genial [20]). The resource is developed as an online toolkit with activities that can be used by teachers and other professionals to facilitate a constructive and involving dialogue about the children’s digital well-being.

Another example of awareness material is the online magazine ‘Internet detours’ from 2018, which addresses the Internet as a platform for lies, manipulation, and propaganda, which can potentially be used to support extremism and radicalisation. This material was published by the Media Council for Children and Young People, the Danish Centre for Prevention of Extremism, and the Danish Security and Intelligence Service. Also, in 2018 the media council was involved in the making of the teaching material ‘We keep the hackers out’, which was produced to increase young people’s IT security. The target group is young people in the age of 15–25.

The media council produces a large range of information campaigns aimed at young people and the parents of young people. The campaigns consist of brochures, videos, podcasts, etc. Aside from the initiatives mentioned above, the following materials are examples of campaigns available online:

Naked on the internet [21]: To help young people take control of the situation when intimate pictures are shared online.

Safe player [22]: Information campaign aimed at young people in the 12–18-year age group. The
objective of the campaign is to help young people with online safety. The project was part of the Safer Internet Day 2018.

As part of the National Strategy for Cyber- and Information Security (2018-2021), a number of new areas of knowledge about cyber and information security have been established at the Danish site emu.dk.

The knowledge areas must provide schools with a comprehensive and easily accessible overview of free courses, activities, and inspirational materials on cyber and information security for use in primary and secondary education and vocational education and training.

The materials dive into topics such as digital footprints, network etiquette, data sharing, echo chambers, cyber-bullying, online risk, critical attitude, etc. under the two main headings ‘digital judgment’ and ‘IT security’.

The materials will be presented to the teachers at the various institutions through a focused dissemination effort in 2019