European Social Partners in Education Embracing Digitalisation

Challenges and Opportunities for European Education Trade Unions and Employer Organisations in the Digital Era

Case study visit to Denmark

9-10 February 2021

CSEE ETUCE

EFEE European Federation of Education Employers

As part of the E-speed project, a virtual case study visit was organised to Denmark on 9-10 February 2021, with the participation of:

- E-speed Project Advisory Group members;
- Two external experts Inga Pavlovaite and Dr. Michael Hallissy;
- National social partners in Denmark, including the presentations from the education sector trade union GL and the Ministry of Education;
- A secondary school in the vicinity of Copenhagen, including interviews with:

  - The school leader
  - Two teachers
  - Two students

Videos showcasing the school were also watched during the visit:

https://www.youtube.com/watch?v=3yXcrCnTwN0
https://www.youtube.com/watch?v=xv7FfoLs-qM

- A teacher training institute in Denmark, including interviews with:

  - The institution leader
  - One teacher trainer (who is also a teacher himself)
  - One newly qualified teacher.

In total, perspectives of 10 stakeholders in the Danish education system were heard in the case study visit. The aims of the case study visit were as follows:

- Identify and discuss examples of practical and concrete ways to ensure optimal use of digital tools, both for the improvement of education personnel's employment and working conditions and for better teaching and learning practices;
- Dive deeper into the topics identified by the survey results and the Advisory Group meetings;
- Discuss the concrete impact of the practices in place as regards the use of digital tools on teaching, learning and education staff's working conditions.

This document provides a summary of main themes and findings from the case study visit.

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KEY FACTS ABOUT THE DANISH EDUCATION SYSTEM

Education is compulsory in Denmark for everyone between the ages of 6-7 and 16. The secondary education system the so-called Folkeskole includes young people between the ages 6-7 to age 16. 80% of such schools are in the public ownership, with 20% being private. The national education standards are established, and are tested through national computer based tests.

The upper secondary education relates to education of pupils aged 16-18 and offers two routes, a gymnasium qualification which qualifies for the entry to a higher education institution (with about 75% students choosing this route) and a vocational training route (less popular with 25% of students choosing this route). In the gymnasium route, individual schools have a high degree of autonomy, are in self-ownership through the concept of academy. The funding follows the pupil, hence the schools can be viewed as own economic systems. There are national standards with goals for skills to be attained, with general achievement aims established in each subject. Students are evaluated twice a yar and the final examinations include 10 national standard exams. The vocational education route offers training for around 100 professions and offers a direct labour market entry upon qualification. The schools are in self-ownership and autonomous. Vocational route offers a combination of practical and theoretical training. The government has adopted many initiatives to increase the attractiveness of VET route.

The Ministry of Children and Education issues the rules according to which the schools work. The schools, which are spread out all over Denmark, are self-governing institutions with different histories and academic profiles. They operate within the framework of general standards for subjects that should be at every school. This general programme of subject is compulsory. They finance the implementation of one or more of the upper secondary education programmes by means of grants from the Ministry of Children and Education provided on the basis of pupil numbers. The head of the school answers to a board, the composition of which reflects the school's specific profile. The teachers and pupils of the school appoint representatives to the board. The school board appoints and dismisses the headteacher and has overall responsibility for the running of the school and its activity.

The regulatory framework for the Danish upper secondary is set down in a joint executive order governing general and vocational upper secondary education. It lays down the framework for teaching as well as some overarching substantive components, including working with students' global, innovative and digital skill-sets or competences. The requirements for digital competences are described in Section 29(6):

> *"Students shall achieve digital competences so as to learn to adopt a critical view of digital media and form part of digital communities.*
>
> *In their subjects, students shall learn to search for information and take a critical view of sources when searching for knowledge through digital media, and through their teaching students shall gain experience of digital communities and work on the creation of digital products."*

In its guideline on the executive order, the Ministry of Children and Education recommends that schools draw up an overarching strategy for each school on the development of students' digital competences. Among other things the strategy must contain a progression plan for students' development of digital competences in their subjects.

The regulatory framework for the teaching of subjects in Denmark is the individual curricula ("subject schedules"), describing which competences students have to achieve in the subject and very general parameters for the content (core material) and organization of the teaching (working approaches). Students' digital competences are developed, e.g. in the following subjects:

- Mathematics: work with more complex topics via CAS (computer algebra systems)
- Physics: digital virtual experiments that cannot be tested IRL
- Danish (native language teaching): engineering digital productions
- History: source-critical analysis of digital media, e.g. fake news
- Social studies: participation in political digital communities.

Teachers are trained in the teacher training institutes through a one year education programmes leading to a Master's level qualification. Teachers must have completed a Master's programme at a university or – in certain cases – be able to document a corresponding level. Teachers must also have completed a course in educational theory and practice before or subsequent to their appointment at the school.

DIGITAL EDUCATION IS AN INTEGRAL PART OF THE OVERALL EDUCATIONAL MISSION

Digital education is steeped in the broader special Danish education tradition of ***Bildung***, a didactic and pedagogical concept referring to the holistic framework for education and formation of young people. Education is seen in the Danish Bildung tradition not just teaching a single subject and preparing students for future studies, but also developing their personal and general competences to become analytical and critical students. Digital education is seen as an integral part of the education mission to enable students to grow their critical and self-reflection skills, so that they can become responsible and active citizens. This is seen as important in supporting students to become critical and analytical citizens in the digital age.

Quotes from the interviewees:

> *"In the climate of fake news and where we see a move towards post-factual society, we need to educate our students to be analytical and critical when they use and consume news on social media or other digital platforms "*

- Digitization as formation (bildung)

  Teaching concrete ways of using hardware and software as well as promoting a critical consciousness in the students. Reflections on the ways the digitzation of our selves and our lives have impacted the way we understand ourself and others

Thus, digital education and the use of digital education tools in the classrooms is not seen in Denmark as the end in itself, with the aim of simply putting in the digital tools into the classrooms for their own sake. It is an integral part of the overall pedagogic approach to educate young people.

PERVASIVE USE OF DIGITAL TOOLS IN EDUCATION

In the education institutions visited, all teachers are using digital tools in their teaching across the board. Predominantly, the use of digital tools is due to the didactic and pedagogical purposes and this is due to the high extent of teacher autonomy enjoyed in the education system in Denmark. The degree of autonomy is a major decisive factor in how the teachers will adopt and use any digital tools as long as the teachers enable students to achieve the learning outcomes. Having said that, some teachers are very skilled and reflective in the use of digital tools. No significant patterns in the use of digital tools were reported in terms of age, gender, or new/experienced teachers. Teacher training has improved over the last 15 years, and everyone trained through the current system are very skilled in using digital tools.

Quotes from the interviewees:

> *"Teachers have become better and better how to work with these digital tools in their teaching and how to use them to their best benefit and also with specialised tools "*
>
> *Teachers have become very good in using meeting spaces like we use Google Meet which gives pupils the possibility to work together in small groups which is great if you have a class of 28 "*

None of the interviewees in the case study reported the use of European level digital tools, such as SELFIE, or through Erasmus+ projects. Otherwise, a range of tools is used, Google drive, Google Meet and specialised digital tools.

Interaction with families and parents in the school visited is very limited, because the emphasis is on supporting students self-sustainability and ownership of their learning experience. Individual meetings with families / parents could be arranged if a need is arising, but such interaction does not play a significant role in the school. Hence, digital tools do not play also play a role.

CRITICAL AND CONSIDERATE APPROACH TO DIGITAL EDUCATION

Educators and students themselves are very careful about the added value of using digital tools and pursuing digital education in the education system. There was an ambivalence identified as to how much digital tools bring the teacher closer to the students or whether digital tools establish a greater distance between the teacher and the students. Views were also expressed as that the use of digital tools per se does not offer a quick fix or a fix for educational problems which already existed before.

DIGITAL EDUCATION DELIVERS A RANGE OF BENEFITS

The stakeholders interviewed in the case study visit have also identified a range of benefits which the use of digital tools brings to the education. They include the following aspects.

Digital education and the use of digital tools enables **a more active role of students** in the learning processes with more participation, more contribution and better interaction between the students. Digital tools can empower students to participate more actively compared to more traditional ways of teaching, where "*only one student would be answering the teacher's question, now they have to be active participants when using digital tools correctly and it is very visible when they do not answer and participate*" (in the words of one interviewee). Through digital tools, more students are motivated to participate, including those who would be more reserved to come forward in non-digital settings. When the students have to participate continuously through digital tools, this encourages their higher level of participation. Overall, digital tools usage has improved the learning process for students, helping with motivation, reducing dropouts and getting students more engaged in learning. There are no patterns in terms of students who do not like the use of digital tools. The exception to this was a group of high achievers girls who find the more traditional way of teaching more appropriate.

Digital education and the use of digital tools offers **smarter and more collaborative ways to work and interact** with and between students which reflect the current realities of young people also outside the school. Digital tools can support the collaboration of students in better and more interactive ways. This increases the

appeal of learning processes to young people and thus can support their motivation and engagement with learning materials.

The use of digital tools has **transformed the role of teacher**, from a traditional perception of the knowledge transmitter to a more role of a tutor and enabler where teachers play a more supportive role to student learning, supportive more collaborations, better integrating written and oral work.
Digital tools can also help certain students with physical disabilities, such as dyslexic or blind students where digital tools can improve their learning experiences dramatically.

Quote from an interviewee:

> *"in a normal world outside COVID, you can use digital tools to support normal education in a very good way and it is a good support"*

TEACHERS ARE AUTONOMOUS TO DECIDE HOW TO USE DIGITAL TOOLS

In the Danish context, teachers are autonomous and thus can decide when and how to use digital tools in their teaching and assessment practice. This is considered to be key to the success of digital education, a perspective shared amongst all stakeholders interviewed. Teachers being empowered to decide on the use of digital tools how they see fit (and also not to use the digital tools just for its own sake) was also welcomed by students interviewed. This freedom to decide when and how to use digital tools is necessary also because the use of digital tools is subject-specific. Examples given by the Danish interviewees related to the different uses of digital tools in humanities or hard science subjects.

DIGITAL EDUCATION IS ACCOMPANIED BY SUFFICIENT INFRASTRUCTURE AND EXTENSIVE ONGOING SUPPORT

In the institutions visited, the use of digital tools in the education process is successful because it is underpinned by the availability of basic level of infrastructure installed and available at education institutions. This includes the hardware and software as well as good-quality broadband connections available to teachers and students. Equally important is the availability of continuous technical support function in the education institutions, so that teachers and students can turn to the IT specialists to resolve technical issues.

Continuous professional development system is well developed and teachers access additional training courses on a regular basis should they wish so. This training need assessment is also reflected in the annual reviews of the teacher development needs.

DIGITAL EDUCATION IS AN INTEGRAL PART OF THE DANISH TEACHER TRAINING SYSTEM

The teacher training institution visited in the case study is a collaboration of five universities in Denmark to provide teacher training. As it has no home university it is close to schools. Teacher trainers and trainees bring the digital technologies they use in the classrooms together to the teacher training. Teacher training offers a mix of practical and theoretical pedagogical training. Every four years, the Ministry of Education tenders out the teacher training and the consortium of five universities has been successfully bidding for it in the last years. Around 400 candidates are trained each year, by around 80 trainers and vocational consultants. The curriculum is provided by the Ministry of Education, and the training is funded with around EUR 15 million per year. In 2017, a reform was undertaken of the curriculum, and one of the specific requirements was to include and integrate the digital education in the curriculum.

The training itself is blended, with physical presence and a virtual learning platform for teacher candidates. In the COVID-19 context, the training has been moved fully to online modules.

Digital education is an integral part of teacher training, with the topic of digital tools forming an integral part of each teacher training module. The candidates use and discuss the technologies in their teaching practice, and reflect on their digital teaching practices through action learning.

Throughout the teacher training, a virtual platform is used that provides access to materials, notes and discussion forums across teams and disciplines. In addition, digital media is included in the training with the aim of supporting the candidates' knowledge and experience of using digital media in their own practice for planning, teaching and evaluation, and the knowledge of teaching materials in the subject, including digital teaching materials. The use of digital media is an integral part of the course of study, among other things through virtual courses, where the candidates address the relationship between the digitalisation and learning and the opportunities that this opens up in teaching. The training also enables the candidates to examine what happens to teacher and student roles in virtual teaching as a digital practice. Through the training of candidates, they are expected to develop a range of skills and competences relating to the digital education, as follows:

- have knowledge of the subject's materials and technologies, including digital resources;
- be able to develop his or her own teaching practice through reasoned academic didactic choices, including being able to use and think about digital practices;
- be able to relate to different forms of work and teaching, including digitally supported forms, and incorporate them into his / her own teaching;

- be able to think and discuss digitally supported forms of evaluation and feedback;
- have knowledge of virtual teaching as a digital practice, including blended and flipped learning;
- relate to current discussions about teaching, learning and education in relation to digital and global challenges.

RAPID ADAPTATION TO COVID-19 EMERGENCY TEACHING

The education system was ready to respond to the medical emergency very well due to its high degree of digitalisation preceding the pandemic. The lessons took place as scheduled, and teachers have developed and evolved their teaching practices and approaches as time in the emergency teaching context evolved over months. The emergency teaching went well because the teachers were ready to use digital tools already and this has worked well for a restricted amount of time. Teachers were well supported in the online teaching through existing support structures.

Quote from the interviewee:

> *"It's the best we can do at the moment, it works and it is better than before but we all long to go back to the real classroom"*

The reason for this quick adaptation in the school visited was a three year project before the pandemic on how to develop digital practices in teaching and adopt other and new ways of working and teaching. The first year the new ways were pioneered with a core team of teachers, and the second year it was rolled out to other teachers, including internal training courses between the peers and other teachers, and in the third year more teachers took part in it across the school. Without this large-scale three year school development project, the school would not have been ready to respond so quickly to the move to emergency remote teaching. The school developed the project autonomously without the input of external institutions, and it was seen as part of the overall development vision for the school. Some teachers were initially sceptical about the use of digital education, and had concerns about how this would fit into the overall Bildung mission. This was overcome through training and support from other colleagues.

The interviews showed that the students and teachers are increasingly demotivated, frustrated and have problems with the concentration (a monitor fatigue) and tired of online teaching in the emergency context and long to return back to the normal classrooms. So the prolonged lockdown is having a negative impact on students and their learning experiences. There is no sense of community at school as usual before the pandemic.

> *"Our students miss each other and the social interaction which is also part of the education and being at school This pandemic teaching showed that no amount of digital tools can replace the teacher"*

THE FUTURE OF DIGITAL EDUCATION

The state curriculum states that up to 20% teaching can be digital, and this is where education system is moving. So digital education will become an integral part of the teaching and learning supporting the education process. It is also expected that new specific digital tools will become available and used by teachers. Examples mentioned included the teaching of programming for example. Also, the digital education should reflect the critical use of digital media, also with the view of forming critical and reflective democratic citizens. The lessons learnt show that the digital tools can offer the level of flexibility in arranging and delivering teaching and assessment, which is a great advantage where digital tools used appropriately can support the learning and teaching process.

ADDITIONAL PERSPECTIVES FROM THE EDUCATION INSTITUTION LEADERS

For both leaders interviewed in the case study, delivering digital education is an integral part of their mission in the education institution they lead.

For the upper secondary school leader, digital education is part of the overall Bildung education philosophy in the school, to make students critical and active thinkers and citizens and persons who can act, discuss and participate in a democratic society based on their knowledge. Digital education is part of the education of students to become an educated person. The work of the school leader is to stimulate the teachers and teacher teams working on digital education to develop their ideas and approaches at school. In this way, digital education is not an end in itself but is supportive of the broader education goals and objectives. It was necessary for teachers and pupils to be developed and educated digitally. Everybody was proficient using technical devices but there was little reflection critically and reflectively on what it actually means to use digital media in a reflective and critical way. For example, how to use Internet materials to research a subject, how to critically assess the information and acknowledge the sources.

Digital education or digital tools cannot fix educational problems or help students who already had problems learning before using digital tools. If students have problems learning at school already, the digital tools will not provide a magical solution to address pre-existing challenges.

For the leader in the teaching training institution, it was important to highlight the role of digital education in the teacher training process. Theoretical postgraduate teacher training is a sandwich course alternating between theory and practice, delivered in collaboration between five of Denmark's universities and the Danish Ministry of Education (UVM). Approx. 400 graduates are being trained in 2020-21 (previously 400-800), with approx. 80 instructors and specialist advisers attached. Annual budget is around DKK 15-20m. The training is delivered in the following timetable, also indicating the extent of virtual training offered.

Autumn				
August	September-December	October	September-December	December
Being a teacher	Being a teacher in subject A	Being a teacher in practice 1	Being a teacher in subject B	Being a teacher in practice 2
3 days	3 days	1 day	3 days	1 day
Regional	National	Local	National	Local
Spring				
January-February	March	March-April	April-May	May-June
Being a teacher in upper secondary education	Being a teacher in practice 3	Being a teacher in practice	Being a teacher in society	Examination
3 days	1 day	½ day	3 days	Handing in assignment
National	Local	Virtual	1 day virtually 2 days regionally	

In addition, an online action learning activity is undertaken by the teacher candidates, following the outline below.

Time	**Module**	**Activity**
August	LEARN	Introduction to Teams, action learning (clarification of purpose and written templates), setting-up action learning groups etc.
		EVERYONE performs an action formalized in writing.
October	LIP1	Intro to didactic conversations based on Beck, pp. 54-56. Physical didactic conversations about the actions.
		All groups: One person performs an action. Virtual didactic conversation about the action with notes. A select group performs and records a virtual didactic conversation about an action - teacher is present (and offering guidance, if necessary).

Time	Module	Activity
December	LIP2	Collective analysis of recorded didactic conversation with a view to upgrading actions and conversations. Focus on use of theory, the action, empirical analysis and the didactic conversation. Initiate new action.
		All groups: One person performs an action. Virtual didactic conversation about the action with notes.
March	LIP3	New groups are set up with a view to action in relation to the Theo-Post-Grad assignment.
Conversation about new action in the groups.		EVERYONE performs an action oriented towards the Theo-Post-Grad assignment.
April	LIS	Collation of the actions performed - loosely structured didactic conversations and mutual sparring.

ADDITIONAL PERSPECTIVES FROM THE TEACHERS

Digital education is both new ways and approaches of delivering education through the use of digital tools and a formation of students in a broad sense of the word to enable them to become democratic citizens, helping the students to understand who they are in the digital world.

The majority of teachers in the school visited have adopted digital tools for pedagogical purposes on a voluntary basis, including using programmes which comply with data protection rules and can support different elements in teaching and learning. There has been a focus on upskilling teachers digital skills and this has been achieved since. The voluntary use of digital tools is absolutely important.

> *"The use of digital tolls differs more by subject, for example, the teaching of languages, history, social sciences uses more digital tools, whereas in maths and science this is less the case or in different ways. "*

Most of teachers are confident in using the digital tools in teaching, also because teachers are using tools on a voluntary basis, and teachers can develop and use tools in their own space. The support provided is also important to ensure confidence amongst the teachers. However, some teachers are not confident to the same extent in the use of digital tools as in their confidence in the subject knowledge, and this need has been addressed through additional training, support from peer colleagues and IT digital experts and a gradual adoption of digital tools. This can be also widespread amongst the older teachers, although this should not be generalised.

Teachers are also trained in the use of specific digital tools, and it has helped that this training is also delivered by peer colleagues, also backed up by the availability of support on everyday basis.

The use of digital tools has also transformed the assessment practices in a sense that the assessment has become more nuanced through the use of digital tools.

Some of the rules on data protection can also have a negative impact, for example, not being able to see previous student assessments. Planning of teaching with digital tools can also become more cumbersome, because teachers have to take account of the data protection rules.

There is also a tool called DIGIT developed by the Centre of Educational Means which helps the teachers in primary and lower secondary education to decide which digital tools to use and assess themselves how well they use digital tools in teaching.

ADDITIONAL PERSPECTIVES FROM THE STUDENTS

The experience of students with digital tools is coloured by the current context of online teaching in the COVID-19 pandemic, which had a detrimental effect on motivation and the level of materials absorbed.

Quote from the interviewee:

> *"Motivation is at the rock bottom level now, we also don't have the fundamental knowledge of many subjects anymore".*

In a more typical classroom setting, teachers use digital tools a lot, and in some subjects this is perceived to make sense, where special digital programmes can help to learn, for example in mathematics or physics. Otherwise, digital platforms can also hinder the learning, as it is also good to learn things visually and hearing from teachers. For example, reading texts on the computer is much better in a book rather than on screen, where the pupils cannot take notes or reflect further. Sometimes, students remember things better if they work by hand, rather than looking at the screen. If students are in the classroom already, it does not always make sense to use digital tools in addition to the more traditional tools.

There is not necessarily an important difference between the young and old teachers using digital tools, but more by individual subject. For example, in maths or chemistry the digital tools are used a lot and make things easier to understand for students (such as making graphs or doing calculations), whereas where a significant amount of reading is involved, such as in social sciences, the students prefer to use physical books and take notes by hand as in this way they remember things better. So for assignments it is useful to use digital tools, and some not, this depends largely on the subject and mode of learning (individual/group).

Digital tools can be complicated if they are applied too much, sometimes it would be better to work on paper and pencil.

Quotes from the interviewees:

> *"the devices we use is not the most important, what is the important that teachers talk to us and explain things, and we then use digital tools in groups afterwards for example.*
>
> *It is very good that we can use devices sometimes but we don't have to use them all the time.*
>
> *When there is a lot of reading involved or instructions, I prefer to learn it from a teacher directly than watching a Youtube video. I learn better and more when somebody explains it to me.*
>
> *Digital tools can be smart, fun and fast because I can quickly find an answer, but that can backfire as well. For group work, it can work well because we can all work on the same document, but then we forget to talk about what we write. So it becomes more difficult to communicate online as we lose out on some aspects of group work".*