



# Comprehensive Schools in the Digital Age II

Key results of the final report for 2020 and an overall picture of digital transformation in comprehensive school education

## COMPREHENSIVE SCHOOLS IN THE DIGITAL AGE - EQUALITY THROUGH DIGITAL SKILLS

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Comprehensive school education plays a key role in both preventing inequality in digital skills and providing skills for the future equally for all. But what is the state of play in Finnish comprehensive schools right now, at the beginning of the 2020s, and what measures do we need to ensure that all children and young people can enjoy equal education and opportunities in our future societies?

For future citizenship, whether or not we provide young people with equal opportunities to accumulate digital competence through comprehensive school education is an important question of equality. And while access to technology is important, its appropriate pedagogical use in each learning context is a particularly pertinent issue.

In recent years, the strategic objectives of the Finnish school reform have signalled the right kind of direction to advance the digital transformation at schools, when previously progress was made without any clear objectives. Even so, we continue to lack standardised practices and measures for implementing the strategies.

This brochure summarises the key results of the Comprehensive Schools in the Digital Age II study and the conclusions drawn from it to develop primary and lower secondary education so that the digital transformation may continue.



## MANAGING DIGITALISATION

On the basis of the interviews conducted for the study, school leadership must take account of digitalisation: managers can inspire positive attitudes and encourage teachers to work together.

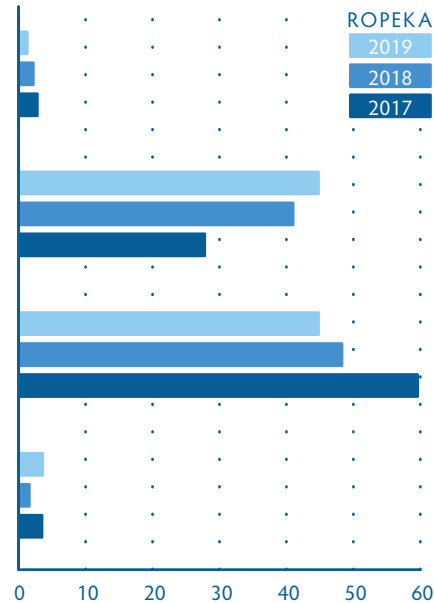
Managers are also responsible for resourcing the digital environment, such as networks, equipment, learning materials and the provision of continuing professional education for teachers.

We are on target: My school has a clear shared objective and a clearly indicated number of digitalisation targets. They are enhancing digitalisation skills, supporting the teachers in learning a new pedagogy and developing digitalisation skills, support teachers in learning new pedagogy and develop capabilities to support the learning process.

We have advanced: We have a well-defined strategy to achieve the objectives of digitalisation and nearly all teachers (and other members of staff) can accurately describe it.

We are discussing it: The objectives of digitalisation have been defined but they get lost among the other objectives. Our strategy to achieve the objectives needs to be more clearly defined to allow implementation.

We have just begun: We do not have a strategy to achieve the objectives of digitalisation or it has not been thought through or it is not clear enough to be understood and implemented.



*The work to develop digital strategies for schools has at least been discussed, and matters have progressed between 2017 and 2019.*

In addition to school leaders, tutor teachers play key roles, supporting teachers and the principal in various ways, depending on the school.

Organisational culture changes slowly in schools, and the interviewed principals and managers considered that to be a good way forward.

Teachers need time to adopt new practices but Ropeka results show positive development.

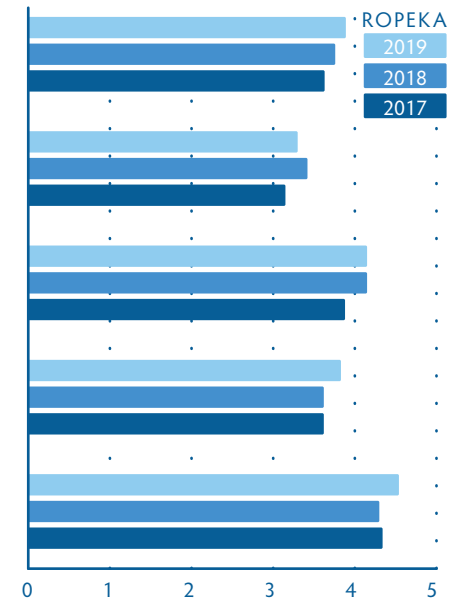
Pedagogical opportunities stemming from digital technology have been understood in my work community. (2017: 2019  $p < 0.05$ )

My work community has a vision that includes detailed objectives to enable digital learning. (2017: 2018  $p < 0.05$ )

I know the content of my municipality's plan for developing ICT. (2017: 2018 and 2017: 2019  $p < 0.01$ )

Teachers' pedagogical choices are evolving at the same pace with the digitalisation process, leading to significant changes in my school's organisational culture. (2017: 2019 and 2018: 2019  $p < 0.05$ )

At my school, peer teachers offer ICT guidance (2018: 2019  $p < 0.05$ )



*Ropeka questions with statistically significant changes between 2017 and 2019.*

## MAKING USE OF DIGITAL RESOURCES IN TEACHING

Traditional teaching and learning tools continue to be utilised more than digital resources in teaching, by both teachers and students.

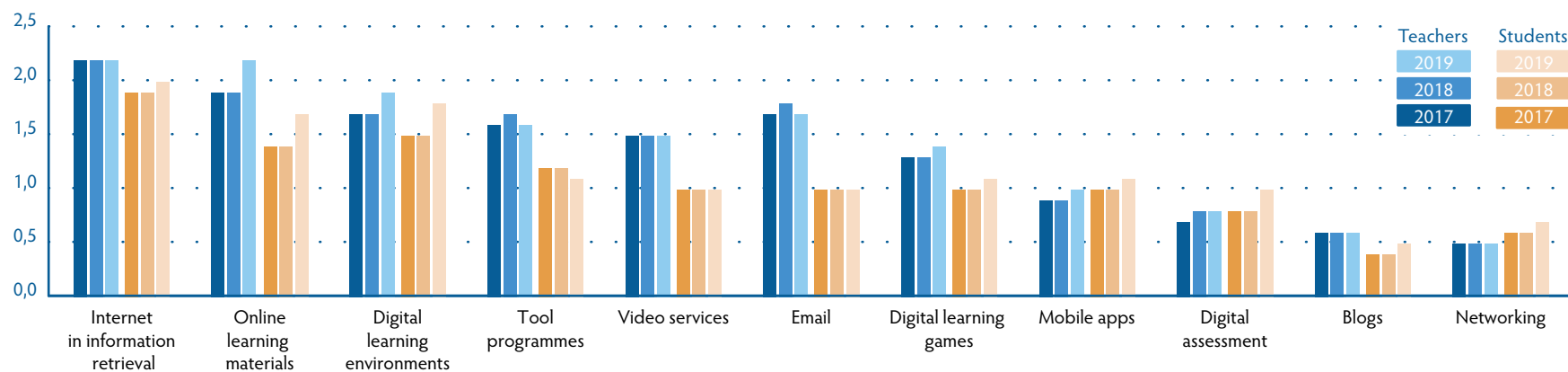
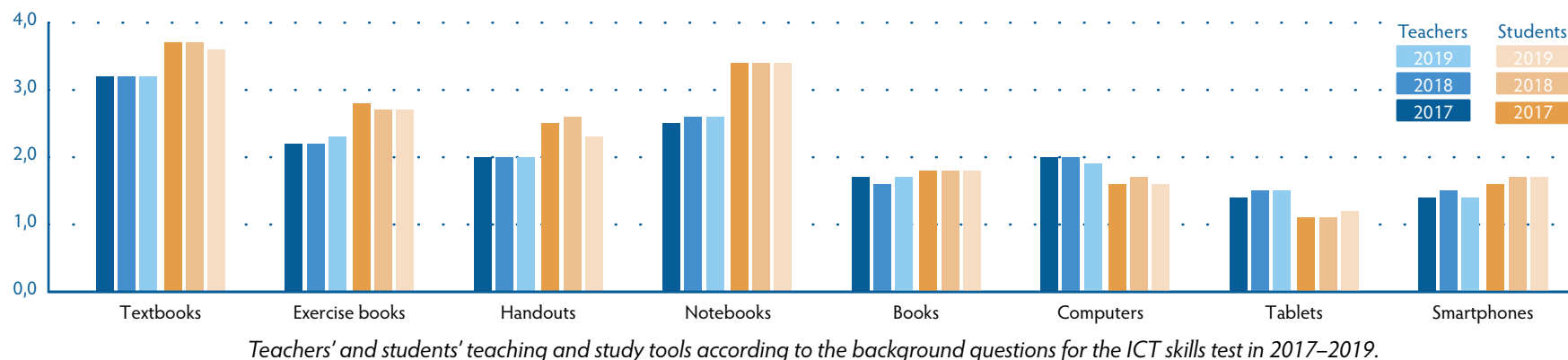
Students use textbooks and notebooks on a daily basis, and exercise books and handouts on average at least once a week. Teachers' answers emphasised the use of textbooks in teaching, but students said notebooks and handouts also played a key role.

In order to enable diverse use of digital resources, both teachers and students

need to have enough personal devices at their disposal.

The most popular digital resources for teaching included the internet for searching information, online learning materials, digital learning environments and tool software. Of these, online materials and digital environments have gained in popularity.

The use of networking services, blogs and digital assessment tools in education remained limited, but their popularity has slightly increased.



## MAKING USE OF DIGITAL RESOURCES IN TEACHING

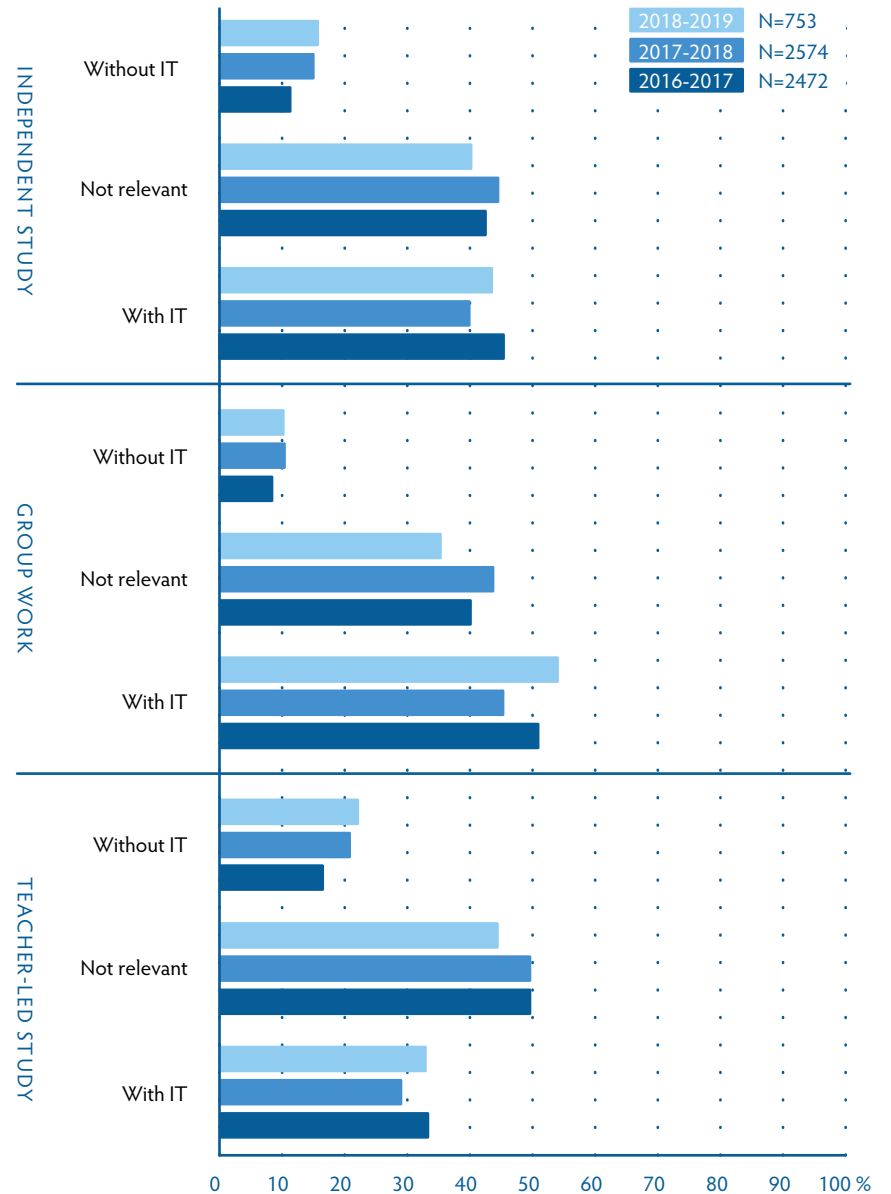
For students, using information technology and digital materials in teaching feels natural.

Irrespective of their year group, most of the students who responded to the Oppika survey said the working method made no difference to them.

Year 8 learners preferred information technology in group work and independent work.



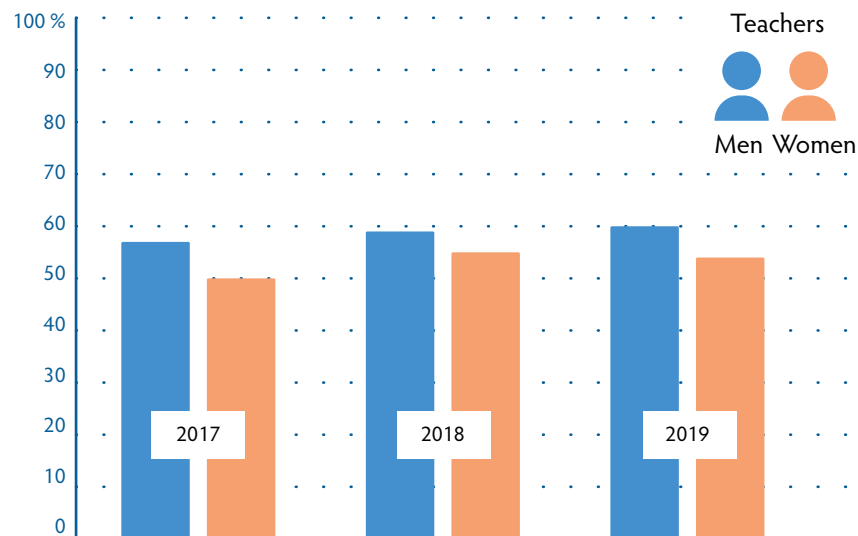
Preferred working method in various contexts (year 8)



## NO CHANGE IN TEACHERS' DIGITAL SKILLS BUT POSITIVE DEVELOPMENT IN SKILLS ASSESSMENT

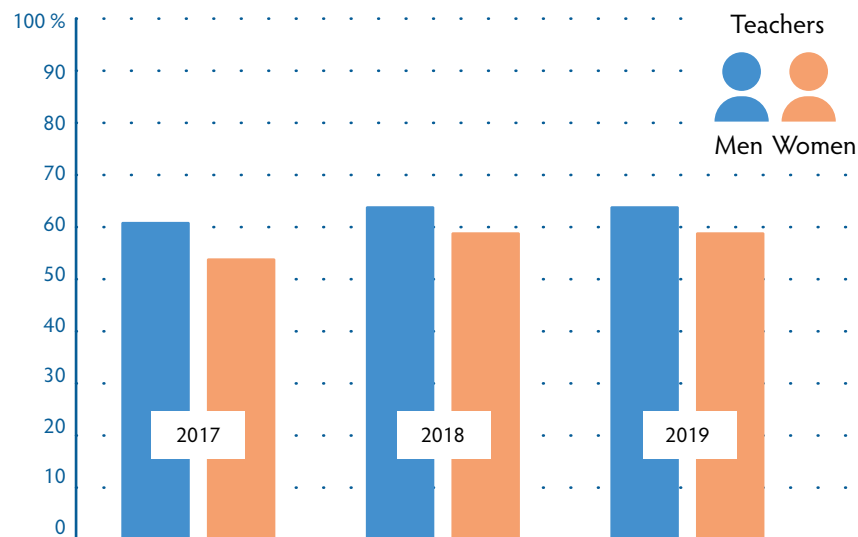
Teachers' digital tool skills, i.e. competence related to equipment and tools, internet navigation and knowledge of how basic tool applications function, somewhat increased during the Digital Comprehensive Schools I project in 2017–2018. No corresponding increase was evident among the new sample.

*Command of the tasks requiring **tool skills** included in the teachers' ICT skills test (%) in 2017–2019.*



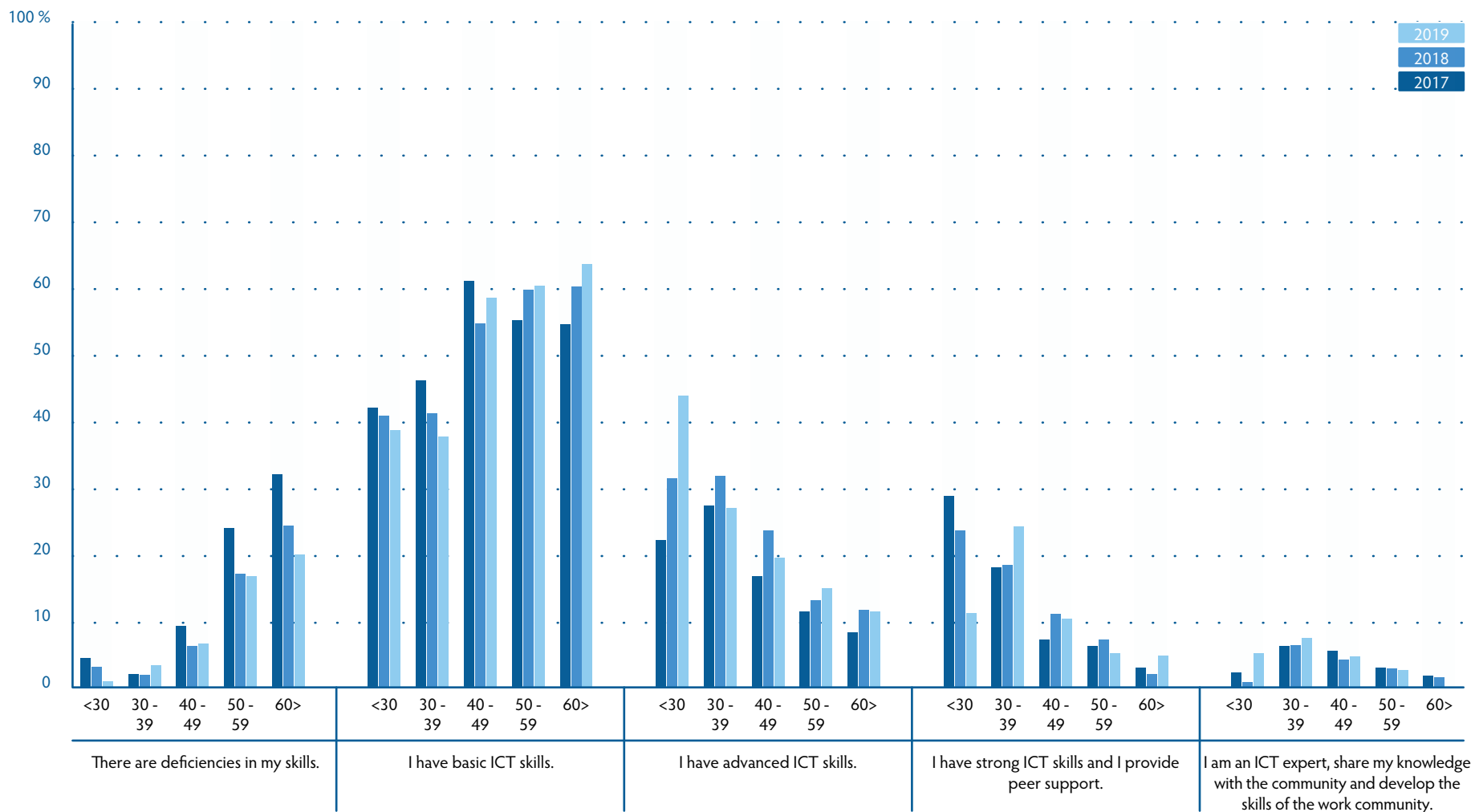
Digital content skills, i.e. competence related to the production of digital content, to communication, to networking and generally to employing tool skills, also improved between 2017 and 2018, but the results from the new sample for 2019 showed no change from 2018.

*Command of the tasks requiring **content skills** included in the teachers' ICT skills test (%) in 2017–2019.*



In the three-year self-assessment data, teachers aged over 50 and over 60 felt they had more skills deficiencies in comparison with their peers in other age groups. Similarly, in comparison with all teachers who responded to

the questions there are fewer people in these age groups who categorise themselves as pedagogical experts. However, when observing the data over the three reference years, all age groups were found to have improved their skills.

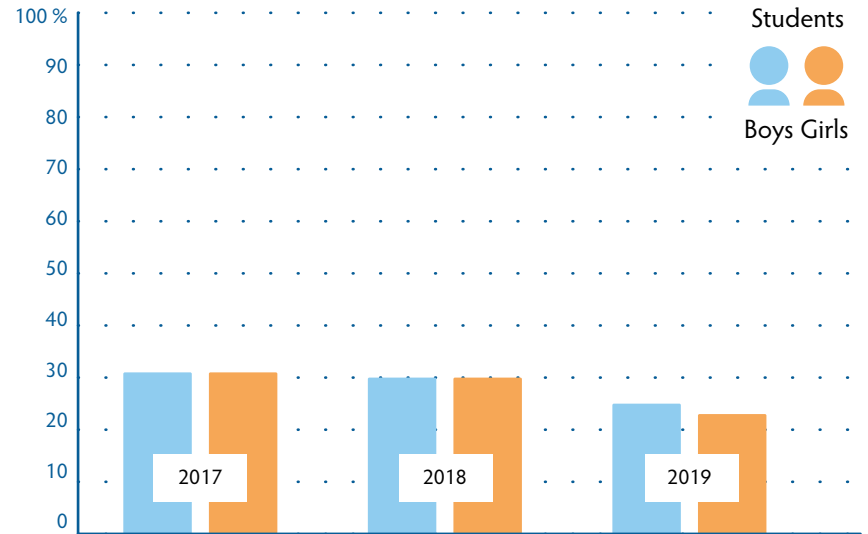


Teachers' assessment of their skills by age group in the Opeka survey in 2017-2019.

## STANDARD OF STUDENTS' DIGITAL SKILLS REMAINS POOR

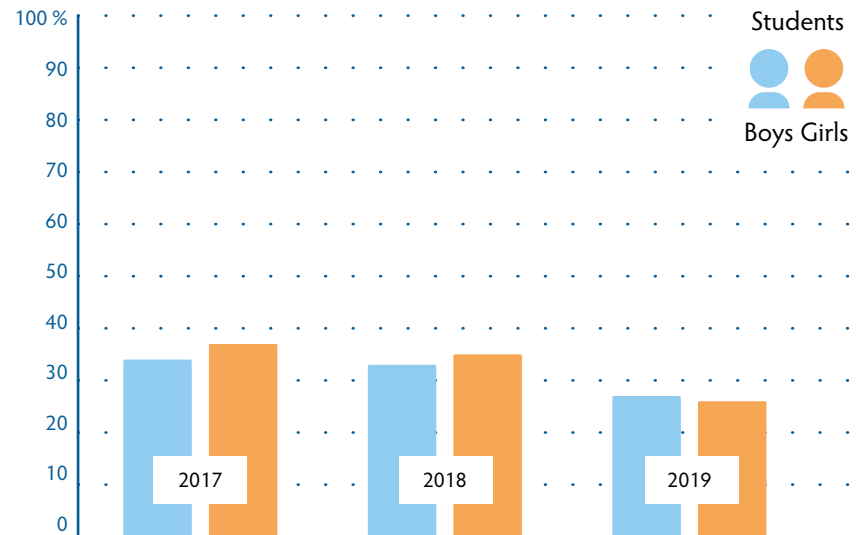
Students' tool skills have declined during the observed period. While gender gaps remain small, skills in using digital tools have declined significantly more among girls than among boys, especially between 2018 and 2019.

*Command of the tasks requiring **tool skills** included in the students' ICT skills test (%) in 2017–2019.*



Students' digital skills are also on a downward trend. In these skills the level among girls has also fallen more sharply than among boys.

*Command of the tasks included in the students' **content skills** test (%) in 2017–2019.*



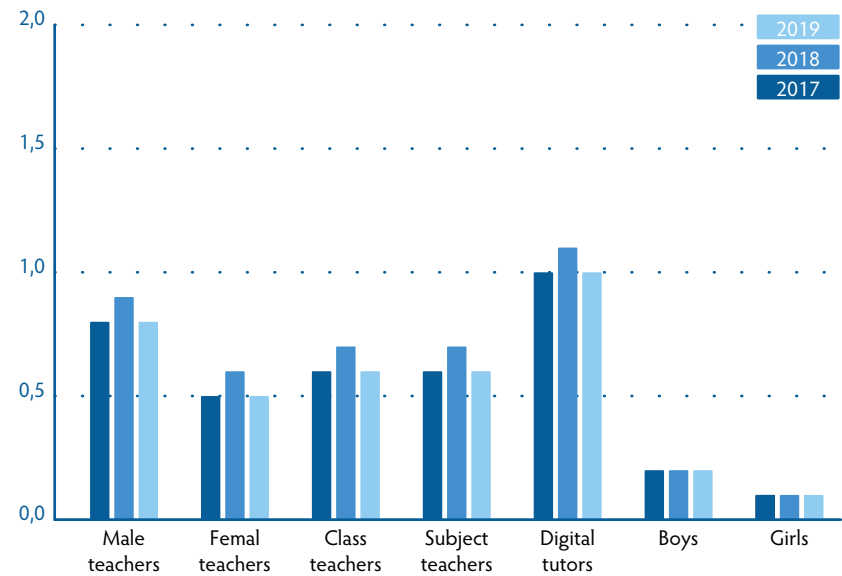


## TEACHERS' AND STUDENTS' ELEMENTARY PROGRAMMING SKILLS HAVE NOT IMPROVED

There was some improvement in teachers' elementary programming skills between 2017 and 2018, probably due to investment in programming skills after the 2017 outcomes were revealed. However, the results from the new sample for 2019 show that this increase has not become a general trend.

Students' elementary programming skills have remained poor throughout the project.

*Development of elementary programming skills in 2017 and 2018 among teachers and students by gender and respondent group (section points 0–2).*



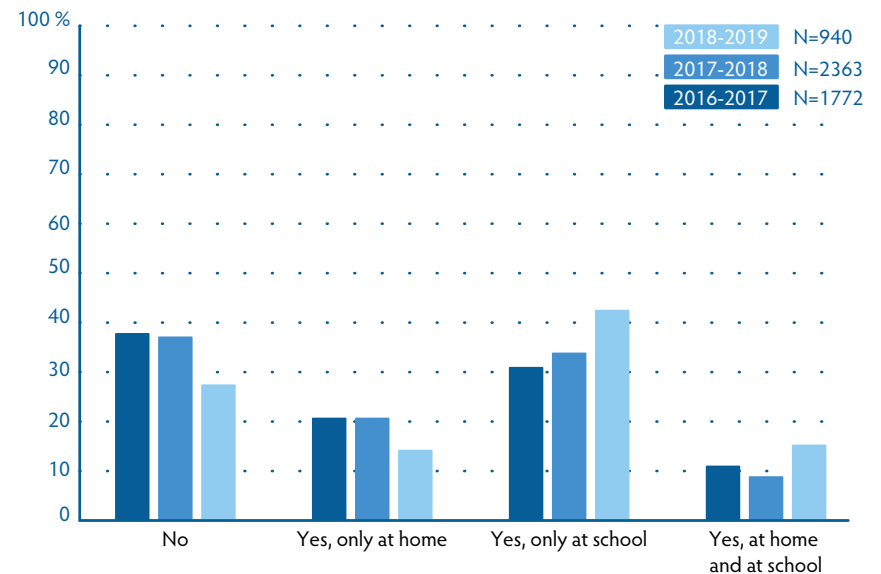
## BUT STUDENTS HAD MORE CHANCES TO TRY PROGRAMMING

During the 2018–2019 school year, 57% of year 8 students had used a programming environment at school, up from 37% in the previous year and 32% in the 2016–2017 school year.

Among year 5 students, only about half of the respondents had used a visual programming environment at school. This result has remained largely unchanged from the levels of the previous two years.

However, learners in year 2 had more experiences of programming and directing robots than before.

*Have you tried programming or directing robots?  
(Year 2 learners)*

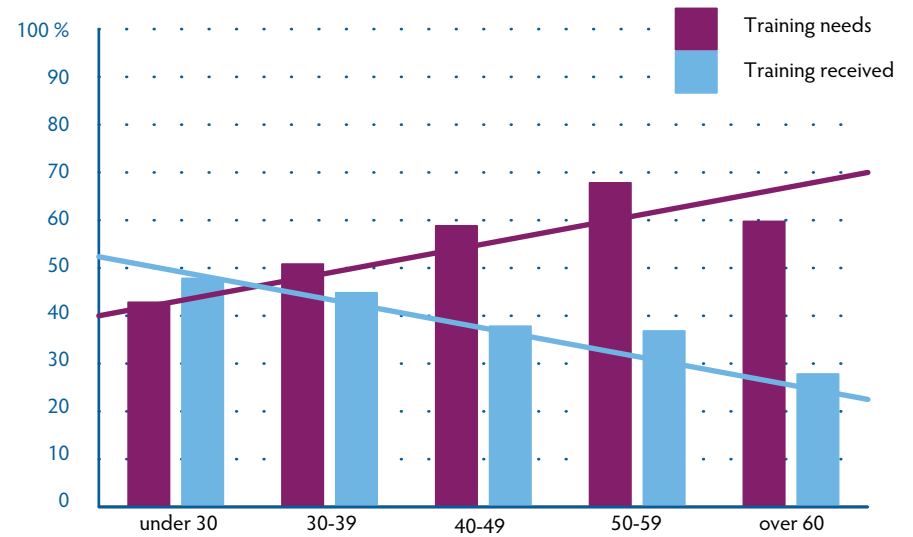


## CHALLENGES IN THE TARGETING OF CONTINUING EDUCATION WHILE TUTORING STRENGTHENS THE NEW PEDAGOGY

For subjects related to the digital transformation, the uptake of continuing professional education somewhat decreases with age, even though the need for new knowledge clearly increases. The results confirm the earlier finding that older teachers have a particularly high need for continuing education in topics related to the digital transformation.

About 90% of schools have tutor teachers, who have been found to be very good at initiating new pedagogical practices among teachers.

We also received feedback that there is need for more forms of continuing professional education, such as short half-day courses, because supply teachers are difficult to find or the schools cannot afford them.



*Continuing education related to digital matters received by teachers and the need for continuing education by age group according to the ICT skills test in the complete dataset for 2017–2019.*



## OVERALL PICTURE OF DIGITAL TRANSFORMATION IN COMPREHENSIVE SCHOOL EDUCATION

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According to school principals and managers, encouraging teachers and ensuring that the financial resources are in place are the most important issues for managing the digital transformation at schools.

Most of the interviewed schools followed a municipal ICT plan or digital strategy. Some schools had also created competence levels or skills paths to support teachers' and students' ICT skills and pedagogical practices.

However, at schools the organisational culture changes slowly and the principals agreed that enough time must be allowed for managing the change.

While there had been no significant changes in the use of digital materials during the reference period, small increases were seen in the uptake of online learning materials, digital learning environments and mobile applications. Access to digital assessment tools and networking services had also increased.

In teaching, digital materials complemented traditional materials, offering more diverse opportunities for learning the subject content.

Digitalisation of teaching has provided layers and versatility for teaching and improved teachers' motivation. The burden of administrative work has eased when such tasks have been moved to digital environments.

Digital devices have facilitated teaching, especially by illustrating the content and differentiating learning. The reorganisation of teaching spaces has brought diversity to teaching and facilitated the use of different teaching methods and practices.

Teachers' digital skills, as measured by the skills test, failed to improve by any noticeable degree during the project. However, the results of the self-

assessment surveys showed positive development. An examination of the full dataset shows that teachers' skills had clearly improved between 2017 and 2018. Among the youngest and oldest teachers in particular, the number of those who had experienced a lack of competence had clearly fallen, also when comparing the last two years with each other. The results indicate that teachers can improve their digital competence by actively using digital services, in particular by producing digital content, playing digital games and accessing diverse forms of digital entertainment.

In the interviews, the key factors thought to improve the skills levels included teacher's personal interest in digital matters, manager's supportive attitude, digital tutor activities, continuing professional education and experience of the benefits of digital transformation for teaching and learning, shared by everyone at the school.

There was some indication that students' skills levels had declined during the project. The factors that were identified to have improved skills included the use of digital tools in searching for information and in producing digital content. In order to improve their skills, students would need diverse user experiences.

Both teachers and students continue to have limited programming skills, and there is a lack of standardised practices for teaching programming, even though the new national core curriculum was introduced nearly four years ago.

In developing comprehensive school education, the emphasis on digitalisation has not been, and should not be, an end in itself. The real aim is to increase diversity in learning by introducing new opportunities alongside more traditional learning methods, and to provide all students with the basic digital skills in accordance with the core curriculum.

## GOOD DIGITALISATION PRACTICES AT SCHOOLS - FINDINGS BASED ON QUALITATIVE DATA

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Common online environments helped teachers and the entire school community to share tasks and information. Respondents felt that openness and a sense of community were important in the school's organisational culture.

Tutor teachers and lead teams helped teachers to put into practice their ideas for digital working methods. Compared with targeted continuing education, respondents thought that sharing digital skills within a school or municipality was a more useful way of promoting the take-up of digital resources. Participation in continuing education was easier if the education provider's all available courses could be found in one place.

Students acted as digital agents or mentors to other pupils and also to teachers. Students said they enjoyed peer teaching and learning in digital matters.

Open common spaces and resources were available to students also during lessons. Flexible access to digital resources supported diverse learning methods even when there was limited equipment available at school.

Various forms of joint teaching (joint planning, sharing of subjects or simultaneous teaching) enhanced students' diverse learning experiences, also with regard to digital skills.

Skills levels or learning paths defined for teachers and students harmonised teaching practices and contents and ensured that students were learning equal digital skills.



## OBSTACLES TO DIGITALISATION AT SCHOOLS - FINDINGS BASED ON QUALITATIVE DATA

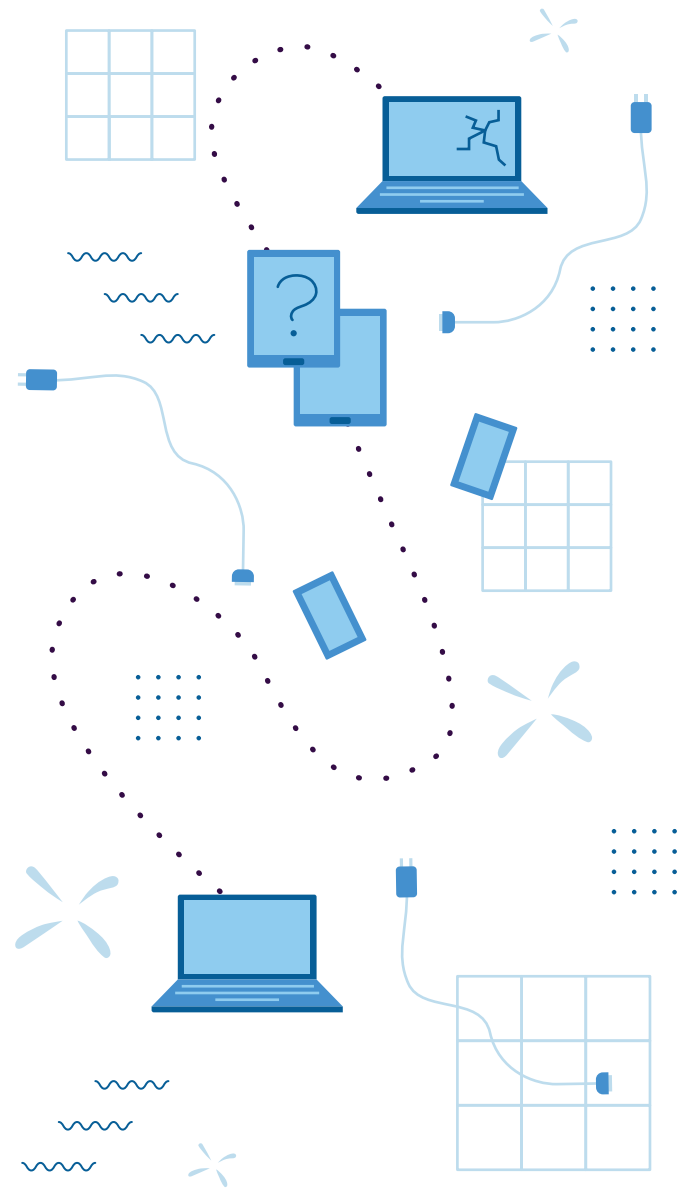
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The school's own development efforts were hampered by poor standards of cooperation between the municipal information management systems and the school, for example in the procurement, maintenance and servicing of equipment.

Lack of personal equipment available to teachers and lack of one-to-one equipment available to students prevented the use of digital teaching and learning methods, impeding the learning of diverse digital skills.

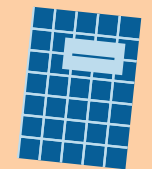
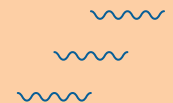
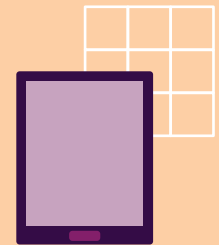
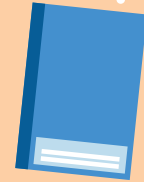
Insufficient national guidelines - especially concerning the objectives for comprehensive learning and the teaching of programming - were seen as a challenge at schools. Uniform guidelines and content would make it easier to achieve the objectives set out in the curriculum.

Some teachers' reluctance to experiment with new ideas exacerbated the unequal status of students in terms of accumulating digital competence. The uncertainty people felt about their own skills and their resistance to change also hindered the introduction and development of new practices at schools.



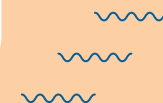
## RECOMMENDATIONS FOR MEASURES

- » The national core curriculum should define the ICT competence levels for students, for example by setting out the minimum levels by year group.
- » National guidelines should be drawn up to enable schools to achieve the core curriculum's objectives for comprehensive skills and competence.
- » In teaching programming, content should be specified and the parties responsible for the teaching should be clarified.
- » Reintroducing basic ICT as a specific subject area should be considered in the next core curriculum. If it no longer seems appropriate to teach ICT as a subject in primary and lower secondary education, some kind of intensive courses, for example at the start of lower secondary school (years 7–9), should be generally adopted with national guidance.
- » A national definition for teachers' ICT skills levels should be introduced in order to ensure that students are provided with equal opportunities to function in future societies.



## RECOMMENDATIONS FOR MEASURES

- » The tutor teacher system should be made a permanent practice and included in the planning of lesson hours and in the Budget.
- » Principals should continue to support teachers' skills by encouraging them to attend continuing education and by ensuring that they have genuine opportunities to do so.
- » All students should be provided with a personal device, and schools should also have a range of shared devices and other digital resources enabling the learning of diverse digital skills.
- » Importantly, teachers should also be provided with a personal device, enabling them to try out and put into practice the skills learned in continuing education, which otherwise would be difficult to achieve.
- » Students', teachers' and principals' ICT skills should be monitored regularly and systematically. Access to tests to measure competence should be offered to schools by a national body, for example the Finnish National Agency for Education or the Finnish Education Evaluation Centre.



## Research data

New data for the Comprehensive Schools in the Digital Age II was collected in early 2019 from a representative sample of municipalities formed by the Finnish Education Evaluation Centre. Reference data comprised equivalent sample data collected from different municipalities in 2017 and 2018.

Interview data was collected from 10 comprehensive schools in different parts of Finland. In all schools, interviews were conducted separately with principals, and with teachers and students in their respective groups.

### Self-assessment questionnaires:

In 2017–2019, 6,409 teachers responded to Opeka (2017 N=1579, 2018 N=2698, 2019 N=2132)

460 principals and school managers responded to Ropeka (2017 N=164, 2018 N=165, 2019 N=131)

16,568 students responded to Oppika (Year 2 N=5075, Year 5 N=5683 and Year 8 N=5810)

### ICT skills test:

In 2017–2019, 5,065 teachers took the test (2017 N = 3594, 2018 N = 1151, and of them N = 720, 2019 N = 1040 had taken the test in the previous year). In 2017–2019, 9,318 students in year 9 took the test (2017 N = 5455, 2018 N = 2297, 2019 N = 1566)

Opeka  
Oppika  
Ropeka  
ICT skills test

**opeka.fi**  
**oppika.fi**  
**ropeka.fi**  
**rosa.utu.fi/taitotesti**

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