On the threshold of digitalization: Towards the high school of the future
Contents

From the Authors  7
Introduction  8
Digital revolution to accelerate Finland's success  8
Digital – from vision to practice  8
Digitalization is not yet sufficiently utilized in schools  11
SWOT of digital learning  11
Making the most of digitalization  14
Through management: principals to drive the change  14
A clear strategic view is required amidst changes  17
Resolve to manage changes  17
An open operating culture is receptive to change  18
An empowering management model energizes renewal  18
Objectives: an enthusiastic principal engages in change  18
Competence through skilling: teachers to learn through work  20
Teachers to guide learning and engage students  20
Digitalization challenges the teacher to learn continuously  21
Supporting teachers’ information and communication technology skills  22
Colleagues as ICT instructors  22
Stimuli for continuous learning  22
Objectives: teachers develop and evolve systematically  24
Through practice: digital content and learning environments for learning  27
Focus on user experience  27
Electronic study materials are still tied to convention  27
Unutilized resources – applications and virtual learning environments  29
High expectations for the national education cloud service  29
Objectives: real-time study materials and learning environments engage students  29
Through functionality: infrastructure is a basic precondition for digitalization  30
From conventional classrooms to versatile learning environments  30
Alternative hardware solutions  33
Objective: reliable infrastructure is always available to everyone  34
Towards the ideal state of digital learning  36
Model: five steps to a digital high school  36
Future visions for the digitalization of high schools  40
Summary  43
References  44
Interviews  46
From the authors

On the threshold of digitalization: Towards the high school of the future was written as part of the cooperation between Accenture and the City of Helsinki Education Department, in which Helsinki high school students are introduced to entrepreneurial mindset and work life skills. The cooperation is part of Accenture’s 25th anniversary and corporate citizenship activities in Finland. In addition to the “Work life skills and entrepreneurial mindset” study materials produced in 2014, Accenture wants to share its insights into the opportunities digitalization creates for Finnish high schools.

New digital study materials and learning environments offer a variety of new ways of learning to students and teachers alike. However, effective implementation of digitalization in high schools requires that the entire operating environment from the school buildings to the high school staff support the development.

In our view, the important elements supporting the digitalization of high schools include leadership, development of competence, learning to take advantage of digital content and learning environments, and the available infrastructure. We will outline an ideal state of digital learning and the preconditions for achieving this by looking closer at these elements in the On the threshold of digitalization: Towards the future high school report.

Digital skills are part of every citizen’s skills, required for functioning in society and succeeding in work. Therefore, it is necessary to adopt digitalization as a natural part of learning and teaching. Our vision is a high school of the future where digital tools and materials are used by both students and teachers. In addition, customizable study content allows teaching to better meet the diverse needs of individuals. The development of the management and teaching practices of schools utilizes models proven in other sectors, and connections with working life are active. In the high school of the future, all parties acknowledge the benefits of digitalization and have harnessed them.

We hope that our report will succeed in giving rise to discussion on the opportunities offered by digitalization and the changes required by it, thereby contributing to the efforts of the City of Helsinki Education Department to develop the school of the future.

We would like to thank everyone who has contributed to preparing the On the threshold of digitalization: Towards the high school of the future report – teachers, students, principals, the staff at the Department of Education, and our colleagues at Accenture and Fjord. Without all of the time contributed by you to discussions, interviews, and workshops, this report would not have been possible.

Helsinki, September 24, 2014

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**Digital learning**

Digital learning (often also referred to as digital pedagogy) refers to the use of digital applications, tools, and study materials in teaching and learning.¹

**Digitalization**

Digitalization is a (business) model based on the extension and support of electronic channels, content, functions, and their use at the unit as well as organizational levels.²

**Participatory teaching**

Participatory teaching (also known as participatory pedagogy) provides learners with the opportunity to participate in decision-making and activities. The learners are heard, respected, and given responsibility. It is also important to prevent the emergence of mutual hierarchical power relationships.³

**School of the Future**

The school of the future is not a building; it is a pedagogic culture of learning that plays an active part in the evolution and development of our information society. In the school of the future, information technology is utilized as a part of teaching, learning, and operation of the school in terms of pedagogy and operations.⁴

**Empowerment**

Empowerment makes employees feel that their views are listened to and appreciated, they are trusted, and they are given

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**Introduction**

We began to shape our view of the opportunities offered by digitalization to high school students by first defining the core question that we aim to answer in this report. Following discussions and analysis, we crystallized it into the following form: What opportunities does digitalization offer high schools? We also defined the key elements for which growth in digitalization sets specific requirements (see figure below).

**Framework used in the analysis**

<table>
<thead>
<tr>
<th>What opportunities does digitalization offer high schools?</th>
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<tr>
<td>- Operating methods?</td>
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<tr>
<td>- Structures and processes?</td>
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<td>- Learning environments?</td>
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<td>- Technology?</td>
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**Management:** Principal’s role and responsibility, other roles and responsibilities related to management

**Organization of teaching:** Teacher’s role and responsibility, students’ roles and responsibilities

**Competence development:** Hardware, software, learning environments, new teaching methods, utilizing digitality in teaching

**Physical premises for learning and teaching:** Adaptability, teachers’ needs, students’ needs

**Virtual premises for learning and teaching:** Adaptability, teachers’ needs, students’ needs

**Premises for purposes other than learning and teaching:** Teachers’ work premises

**Hardware:** Terminal devices, software, utilization rate, guidance in deployment, and IT support

**Infrastructure:** Architecture, systems, learning environments

**Study content:** Electronic study materials, material available freely on the web, search engines, etc.

These definitions have acted as starting points for our deliberations and discussions with various parties. We interviewed a total of twelve principals and teachers at Helsinki high schools in November 2013. In addition, we held discussions with a total of eight Accenture professionals from different areas in May 2014. Digitalization was discussed from the point of view of education with both groups. In addition to the interviews, our insights are based on numerous discussions with representatives of the Education Department, our experiences from piloting the “Work life skills and entrepreneurial mindset” study materials in three Helsinki high schools in spring 2014, and workshops with principals, teachers and students. Furthermore, we have extensively reviewed recent research and studies related to the digitalization of schools.

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¹ Finnish Online University of Applied Sciences 2007.
² Gartner IT Glossary 2014; Businessdictionary.com 2014.
³ Kumpulainen et al. 2010.
⁴ Silander 2013; Tulevaisuuden koulu on täällä tänään 2013.
⁵ Viinisalo 2006.
Perhaps surprisingly, the report discovered that the traditional sectors, such as engineering workshops, forest industry, and construction industry, already consider digitalization an important precondition for success. On the other hand, extensive changes are only now expected to begin in sectors that have been within the scope of digitalization, such as banking and telecommunication. The City of Helsinki Education Department is also aiming to utilize digitalization in developing secondary-level virtual teaching, Stadin eKampus, which will offer high school students and vocational students new flexible studying alternatives.

The four largest global digital technology trends and significant factors in the digital revolution can be abbreviated as SMAC – Social media, Mobile technology, Analytics, and Cloud. In the Finnish organizations that took part in the survey, mobile technology was the most extensively adopted technology trend, and its impacts can already be seen in several companies, while analytics is only making its breakthrough. The greatest challenges are often financial constraints, decentralized and unclear ownership of digital, as well as the lack of skills required. In the middle of the digital revolution, it is essential to remember that digital is a good slave but a poor master. In schools, the opportunities provided by digitalization should be considered first from the perspective of pedagogy and then technology. Based on our experience, quick testing of ideas based on a clear digital vision, and the subsequent successes or failures, have turned out to be the best implementation method for promoting digital innovations.

Digitalization – from vision to practice
Surviving the digital revolution requires organizations to have a strong vision about how digitalization affects their organizations and operations. Implementing digital operating models in practice is challenging. The greatest challenges are often financial constraints, decentralized and unclear ownership of digital, as well as the lack of skills required. In the middle of the digital revolution, it is essential to remember that digital is a good slave but a poor master. In schools, the opportunities provided by digitalization should be considered first from the perspective of pedagogy and then technology. Based on our experience, quick testing of ideas based on a clear digital vision, and the subsequent successes or failures, have turned out to be the best implementation method for promoting digital innovations.

Extensive utilization of digital is a demanding process, but the preconditions for it are good in Finland. According to the Digibarometri 2014 survey published in early 2014, Finland ranked first among 22 countries for preconditions for utilizing digital, but only seventh in the use of digital services and environments. With regard to the public sector, Finland was second in the preconditions for digital and eighth in their utilization. The public sector has lacked a shared view of the principles and implementation of digital for a long time, but the strategic intent is clear nevertheless. Riku Jylhänkangas, Director of the Strategic Governance unit at the Ministry of Finance of Finland, states: “We must create an information-related national infrastructure in Finland in the same way as we have a physical road network.” Timo Valli, ICT Director at the Ministry of Finance, and the ICT2015 working group headed by Pekka Ala-Pietilä, have presented similar views. The authors of the Digibarometri 2014 report consider the imbalance between the preconditions for digitalization and the utilization of digital services a significant threat to the future of Finland.

The digital revolution among Finnish companies and organizations is already progressing at full speed. The only way to survive the revolution and harness the opportunities provided by digitalization is to create a powerful vision of the importance of digitalization in the operations of one’s own company or organization and to effectively deploy this vision in practice. In the following chapters, we take a closer look at what high schools should take into account in forming their own view and what is their starting point in the digital evolution.

8. DIGILE 2014.
Some impulse is missing which is why high schools have not got off to a quick start in their digitalization.

High school principal

There is an imbalance between the preconditions for using technologies and their use in schools as well. According to the latest national and international surveys, educational use of information and communications technology (ICT) is low in Finland, especially considering the relatively good state of the corresponding infrastructure. In addition, Finland has been found to trail behind many other countries in digital learning.  

The final report of the Ministry of Education and Culture’s preparation group for information society development in education published in 2010 suggested that one problem is the strong investment in hardware and network connections in Finland, while pedagogy and the operational culture of schools have not changed much. Similar conclusions were also reached in the Government report published in 2011. Its finding was that new pedagogic operational models and methods were still largely unutilized in education. The recent Europe-wide ESSIE survey also supports the view of Finland trailing far behind Europe’s top countries in the utilization of ICT in high schools.

SWOT of digital learning

The current state and opportunities of digital learning were surveyed extensively in the SWOT analysis of the current state of digital learning by the University of Turku’s Research Unit for the Sociology of Education (RUSE) published in spring 2014, which is included in the final report of the Finnish National Board of Education’s educational cloud unit. The analysis considered the high general degree of technology, relatively good existing infrastructure, activeness of homes in using information technology, and reasonable technological equipment in schools as the strengths of the current state of digital learning in Finland.

According to the analysis, a strength that has been underutilized is the active leisure-time use of technology by children and adolescents and the resulting accumulating skills. This strength also emerged in the Finland Skills Gap Survey carried out by Accenture. In the Skills Gap Survey, 73% of high school-aged girls and 66% of boys considered that they had good digital and technological skills. In general, students were future-oriented in their estimates of their work-life skills. They considered team work skills, creativity, and problem-solving to be the most important skills needed in working life in the next five years.

Weaknesses identified in the SWOT analysis included the fragmentation of operating methods and the use of technologies, lack of joint objectives of the educational organization with regard to the adoption and utilization of technology, teachers’ culture of doing things alone, low pedagogic utilization of technology, underestimation of the benefits of technology, and existing electronic study materials focusing almost exclusively on presenting individual facts.

According to RUSE’s analysis, opportunities provided by digital learning...
and pedagogy include the opportunities provided by personalizing technologies to students of varying skill levels with materials suitable to themselves, development of new forms of literacy, development of information searching and information assessment skills needed in the information society, and enabling the activeness of learners. Other opportunities mentioned include the utilization of learner-oriented technology, utilization of digital learning materials that develop computing skills and learning activity in phenomenon- and problem-based learning, and highlighting the expert role of teachers.

In addition to the above, Accenture’s interviews revealed other opportunities provided by digitalization, such as the possibility of engaging teachers and students in the development of teaching, cost-savings, and teachers’ increased opportunities for focusing on individual guiding of learning.

RUSE’s SWOT analysis\(^\text{18}\) indicated that threats include deep negative attitudes and fear towards technology, which result in resistance to change, one-sided development of electronic content based on hardware limitations, and the digital gap deepening into a competence gap.

In the light of the surveys, Finland is not among the spearhead countries in implementing digital in teaching, but there are possibilities for development. However, digitalization will not progress without a strong impulse in the right direction. In the following chapter, we will take a closer look at four elements on which we consider the digitalization of Finnish high schools and the new age of learning could be based: **leadership**, **competence development**, **making use of digital content and learning environments in learning**, and **infrastructure**.
Reaping the benefits of digitalization
Through management: Principals to drive the change

Digitalization can provide new methods for actual learning and, above all, motivation to study, but this will hardly result in a major revolution in schools as such. The impacts of digitalization on job descriptions will be a more important catalyst for change. According to the Research Institute of the Finnish Economy's survey, one in three jobs will disappear in Finland within 20 years. According to a report published by the University of Oxford, up to almost one half of jobs can be replaced by robots and artificial intelligence in the United States within the next 20 years. The change in job descriptions will therefore be a radical one, and it will also impact the basic function of high schools: the education given in high schools must reflect the surrounding society and the skills required from future employees.

Graduating from high school does not provide qualifications for a specific job; the primary aim of high schools is to guarantee students extensive general knowledge to secure their opportunities for all further studies. However, high school students also aim to prepare for working life through further studies. The transformation in working life caused by digitalization does indeed shake up the basic function of high schools and presents them with a difficult challenge: how to educated students for an unknown future and to use tools and methods which are yet to be invented.

In this transformation, management, and change management in particular, take an increasingly important role. One must reconsider the type of work we are training young people for, the kinds of skills employees must have in the future, and what all this requires from management.

A clear strategic view is required amidst changes

High schools, too, must create a strong view of the significance of digitalization for its operations and effectively implement it. It is the primary task of managers to ensure that the high school's pedagogic vision of the future school is up to date, and corresponds to the social changes caused by the transformation. National and municipal curricula and the Finnish National Board of Education's guidelines guide development in the use of information and communications technologies in education at high schools and related strategies and plans. Major structures need to be changed so that high schools can focus on teaching the skills needed in the future. However, in this report, we focus on changes that can be implemented at the individual school level instead of discussing major structural guidelines.

According to a recent Finnish study, principals have played a key role in digitalization in those Finnish primary schools that have successfully adopted information technology as part of everyday activities. It is also our view that principals play a key role in enabling digital development in schools. Instead of traditional administrative and financial, education and people management expertise, the role of the principal in

The change has to be done very delicately, it is so closely connected to each person's preferences. Being a teacher in Finland is based on teaching being independent work and everyone being an expert in their own field. Pedagogic freedom is central, and therefore a strict model will not work. Probing and listening, offering information, giving everyone space to do their work within certain boundaries.

Principal, high school
digitalization is to clarify the strategic direction of the school.

In practice, the pedagogic vision of the future school should be visible at the high school level as a clear high school education information and communications technology (ICT) strategy in which the focal points of development and concrete objectives of the use of ICT in education have been specified. High schools do not need to prepare a separate digital strategy, but the digital point of view should be incorporated into the general ICT strategy. From the point of view of developing and implementing the ICT strategy, it is of paramount importance that principals engage teachers and students in working on the school’s ICT strategy.

Resolve to manage changes
The principal plays a particularly important role in school-level planning and prioritization of objectives and development needs, as implementing too many changes at the same time is very challenging. Compiling the objectives into clear change programs or projects makes it easier to implement them. These change programs or projects should have clearly defined objectives, resources and schedules, as well as indicators for monitoring them.

Once the objectives of change are clear and unambiguous, it is the principal’s role as the change manager to get each teacher to understand why a specific objective is important and what their role is in implementing the change. It is the principal’s task to ensure that everyone gets sufficient information about the changes, tools for implementing them, possible further training in the topic and, above all, encouragement. According to the ESSIE survey\(^2\), almost one half (47\%) of Finnish high school students study in schools where some kind of change program had been implemented during the last three years.

Change management is often a major challenge also for businesses in adopting new technologies and operating methods, as illustrated by the figure above. If the points of view of the different stakeholders are not systematically taken into consideration in adopting new technologies, the desired benefits are also often left unattained. Any resistance to change should be dissolved through benefits and engagement, so that the stakeholders (in schools, teachers and students) understand the benefits of the change to them. In implementing the change, continuous communications on the progress of the change, sharing successes, and developing the required competence, are also essential.

An open operating culture is receptive to change
The organization’s open culture of sharing, developing, and creating things together is one of the fundamental prerequisites for successful change. In the digital transformation of high schools, the principal’s active and long-term participation in building an open and ICT-positive operational culture is crucial. According to a Finnish study published in 2014\(^2\), most teachers had adopted a communal working culture in schools that successfully utilize ICT. In addition, this had attracted teachers who wanted to develop ICT as a part of teaching and learning to these schools. In these schools, the teachers and the principal joined their forces and worked together. The teachers visited each other’s classrooms and got ideas for developing their teaching methods.

Reasons for the failure of technology projects

5% of technology projects fail due to reasons related to technology

50% of technology projects fail due to the organization, culture, and people

Source: Jim Markowsky, Organization Dynamics, 1995

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22. European Schoolnet & University of Liège 2013.
23. European Schoolnet & University of Liège 2013.
Systematic investment in open and ICT-positive operating culture has also been implemented at Turun normaalikoulu, where the teaching structures have been renewed through, for example, engaging meetings, high school students’ ICT digitutors, ICT afternoons, on-site support by peer tutors and reflection forms (how do I use ICT). In spite of the extensive development work, the change in the operational culture has not been easy at Turun normaalikoulu. A change in operational culture is a slow process in any organization, and it requires patience from all of the parties to reach the desired results.

An empowering management model empowers renewal

One way of developing the operational culture is to empower both teachers and students to utilize information technology. Studies indicate that empowering management at schools increases the use of technology and its integration into teaching. A “People first” attitude yields better results in a digital environment than “setting the pace”. Encouraging self-steering and engagement are important. For example, the decision on the application used for a specific exercise can be given to the students instead of the teacher deciding on it. When power is shifted to students, their self-regulation skills develop. For some students, the liberty of browsing Facebook in class, for example, may impair the learning result. On the other hand, the importance of self-regulation skills has also increased in work life, and therefore developing them also as part of high school education is useful.

The attached empowering management model has been defined on the basis of Accenture’s own coaching model. The empowering management model crystallizes issues that we deem particularly important in the work of principals to allow the implementation of the opportunities provided by digitalization.

Objective: An enthusiastic principal engages in change

Ideally, the principal engages all teachers and students to first try and later implement digitalization as a supporter and motivator to learning. In order to achieve this, the principal needs to ensure that:

- The school’s ICT strategy has been defined, it is clear and all teachers understand what it means for their own work
- Changes are led in a systematic way, taking all stakeholders into account
- The principal supports an open and ICT-positive operating culture by way of example
- The principal achieves a spiral of positive and proactive development through an empowering management style.

27. Franciosi 2012.
Reaping the benefits of digitalization

**Competence through skilling: Teachers to learn through work**

The digital revolution requires changes in both principals' and teachers’ attitudes and ways of working. The uncertainty brought about by the transformation may feel scary. However, after the initial reaction, principals and teachers must begin to look for new ways of working which harness the opportunities offered by digitalization, enriching and making work easier.

**Teachers to guide learning and engage students**

The meaning of the idiom “information is power” becomes weaker in a digitalizing world, with information increasingly available to everyone. The traditional role of the teacher is transforming as the ability to find, critically evaluate, interpret, and apply information is becoming increasingly important in students’ learning. However, besides sharing information, students increasingly need guidance in information processing and analysis skills. Students need these skills to succeed in their studies after high school, which include hands-on learning, teamwork, project work, and, of course, eventually in working life. Thus, teachers also need to be able to teach these skills to students.

The world is changing at such a rapid rate that we cannot foresee all the information that will need to be managed in the future. Actually, one of the Accenture professionals interviewed said: “The task of schools should be to refine abilities with which people can solve future problems that are not yet known, with tools that are not yet known.” In fact, the role of teachers will be increasingly to guide students towards finding the right tools, channels and ways of finding information and functioning in working life instead of distributing readymade packages of information.

**Digital services and methods are tools, not values in themselves**

Teachers who master a subject are becoming learning instructors. It is a slightly similar trend as in the world of business for an employee advancing from a specialist position to supervisory tasks. It is impossible – and unnecessary – for the employee to master all subject matter; the focus of activities shifts from managing subject matter to managing people, processes, and development measures.

**Engaging students in teaching**

For teachers, the change in role means temporarily leaving their comfort zone and sense of being in control when they practice the new operating methods. Some may consider the change heavy when the old operating models no longer work and the new ones seem more laborious than the old ones. How, for example, you can one make sure that students learn the digital skills that are important for them if one is only teaching them yourself? However, in the same way as supervisors do not know everything that their subordinates know in the business world, a teacher does not need to be a superior champion of digital learning practices to achieve good learning results.

The idea of engaging employees – or in this case students – plays the key role in change. When students can participate in planning and carrying out teaching, they also more readily commit to the teaching and achieve better learning results. If the teacher becomes frustrated, for example, by how much time evaluating new teaching methods takes up instead of correcting a conventional exam, peer review is a worthy option. The opponent practice used in universities can be utilized for evaluating diverse teamwork projects and exercises, with students evaluating each other’s work. This means students also need to take more responsibility for their own learning, and perhaps also ultimately learn in more depth.

In empowering teaching, the roles of the teacher and student can be temporarily reversed at times, and the student can teach the teacher. This means the teacher can save time, but also gain useful insight into new social media services as facilitators of knowledge. If the teacher does not have an answer to a question, it is often enough that the teacher asks the students – this means the teacher assigns the students the task of finding out the answer. Instead of the teacher thinking alone or with colleagues about “how could digital be used in teaching” they can directly ask the students – this can also increase students’ sense of their own possibilities to influence and thereby their motivation to study. The same empowering management that is expected of principals towards teachers can also be implemented by teachers with their own “subordinates”, i.e. students. For example, a discussion between the teacher and students can be held at the beginning of a new course, providing the students with an opportunity to influence the focus of the course content and the teaching methods used.

**Digitalization challenges the teacher to learn continuously**

Naturally, the benefits of digitalization also play an essential role in the change of the teacher’s role; they must be sufficiently obvious to contribute to encouraging the change. Instead of teachers experiencing new equipment and methods as difficult and time-consuming, they must provide teachers with obvious added value and make their work easier. “We cannot expect every high school teacher to become a ‘digital lecturer’, the environments must be so easy to use and functional that a large mass of teachers adopt them,” one of the interviewed Accenture professionals said. This also results in a sense of success and joy of learning among teachers.
Personal experience and perceived benefits are the best drivers of change. It must be possible to package cloud services, for example, in a way that teachers can efficiently use their time in guiding the student, not on technology. This means teachers also get more time to build learning entities in new ways and better acknowledge the diverse needs and skills of students.

Remote tools, on the other hand, liberate teachers from location-related constraints, which, for example, make it hard to hold meetings with colleagues despite the different schedules of the teachers. The teachers or other staff members (school counselors, for example) need not be always physically present at the school to be able to offer guidance to students. Correspondingly, remote tools facilitate contacts even outside Finland and provide new opportunities for building national and international cooperation. Contentwise, teachers and students can utilize open lectures (e.g., open courses held by top foreign educational institutions and video lectures, Massive Open Online Courses, Ted talks, etc.).

Supporting teachers’ information and communications technology skills

According to the Europe-wide ESSIE study, Finnish teachers considered pedagogic reasons to be the greatest obstacle to the use of information technology in teaching, while the shortage of devices was less frequently quoted than others. This view is supported by Finnish students’ experience of the benefits of information technology in education being lower than that of students in other European countries, even though they trust in their personal information technology skills. In light of these results, the focus of teachers’ ICT training should shift increasingly from content and devices to their pedagogic use.

Changing the teacher’s role to meet future requirements requires that the teachers themselves have an active grip and ability to update their skills during their work career. With accelerating digital evolution, participation in externally planned complementary training only is no longer sufficient. The ESSIE study reviewed teachers’ participation in ICT training. In Finland, complementary ICT training has been offered within OPE.fi training, for example, in recent decades. Training has been offered to teachers at three skill levels with the aim of all teachers having at least basic ICT skills, including the skill of using basic software and knowledge of the basics of the use of ICT in education. Based on the ESSIE study, Finnish teachers have little mandatory training compared to their European colleagues, and their training courses are shorter than those offered in other countries. Finnish teachers are not particularly enthusiastic about using their own time to develop ICT skills, either. In Estonia, for instance, 91% of high school students were taught by a teacher who had self-studied ICT during leisure hours, while in Finland the corresponding figure was 48%. On the other hand, in Finland almost all high school students were taught by a teacher who had participated in an ICT-related training course during the last two years. Increasing adoption of electronic study materials and learning environments and, in particular, electronic matriculation examinations, have been estimated to result in increasing training needs in almost all municipalities. Another approach to teachers’ ICT training can be found in South Korea, where training is clearly tied to the national program and it is guided in a centralized manner.

Colleagues as ICT instructors

Conventional classroom training is not always the best possible option for learning digital skills and achieving change; the teachers’ own school community has tremendous potential for supporting the implementation of digital change. According to the above-mentioned ESSIE study, ICT training arranged by the school’s own staff has been a particularly popular training method among Finnish teachers. One’s own colleagues are easily available, in addition to which their support is important in creating an encouraging atmosphere and adopting new operating models. As the head of the school, the principal also plays a significant role in the opportunities for participation and development of competence available to the teachers in their environment.

Our discussions with teachers and principals support this view. Several interviewees brought up the importance of communal sharing of information in the discussions. Diverse working groups have been established to support the digitalization and pedagogic development of schools, and best practices can be shared and emerging challenges discussed in them. Since there can even be major differences between the skills of teachers, the school’s own forums are very valuable, as top teachers can share their competence in them and thereby engage others in the development. Schools’ joint projects, such as Stadin eKampus, also play a significant role in digitalization development, as they offer schools shared readymade operational models and proposals for their future challenges.

From the point of view of maintaining their own professional value, teachers are not only responsible for their own development, but also have the right to be supported in their development by their community. In Accenture’s view, schools should have their own pedagogic visions for the competencies that particularly require development, for instance, and plans and follow-up methods for promoting this development. An annual development plan aligned with this vision should be prepared for each teacher, within which teachers can combine their needs and wishes for various ways of competence development.

Stimuli for continuous learning

Through the digitalization of high schools, the teacher’s roles as an instructor and

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29. European Schoolnet & University of Liège 2013.
30. European Schoolnet & University of Liège 2013.
31. European Schoolnet & University of Liège 2013.
32. Ope.fi s.a.; Ope.web 2008.
33. European Schoolnet & University of Liège 2013.
35. European Schoolnet & University of Liège 2013.
36. European Schoolnet & University of Liège 2013.

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coach as well as his development tasks are emphasized rather than the role of a lecturer sharing information. In order to achieve all of the benefits offered by the opportunities of digitalization, a sufficiently high share of teachers must be actively committed to changing their role.

Some of the information taught becomes obsolete faster than the current curricula and content can foresee, so the teacher’s role as an active processor of information will increase further. This sets new requirements for the teacher’s time management. It may be necessary to open discussion on whether the current hour-based salary system supports the change in the teacher’s role. The possibility of utilizing monetary incentives, which are typical in the world of business, as the requirements of the teacher’s role changes, should also be investigated.

Migrating to an annual working time, with the possibility of incorporating the development of personal competence into the salary solution, could be an option. At the same time, this facilitates more accurate monitoring of all the things on which teachers’ working hours are actually spent (teaching, instruction, studying new methods, distribution of information, participation in training and development projects, etc.), and some teachers could profile themselves increasingly clearly as “development teachers.” Also non-monetary rewarding of teachers could be considered to support the change. In Estonia, for example, teachers are rewarded for the use of ICT through devices, training hours, and various competitions, for example.37

In general, the development of competence should be seen as a more extensively than merely participating in training. Suitable elements of the teacher’s personal development plan include, in addition to conventional classroom training,
- virtual training
- self-study
- planned hands-on learning and embracing new areas of responsibility
- mentoring
- leading or participating in development teams
- unofficial discussions with colleagues
- observing colleagues’ lessons
- giving feedback on other teachers’ teaching and requesting feedback on own teaching
- participation in networks outside the school
- systematic sharing of best practices
- making use of expert organizations and networks in one’s own field.

When such low-threshold factors close to the teachers are utilized in developing the competence of the teachers themselves, the teacher develops a “learning chain,” which offers several opportunities for developing competence and receiving help when needed, without having to wait for specific training. According to Accenture’s study 38, learning is most efficient when learning at work instead of classroom training. This approach also offers other benefits, as it is continuous, readily available, affordable, and rewarding for the learner.

The change required by digital and pedagogic development is very difficult to implement if sufficient resources are not allocated to teachers’ training and development activities.

As teachers adapt to their changing role and develop their digital competence, it is essential that they get the necessary support from their supervisors, i.e. principals (cf. the model of empowering management discussed above). In our opinion, ideally, the benefits of digitalization to teachers materialize in the following ways:
- The focus of teachers’ time is on guiding students and developing their own work instead of “pouring out information.” Teachers acknowledge that they do not need to know and master everything; the ability to engage students in their own learning is more important.
- Teachers have access to increasingly diverse and up-to-date content.
- All teachers keep their own skills up to date by utilizing the methods of hands-on learning diversely in addition to classroom training, as well as the internal information resources of their workplace, and they are given ideas and support for their own work by pioneer teachers.
- Competence development is systematic (e.g., setting of objectives), and arrangements related to rewarding and working hours encourage teachers to continuously update their skills.

37. European Schoolnet & University of Liège 2012.

Objective: Teachers develop and evolve systematically
Planning the learning process in a digital environment is a challenge to which one must become accustomed. Teachers can get frustrated with miscellaneous devices or devices not working. It is important that they learn to manage unexpected issues in teaching and tolerate uncertainty in the teaching situation.

Teacher, high school

Reaping the benefits of digitality

By using: Digital content and learning environments for learning

The digitalization needs of schools are pretty much the same as for businesses. Digitalization brings uncertainty to business as well, but its benefits have nevertheless been considered to be quite high – in particular, the increased flexibility with regard to working hours and physical location provides employees with a lot of freedom of choice in their work. In schools, ICT is used to pursue cost-savings in addition increased work flexibility. Students, teachers, and employees can benefit from digitalization in their everyday lives (school or work), for example, in communications, sharing materials and information, and self-study.

Instead of restricting, digital services must inspire and release the creativity of teachers

Focus on user experience

When learning and teaching are digitalized, it is important to be able to ensure that teachers’ pedagogic freedom and decision-making power in teaching remain. Even though schools will probably increasingly adopt virtual learning environments and platforms, they must support teachers’ freedom of choice and support best teaching and learning practices instead of chaining them to only act as specified by the digital platform.

The virtual learning environments and platforms must be easy to use and flexible to be able to support teachers in the change of the classroom and learning environment. Different teachers may use several different software products and applications, and it should be possible to combine them easily on the digital teaching platform used by the teacher according to personal preferences. In addition, it should be possible to easily customize the platform according to the teacher’s needs. According to the Finnish National Board of Education’s final report on cloud services, virtual learning environments are already available in schools, but the skills to make use of them don’t exist. Exercises are still tied to traditional textbooks, and the use of information and communications technology is integrated with teaching and learning the core content of the subject being taught. We also made similar observations in our discussions with high school principals and teachers. In fact, in our opinion, this is one of the key challenges to which a solution must be found in the digitalization of schools.

Electronic study materials are still tied to convention

The use of electronic study materials has been limited in schools until now. Based on our interviews with teachers and principals, the main reason for this is that the digitalization of materials is not currently considered to offer added value. Many existing electronic study materials are merely textbooks in electronic format. Electronic study materials would need to have more functionalities and properties to activate students, such as different kinds of exercises, more extensive and diverse materials, the possibility to conduct tests and exams, real-time updating of information, and for example, links between study materials and articles on news sites.

During the spring semester, the Helsinki School of Natural Sciences experimented with studying English completely without textbooks utilizing various kinds of electronic materials, videos, Facebook, google Sites and blogs. Thanks to the new approach, the students also learned ICT and work life skills in addition to English.

In an ideal situation, digitalized material supports different learning styles and the student’s own areas of interest better than conventional printed study materials. Rich content supports diverse learning styles better, as content can be assimilated not only by reading but also by listening to it, looking at it, and...
**Actors:** Accenture and City of Helsinki Education Department’s Stadin eKampus

Krista Kindi-Sanjijävi taught a course in English at the Helsinki School of Natural Sciences (in spring 2014) completely without a textbook. The instructions for the lessons were available on the Google Sites service ([https://sites.google.com/site/mrskindtscourse3/course-schedule/class-8](https://sites.google.com/site/mrskindtscourse3/course-schedule/class-8)) and the students’ output in blogs. The entire course (EN3, Study and Work) was built around a story in which the student goes abroad to study and blogs about it. The Work-life Skills and Entrepreneurial Mindset videos (6 videos) were connected to the students’ lives, so identifying with the video content was easy. The themes of the videos were around a story in which the student goes abroad to study and blogs about it. The Work-life Skills and Entrepreneurial Mindset videos supported students’ active role in their own learning in the following ways:

- **Unutilized resources – applications and virtual learning environments**

  Considering the generally high level of technology in Finland, applications and virtual learning environments in teaching are currently underused. The use limited use applications in teaching is mostly due to the additional work to the teacher caused by preparing the lessons. Many teachers consider adopting a new application for the class a laborious process, as they first have to chart applications and software suitable for the actual task and then test the use of the application on different devices to ensure the application functions as desired and no extra time in class is spent on testing them.

- **High expectations for the national education cloud service**

  The planned national education cloud service should, according to the report on it, be user-friendly, include game-like, illustrative and communal elements, and function as a material bank, among other things. The aim is to develop the service on templates related to, for example, digital content, development of electronic desktops, interaction environments, and utilization of analytics. The cloud service project as a whole does in fact seem to answer the current needs for digital development, which have also emerged in the discussions had by Accenture. The cloud service will hopefully make it possible to realize several benefits associated with digitalization, such as student-oriented learning, working methods that support teamwork, teaching outside the classroom, and cooperation across subjects.

The greatest challenge for achieving the benefits of the cloud service project will certainly be in the transition – getting students’, teachers’, and principals’ commitment to the new way of working. This is a major project which requires solid insight and support for the change process requires, in addition to the technical implementation, in order for it to succeed. Since digitalization is continuously introducing new changes, this service, too, should be built and implemented as soon as possible so that it can be utilized before new innovations.

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**Objective:** Real-time study materials and learning environments engage students

Finnish schools are still at an early phase of development in utilizing digital content and learning environments. Ideally, digitalization supports students’ active role in their own learning in the following ways:

- The focus of study materials shifts from static textbooks to more extensive utilization of real-time (digital) information.
- The students play a bigger role in the choice of materials. Everyone has a common narrow basic level on top of which digital study materials and information sources can be assembled for example, certain materials can always be available to students on demand, in addition to which voting and rating of materials is possible.
- Digitalization supports different styles of learning and profiling content in a way that motivates the student.
Reaping the benefits of digitalization

Through functionality: Infrastructure is a basic precondition for digitalization

In order to use digital content and environments in learning, the "basic infrastructure" of high schools must also contribute to the digital development. In this context, infrastructure mainly refers to premises used for teaching (such as classrooms), devices used in teaching (computers and other ICT hardware), and network connections.

From conventional classrooms to versatile learning environments

Classrooms have not changed much in decades. Teachers’ desks have been lowered down from the pedestals and school desks have changed their shape over the years, but the tradition born in the 19th century still lives strong in classrooms. The teacher’s desk is still at the front of the classroom, and students’ school desks point towards the front wall. Information and learning are now everywhere: in smartphones, laptops, tablets; blogs, news sites, archives; on the desk, in the pocket and backpack. Despite this, students are still sitting facing a blackboard.

Conventional physical classroom teaching can be enriched with virtual learning environments. At its best, a versatile classroom combines the best of both worlds in a mutually complementing way. The physical classroom plays an important role in the modern learning environment as well, since it allows more detailed observation of students and monitoring their progress in a different way than a virtual classroom. Teamwork in a physical classroom develops interaction and social skills more extensively than a virtual discussion group.

Individual and independent learning increases with digital learning environments, but the need for communality and cooperation remains

Opportunities of a virtual classroom

A virtual classroom does away with the constraints of time and place. The student can use as much or little time on studying as he or she considers necessary. The virtual classroom also allows flexibility in the extent of the material being studied and the efficient utilization of premises. While some students find the materials included in the scope of the session sufficient, others may be interested in deepening their competence through self-studying online.

In the Danish Ørestad high school, for example, both solutions related to physical premises and utilization of ICT have been harnessed to support the school’s pedagogic vision. With

Even if teachers would want to use computers more, there are no resources. A major milestone driving digital learning would be the ability to take computers into use at any time and not having to book the computer classrooms in advance.

Teacher, high school

New ICT-enabled learning has yielded good results in Denmark

Actors: Ørestad high school

The pedagogic vision of the Ørestad high school is based on a modern view of the birth of information. Competence, capabilities, creativity and culture are at the center. Extensive utilization of ICT, which is essential to implementing the vision, offers students exceptionally broad autonomy with regard to when and where they work and how they demonstrate their learning. In the school, conventional classrooms are only used for efficiently distributing new information. Teamwork tasks are enabled by open-plan premises in which students lead their own learning and teachers act as mentors.

Special features of the trial: Even though nearly half of the students come from families with no history of further studies, they achieved results corresponding with the national average and are more likely to be able to continue their studies at university level than their peers. Learner-oriented methods and advanced use of ICT have made the school the most popular high school in Denmark.

ICT, students have become producers of information, and the entire school has simultaneously become a new and different, information-producing organization. Classrooms are only used for efficiently distributing information. Teamwork exercises in which students lead their own learning and teachers act as mentors are held on open-plan premises. Virtual learning environments facilitate studying independent of time and place, and shyer students have a chance to prove their competence without the pressure of the classroom environment.43

Low adaptability of classrooms
Currently, physical classrooms do not optimally support seamless cooperation between the virtual and physical classroom. Classrooms have tangible shortcomings, such as inefficient wireless networks and scarcity of power outlets. If teachers wish to utilize terminal devices in the physical classroom, they spend time either on booking a separate computer room or booking hardware, moving them, and preparing for the lesson. Modern learning environments are actually already getting rid of computer classrooms. A model is emerging in which every classroom is a computer classroom where the students bring their own devices.

Alternative hardware solutions
Based on our discussions with high school principals and teachers, almost all high school classrooms nowadays have a desktop computer and document camera, some also feature a SmartBoard. Schools also still have computer classrooms with desktop computers, and, in addition to these fixed terminals, a varying number of flexibly movable devices, such as laptops, mini laptops, tablets, and smartphones. Not all teachers have a personal laptop computer. Students are also encouraged to bring their own devices to the school, and this BYOD trend (Bring Your Own Device) is also expected to increase in the future.

Survey: Information and communications technology hardware in high schools (2013)
More detailed information on high schools’ data connections and volume of hardware stock in proportion to the number of students is available from the Association of Finnish Local and Regional Authorities’ recent survey44. According to the survey, high schools have an average of 1.88 laptop computers, 1.82 desktop computers, and 1.07 tablets per ten students. The number of SmartBoards is 0.34 and smartphones 0.15 devices per ten high school students. All high schools in Continental Finland have Internet access. The connections are mostly high-speed optic fiber connections. In almost all (96%) municipalities in Continental Finland, a wireless network has been built in high schools, and in some municipalities it is open for the students’ own devices, in others it is for the high school’s computers or devices used by the staff.

In high schools, both the use of personal devices and purchasing computers for use by students are relatively common. The students’ own devices are used in high schools in 61% of municipalities. More than one third of the municipalities that took part in the survey have purchased personal computers for students in high schools. Even though the use of one’s own devices is common in high schools, it is relatively rare that students are required to obtain a computer for their studies.45

Challenges of maintaining the hardware stock
The greatest challenge of the hardware stock in Finnish school is its going out-of-date. The hardware stock is not renewed at a sufficiently fast rate, which leads to the school’s hardware being almost always older than the students’ own devices. In the schools where we interviewed principals and teachers, the rotation period of individual devices is approximately five years.

It can also be questioned if the kind of availability of devices described above (e.g., 1.88 computers per ten students) is sufficient for teaching needs. In order for the “anywhere, anytime” principle of digitalization to be realized, a balance should be found between using school devices and the students’ own devices. On the other hand, schools cannot buy every student a computer. It would be an impossible equation to try and solve...
the availability of computers by buying every student one while also shortening the rotation period at the same time. As the number of computers increases, the need for related IT support also increases considerably. Based on our discussions with high school principals and teachers, the amount of IT support is not even currently considered to meet the new, continuously growing needs. IT support, which is taken for granted in businesses, works insufficiently in schools.

The role of data security is also emphasized, in particular with regard to loan computers owned by the schools, when the devices are increasingly used and the same device can be rotated between several students. Therefore, a better approach is to focus on students’ own devices which they care for of themselves and for which they are responsible rather than purchasing computers for everyone.

BYOD, Bring Your Own Device, is a trend that is guiding development also elsewhere in the world. Digitalization does not depend on everyone having a device of their own – especially since teaching also otherwise emphasizes the development of teamwork skills and community.

The diversity of the hardware stock also presents challenges to its maintenance. Schools’ devices are usually quite uniform, but if the students’ own devices are also used in teaching, the range of hardware becomes extensive. Schools and municipal administrations should form a clear view of the overall architecture and the current hardware stock so that purchases could be allocated effectively.

**Approach combining personal devices and loan devices**

In our view, the most functional solution for high schools’ device stock is a combination of an agreed BYOD practice and the school’s loan devices. Computer laboratories and desktop computers can be omitted completely and replaced by mobile "device carts" whose device range and numbers should be optimized in proportion to the number of students and the ICT strategy. Some schools are already using this approach. In order to make the model more functional, the ICT strategy should clearly state joint guidelines on the use of personal devices. At the practical level, teachers and students need to be encouraged to use their own devices and they also need to be provided with guidelines on procedures related to the use of personal devices, such as rules for using social media applications during lessons. In addition to the ICT strategy and practical instructions, the school’s loan device stock must have a sufficient number of devices for teaching purposes. This releases teachers’ time from continuous optimization of computer laboratory and device booking lists.

After some years, students’ study materials will most likely be available more extensively in electronic format, with money being spent on studies shifting from books to devices. When this happens, students and parents can no longer object to the recommendation of using one’s own devices with the argument that it is too expensive to purchase both books and devices. For the time being, as both books and devices are actively used at the same time, the strategy combining own and loan devices must, however, be so precisely specified that the responsibilities and duties of all parties are clearly presented.

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**Objective: Reliable infrastructure is always available to everyone**

Integrating school infrastructure with digital change still requires a lot of work. However, one should not plead lack of infrastructure in schools and consider it an obstacle to change: not all technology has to be 100% in order to obtain benefits from it. Ideally, the infrastructure supports digitalization in a way that doesn’t cause concerns or inconvenience in teaching situations.

Ideally, the basic infrastructure is reliable with regard to network connections, for example. In addition to reliability, a lot of flexibility is also required from infrastructure:

* The premises used for studying are adaptable and serve the purpose, such as teamwork, independent learning, etc. (e.g., case Ørestad high school).

* Teachers and students have access to comprehensive and readily available ICT and digital solutions support. (cf. many companies have 24/7 IT support available).

* Approaches to students’ use of personal devices (BYOD) and loan devices in use at the school are clearly defined.
Towards an ideal state of digital learning

Good models are required for all high schools to swiftly proceed with digitalization. In changing teaching practices, excellent results have been achieved by sharing best digital teaching practices among teachers. However, models that help to outline the broader context of the change are also required, as it is difficult to proceed to details without an overview. In investigating the development of digitalization in high schools, we ended up using an applied CMMI maturity model.46

Model: Five steps to a digital high school

In maturity models, the development of operations is divided into levels (steps), which are scaled with the aim of more mature, systematic activity. In an immature organization, processes are one-time, improvised. In mature organizations, on the other hand, processes are documented, repeatable, managed, and optimized.

The different digital maturity levels focus on improving different areas. It is good to know which phase of the digital development path the organization is on so a roadmap the required reforms and improvements to reach the objective can be created. To achieve the maximum benefit from such a model, it is important not to consider the model a truth carved in stone, but to apply it where applicable in the environment in question.
The degrees of digital maturity in high schools can be outlined as follows:

1. Fumbling procurement (baseline situation)
   - Utilization of digital opportunities is in no way organized.
   - Leadership is without direction, and the procurement of computers and electronic study materials and environments is hit-and-miss.

2. Occasional training (repeatable)
   - Utilizing digital opportunities is mainly reactive, i.e. reacting to real and acute change. For example, teachers’ need for training is understood as a consequence of upcoming digital matriculation examinations.
   - With regard to infrastructure, the framework is mainly in order, however, management and competence development are reactive.

3. Experimental teaching (defined)
   - The utilization of digital opportunities is experimented, headed by ‘early adopters’ /pioneer teachers.
   - The objectives of the desired development have been specified and the development measures are partly projectized, teachers’ development of personal competence is partly proactive.

4. Organized pedagogic development (managed)
   - The utilization of digital opportunities is managed in a clear and participatory way.
   - Digital development is student-oriented and proactive at every level, while also very organized and target-oriented. The development is monitored using clear indicators.

5. Further refining established best practices (optimizing)
   - Genuine, advanced utilization of digital opportunities by way of tested methods and extensive analytics.

Our view is that Finnish high schools rank mainly between fumbling procurement and experimental teaching on these maturity levels. Some pioneer high schools have already partly reached the fourth level. Principals should discuss the digital maturity level of their high schools together with teachers. This could help everyone better understand the chosen focus areas in teaching and digital development in a broader context. However, the purpose of presenting the maturity model in this report is not to have everyone rush up the stairs in a race. Rather, the aim is to present critical questions related to each development level to help schools advance in their digital development. Each level could be analyzed, for example, with the help of the questions in the diagram below.

Critical questions on different degrees of maturity

- Who is responsible for developing digitality?
- Is the student at the center of development?
- Do the indicators monitor the right things?
- How can good ICT experiments be distributed widely?
- How is proactive development encouraged with determination?
- How is versatile ICT competence development seen in everyday life at the High school and does it meet future challenges?
- What kind of an ICT strategy do we follow?
- What could we learn from research businesses other sectors?
Future visions for the digitalization of high schools

The changes in operating methods brought about by digitalization will have very big, and partly even unforeseen, impacts on schools, Finland, and the world. Embedded digital innovations, such as smart glasses, will probably transform the world as radically as the invention of cellular phones did. In the school of the future, digital study materials and learning environments are a natural part of learning.

The technology trends mentioned in the introduction – social media, mobile technology, analytics, and cloud services – must be harnessed in full to benefit schools as well. Of them, social media is currently the most commonly used in schools, and schools seem to have a relatively low threshold in adopting Facebook, for example. On the other hand, social media is currently mainly utilized in the schools’ communications. Various mobile applications diversify students’ learning experience, and with the BYOD trend, using them in everyday life at the school is easy. The development of analytics has not yet reached the point at which the opportunities it provides could be utilized in daily school work. In this field, an abundance of opportunities can be seen in the near future, such as user-specific profiling and targeting study content. However, creating a mobile application requires a user-friendly interface and an easy-to-use system, not different systems for each of the teachers’ messages should be sent automatically to cellular phones offering free access in the school building and ability to log into the school system.

Financial constraints do not mean that schools cannot be used to make the required device purchases, for example. The lack of funds, and in particular of a monetary rewarding system, can be seen to be limiting matters that are much more significant than hardware stock, such as teachers’ participation in training (training sessions, hiring substitutes for the duration of training) or monetary incentives for developing one’s competence and sharing best practices. In our opinion, an incentive scheme would be needed to support developing teachers’ skills for the acceleration of digital transformation.

Ideally, digitalization is part of the vision of the school of the future, with a culture of continuous development built around it. Schools must boldly experiment with new ways of working, but also continuously and systematically evaluate the new methods’ functionality success as learning drivers. The digitalization of schools is a demanding process for teachers, students, and principals alike. Each one of these groups has its own needs, expectations, and concerns that must be taken into consideration when developing digital services and in all phases of planning their adoption. This customer-oriented perspective should also be linked to the school’s strategy, for example, when specifying cost-saving objectives.

For this report, we organized workshops with principals, teachers, and students, so that their needs would remain at the center when defining the ideal state. Not all wishes can be granted, but a successful change process requires listening to all groups and engaging them in carrying out the change. For example, the model of a single digital system serving all teachers’ needs is not realistic, at least in the near future. However, Finnish schools cannot afford to wait for readymade systems and best practices, otherwise digitalization will be delayed.

Proactivity, ability to apply, and courage to leave their own comfort zone will be increasingly required from teachers. At the same time, they will also be instilling an active and curious mindset in students. This contributes to the objective of teaching: to provide students with the resources for doing things in a new way and coping in future working life.

Concerns: • Losing face in front of students • Losing control in a teaching situation • Having enough time for studying evolving digital services • Fair pay related to increasing development • Can a single system serve all subjects efficiently

Needs: • Pedagogic approach to the development of digital services • One uniform system • Remote management and monitoring opportunity for students’ teamwork tools • Training expert teachers to offer peer support

Expectations: • The system must be automatically always up-to-date • Engaging teachers in developing services • Long-term development of digital services

Concerns: • Losing face in front of students • Losing control in a teaching situation • Having enough time for studying evolving digital services • Fair pay related to increasing development • Can a single system serve all subjects efficiently

Needs: • One uniform digital service, not different systems • Teamwork tools independent of time and place • Teachers’ messages should be sent automatically to cellular phones offering free access in the school building and ability to log into the school system • Access card/key fob offering free access in the school building and ability to log into the school system

Expectations: • Entire school path stored in a single system • There should be an easy-to-use and always available communication method between students and teachers • All students should have the physical devices for using the service

Concerns: • How will it ensured that all students have the required devices • Students’ privacy in digital services • How to engage the right students in the development of digital services?

What should be prioritized among all the development projects so that teachers and students would get the most benefit from the reforms?

- Pedagogic approach to the development of digital services
- One uniform system
- remote management and monitoring opportunity for students’ teamwork tools
- training expert teachers to offer peer support

Shift of curricula from content to methods
- Digital services must make everyday work easier
- All teachers must be made to utilize electronic assessment

- Digital services must serve all subjects
- Digital services must be environmentally friendly
- Can the school system keep up?

Will the boundary between teachers’ working and leisure hours disappear?
- Professional development
- Digital services must be environmentally friendly

How to inspire all teachers to be involved in studying and using digital services?

What can the school do to keep up with the changes?

- Digital services must make everyday work easier
- All teachers must be made to utilize electronic assessment
- Digital services must serve all subjects
- Digital services must be environmentally friendly

How can I keep myself up to date on all of the things that should be done and all the places from which that information can be found?

I would be more motivated to study if I could influence the content of my studies, studying methods, study period and place more.

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The digital society and changing work models challenge schools to develop educational content and methods that help students to adopt the skills required for work and in society. The City of Helsinki Education Department’s Stadin eKampus program was also launched to address this challenge. The project lead, Liisa Pohjolainen, Line Manager at the Helsinki Department of Education, calls for a change to the traditional models of high school tuition: “High school education should be reformed thoroughly to be more innovative and increasingly encourage students to be proactive and active. High schools are still very much about absorbing of information, even though the focus should be more on investigating new things, critical processing and application of information, and cooperation.” Pohjolainen believes that the digitalization of teaching will accelerate in the coming years, which will facilitate new kinds of operating methods in education, while also requiring teaching and learning different skills. “We are proceeding at a good pace in developing teaching and have got off to a good start, but a lot still remains to be done.”

With a competent workforce, Finland and its businesses will be able to increase their competitiveness and level of innovation, as well as build sustainable business taking advantage all of the opportunities digitalization provides – also in the future. Strong work-life skills and digital knowhow will also help our young people to find their place in the globalizing labor market.

Our society is digitalizing at an increasingly rapid pace. High schools cannot remain outside this development. Several parties play important roles in promoting digitalization: The government and municipalities can offer schools allowances and training for digitalization, and principals can support change by providing it with a stable framework and by ensuring that schools have appropriate ICT strategies and action plans. Digital study materials and environments can be developed using public funds and voluntary work. The digital change of high schools must be driven, one step at a time. The future of the youth of Finland is our common cause.

Summary

Ideally, the digitalization of high schools follows a pre-defined strategy that includes all of the basic preconditions for managed digital change. Based on the elements of digitalization discussed above, successful development requires taking at least the following factors into account:

• It is important that principals systematically develop the operating culture of the high school to be more open and more committed to continuous development.

• Teachers’ proactivity with regard to developing their ICT competence should be supported, and the training should be diverse and customized according to user’s needs.

• The education cloud service will be a major development step for the better with regard to digital learning environments as well as study materials, but it will not probably meet the need for innovative and personalized study materials as such – therefore, also Finnish publishers will be required to have digital insight and competence.

• The functioning of the basic infrastructure is a basic precondition for optimal digitalization in the future (i.e. sufficient number of computers per student, adaptable classrooms, sufficient networks, and IT support).

The digital society and changing work models challenge schools to develop educational content and methods that help students to adopt the skills required for work and in society. The City of Helsinki Education Department’s Stadin eKampus program was also launched to address this challenge. The project lead, Liisa Pohjolainen, Line Manager at the Helsinki Department of Education, calls for a change to the traditional models of high school tuition: “High school education should be reformed thoroughly to be more innovative and increasingly encourage students to be proactive and active. High schools are still very much about absorbing of information, even though the focus should be more on investigating new things, critical processing and application of information, and cooperation.” Pohjolainen believes that the digitalization of teaching will accelerate in the coming years, which will facilitate new kinds of operating methods in education, while also requiring teaching and learning different skills. “We are proceeding at a good pace in developing teaching and have got off to a good start, but a lot still remains to be done.”

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It is essential to be able to apply different digital tools and forms of cooperation as facilitators of learning.
Interviews

Teachers and principals
Hartikka, Timo, principal, Helsinki School of Natural Sciences
Huovinen, Ari, principal, Ressun lukio
Jalkanen, Sirpa, principal, Itäkeskuksen lukio
Karhumäki, Johanna, teacher, Ressun lukio
Kosonen, Annukka, teacher, Alppilan lukio
Linkopuu, Salo, deputy principal, Etu-Töölön lukio
Majakangas, Pirkko, principal, Helsingin kuvataidelukio
Rihunkangas, Janne, teacher
Savolainen, Juha, teacher, Ressun lukio
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