

# Chapter 3

## Curriculum and Teacher Education Reforms in Finland That Support the Development of Competences for the Twenty-First Century



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**Abstract** This chapter analyzes how learning twenty-first century competences has been implemented in the Finnish educational context through the enactment of national and local level curricula and the design of a teacher education development program in a decentralized education system, in which teachers, schools, municipalities, and universities have high autonomy. The curricula and development program emphasize learning twenty-first century competences. Both were designed in collaboration with Finnish teachers and teacher educators, representatives from the Ministry of Education and Culture, the Association of Finnish Local and Regional Authorities, the Teacher's Union, the Student's Unions, and the Principal Association. The major actions taken to implement these changes included piloting, seminars and conferences, having different support and local level collaborations, and networking. According to recent evaluations, both endeavors – the development of national and local level curricula and a teacher education development program – have resulted in progress towards implementing twenty-first century competences in schools and for teacher education.

### 3.1 Introduction

The Finnish education system is an internationally recognized example of a high-performing system that successfully combines high quality with widespread equity and social cohesion through reasonable public financing (Niemi et al. 2012). International interest in the Finnish education system started in 2002, when the results from the first Program for International Student Assessment (PISA) were

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published and Finnish 15-year-old students were ranked high in reading, science, and mathematics. Thereafter, Finnish students have achieved high scores among OECD countries in 2000, 2003, 2006, and 2009 (OECD 2007, 2010). Both high scores and low variation in performance results are typical considered as outcomes of a successful education system. The International Education Database<sup>1</sup> recently ranked Finland as second in the world for the impact a nation's education system has had on stabilizing its economy and developing its social environment.

The success of Finnish education has been explained in large part due to Finnish education policy and its implementation, which is always aiming to recognize challenges and overcome them through collaborative reform and strategy. These efforts include developing program processes in which policymakers, administrators from the Ministry of Education<sup>2</sup>, municipalities<sup>3</sup>, universities, teachers, and teacher educators design strategies and development programs (Simola 2005). Moreover, the decentralized and autonomous role of professional teachers and teacher educators to implement curriculum and assessment practices is another reason for Finnish success in education (Väljjarvi et al. 2002). Professional teachers play an important role in the Finnish decentralized educational system. They are responsible for participating in local curriculum design, designing learning environments and courses, and, moreover, assessing both their own teaching and their students' learning outcomes. Professional primary and secondary teachers are educated at traditional universities in a 5-year master's program, which has been the case in Finland for more than 45 years. All teachers working in Finnish schools must have completed this 5-year program.

The PISA results are considered an important indicator for the competence young people have for living and succeeding in the twenty-first century. The OECD utilized the outcomes of its project—*Definition and Selection of Competencies* (DeSeCo) (OECD 2005)—while it designed the PISA framework, which was used for PISA test item design (Ananiadou and Claro 2009). The outcomes of the DeSeCo and other relevant analysis of the twenty-first century competences and learning (Look: Voogt and Roblin 2012; Reimers and Chung 2016) were also used in Finland when the new curriculum was designed between 2014 and 2015. Therefore, from a Finnish point of view, its educational outcomes are in line with DeSeCo's list of twenty-first century competences. Moreover, the DeSeCo and other relevant analysis of the twenty-first century learning descriptions were used as one framework in designing the Finnish curriculum, which is described below. In this chapter, analysis and discussions are made only in the framework of the DeSeCo.

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<sup>1</sup> [https://worldtop20.org/education-data-base?gclid=Cj0KCQiA-onjBRDSARIsAEZXCkZKxRAo5fD3GqmaUE87NwK-6TERn1GLz3vJXZi2TVFH7U4r0hVVmTPMaAjB1EALw\\_wcB](https://worldtop20.org/education-data-base?gclid=Cj0KCQiA-onjBRDSARIsAEZXCkZKxRAo5fD3GqmaUE87NwK-6TERn1GLz3vJXZi2TVFH7U4r0hVVmTPMaAjB1EALw_wcB)

<sup>2</sup>The Ministry of Education and Culture is responsible for the overall planning, steering and, supervising pre-primary education and care, as well as for drafting the necessary legislation. <https://minedu.fi/en/frontpage>

<sup>3</sup>Providers of education (cities and municipalities) are responsible for preparing a local curriculum and organizing primary and secondary education.

According to DeSeCo (OECD 2005), individuals in the twenty-first century need to be able to use a wide range of tools—including socio-cultural (language) and digital (technological) ones—to interact effectively with the environment, to engage and interact in a heterogeneous group, to perform inquiry-oriented work and problem solving, to take responsibility for managing their own lives, and to act autonomously. In this environment, both critical and creative thinking are needed to learn these competencies.

Despite the relatively high ranking of the Finnish education system, several challenges have been recognized in the last 8 years. When the PISA 2012 (OECD 2013) and 2015 (OECD 2016) reported declining learning outcomes for Finnish youth, Finnish policymakers argued that the educational system was no longer promoting twenty-first century competences nor adequately preparing students for the future. The discussion in Finland has been similar to several other countries and has been based around questions about which knowledge and skills should be taught and which competencies the next generation will need (Reimers and Chung 2016). Another discussion in Finland has concerned the challenges linked to the impact and use of new technologies inside and outside of the school environment (Niemi et al. 2012). In addition to PISA, the Teaching and Learning International Survey 2013 (TALIS) (OECD 2013) demonstrated several weaknesses in the operation of Finnish schools and in teacher activities.

Because of these challenges, several national forums, committees, and projects have been launched in Finland since 2013—including Future Upper Secondary School (MCE 2013), the Future Primary and Secondary Education Group (Ouakrim-Soivio et al. 2015), and The Finnish Teacher Education Forum (MEC 2016)—as a part of Prime Minister Sipilä's government (2015–2019) programs (Government Publications 2015). Moreover, the preparation of a national core curriculum for both basic (primary and lower secondary) and upper secondary education (Finnish National Board of Education 2014, 2015) has been part of these endeavors. Challenges in the Finnish education system were discussed in these forums, committees, and projects and were based on the OECD, PISA, and TALIS (OECD 2013, 2014) surveys and on national monitoring reports, which were produced by the Finnish Education Evaluation Centre (e.g., Blömeke et al. 2018). The challenges in Finnish education can be summarized based on these reports and are listed below. The main challenges related to twenty-first century competences are underlined:

- *student-level challenges*: decrease in learning outcomes, wellbeing, and engagement in learning and lack of interest in science, technology, engineering and mathematics (STEM) careers; various needs and support to the learning processes of various learners; and, moreover, challenges in integrating formative and summative assessment in order to support learning;
- *classroom-level challenges*: challenges in guiding students in active and collaborative learning processes; challenges in teaching and learning in heterogeneous and multicultural classrooms; challenges in supporting students to learn twenty-first century competencies according to the new curriculum; and challenges in designing and using versatile inside and outside of school learning environments, including the use of technology in learning;

- *school- and city-level challenges*: increase the variation between schools in the learning outcomes; lack of teachers' collaboration; organizing quality work at the local level; designing and implementing improvements or education reforms and using digital tools in teaching and administration; lack of pedagogical leadership support for teacher's professional learning, including teachers' personal development plans and support in induction phase; and lack of resources;
- *challenges in teachers' competencies*: challenges in pedagogical competences and innovative orientation; lack of willingness and competencies for personal professional development and for the development of the school environment; and teachers' local and international networking;
- *society-level challenges*: number of young people dropping out of school or from the labor market and an increase in inequality; the influence of digitalization, such as artificial intelligence and automation, on the education sector; the need for continuous training of adults to reflect the changes in working life, like digitalization; and the need to support sustainable development.

A development project or reform, like curriculum reform, in primary education or teacher education is a common tool for improving school education and overcoming the recognized challenges (Garm and Karlsen 2004; Young et al. 2007). Nonaka et al. (2006) argue that implementing new ideas to practice builds on learning processes and knowledge creation that span the individual, group, and collective level, and peers seek help and guidance from more expert colleagues. A similar idea is emphasized in the communities of practice, or learning at the workplace or communities, where professionals access, adopt, and internalize knowledge that has been developed in the community (Wenger 1999). In order to have success designing and implementing reform or development programs at the national level, the OECD (Burns and Köster 2016) recommend the following: engage stakeholders, such as teachers, university professors, and teacher union members; employ organizations to design the strategy; strive for consensus in the design; allocate sustainable resources for the design and implementation of the strategy; organize pilot projects; and disseminate the outcomes of the pilots.

As described earlier, several national projects have been launched in Finland since 2014, which aim to implement twenty-first century competences in teaching and learning practices. This paper focuses on two national level projects, which aim to contextualize and implement twenty-first century competences for the Finnish education context.

### **3.2 Curriculum Reform in Basic Education: Aiming to Support the Development of Competences for the Twenty-First Century**

Since 1985, the Finnish curriculum has been written at two levels: the national level core curriculum and the local or municipal school level one. The national core curriculum includes general aims as well as the objectives and core contents of

different school subjects. Schools and municipalities prepare the local curriculum, which takes into account the local context and needs based on the national core curriculum.

In Finland, curriculum reform started at the political level, when the government emphasized twenty-first century competences should be better integrated into schools than in the previous curriculum (Change in Basic Education Act 642/2010). The national framework curriculum was designed during the years 2013 and 2014 in a collaborative project, which is described below. A few guiding questions related to the reform were stated by the National Board of Education<sup>4</sup> as follows (Vahtivuori-Hänninen et al. 2014):

- What will education mean in the future? What types of competences will be needed in everyday and working-life situations? What kind of learning environments and practices or teaching methods would best produce the desired education and learning?
- How will change be realized at the municipality and school level, and even in every lesson?
- What kind of competences will teachers and other school staff need in order to be able to collaborate and promote learning for the future?
- How does the national core curriculum guide the preparation of the local curriculum and support the work of teachers and the whole school community? (FNBE 2014)

The preparation process was collaborative as it has always been. Large panels of experts— involving pre-primary classroom teachers and subject teachers, principals, teacher trainers, educational scientists, researchers from different subject areas, and representatives of various stakeholders—helped to prepare the curriculum together. The whole process was transparent and publicly accessible through social media tools, a variety of different open discussion forums, and local meetings held in various areas in Finland.

After the expert team completed the first draft, all of the materials, including the draft curriculum, were uploaded to the Finnish National Board of Education website for comments. All of the teachers, teacher educators, stakeholders, and even parents could comment freely on the first draft. The comments were read, and a content analysis of the comments was made. After this, a new draft based on the comments was prepared and posted on the website again for comments. The involvement of the various stakeholders, and their feedback, in the design process was essential for the implementation. The stakeholders felt involved in the implementation of the curriculum in a way Ogborn (2002) has described as the development of ownership to the reform or development program.

The above questions guided the design of the curriculum as did discussions about the competences needed in the twenty-first century, about redefining the aims of

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<sup>4</sup>The Finnish National Board of Education is a national development agency and is responsible for preparing the national core curriculum, supporting its implementation, developing school education, and financing in-service training programmes for teachers. <https://www.oph.fi/english>

education, and about how to organize learning to meet the demands of the twenty-first century. Consequently, the national level curriculum process between 2013 and 2014 has helped to develop the Finland educational sector for the twenty-first century (Vahtivuori-Hänninen et al. 2014). While designing the curriculum, the transversal competences were also taken into account. The transversal competences were grouped under the following competence areas: taking care of oneself, managing daily life; multiliteracy; digital competence; working life competence, entrepreneurship; participation involvement, building a sustainable future; thinking and learning to learn; and cultural competence, interaction, and expression. These 7 competence areas are close to the DeSeCo definition of twenty-first century competences and are assumed to promote students' growth as human beings and as citizens for the twenty-first century. In addition to a general description of the transversal competences, the aims for those competences were included under subject-specific curriculum aims. This approach was supposed to help teachers understand the meaning of the competences and how to implement them (Halinen 2018). Moreover, it was assumed that it is easier for the textbook authors and the designers of the digital learning environments to design the teaching and learning materials and environments that take into account the transversal competences. In Table 3.1 below, the twenty-first century competencies (DeSeCo) and the Finnish transversal competences (FNBE 2014) are compared.

Preparation of curriculum in Finland engage teachers to become familiar with the transversal competences at two levels. Teachers first become familiar with the new curriculum and introduction of transversal competences by participating in the national level curriculum work. During the local curriculum process, teachers and other stakeholders have been active in the preparation of the local curriculum and have described in detail, how the learning of transversal competences is integrated to school subjects. According to Jauhiainen (1995) and Holappa (2007) local curriculum processes inspire and empower teachers and principals to design the local curriculum and their own work processes, and increase the overall quality of education.

In order to support the learning of transversal competences, curriculum reform aims to increase collaborative classroom practices by engaging students in multidisciplinary, phenomenon- and project-based studies in which several teachers may work with any number of students simultaneously. In practice, all schools have to design and provide at least one such study period per school year for all students, which focuses on studying phenomena or topics that are of special interest to students. Students are expected to participate in the planning process of these studies. Schools will provide their own specific viewpoints, concepts, and methods for the planning and implementation of these study periods. Which topics are chosen and how these integrative study periods are realized will be decided at the local school level.

To support schools in preparing and implementing the curriculum, the National Board of Education established the Majakka-network (FNBE 2016). This network

**Table 3.1** Comparison of twenty-first century competences and Finnish transversal competences introduced in the National Core Curriculum

21st century competences (DeSeCo)	Finnish transversal competences introduced in the National Core Curriculum
<i>Ways of thinking</i>	
Critical thinking	Pupils are instructed to find how knowledge can be built, for example by asking questions and looking evidence in order to answer these questions ... pupils are instructed an opportunity to critically analyze the issue from different perspectives
Creative thinking	Finding innovative solutions that requires students to learn to see alternatives and unite perspectives Exploratory and creative work, working together, and contributing to the development of thinking and learning to learn
Learning to learn	Use information independently and interact with others for problem solving, reasoning, and concluding Practicing appropriate behavioral and collaborative skills in working situations, and noticing the importance of language skills and interaction skills
<i>Ways of working</i>	
Inquiring	Collaborative, inquiry oriented and creative working
Problem solving	Use information independently and interact with others for problem solving, reasoning, and concluding
Communication and collaboration	Practicing appropriate behavioral and collaborative skills in working life situations, and noticing the importance of language skills and interaction skills
<i>Tools for working</i>	
Information literacy	Cultural literacy, interaction, and communication Multiliteracy refers to the skills of interpreting, producing, and valuing different texts that help students to understand diverse forms of cultural communication and to build their own identity
Technological skills, media literacy	Develops skills in both traditional and multi-media environments that utilize technology in different ways ICT skills are developed in four major areas ... and understand the use and operation of ICT ...
<i>Acting in the world</i>	
Global and local citizenship	Taking care of yourself, everyday life skills, and safety ... students grow as active citizens who act according to democratic rights and responsible ...
Cultural awareness and social responsibility	Working life skills and entrepreneurship ... Participation and influence, responsibility for sustainable future

has organized meetings and designed a web platform. Additionally, in 2017 the National Board of Education allocated 100 million euro to the providers of education for hiring tutor teachers who can support the teachers in their classrooms in the implementation of the transversal competences to their teaching (MEC 2017). Altogether, 2000 tutor teacher positions were established in Finnish municipalities

in order to support the learning of transversal competences, especially for creating new digital learning environments (Oppiminen uudistuu 2018).

In 2018, the Finnish Education Evaluation Centre evaluated both the implementation of the national core curriculum at the local level and the process of preparing the local curriculum by analyzing the local curriculum of all education providers. Moreover, the Centre interviewed curriculum specialists to learn about the success and challenges of implementing the local level curriculum. According to the evaluation, the national and local steering systems have supported the implementation of the curriculum as well as classroom teaching. Moreover, the transversal competences have been integrated with the aims of the school subjects at the school level, and teachers are aware of this integration. However, there are challenges with integrating the transversal competences into classroom teaching and learning (Saarinen et al. 2019),

### **3.3 Teacher Education Reform: Aiming to Support the Development of Skills for the Twenty-First Century**

In order to make progress in teacher education and overcome the recognized challenges, the Minister of Education and Culture created a Finnish Teacher Education Forum in 2016 (MEC 2016). The forum was asked to collaboratively prepare a development program for teacher education. Additionally, the forum was asked to identify key actions for developing teacher education and supporting the implementation of the development program.

Between 2016 and 2018, the teacher training forum organized a literature review related to teachers' knowledge and education. They held 12 nationwide meetings and 7 local meetings, in which teacher educators from Finnish universities and stakeholders related to teacher education, including unions and regional authorities, participated. These meetings discussed the challenges and aims of teacher education and the preparation of the development program for teacher education document.

The literature review, also organized by the forum, introduced the outcomes of research related to the role of education in a society; teachers' knowledge and learning; teaching and learning in a heterogeneous classroom; the individual differences of learners; and the design and use of educational innovations, such as education technology (Husu and Toom 2016). This review had an impact on the forum meeting discussions, and it influenced the design of the development program.

A national web-based brainstorming process related to the renewal of teacher education was organized based on the idea that a large group of people is smarter than a few elite individuals; such a group is also better at generating ideas, solving problems, fostering innovation, and coming to wise decisions (Surowiecki 2005). This nationwide brainstorming session also supported the implementation of the



development program: people will more easily adopt a strategy if they participate in developing it. A call to participate in the web-based brainstorming process was sent to teacher educators in all Finnish universities as well as to all teachers and administrative employees working in the field of education at both the national and local level. The participants were guided to generate ideas about what would be important for the future of teacher education and to evaluate and rank 10 ideas contributed by others. In the ranking, participants assigned a number from 0 to 100 in evaluating the importance of these ideas. The web-based brainstorming tool combined similar ideas for ranking. According to participants, the most important priorities for students to learn in teacher education were learning-to-learn skills, along with interaction and collaboration skills. The competences involved generating ideas, preparing for change, conducting research-based action, and collaborating in partnerships and networks so that teachers can participate collaboratively to develop classroom practices and culture in particular school contexts. Most of the top-ranked skills and competences identified were needed outside of the classroom. This indicated that in teacher education, participants believe more attention should be paid to the skills and competences needed for effective teacher collaboration.

The development program sets out three strategic competence goals for teachers' pre- and in-service education and their continuous life-long professional development. These competence goals do not actually include all the possible goals, but they do highlight the direction for the development of teacher education. According to this document, a professional teacher should have, first, a broad and solid knowledge base, including knowledge about a particular subject and pedagogy, how to accommodate diversity among learners, collaboration and interaction, digital and research skills, their school's societal and business connections, and ethics. Second, a teacher should be able to generate novel ideas and educational innovation while making the local curriculum, to plan inclusive education initiatives, and to design and adopt pedagogical innovations. Third, a teacher should have the competences required for the development of their own and their school's expertise, especially for the development of networks and partnerships with students, parents, and other stakeholders. In Table 3.2, twenty-first century competencies (DeSeCo) and the strategic aims of the Finnish development program for teacher education (MEC 2016) are compared.

In addition to strategic competence goals, the development program also includes six concrete strategic action guidelines, which determined the direction for the development of teacher education. After publishing the development program in October 2016, 31 pilot projects were selected and started at the end of 2016. These projects have been organized according to the three strategic aims and six strategic action guidelines for the development of teacher education. Altogether, 30 million euro was allocated to these projects in the state budget. During the forum meetings in 2017 and 2018, the pilot projects gave presentations and got feedback from other participants in the meetings.

**Table 3.2** Comparison of twenty-first century competences and the strategic aims of the Finnish development program for teacher education

Twenty-First century competences (DeSeCo)	The strategic aims of the Finnish development program for teacher education
<i>Ways of thinking</i>	
Critical thinking	Research skills (skills required to be critical and consume research-based knowledge)
Creative thinking	Skills for generating and evaluating ideas related to classroom teaching and learning
Learning to learn	Skills for developing teachers' own expertise through reflective activities Skill for coaching , mentoring, or training other teachers
<i>Ways of working</i>	
Inquiring and problem solving	Skills for planning, implementing, and assessing teachers' own practices and their students' learning Research skills (skills to produce research-based knowledge)
Communication and collaboration	Interaction skills for collaborating in different networks and partnerships
<i>Tools for working</i>	
Information literacy	Subject matter knowledge, pedagogical and pedagogical content knowledge, and contextual knowledge
Technological skills, media literacy	Skills for acting in various digital and physical learning environments, including digital skills, and for learning in settings outside of the classroom Digital skills Knowledge about learning and diversity among learners
<i>Acting in the world</i>	
Global and local citizenship Cultural awareness and social responsibility	Awareness of various cross-curricular topics, including those related to human rights and democracy, entrepreneurship education, sustainable development, and globalization Awareness of the different dimensions of the teaching profession: the social, philosophical, psychological, sociological, and historical bases of education as well as the school's societal connections

The Finnish Education Evaluation Centre evaluated the implementation of the Finnish development program for teacher education by analyzing the pilot project documents, organizing a survey for the pilot projects, and interviewing the stakeholders and pilot project experts. According to the evaluation, the teacher education reform model prepared at the teacher education forum had several strengths, including the networking and bringing together of different experts and stakeholders. This networking had supported the implementation of all strategic competence goals, including the emphasis on twenty-first century competences. Most pilot projects were recognized to have a strong emphasis on community building and collaboration. The evaluation also noted challenges and further targets for implementing program, such as creating a clear plan for supporting the achievement of the strategic competence goals. Moreover, the effectiveness of the pilot projects should be

monitored and evaluated during and after its completion in 2023–2024 (Niemi et al. 2018).

### 3.4 Discussion

This chapter has analyzed the challenges of Finnish education, especially the implementation of twenty-first century competences into primary, secondary and teacher education. Additionally, it has examined how these challenges will be overcome through the collaborative design and implementation of the national level curriculum and national teacher education development program in a decentralized education system, where autonomy is emphasized at the teacher, school, municipality, and university level. Based on the national evaluations, the implementation of the core curriculum and teacher education development program has supported the development of teaching and learning of twenty-first century competences. However, it is too early to evaluate the level of impact the curriculum and development program have had on education practices or how well the curriculum and program have supported teacher education and schools to overcome the identified challenges in education.

The design and implementation of the national level strategies, curricula, and programs were all supported by goal orientation, planning, designing and timing, collaboration and networking, piloting and dissemination of the pilot outcomes, and a reflective orientation (Burns and Köster 2016). Collaboration and networking created forums for discussing the challenges in schools and teacher education, as well as for setting strategic aims to support designing the core curriculum or the teacher education development program (Kitchen and Figg 2011; Paavola and Hakkarainen 2014). Therefore, collaboration happens between teachers and teacher educators in schools or universities, between the schools or universities and stakeholders in education, like the Ministry of Education and Culture, and between providers of education or municipalities and individual teacher educators and teachers. These supportive characteristics for the implementation of the development program or strategy have helped teachers' and teacher educators' professional learning (Maier and Schmidt 2015).

In order to meet the challenges of the future, transversal competences have been emphasized since 2014 at the national and local level in Finland. Transversal competences have been integrated into the aims of various school subjects. Moreover, they are emphasized in collaborative classroom practices through engaging students in multidisciplinary, phenomenon- and project-based studies. The transversal competences were described in 7 categories: taking care of oneself, managing daily life; multiliteracy; digital competence; working life competence, entrepreneurship; participation involvement, building a sustainable future; thinking and learning to learn; and cultural competence, interaction, and expression. These 7 competence areas are in line with the outcomes of the DeSeCo project (Table 3.1). The implementation of the transversal competences for teaching and learning is assumed to holistically

promote students' growth as human beings and as citizens. In order to support the adoption of transversal competences, the national level core curriculum was designed in an extensive collaboration process where the Finnish National Board of Education worked side by side with municipalities, schools, and teachers as well as with teacher educators, researchers, and other key stakeholders. At the level of the local curriculum, there is autonomy for teachers and municipality level authorities for designing the curriculum and developing their own innovative approaches for implementing the transversal competences into teaching and learning.

The national level project, the teacher education forum, aimed to better support teachers to meet the challenges of the future. The development program was designed by 70 experts from universities and applied universities, the Ministry of Education and Culture, and representatives from the Association of Finnish Local and Regional Authorities, Teacher Union, Student Union, and the Principal Association. The collaboration and activation of teacher educators was supported through local and nationwide meetings, allocation of resources to pilot projects, and a national web-based brainstorming process. The brainstorming process aimed to solicit diverse opinions related to the development of teacher education. The forum recognized three strategic competence goals that should be emphasized in teachers' pre- and in-service education in order to prepare teachers to teach twenty-first century competences. According to these goals, student teachers and teachers should learn the following: first, broad and solid knowledge base in a subject matter and pedagogy, including accommodating diverse learning styles and using digital and research skills; second, competence in generating novel ideas and educational innovation; and, third, competences required for the development of the teachers' own expertise and their school's (MEC 2016). These three strategic competence goals are in line with the outcomes of the DeSeCo project (Table 3.2). While designing the program, several local and nationwide meetings were organized during the design and dissemination phase. Altogether, 31 pilot projects were financed by the Ministry of Education to implement the development program.

Characteristics of the Finnish education system include decentralization and autonomy. Decentralization allows teachers and teacher educators to address local contexts in the implementation of the national curriculum, strategies, and programs. Decentralization and autonomy are strongly linked to the Finnish way of interpreting the teacher's and the teacher educator's professionalism, as well as the status of teachers and teacher education in Finnish society. However, decentralization and autonomy make the preparation of national strategies or national guidelines challenging—how should autonomous entities be supported in adopting these strategies or guidelines? In Finland, twenty-first century competences have been implemented to school and teacher education through the design and implementation of the national core curriculum and the teacher education development program. They were prepared in collaboration with the national level and implemented at the local level. Teacher education institutes or faculties and providers of education—responsible for organizing teachers' professional learning as well as compulsory and secondary education—have been supported in the development and implementation in many ways. First, the design and implementation have engaged teachers and teacher

educators in the preparation of the national core curriculum and teacher education development program. Second, they have organized professional learning through mentoring, training, and pilot projects. Third, several national and local level meetings and seminars have been organized to support communication and professional learning. Thus, the design and implementation of the national core curriculum and teacher education development program offer a supportive environment for teacher educators and teachers to familiarize them with twenty-first century competences and to help them plan teaching and learning strategies that support these competences (Müller et al. 2010).

National level collaboration in designing the curriculum and developing reforms is a tradition at both the national and local level in Finland. They are always designed in heterogeneous groups with experts from different fields. During the process, it becomes clear what the aims are and how to achieve them. Subsequently, a draft reform plan is discussed, and feedback is collected and analyzed. Moreover, resources for piloting and implementation are offered. Consequently, the nature of implementation and design has been in line with OECD recommendations (Burns and Köster 2016). Based on Finnish experiences, some minor modifications to the supportive nature of preparing national and local curricula are suggested by Burns and Köster (2016). At the national level, the following factors are critical for designing a new curriculum or implementing a new strategy:

- Good timing or enough time for designing and implementing the program, strategy, or reform;
- Engage stakeholders—like teacher educators, providers of education, university administrators, and employer organizations—to design the program, strategy, or reform and to implement it;
- Be in partnership with teacher unions and employer unions;
- Strive for consensus in the design and implementation;
- Use sustainable resources for the design and implementation of the program, strategy, or reform;
- Use holistic development, or development of several sectors of education at the same time, and organize interaction between these projects.

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