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European Early Childhood Education and Care (ECEC) Working Group

Peer Learning Activity

Positive impact, opportunities and challenges of digitalisation in ECEC

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REPORT

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Questions related to this PLA can be addressed to EAC-WG-ON-ECEC@ec.europa.eu.

Summary

To support Member States in implementing the 2019 Council recommendation on high-quality early childhood education and care (ECEC) systems and the European Quality Framework for ECEC, the European Education Area Working Group (WG) on ECEC works towards identifying best practices and ideas that can support efficient reforms. Through meetings and peer learning activities, members of the Working Group support each other in understanding the challenges of providing quality ECEC to all children and identifying solutions and resources to address these challenges.

In a context where digitalisation is gaining ground in all aspects of society, ECEC decisionmakers and practitioners also need to consider how this is impacting the sector. This peer learning activity (PLA), jointly organised by the European Commission and the Slovenian Ministry of Education, considered the research findings identified by the Organisation for Economic Co-operation and Development (OECD) in its report Empowering Young Children in the Digital Age and explored four topics and guiding questions related to digitalisation in ECEC:

Topic	Guiding question
Guidelines, legislations and regulations	What systematic approaches are used at the national / regional level in your country in relation to digitalisation and ECEC (legislation guidelines, regulations)?
Workforce – staff initial training and continuing professional development	How can initial and in-service institutions (providers) equip and support preschool teachers with essential digital pedagogy and competences?
Curriculum framework and pedagogy	How can curriculum development and pedagogical strategies empower children in becoming responsible, creative and active citizens in a digital world?
Future impact, benefits and challenges of digitalisation in ECEC	What are the main positive impacts, benefits and challenges of the digitalisation in the ECEC?

The PLA featured various presentations of strategies, policies, tools as well as questions and challenges from the hosts and Working Group members to promote peer learning. It also provided space for interactive panel and smaller group discussions in different formats to allow for sharing knowledge and experiences. Discussions focused on centre-based provision of ECEC, and the full ECEC age range was covered – from birth to the start of primary schooling. Participants were encouraged to reflect on the policy and practical implications gathered during the PLA to support their own policy development and the development of the agreed outputs of the WG. The PLA also provided all participants with the opportunity to visit ECEC centres in Ljubljana, Koper and Škofja Loka. Kindergarten staff and pedagogues from the Faculties of Education presented activities and the results of projects aimed at enhancing digital competences and computational thinking appropriate for the developmental level of children enrolled in ECEC.

Guidelines, legislations and regulations related to digitalisation in ECEC

Across Europe, countries are responding to digitalisation in ECEC in various ways, including legislation, guidelines, and regulations. As noted by the 2023 OECD report on "Empowering Young Children in the Digital Age", several countries focus on risk management, such as privacy protection and healthy technology use, but opportunities to prepare young children for the digital age are less explored. While the safe and responsible use of technology is promoted, guidelines and regulations are often incomplete or inconsistent, resulting in variable practices. Only a minority of countries have comprehensive frameworks or safety-by-design standards for digital service providers targeting young children.

In this regard, two in-depth country cases were presented, including Slovenia's Digital Education Action Plan 2021-2027 as well as the Finnish approach to digitalisation in ECEC. Participants also discussed about the approaches taken in their contexts to digitalisation in ECEC, and the aspects that could be improved.

Discussions during the PLA have also confirmed that countries differ in their approaches to digitalisation in ECEC, and that only a few of them have concrete legislation / regulations in this regard. Key challenges remain around the safe use and limited research evidence on digitalisation in ECEC; and the lack of systematic, ECEC-specific frameworks and practical guidance on digitalisation. There is a need for balanced, ECEC-specific frameworks that protect children while enabling pedagogical innovation and practical use of digital tools, supported by stronger research on their impact.

ECEC workforce – Equipping staff with essential digital pedagogy and competences

Staff are central to building high-quality ECEC systems, and digitally competent educators are essential for supporting children and families in navigating the opportunities and risks of the digital world. Case studies from the Slovenian Ministry of Education, three Slovenian universities, Portugal, as well as Lower Saxony, Germany, were shared to showcase how the ECEC workforce is equipped with essential digital pedagogy and competences. In addition, the Erasmus+ GREELCO project – an online community connecting ECEC professionals and offering them the opportunity to improve their digital competencies, share their expertise and reflect on their practice – was also presented, and the Slovenian Kindergarten Jelka provided feedback on the SELFIEforTeachers for ECEC tool.

While certain countries include digital competencies in initial teacher education, discussions highlighted that systematic training and ongoing professional development in digital pedagogy for pre-school teachers is lacking. Where training exists, it is often fragmented, optional, or dependent on local providers, leading to inequalities in coverage and quality. There is limited systematic monitoring of teachers' digital skills, and funding for digitalisation and professional development is inconsistent. There is a strong need for a common understanding of digitalisation, comprehensive training programmes addressing different levels of digital competence, and practical guidance embedded in national curricula. Ongoing professional learning, technical assistance, and resources are also needed to empower staff and reduce administrative burdens.

Curriculum frameworks and pedagogies

Curriculum frameworks and pedagogies are evolving to address the challenges and opportunities of digitalisation in ECEC. Eurydice reports that nearly three quarters of European countries now include digital competences in their ECEC curricula, with information literacy and digital content creation among the most prominent areas. However, several countries lack specific goals for early digital literacy in their curriculum frameworks. According to OECD, most existing curricula promote play-based approaches, with project-based and collaborative pedagogies being less common, especially for the youngest children. Supporting digital literacy does not always require direct screen use; unplugged activities and experiential learning are effective and encouraged. The OECD recommends setting clear, comprehensive goals and adopting broad, age-appropriate strategies to help young children thrive in the digital age, with a focus on reducing digital divides. The PLA explored various pedagogical practices related to digitalisation in ECEC, with two country cases from Slovenia and Lithuania.

The discussion highlighted significant variation across Europe in how ECEC curricula address digital competences and computational thinking. Some countries include these explicitly, providing methodological resources and training, while others embed them only broadly/implicitly. Approaches to digital competences vary, some being left to the discretion of individual settings or teachers, with limited national vision or systematic support. Digital skills are taught through both "plugged" and "unplugged" activities, and certain countries are updating curricula to strengthen continuity from ECEC to primary education. However, challenges remain, including the risk of formalising ECEC – potentially undermining the play-based approach that is central to the field, lack of common terminology, and limited evidence on the impact of digital competences in ECEC, with concerns about technology use for the youngest children. Solutions proposed include adopting a whole-school approach, providing ECEC staff with training and clear guidance on emerging topics, fostering child-centred pedagogy, involving children's voices, and ensuring leadership support.

Future impact, benefits and challenges of digitalisation in ECEC

To explore this topic, a presentation was provided on ethical considerations around digitalisation in ECEC, and a set of panellists from Slovenia discussed the related opportunities and challenges. It was noted that a participatory and meaningful use of technology involves both children and teachers in decision-making, professional cooperation, and reflection. In addition, the panel highlighted that the value and purpose of digital competences need to be clarified and communicated to children, families, and educators. Digital education in ECEC should address the needs of children, families, ECEC staff and settings, and other key stakeholders, with the aim of preparing children for the future by fostering critical thinking, problem-solving, and various forms of literacy. Creating learning communities and promoting good practice examples can support the meaningful integration of digital education. It is key to ensure that lessons learned from projects are recorded and incorporated into the subsequent projects. Early and thoughtful engagement with emerging technologies, including AI, should be ethical and purposeful, supported by open, scientifically upgraded, and flexible curricula. Key challenges that persist include fear and misconceptions about digital tools, ethical and privacy concerns, slow systemic change of education systems, and gaps in knowledge and access. Addressing these requires training, collaboration across institutions, sustainable funding, and efforts to shift mindsets among educators and parents. Ultimately, digital tools should complement play-based learning and holistic child development, with ECEC professionals acting as role models for meaningful and age-appropriate technology use.

Key messages and conclusions on the impact of digitalisation in ECEC

PLA participants were invited to reflect on digitalisation's impact on the ECEC system as a whole, on children, and on ECEC professionals. The outcomes of these discussions highlighted both the transformative potential and the complex challenges of digitalisation in ECEC. Additional insights on how digitalisation can impact parents emerged from the discussions.

On the ECEC system as a whole

- Digitalisation offers opportunities to improve data collection, monitoring, and quality assurance, and to facilitate communication and collaboration across all levels of governance and between ECEC staff and families. It enables more active participation in decision-making and supports professional development.
- However, participants noted persistent challenges, including concerns about data safety, privacy, and the quality of digital infrastructure. The rapid pace of technological change often outpaces policy and practice, and there is a need for clearer definitions, leadership, and continuity in digitalisation efforts. Financial constraints and the risk of technology-driven decisions, rather than needs-based policy, were also identified as ongoing issues.
- Moving forward, participants stressed the importance of developing safe, accessible digital platforms, building multidisciplinary expertise, and ensuring that digitalisation is guided by a clear purpose and adds genuine value to the system.

On children

- When used thoughtfully, digital tools can motivate learning, foster computational and critical thinking skills, and support inclusion, particularly for children with special needs. Digital education in ECEC can prepare children for the realities of a digital world and offer new experiences.
- Nevertheless, participants raised concerns about the risks of overuse, screen addiction, and unequal access, which can lead to exclusion and negatively affect cognitive and social development.
- It was noted that well-designed digitalisation strategies in ECEC should focus on preparing children for a digital world through developmentally appropriate, largely unplugged methods. These approaches should intentionally aim to strengthen critical thinking, build early computational thinking skills, and introduce concepts of digital safety, without relying on screen-based tools.
- The importance of safeguarding children's privacy and ensuring age-appropriate, meaningful use of technology was emphasised. Participants agreed that adults (educators, parents, and caregivers) must be supported to guide children effectively, and that children's participation and voice should be considered in digitalisation efforts. Regulations and practices must protect children's rights, well-being, and unplugged activities should remain a core part of early learning.

On ECEC professionals

- Digitalisation has the potential to reduce administrative burdens, facilitate resource sharing, and inspire new approaches to teaching, learning and documenting child's progress. It may support systematic planning, professional development, and enhanced communication with parents.
- At the same time, professionals face increased bureaucracy, demands on time, and exposure to potential misuse and privacy risks. There is a need for training, clear guidance, and support to build confidence and digital competence among staff. Mindsets towards technology vary, and effective communication with families can be challenging.
- Participants highlighted the importance of providing safe and useful digital tools, protecting staff privacy, and creating opportunities for reflection and sharing successful practices. Keeping up with technological developments and maintaining a clear focus on the educational purpose of digitalisation remain ongoing priorities.

On families

- Digitalisation influences how parents engage with their children's learning and wellbeing – for instance by affecting how families communicate with ECEC settings, how they support children's digital habits at home, and how children are exposed to digital tools or screen time. In this context, early childhood professionals can play an important role to build a shared understanding with families of how young children encounter digitalisation, acknowledging both its educational potential and its risks, such as excessive screen-time, privacy concerns and the influence of online content. While digital tools can strengthen communication between ECEC settings and parents, we should also be aware that sensitive issues often require personal, face-to-face conversations.
- A recurring emphasis is the need to connect children's digital experiences at home with pedagogical intentions in the ECEC setting, which requires insight into how families use technology in everyday life, for example through joint workshops, shared digital resources or suggestions for home-based exploration.

In summary, participants agreed that digitalisation in ECEC must be approached with caution, clarity, and a commitment to quality and inclusivity. Systems should strive for balanced frameworks that protect children and enable innovation, professionals need ongoing support and training. Children's holistic development and active participation should remain central, with curricula promoting foundational digital skills such as critical thinking and problem solving, delivered primarily through developmentally appropriate unplugged activities. Collaboration, evidence-based practice, and thoughtful integration of digital tools will be essential for building sustainable, high-quality ECEC systems in the digital age.

Background information

To support Member States in implementing the 2019 Council recommendation on high-quality early childhood education and care (ECEC) systems and the European Quality Framework for ECEC, the European Education Area Working Group (WG) on ECEC is working towards identifying best practices and ideas that can support efficient reforms. Through meetings and peer learning activities, members of the Working Group support each other in understanding the challenges of providing quality ECEC to all children and identifying solutions and resources to address these challenges.

The Peer Learning Activity (PLA) in Slovenia – jointly organised by the European Commission and the Slovenian Ministry of Education – took place between 21-23 October 2025. In a context where digitalisation is gaining ground in all aspects of society, ECEC decisionmakers and practitioners also need to consider how this is impacting the sector. The discussions focused on centre-based provision of ECEC, and the full ECEC age range was covered – from birth to the start of primary schooling. Participants were encouraged to reflect on the policy and practical implications gathered during the PLA to support their own policy development and the development of the agreed outputs of the WG. The event considered the research findings identified by the OECD in its Empowering Young Children in the Digital Age report, and the following four key topics and related guiding questions:

Topic	Guiding question
Guidelines, legislations and regulations	What systematic approaches are used at the national / regional level in your country in relation to digitalisation and ECEC (legislation guidelines, regulations)?
Workforce – staff initial training and continuing professional development	How can initial and in-service institutions (providers) equip and support preschool teachers with essential digital pedagogy and competences?
Curriculum framework and pedagogy	How can curriculum development and pedagogical strategies empower children in becoming responsible, creative and active citizens in a digital world?
Future impact, benefits and challenges of digitalisation in ECEC	What are the main positive impacts, benefits and challenges of the digitalisation in the ECEC?

Participants could also attend several site visits to ECEC centres in Ljubljana, Koper and Škofja Loka. Kindergarten staff and pedagogues from the Faculties of Education presented activities and the results of projects aimed at enhancing digital competences and computational thinking appropriate for the developmental level of children enrolled in ECEC.

Guidelines, legislations and regulations related to digitalisation in ECEC

The 2023 OECD report "Empowering Young Children in the Digital Age"[1] shows that digital technologies are becoming increasingly present in the lives of young children, yet the implications for ECEC remain unclear. While **children use digital devices and go online at ever younger ages** – primarily at home and in diverse ways, shaped by their social environment – this trend brings both opportunities and risks for their learning, development, and well-being. As a result, there is a growing **sense of urgency in ECEC contexts to respond to digitalisation trends**, balancing the need to exploit potential benefits with the imperative to manage risks, despite a sense of low preparedness.

Across countries, policy agendas are mostly concerned with **risk-focused challenges related to young children**, such as ensuring their privacy protection, preventing unhealthy habits to technology use, preparing them for the future of education, and reducing inequalities in digital literacy among others. On the other hand, **opportunities to prepare young children for the digital age** are **less explored**.

While **most countries promote the safe and responsible use of technology in ECEC** rather than restrictive approaches, **guidelines and regulations are often incomplete or inconsistent**, leading to variable practices. Only 40% of countries have safety-by-design standards or guidelines for digital service / content providers also targeting young children.

Country experiences

In-depth examples of Slovenian and Finnish approaches to guidelines and regulations on digitalisation in ECEC were explored during the PLA; they were completed by insights from other PLA participants.

Slovenia

The Digital Education Action Plan 2021-2027 of Slovenia provides the strategic and regulatory framework for digital transformation in education, including in ECEC. The vision is to build a well-established education and training system that prepares individuals for a quality life in the digital and green society. The plan identifies six priority areas:

1) Establishing a national hub and centres for digital education
2) Advancing digital pedagogy
3) Renewing curricula, study programmes and job profiles
4) Education and training of educators
5) Supporting the digital education ecosystem
6) Developing protocols for education in special circumstances to ensure resilience and adaptability in the face of disruptions.

The Action Plan is implemented through a combination of national projects, research and development initiatives, as well as international collaborations, and it is supported by both national and European funding.

Box 1 – Development projects enhancing students' digital competences and computer science in Slovenia

The projects presented below build on learning communities at multiple levels – national, project, institutional, and the classroom level. Regular coordination meetings take place between all projects and the Ministry of Education. The projects foster collaboration and professional growth through peer learning, interdisciplinary planning, and the sharing of best practices.

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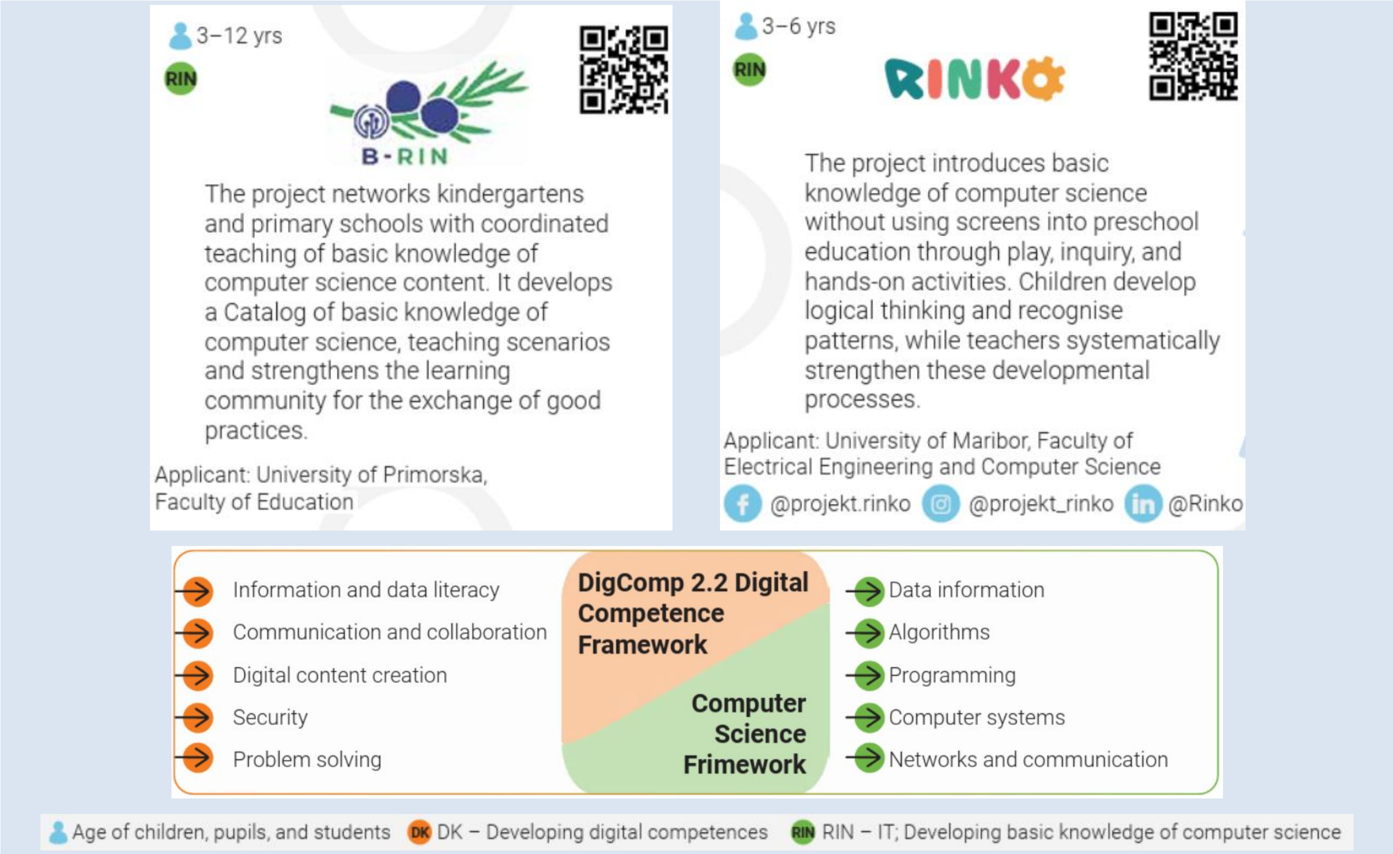
[1] The report collected 2022 data from 30 countries and jurisdictions. It includes a policy roadmap for making ECEC responsive to digitalisation, as well as thematic chapters on policy levers for developing high-quality and equitable ECEC. Supplementary inputs include 6 country notes (Canada, Finland, Japan, Korea, Norway, Sweden), 20 case studies, data tables and expert literature reviews. The report identifies 5 key challenges for ECEC in responding to digitalisation, such as 1) reducing digital divides, 2) developing young children's early digital literacy, 3) protecting young children against digital risks, 4) enhancing quality interactions with children and families, 5) supporting work processes and quality assurance. It also offers 15 policy pointers to overcome these challenges, organised around the following policy levers: guidelines and regulations, curriculum and pedagogy, workforce development, family engagement, monitoring and data, funding and infrastructure, and governance.

At the project level, vibrant virtual communities enable peer evaluation, whereas classroom observations, study visits, and networking opportunities are also organised. Within each educational institution, teachers and school leaders engage in joint planning, reflection, and the exchange of good practices, while at the classroom level, teachers work closely with external experts to plan, test, implement, and evaluate innovative activities.
Project activities so far developed over 1,200 innovative teaching scenarios and 140+ whole-school approaches, aiming at systemic improvements at all levels for the continuous improvement of kindergartens and schools in digital competences and the basic knowledge of computer science. Project activities start with a **comprehensive analysis of schools' situation**, include **ongoing reflection** and the **creation of development groups** at different levels, as well as **building learning communities** to ensure that the initiatives create sustainable, digitally competent learning environments for both children and educators across Slovenia.



Source: Brochure on Development projects enhancing students' digital competences and computer science in Slovenia.

Finland

The Finnish Ministry of Education and Culture has adopted a **comprehensive and strategic approach to digitalisation in ECEC**, guided by national and European frameworks. Finland's digitalisation in ECEC is anchored in Europe's Digital Decade and Finland's Digital Compass, as well as the 2023 report on "Policies for the digitalisation of education and training until 2027". The latter outlines the **vision for the country to become the world's leading developer and user of sustainable digitalisation in teaching, education, and training by 2027**. This vision emphasises equal opportunities, the accessibility of education, and the support of individual learning needs through digital tools and environments.

The 2022 "Framework for Digitalisation in ECEC, Comprehensive School Education, and Liberal Adult Education" was developed collaboratively with stakeholders. It defines principles, targets, and measures for steering and coordinating digitalisation. It also provides a structure for assigning responsibilities and monitoring impact. The framework aims to:

- Promote equal digital learning opportunities,
- Strengthen digital competences,
- Establish a shared direction for the development of digitalisation,
- Build interoperable data systems and analytics capabilities to support decision-making,
- Develop common ground rules and operating models for digital services,
- Improve resource allocation and strategic steering.

The "Target state of digitalisation in ECEC, pre-primary, primary and lower secondary education" was drawn up as part of the above framework, providing concrete guidance on the topic. It addresses digitalisation across seven key areas: 1) preconditions for development; 2) digital competence, 3) support for developing digital infrastructure, services and interoperability; 4) data management and quality; 5) data protection and information security; 6) legislation and legal interpretation; and 7) digitalisation research.

The Finnish national curriculum for ECEC highlights **multiliteracy and digital competence as core skills**, **with an emphasis on responsible, safe, and creative use of digital tools**. Multiliteracy encompasses interpreting and producing various types of messages, including digital, and is closely linked to thinking and learning skills. Digital competence is considered essential for interactions, participation in the society and learning, therefore, its strengthening is believed to promote children's educational equality. The task of ECEC in Finland is, together with the home, to support the child's understanding of digitalisation, and the role of digitalisation in everyday life is explored and observed with the children. Evaluation tools such as Valssi, support the assessment of practices in multiliteracy, digital skills, and media education in ECEC.

The 2022 Framework for Digital Competence defines digital / ICT competences as consisting of four main areas: 1) practical skills and personal production, 2) responsible and safe use of ICT, 3) information management and inquiry-based creative work, and 4) interaction. **Staff play a key role in modelling appropriate technology use and ensuring children learn to use devices safely**.

A 2025 national survey revealed that **progress in digitalisation varies widely between Finnish municipalities**. There is a strong need for information, support, and training in digital transformation. Only half of respondent municipalities have a digitalisation strategy for ECEC, and competence assessment is irregular. Competence gaps, attitudes, and inadequate infrastructure hinder development, whereas investment in education and training improves the understanding of digitalisation. Barriers to staff training include lack of resources, substitutes, attitudes, and time constraints. Digital infrastructure remains less developed in ECEC compared to basic education, though improvements have been made. Funding for teachers' digital skills development is not centrally secured, raising concerns about equitable benefits for all children.

The 2025 "Artificial intelligence in education – legislation and recommendations" aims to support ECEC and training providers in utilising AI as part of teaching and learning. It supports the development of AI competence and promotes its responsible, safe and innovative use.

National recommendations on screen time for children aged up to 13 years suggest no screen time for children under 2 years (except for video calls and photos), and limited, supervised use for children between 2-5 years (up to 1 hour).

Ongoing work in 2025-2026 focuses on expanding support materials to promote digital competences in ECEC, mapping existing resources, producing competence descriptions for staff, and providing plain language materials on data protection and security.

In summary, Finland's strategic and inclusive approach to digitalisation in ECEC aims to ensure that all children benefit from high-quality, equitable digital learning environments, supported by competent staff and robust infrastructure.

Portugal

Portugal's strategic framework for digitalisation in education includes several national initiatives supporting digital transformation in ECEC:

- Action Plan for the Digital Transition, which prioritises digital skills and education;
- Action Plan for Schools' Digital Development (PADDE), a framework inspiring local ECEC strategies;
- Since 2021, initial teacher education reforms have aligned ECEC Master's degrees with the European Framework for the Digital Competence of Educators (DigCompEdu);
- In-service training, led by the School Association Training Centres (CFAE) focuses on digital literacy, inclusion, and technology use in early years; while
- Municipal partnerships are expanding PADDE approaches to preschool clusters.

The Portuguese Ministry of Education has shared about what digital tools can bring to the ECEC system in terms of its management, organisation, and the relations between the different actors that intervene – rather than how these tools can change the ECEC pedagogy. In reality, digitalisation affects ECEC systems beyond pedagogy by influencing management, monitoring, coordination, and inclusion. Educators require digital literacy to engage with families, document learning, and access professional networks. Furthermore, municipalities and ministries increasingly depend on digital systems to ensure transparency, quality monitoring, and equitable access to services. Therefore, it was proposed that **digitalisation in ECEC should be understood as a question of governance, equity, and professional empowerment** – instead of (only) direct children-technology interaction – and that **it should serve pedagogical and developmental priorities, not dictate them**.

Portugal also has regulations regarding digital technology in ECEC, but these are often bypassed in practice. This is sometimes due to a lack of knowledge or awareness, meaning that there is not a full understanding of the implications of technology use.

The governance structure is divided between central authorities, responsible for policy and curriculum, and municipalities that manage equipment and local planning. There has been an effort to limit the number of digital platforms that ECEC settings need to fulfil, in order to reduce their administrative burden – such as through efforts of centralising information in a larger central database. The challenge of not having a dedicated national ECEC digital strategy remains, and implementation varies across regions, with capacity gaps.

Key policy debates in Portugal revolve around the following two questions, with key policy insights and pathways proposed below each:

1) **How can digital platforms support integrated, equitable monitoring in decentralized ECEC governance?**
   - By developing an interoperability framework linking education, social security, and municipal data systems;
   - Adopting a unified data platform ensuring both local autonomy and national oversight;
   - Training ECEC and municipal leaders in ethical and evidence-based data use;
   - Using Portugal 2030 and Recovery and Resilience Plan funds to address territorial inequities in digital capacity; and
   - Aligning indicators with EU frameworks, such as the Digital Education Hub and the European Child Guarantee.

2) **How can digital tools reduce administrative burden on ECEC leaders and enhance pedagogical focus?**
   - By streamlining reporting obligations via unified digital templates and automatic data sharing;
   - Introducing AI-assisted tools for attendance, resource management, and planning;
   - Piloting ECEC-tailored management modules in digital platforms;
   - Co-designing solutions with ECEC practitioners to ensure usability and pedagogical relevance; and
   - Embedding digital leadership training in accredited programmes for ECEC coordinators.

Accordingly, Portugal aims at developing a national digital strategy for ECEC that integrates pedagogical and administrative dimensions, creating unified digital platforms for monitoring, providing mandatory training in digital pedagogy and management tools, fostering co-design processes, and ensuring equitable digital infrastructure.

As a key takeaway, it was suggested that **digitalisation should be a governance enabler, not a bureaucratic layer**. **The integration of systems, capacity building, and the ethical use of children's data are** identified as **key levers for sustainable digital transformation in ECEC**. In addition, **digital governance must strengthen the pedagogical mission of ECEC**, with technology used to enhance access, inclusion, and efficiency, but not to replace play or human contact. The focus should be on **proportionate, context-sensitive use that supports documentation, communication, and management, always aligning with developmental and relational goals**.

The key challenge is how to **guide digitalisation through reflective practice, policy coherence, and staff empowerment**. It will be necessary to **ensure that digital practices are pedagogically grounded, equitable, and developmentally appropriate**, enriching observation, documentation, and communication with families without displacing the centrality of human relations.

Other countries' insights

PLA participants discussed how their countries (or countries where they work) approach regulations in relation to digitalisation and ECEC:

- **Only a minority of them has concrete legislation / regulations** in this regard (such as BE-fr, DE, PT). Some have developed national strategies (such as IE and CZ) and guidance documents (IE), while others have only limited guidelines or none (CY, HU, SK). The level of detail, enforcement, and practical support varies widely.

- In some countries (BE, DE), regulations and protocols **can be rather restrictive**, hindering the practical and pedagogical use of digital tools in ECEC. Staff may lack the skills or knowledge to use digital technology effectively due to these constraints. Whereas in other countries (PT), regulations exist but are often bypassed in practice, sometimes due to a **lack of awareness or understanding of their implications**.
- Some countries, such as CY, have prioritised **investment in digital infrastructure** (e.g. laptops, high-speed internet, interactive panels) but lack curriculum integration or guidelines for pedagogical use.

Box 2 – Country examples on guidelines, legislations and regulations for digitalisation in ECEC

In **Germany**, there is a strong emphasis on authority and rules regarding the use of data and protocols for digital technology in ECEC. These regulations can be rather restrictive in certain cases, and thus, staff may lack the necessary skills or knowledge to use digital tools effectively in pedagogical practice. This creates a gap, as the existing rules and regulations can work against practical use in ECEC settings.

Belgium faces similar challenges, where various regulations – including in domains not directly referring to ECEC, such as related to data protection – can make it difficult to use digital technologies in practice in a way that is genuinely beneficial for children.

Ireland has a national strategy and a range of guidance documents, with the current focus being on the practical aspects of how to learn and teach the use of digital tools. In this regard, it is important to strike a balance between using digital tools while maintaining quality interactions with children.

Czechia does not have specific regulations for digitalisation in ECEC, but there is a strategy in place. Data is collected at the preschool level, and there is a focus on developing computational thinking related to digital technology, not only in ECEC but in education more broadly.

Lithuania has a policy framework for digitalisation in education, but there are no specific guidelines or legislation for ECEC in this regard. Investment in digital infrastructure is managed through an education basket, with funding allocated from the government that include IT support to municipalities as owners of kindergartens, and national or private kindergartens. Participation in Erasmus+ and other international projects is seen as an advantage for securing additional funds to support digital competencies. Kindergartens use a mandatory e-diary platform for communication with parents, children's assessment, and process planning, use of e-diary is regulated by the order of minister. Improvements are needed, particularly in ensuring data safety for children and families, and in working with parents to align digital practices between home and ECEC environments. Data safety is considered particularly important, especially given the detailed level of data collected from children and families.

Slovakia does not have formal regulations for digitalisation in ECEC, but there are some guidelines on how to use digital tools in learning. The Ministry is currently discussing the use of artificial intelligence (AI), but primarily in higher education.

In **Hungary**, digital tools are not used in ECEC. However, there are guidelines for the methodology of using application programmes for children aged 3-6 years.

Cyprus has invested in infrastructure, providing laptops in all classrooms and high-speed fibre internet in all kindergartens. There are plans to introduce interactive panels over the next five years. Teachers use digital tools in teaching and learning, but technology use is not part of the curriculum, and there are no guidelines on how to use technology in ECEC.

Source: summary of examples from PLA discussions.

Challenges and opportunities

PLA participants reflected on aspects which were insufficiently developed and could be improved:

- **Lack and use of data in a safe manner:** there are ongoing discussions about how to collect, use, and retain data on children, as data safety and privacy remain significant concerns. At the same time, it is recognised that there is a dichotomy between what is allowed in educational settings and what people allow in their private lives. Therefore, collaboration with parents and alignment between home and ECEC digital practices would be crucial. There is also a lack of information and research on the benefits of digital tools for learning, pedagogy, and education. Data is mainly used to monitor, observe, measure, and report to parents – serving system management rather than direct educational purposes. As a result, the pedagogical space remains less informed about data use. In addition, there is still a lack of vision regarding the role of data in ECEC.
- **Lack of ECEC-specific frameworks:** in the absence of systematic, ECEC-specific policy frameworks – especially regarding digitalisation, data use, privacy, and child protection – it is important to explore how digital media can be leveraged to enhance learning. On the other hand, overly restrictive regulations can prevent the effective and creative use of digital tools, while a lack of awareness can lead to regulations being bypassed naively.
- **Need for practical guidance:** there is a need for clear frameworks and guidelines on the appropriate / inappropriate use of digital tools in early years settings, rather than simple yes/no rules. The focus should be on how digital tools are used to enhance learning, not just whether they are used.

Discussions showed that it would be beneficial to have a balanced approach where regulations protect children but also enable pedagogical innovation and the practical use of digital tools. Such approach would include comprehensive, ECEC-specific national frameworks and guidelines that are well-communicated. There should also be a stronger research base on the impact of digital tools on learning and pedagogy.

ECEC workforce – Equipping staff with essential digital pedagogy and competences

As one of the five key pillars in the European Quality Framework for ECEC, **staff are central to building high-quality ECEC systems**. As children engage with digital technologies from an increasingly young age – primarily at home –, digitally competent ECEC **staff are essential for supporting families and children in navigating both the opportunities and risks of the digital world in an equitable and inclusive manner**. This priority is reflected in the 2023 Council Recommendation on improving the provision of digital skills and competences in education and training as well as in the Action Plan on Basic Skills – that encourages school leaders to aim at integrating digital education into all subjects – as part of the 2025 Union of Skills strategy. In addition, the EU Teachers and Trainers Agenda will be set out in 2026 with an aim to focus on improving educators' working conditions, training, and career prospects, including in ECEC. To support these European policy objectives, the Erasmus+ 2021-2027 offers funding opportunities for ECEC staff and institutions, including staff mobility, various training, job shadowing and courses for developing their digital skills.

The **ECEC Working Group has done significant work on the topic of ECEC staff**. This includes discussions involving staff in relation to the 2024-2025 work cycle's topic (ECEC leadership) and related to the Covid-19 pandemic – where one of the key conclusions was that staff needed to improve their digital skills e.g., to communicate with families. The free SELFIEforTeachers for ECEC tool was also published (available in all EU languages), which is a guided self-reflection questionnaire, aiming to help staff to reflect on their skills related to digitalisation in ECEC. The below deliverables also capture the WG's focus on ECEC staff:

- How to recruit, train and motivate well-qualified ECEC staff?
- Involving children, parents, staff and stakeholders in monitoring & evaluation of quality in ECEC
- Policy brief on Staff shortages

As identified by the OECD report "Empowering Young Children in the Digital Age", supporting work processes and quality assurance is one of the key challenges for ECEC in responding to digitalisation. This includes data collection on interactions with children, on administrative aspects and the work carried out. The 2018 TALIS Starting Strong Survey shows that while **many ECEC teachers recognise the importance of digital skills for preparing children for the future**, **their perceived self-efficacy in using digital technology to support learning varies widely across countries**. Most countries include digital competencies in initial teacher education, but only a minority formally require or fund continuous professional development (CPD) in this area.

The report proposes a **model for ECEC workforce development with three levels of digital competence** – foundational, enhanced, and specialised – **across pedagogical, management, and knowledge domains**. Foundational skills are needed by all staff to use digital technology safely and meaningfully with children; enhanced skills are required for ECEC leaders and lead staff to implement safeguards, select resources and meet reporting requirement; and specialised skills enable digital specialists to innovate and support colleagues. However, **most countries rely on traditional CPD approaches** – such as online courses, seminars, training combining online / in-person activities – **despite the need for more systematic, targeted, and sequenced training**, as well as **clear pedagogical guidelines for digital technology use in ECEC**.

Country experiences

Slovenia

Slovenia's approach to equipping the ECEC workforce with essential digital pedagogy and competences is characterised by a strong regulatory framework, **comprehensive teacher education programmes, and close collaboration between higher education institutions and kindergartens**. A key priority area of the Slovenian Digital Education Action Plan 2021-2027 is the education and training of educators at all levels, including ECEC. The plan promotes the development and use of competence frameworks to support self-reflective practices, while also supporting the development of digital school leadership and encouraging participation in EU and international projects. There is also a strong emphasis on research and development activities, with teachers encouraged to participate in forward-looking projects such as those on generative AI and data literacy.

Ministry of Education

As shared by the Ministry of Education, **the preschool teaching profession in Slovenia has a regulated structure with linear career steps**. Legal requirements include a relevant university degree in preschool education or related fields, proficiency in Slovenian, and passing a state teaching certification examination covering constitutional and educational regulations. Assistant preschool teachers require secondary vocational education in preschool education. The career path for preschool teachers follows a linear progression, beginning with the role of student trainee – for 6-10 months –, advancing to candidate for the teaching certification, and subsequently to certified teacher. While traineeships are not mandatory, gaining work experience is. Most new teachers gain experience through full or part-time jobs, and there is also a possibility of formal project work. **Career advancement is incentivised through a structured system of titles**, such as Mentor, Advisor, Counsellor, and Senior Counsellor, with **additional professional work and ongoing development recognised for promotion**. The Ministry is responsible for the validation of education and professional qualifications obtained abroad, ensuring that these align with national standards. The Ministry also coordinates the national catalogue of continuing education and training programmes for educational professionals (KATIS).

University of Maribor

The University of Maribor offers a three-year professional Bachelor's degree in preschool education, combining subject-matter, pedagogical, and professional practice courses. **Practical training is included in every semester**, with extended placements in the second and third years, and strong partnerships with kindergartens across Slovenia. **Digital competence is considered essential**, with **computational thinking and information literacy integrated across courses**, **using child-friendly and unplugged approaches**. Students are introduced to educational robots (such as mTiny, True True, Cubetto, and Kubo) to foster algorithmic thinking, creativity, and problem-solving. Innovative electives, such as 'Learning Mathematics through Play', involve workshops with children and parents. The Faculty of Education supports digital communities and peer learning and operates a modern research hub (EDUMLAB) for interdisciplinary collaboration. **CPD is promoted** through seminars, workshops, and participation in national and international projects, including RINKO (see Box 1), SETCOM (to foster transversal competencies, such as AI literacy and social-emotional skills).

University of Ljubljana

The University of Ljubljana has reformed its preschool education curriculum to address the digital and green transitions. Through the ULTRA project, the Faculty of Education has **revamped existing courses and developed new electives to enhance digital skills among future preschool teache**rs. The programme places particular **emphasis on essential competences**, including the ability to search for and process digital resources, communicate and collaborate using digital tools, produce and present multimedia, safeguard privacy, solve problems, analyse media, and apply technical skills such as computational thinking and research literacy. Research at the faculty has shown that **systems thinking and digital competences can be effectively developed through targeted curriculum changes**, with **micro-credentials** and **hands-on, developmentally appropriate activities**. Accordingly, the new model includes micro-credentials and essential educational modules for pre- and in-service teachers. The faculty emphasises the importance of feedback literacy, authentic tasks, and tailored support for different student profiles, and is committed to ongoing curriculum adaptation based on research and project outcomes.

University of Primorska

The University of Primorska systematically develops digital competencies among pre-service and in-service preschool teachers. **Digital pedagogy and computer science education are integrated from preschool onwards in a developmentally appropriate way**. The curriculum includes compulsory and elective courses on educational technology, digital competencies in ECEC, and perspectives on digitalisation, with structured opportunities for students to design, implement, and evaluate innovative pedagogical practices. Collaboration is fostered through mentoring during internships and through the RA-RA research unit, which serves as a multilingual kindergarten and innovation hub. The Faculty of Education participates in national and international projects such as DigiChild (recognised by the OECD), B-RIN (see Box 1), and RAČek, and offers professional development through the Centre for Lifelong Learning and the national KATIS system. These initiatives promote a professional learning community and support continuous growth and knowledge exchange among students, teachers, and researchers.

Box 3 – Feedback on SELFIEforTeachers for ECEC by Kindergarten Jelka, Slovenia

Educators from Kindergarten Jelka in Slovenia provided constructive feedback on the SELFIEforTeachers for ECEC tool, particularly regarding its suitability for the preschool context. It was highlighted that the approach to teaching in Slovenian kindergartens differs significantly from that in schools, and therefore a tool initially designed for primary and secondary education cannot simply be adapted for early childhood settings. Therefore, it was recommended that a dedicated tool, developed specifically for preschool education, was needed.
A key point raised was that the choice of digital tools used by educators is often determined at the institutional level, not by individual teachers. As a result, responses in the tool's self-assessment section may reflect organisational practices rather than the digital competence of individual educators. It was also noted that the tool's rating system, which requires users to select a single level of engagement (such as "I use", "I reflect", or "I promote"), does not capture the complexity of practice, as these aspects often overlap. Thus, a multi-choice or more nuanced approach would be more appropriate.

The feedback further emphasised that ratings can be highly subjective, influenced by personal philosophy rather than actual competence. The tool should focus on empowering teachers rather than grading or ranking them. In addition, the importance of providing guidance on safe, high-quality digital tools suitable for preschool settings was also stressed.

The educators recognised the value of the tool in raising awareness of digital competence and encouraging reflection. However, they cautioned that digital technology in ECEC should be used thoughtfully, creatively, and only when it adds real value. They advocated for a strong emphasis on unplugged learning, where technology is used as a tool to enrich learning rather than as an end. Safety and responsible guidance were identified as paramount, and the need for practical, context-specific recommendations was also highlighted.

In conclusion, the feedback from Kindergarten Jelka suggested that **SELFIEforTeachers in preschool education should aim to empower digitally competent teachers while supporting unplugged children who develop digital competences through meaningful, developmentally appropriate experiences**.

Source: summary of feedback shared by Kindergarten Jelka.

Lower Saxony, Germany

The Ministry of Education of Lower Saxony presented their approach to professional development for ECEC staff with and through digital media, noting that children increasingly live and learn in digital environments, and digital media has a strong impact on how they grow up. While digital media can offer educational opportunities, it also poses risks to children's health. Although **children often intuitively understand how to use digital devices**, they **need to learn how to use them competently**, to judge when and how to use them, and to understand the attitudes and role-modelling of adults. In fact, the **role of adults is key in helping children become competent and safe users of digital media**.

To address these challenges, Lower Saxony developed a curriculum as a basis for professional development of ECEC staff with regard to digital media and the development of approaches in ECEC settings. This **curriculum describes the knowledge, skills, and personal competences that staff need, to enable children to benefit** from the digital world **through healthy and age-appropriate use of digital media**. The aim was not to prescribe a specific curriculum for children, but to bring the debate into settings in a productive way, allowing staff to position themselves and engage with the topic.

Digital media should be recognised for its potential in day-to-day pedagogy as a point of reference, a source of information, and a tool for self-expression. It **enables** children to have **additional opportunities for participation and learning**. However, to use digital media beneficially, children must also be able to see the risks to their well-being in an age-appropriate way. **Communication and interaction between children and pedagogues are essential for reflecting on media use** and experiences in digital worlds.

Children and parents need to learn about the influence of digital media on their lives and **how to use it** consciously, competently, creatively, and critically. They should **understand** both the **opportunities, limits and risks** of digital worlds. **Awareness of the health risks** associated with a high level of media consumption is also important (also as part of health education).

The professional development curriculum for media education in Lower Saxony covers several areas:

- **Pedagogical staff knowledge:** understanding media competence, media education, media pedagogy, media literacy, and media formation in ECEC; knowing the legal / professional foundations of educational work in daycare concerning media pedagogy, and the basic principles of healthy / beneficial digital media use in ECEC.
- **Pedagogical staff skills:** understanding opposing positions on digital media use in ECEC and defining their own professional standpoint; assessing the applicability of digital tools in indirect / direct pedagogical work; acting as role models in digital media use; and planning for media education aligned with the institution's conditions, children's living environments, and team resources.
- **Pedagogical staff personal competences:** evaluating personal experiences and attitudes towards digital devices; reflecting on strengths / resources while also developing goals and expectations for media education; and recognising media education as an opportunity for quality development in pedagogical practice.

In relation to children, the curriculum emphasises **integrating digital media into day-to-day pedagogy**, recognising relevant media trends, **creating safe environments for media use** (including data protection), **understanding the influence of media on development**, and identifying development areas particularly affected by media use. Children should develop skills in media didactics, **rules should be set for media use**, such as **using it to deepen interaction**, and the **effects** of media use **should be observed and documented**. Children should be seen as agents of their own development, while understanding the importance of interaction with educators also in relation to media use.

Parents are also included in the curriculum, with a focus on using new forms of cooperation with them based on digital media and understanding media use in the family and accessing knowledge to further media education. Staff are encouraged to **use digital media to inform parents** about their work, while ensuring that they **communicate effectively via the right channel** (in person, as needed). **Parental support for media education should be ensured**, and parents need to be advised on media use and related health issues. Forming partnerships with parents, engaging them in ongoing reflection / adaptation, and cooperating with other institutions in the setting's area through digital media are also highlighted.

The curriculum includes a foundation of 20 hours and a 4-hour transfer to practice. Qualification for entire settings involves 3 days plus 10 hours of counselling, covering the development of a media concept, data protection and children's rights, media pedagogy, cooperation with parents, creative methods, and media as both a topic and a tool in ECEC. The approach is hands-on and supportive, enabling settings to develop their own media concepts and address the issue in a way that fits their specific context. The curriculum is not prescriptive or mandatory, but rather provides orientation, support, and guidance for settings, with high acceptance among practitioners. Challenges remain, particularly regarding data protection and bureaucracy.

Other countries' insights

PLA participants discussed how their countries (or countries where they work) equip and support ECEC staff with essential digital pedagogy and competences:

- In many countries, **systematic training and ongoing professional development in digital pedagogy for pre-school teachers is lacking**. Where training exists, it is often fragmented, optional, or dependent on local providers, resulting in uneven coverage and quality, highlighting the need for greater investment in CPD.
- **Funding for digitalisation and professional development is frequently inconsistent** and reliant on local budgets, which leads to significant **inequalities between regions and settings**. Some countries have national priorities or projects, but these are not always ECEC-specific or sustained.
- There is **limited systematic monitoring of teachers' digital competencies**. Dedicated funding streams and national oversight are rare, leaving responsibility for CPD to municipalities or individual institutions, with varying levels of support and resources.

Box 4 – Country examples on equipping the ECEC workforce with digital competencies

In **Slovakia**, CPD for teachers focusing on digital skills has been available since 2013, with about half of teachers participating. There is also an ongoing project aimed at transforming education and schools by 2028.

In **Lithuania**, CPD is available for teachers on the use of IT tools and robotics. Teacher training is provided by universities, which are teacher training centres, National Agency for Education as well as local-level training institutions. National priorities for in-service training are set, and for 2026-2028, the priority will be on digital competencies, including AI, across the whole education sector, also covering ECEC. The National Agency for Education provides a range of digital tools and resources to all teachers, available online and downloadable for use up to age 19.

In **Finland**, ECEC teachers must have a Bachelor's degree in the field of education (ECEC), but universities have a high degree of autonomy in designing their programmes. The basis of ECEC teacher programmes is the content of the National Core Curriculum for ECEC. There is also no funding specifically allocated for increasing digital competencies among ECEC educators, and no national steering is set regarding which areas should be covered, leading to variation in resources and priorities across municipalities – who are now responsible for providing CPD to their staff. Areas that could be improved upon are increasing teachers' competencies and influencing the higher education curriculum to include content on digitalisation in ECEC to ensure the preparation of future professionals in this regard.

While **Croatia** has teacher training agencies, teachers (even in the agencies) do not seem to have sufficient competences in digital pedagogy, especially in ECEC.

Ireland has a significant gap in both initial training and CPD for early years educators. There is no national strategy to guide universities / training providers on what should be included in initial and in-service training for digital pedagogy in ECEC.

In **Portugal**, ECEC educators must get a Bachelor's degree in the field of education, as well as a Master's degree in ECEC education. As for in-service training, teachers in Portugal are obliged to attend a certain number of hours of training every year. Remaining challenges include a fragmented training offer and the absence of an ECEC-specific framework since universities have a high degree of autonomy in designing their programmes. This underscores the need for coherent professional development pathways from initial teacher education to practice.
Changes were introduced into the curriculum "Creches" (2022) in light of the 2016 ECEC guidelines; these were more a review of existing frameworks rather than guided by the digital reality. When it comes to digital pedagogy practices, there are some examples of digital storytelling and early media literacy, as well as of integrating the creative and ethical use of digital tools. There are many optional courses for teachers on digital pedagogy, but these are not streamlined across universities. It was noted that educator confidence and digital maturity are limited, and there is a need for pedagogically sound integration across contexts.

Germany has no regulations governing digital pedagogy in in-service training of ECEC staff – this depends on individual providers.

In **Czechia**, there is no specific training for the carers of the youngest children, but digital courses are offered on various topics for free, assuming carers already possess some digital competencies.

Cyprus is implementing a project to strengthen digital skills among teachers at every educational level from preschool to higher education.

Source: summary of examples from the PLA discussions.

Practice example: GREELCO – An online learning community for ECEC professionals

GREELCO is an online community that connects ECEC professionals and offers them the opportunity **to improve their digital competencies, share their expertise and reflect on their practice**. The project originated as a partnership between the Educational Research Institute (ERI) in Slovenia, the International Step by Step Association (ISSA), and the Hellenic Open University, with the aim of providing a sustainable platform for professional development that would continue beyond the duration of Erasmus+ funding. The consortium includes eight kindergartens from Belgium, Czechia, Estonia, Hungary, North Macedonia, Romania, Slovenia, and Serbia. The primary objectives of GREELCO are to enhance the digital competences of preschool professionals, increase awareness of ECEC systems across eight European countries, and improve knowledge of pedagogical practices in preschools. The project also seeks to strengthen professional connections among preschool staff, foster reflective practice, and promote high-quality, inclusive education. A particular emphasis is placed on green education and equal opportunities for participation.

To achieve these aims, 42 professionals were trained from the partner kindergartens, focusing on the digital skills necessary for planning, filming, and editing high-quality videos of educational practice. This training also addressed child-centred quality practices. A webinar was subsequently developed to make the training accessible to a wider audience. **40 videos were produced by the participating kindergartens, showcasing their institutions, daily routines, professional roles, and examples of child-centred and inclusive practice**. The process was closely monitored by ERI and ISSA, who also developed reflection guidelines to support individual professional development.

A series of eight virtual study visits was organised, each hosted by a different kindergarten and presenting the national preschool education system, operational context, learning environment, and pedagogical practice. These online events attracted 992 participants, with 99% expressing satisfaction. The events were highly rated for their implementation and usefulness. **Access to all materials remains available via free registration on the GREELCO platform**, which has attracted users from 63 countries worldwide. The user base includes professional and managerial staff of kindergartens, students, university professors, NGO representatives, directors, school inspectors, educational consultants, psychologists, speech therapists, and researchers.

The project demonstrated that **digital tools and well-structured professional activities can** successfully overcome the limitations of physical meetings, **enabling the effective exchange of knowledge and practice**. GREELCO embodies modern approaches to professional development, such as virtual study visits and the purposeful use of digital technologies. It has strengthened networking among European institutions in ECEC, provided valuable insights into diverse pedagogical practices, and contributed significantly to participants' professional growth. The focus on green education added an important dimension of sustainability to the project.

Challenges and opportunities

PLA participants reflected on how to improve the professionalisation of ECEC staff in relation to digitalisation:

- **Need for a common understanding of digitalisation**: there is insufficient knowledge about what digitalisation means in the context of ECEC. Parents often equate digitalisation with screen time, while it encompasses much more. There is a need for a better common understanding, which should be communicated to parents and based on research evidence. In addition, more research is needed to determine whether technology adds value in ECEC and what that value is, and to provide evidence-based guidance for educators and parents.
- **Need for appropriate training, monitoring, overview of digital competencies:** comprehensive data and systematic monitoring on teachers' digital competencies are lacking. Teacher training programmes should be developed to address different levels of digital competence: foundational skills in using ICT and technologies smartly, learning to teach with digital resources, and connecting these tools to curriculum and pedagogical approaches (rather than simply providing devices). Educators in educational sciences often lack technological competence, and there is a need to bring together education science and technology to ensure that those studying educational sciences gain technological skills.
- **Need for resources and guidance**: there is a widespread lack of resources, including funding, substitute workforce, and time for staff to participate in CPD. Technical assistance and pedagogical guidance should be provided to advance teachers' digital competencies with dedicated funding streams. Guidance should also be embedded into national curricula to support teachers in meaningfully integrating technology into play-based activities while also addressing privacy concerns.
- **Need to reduce the administrative burden**: teachers face demands in navigating various digital platforms and entering data, which can be overwhelming. There is a need for a more comprehensive and integrated data platform to streamline administrative tasks.

Curriculum frameworks and pedagogies

Curriculum is one of the five key pillars in the European Quality Framework for ECEC, as set out in the 2019 Council recommendation on high quality ECEC systems. The 2023 Council Recommendation on improving the provision of digital skills and competences in education and training emphasises the importance of **supporting young children, and their families, in developing digital skills and understanding both the benefits and risks of digitalisation**. The use of age-appropriate, play-based and unplugged activities to foster digital competence is encouraged, ensuring these align with children's cognitive and socio-emotional development. The Action Plan on Basic Skills sets out the preparation of guidelines for curriculum development in ECEC, supporting the acquisition of basic skills early on and facilitating the early detection and intervention of developmental delays.

The 2025 report on "Key data on early childhood education and care in Europe" by Eurydice indicates that most European education systems define specific digital competences to be developed in ECEC. **Digital competence areas that are most common in ECEC in Europe include information and data literacy, digital content creation, and communication / collaboration**. Developmentally age-appropriate methods are usually emphasised. At the same time, a reverse trend is emerging. Around a dozen education systems now place limits on the use of digital technologies in ECEC, promoting cautious, moderate integration and emphasising unplugged activities and social interaction as foundations for digital competence. Countries such as Denmark and Sweden are taking steps to further restrict the use of digital technologies in ECEC by revising their legislation and other steering documents.

Findings from the "Empowering Young Children in the Digital Age" OECD report highlight that **digitalisation is increasingly present in ECEC, but curriculum frameworks and pedagogies are still adapting**. Two major **challenges** – **reducing digital divides and developing early digital literacy** – can be addressed through curriculum and teaching approaches. Disadvantaged children face gaps in both access and engagement with technology, which can affect later educational outcomes. Addressing these gaps from the early years is crucial and can be achieved through developmentally appropriate curriculum and pedagogical approaches. The report also notes that **supporting digital literacy does not always require direct screen use**. While unplugged activities and age-appropriate methods are effective, only 41% of countries report supporting the provision of such unplugged materials in their ECEC settings. Nearly half of countries lack specific goals for early digital literacy in their curriculum frameworks. Most curricula promote play-based pedagogies for digital technologies, with project-based and collaborative approaches being less common, especially for the youngest children. **The report recommends setting clear, comprehensive goals and adopting broad, age-appropriate strategies to help young children thrive in the digital age**.

Country experiences

Slovenia

Digital pedagogy, the renewal of curricula and study programmes are key priorities of the Slovenian Digital Education Action Plan 2021-2027, with a strong emphasis on **integrating digital competences and computer science from early years onwards**. The plan supports the development of comprehensive theory and practice in digital pedagogy, which forms the foundation for all content and system documents. Research and development projects, such as those focusing on the use of generative AI, contribute to the evolution of curriculum frameworks.

In February 2025, **Slovenia adopted a revised kindergarten curriculum** as part of a broader education system overhaul, with significant updates and key innovations related to digitalisation in preschool education. The revised curriculum places particular **emphasis on the meaningful and safe integration of digital technology into preschool education**, recognising the impact of rapid technological change, globalisation, and social developments affecting children and families. A central principle is that **digital technology should be used** by preschool educators **only when** it is **justified for achieving educational goals** that cannot be met otherwise, or when its use enhances the quality of outcomes. The curriculum **discourages the use of personal digital devices in kindergartens** and highlights the importance of raising awareness among parents about the potential **harmful effects of screens** on young children.

Collaboration with parents is a key focus. The curriculum encourages professionals to communicate with parents about the appropriate use of digital devices in the family environment, considering the child's age and the role of parents as models for digital behaviour. ECEC professionals can communicate with parents also via digital technology.

Kindergartens are tasked with **raising parental awareness** about children's engagement in virtual environments, and the role and responsibilities of parents in this regard.

Digitalisation is reflected across several activity areas in the curriculum as noted below:

- In the Society area, educators are encouraged to **develop children's media literacy** and **introduce them to various means of communication**, including AI and digital environments. Digital technology may be used to facilitate learning about new environments, such as virtual museum tours, creating animations or simulations of how a place is created.
- In Nature, **documentation of activities** using media such as photographs, drawings and recordings is encouraged since these **support memorisation and reflection**. With planned activities and the use of appropriate resources, preschool teachers help children form age-appropriate representations of the planet and the universe.
- In Mathematics, preschool teachers enable children in the second age group to solve problems by **developing problem-solving strategies**, and when it is meaningful, they can also use digital technology to help them solve problems (e.g., digital camera, microscope, navigation system, digital devices in the children's environment, etc.). To **develop algorithmic thinking**, preschool teachers also offer children opportunities to learn about and play with technology, with age-appropriate digital didactic tools that are part of the child's everyday life.
- In Art, children are enabled to **experience art through both analogue and digital media**. Preschool teachers enable the meaningful and safe use of digital technology, being mindful of adapting the use to the child's abilities, age, and developmental needs. Interactive content is included thoughtfully, with the goal of enriching activities, while being aware that interactive tools are not a substitute for interpersonal interaction and are not the primary form of work.

The curriculum is complemented by the **2021 Guidelines for the Use of Digital Technology in Kindergartens**, which are due to be updated. These guidelines **support professional staff in gradually developing children's digital literacy**, **teaching correct and safe use of digital content**, raising awareness of potential risks, and introducing positive uses of technology. They also provide didactic instructions, emphasising the following:

- Learning for a preschool child is based on direct activity and gaining concrete experience with people and resources.
- To develop their potential, children need a supportive learning environment (safe, loving relationships, a positive atmosphere, intellectual challenges, resources) and competent professional, pre-school teachers.
- Pre-school teachers provide children with clear rules for using digital media.
- Developing modern technologies requires digitally literate people who are constantly willing to learn.

The National Education Institute of Slovenia has conducted numerous **training sessions** for preschool professionals, focusing on the sensible and safe use of digital technology and finding a balance between natural and digital learning environments. Systematic training aims to ensure that professionals can meaningfully use digital technology in educational work. **Digital literacy** and digital tools can help preschool professionals with planning, document management, collaboration with parents, and teamwork.

As part of the **'Innovative classes'** project, innovative project development groups are set up in each participating kindergarten. Teachers prepare learning scenarios which are then tested and peer-reviewed, and building on these, whole-school approaches / school learning communities are developed. External experts are also involved in each innovative classes, and the school leadership and staff play a key role in designing their own approaches. The aim of the project is to develop over 1,000 innovative classes – with content on digital competences and computer sciences – in 150 schools, with a budget of EUR 10 million between 2023-2026.

Box 5 – Practices gathered from the site-visit to Koper Kindergarten, Slovenia

Topic 1: Protection of personal data for 2-4-year-olds

- **Activity description**: As part of a theatre play, a teacher plays a sad, lonely mouse who searches for friends on the Internet. She meets a very nice mouse online, and after chatting for a while, they become friends. The mouse gives the other mouse her address so they can meet. When the other mouse arrives, it turns out

to be a cat who tries to eat the mouse. Because the cat knows the mouse's address, the mouse is no longer safe and must move out, ending up even sadder than before.
- **Educational value**: The child learns the importance of not sharing personal data with unknown people, whether in real life or digital life.

Topic 2: Activities in classrooms to foster computational thinking

Age group: 2 years
- **Activity description**: The aim is the development of spatial orientation. Children move along a marked path in the playroom, crossing obstacles by going either under or over them
- **Educational value**: The child understands that commands must be arranged in a specific and unchangeable sequence to achieve the intended goal. In everyday activities, the child recognises the sequence of steps needed to reach a goal.

Children repeat a simple pattern made of blocks, mirroring it in the same sequence

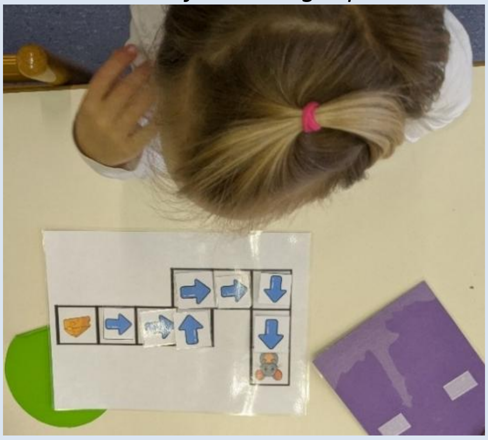
Sorting: children correctly sort objects by colour using either a pincer grasp (by hand) or with the help of spoon

Age group: 3 years
- **Activity description**:
  - Grids and spatial orientation (travelling across Slovenia): children place arrows to show direction and then move along the grid themselves.
  - Orientation on paper in Italian: maze challenge, higher difficulty – by placing arrows in the correct direction and sequence, children find the correct path.
  - Arrange the story in the correct sequence.
- **Educational value**: The child understands that an instruction is composed of several smaller, predetermined basic commands. The child understands that comments must be arranged in a specific and unchangeable sequence to achieve a given goal. In everyday activities, the child recognises the sequence of steps needed to reach

Age group: 4 years
- **Activity description**: Spatial orientation – a simple grid activity with one line.
- **Educational value**: The child understands that a digital device can be used both for entertainment and for learning. In everyday activities, the child recognises the sequence of steps needed to achieve a goal.

Sound bingo: based on the audio recording played, children identify and correctly mark the corresponding sound

Orientation on paper: maze challenge, easy level by placing arrows in the correct direction and sequence, children find the right path



Age group: 5 years

- **Educational value**: The child understands that a digital device works when it is turned on and can turn it on independently. The child understands that a digital device operates based only on human instructions, not on its own. The child understands that, when turned on, a digital device receives our instructions and executes them.

Source: site-visit to Koper Kindergarten, Slovenia.

Lithuania

The Lithuanian Ministry of Education, Science and Sport (MoESS) presented their **curriculum supporting materials**. These were created by implementing "The Innovations in Kindergarten" project (2018-22), which aim was **to support ECEC practitioners in using digital technologies** to include sustainable development, creative competencies, information technology and STEAM in preschool and pre-primary education. Sets of **recommendations and tools were developed** by ECEC specialists. Experienced **ECEC professionals were** selected to participate **in training on how to use these materials** and **to then train other colleagues** in their ECEC settings as needed. Initiated by the MoESS, the project was implemented by the National Agency for Education and financed by the European Social Fund.

The project began with **research into advanced pedagogical practices** and innovations in Lithuanian kindergartens, aiming **to identify progressive methods** and **tools** used by teachers, as well as **gaps in provision**. Findings highlighted the **influence of innovative activities** – such as STEAM and sustainable development – on children's achievements, practitioners' professional growth, and family satisfaction. The study also revealed that while all kindergartens used **technology** to some extent, **uptake varied**, and practitioners expressed a **need for training and methodological support** to use digital tools creatively and effectively.

As a result, **two sets of methodological materials were developed** and released: "Play and Discoveries" for preschool education and "Experience Spaces" for pre-primary education. These resources provide **practical activity ideas**, **methodological recommendations**, and **digital resources** accessible via QR codes. Activities are built around **play-based learning** principles and aim to develop key competencies such as communication, creativity, problem-solving, digital literacy, and social-emotional understanding. For example, "The Game of Realities" booklet provides ideas on how children can acquire informatics thinking and digital literacy skills in the areas of environmental awareness, artistic expression, spoken language, and more. The “Animated Drawings” activity encourages children’s creativity by allowing them to animate their own drawings using augmented reality applications, while “Where Does Honey Come From?” introduces children to environmental awareness and scientific inquiry through experiential learning. Box 5 below provides further details on example activities.

The **training programme for educators included hands-on experience with digital technologies and STEAM tools**, such as educational robots, coding applications, and virtual exhibitions. The virtual learning environment “Moodle” was used to facilitate training and share materials. Although the project budget did not allow for nationwide training, 89 lecturers were trained to cascade knowledge within and beyond their institutions.

The **updated preschool curriculum**, implemented from September 2025, **incorporates digital intelligence** as a new area of achievement. It sets **age-appropriate restrictions on screen time** and **emphasises the safe, meaningful use of digital technologies**. Children under three are encouraged to play with screen-free smart toys, while those over three use educational digital content under teacher supervision. The curriculum promotes **experiential exploration**, creativity, and social interaction, with digital tools supplementing real-world learning contexts. Teachers are guided to facilitate autonomous learning, problem-solving, and the transfer of real-world objects into digital spaces.

“Digital Transformation of Education” (EdTech) is a project funded by the Recovery and Resilience Facility and the state budget, which aims to increase the efficiency and quality of the Lithuanian education system through innovative digital technologies. This included digital skills improvement programmes for teachers, the creation of a national platform for digital learning tools, and the testing of EdTech solutions in educational institutions. The initiative was recognised with the European Innovation in Politics Award in 2024.

In summary, Lithuania’s approach to digitalisation in ECEC is characterised by **a research-driven, collaborative process that prioritises creative, experiential, and safe use of technology**. The curriculum and supporting materials are designed to foster digital literacy, STEAM competencies, and holistic child development, while ensuring equitable access to resources and ongoing professional development for educators.

Box 5 – Curriculum supporting materials for using digital technologies in Lithuanian ECEC

“**The Game of Realities**” booklet is part of the methodological set “Play and Discoveries”, designed for preschool educators working with children aged 3-6. Its main purpose is to support teachers in integrating modern technologies, creative exploration, and experiential learning into early childhood education. The publication helps educators encourage children’s curiosity, imagination, and responsible use of digital tools while connecting play with meaningful learning experiences. The booklet presents practical activity ideas, methodological recommendations, and digital resources accessible through QR codes. Each activity is built around play-based learning principles and aims to develop key competencies (communication, creativity, problem-solving, digital literacy, and socio-emotional understanding). Activities invite children to explore both the real and digital worlds in safe, guided, and imaginative ways.

An example activity of this set is called “**Animated Drawings**”:

- **Objective**: To encourage children’s creativity and introduce them to the possibilities of digital animation through their own drawings.
- **Activity description**: Children draw a chosen character or object on paper, using coloured pencils or markers. With the teacher’s help, they then use a digital application (e.g., Quiver, AR Drawing, or a similar augmented reality tool) to scan the drawing. The app “animates” the image, allowing children to see their artwork come to life on the screen.
- **Educational value**: Promotes creative expression and imagination. Develops fine motor skills and digital awareness. Encourages positive emotional engagement and curiosity about technology. Strengthens the connection between traditional art and modern digital experiences.
- **Teacher’s role**: The educator guides children through each step: preparing materials, scanning drawings, discussing what happens when the drawing “comes alive,” and encouraging reflection (“What does your character want to do now?”). The teacher also ensures safe and age-appropriate use of digital devices.

The “[Experience Spaces](#)” booklet is part of the methodological set for preschool education designed for educators working with children aged 5-6. Its purpose is to offer contemporary, experience-based, and project-oriented activities that encourage children’s exploration, creativity, and independent thinking. The publication helps teachers implement the preschool education curriculum by promoting meaningful learning through play, investigation, and collaboration, preparing children for a smooth transition to primary school. Each theme integrates multiple areas of competence: cognitive, communication, creativity, socio-emotional skills, early scientific literacy. The resource consists of two main parts:

1) **Group and classroom experiences** – activities designed for everyday learning in the preschool environment
2) **Outdoor and community experiences** – projects implemented in nature or other real-life contexts.

This set includes two key publications: 1) “**Information thinking in pre-primary age”** (5-6 years), and 2) “**STEAM in pre-primary age**” – which are short methodological guides for teachers with their content indicated below.

INFORMATINIS MĄSTYMAS
PRIEŠMOKYKLINIAME AMŽIUJE

INFORMATION THINKING IN PRE-PRIMARY AGE (5/6 y)

STEAM
PRIEŠMOKYKLINIAME AMŽIUJE

STEAM IN PRE-PRIMARY AGE (5/6 y)

An example activity of this set is called “Where Does Honey Come From?”:

- **Objective**: To introduce children to the process of honey production and the role of bees in nature, developing inquiry skills and environmental awareness.
- **Activity description**: Children explore where honey comes from by discussing bees’ work, observing pictures or videos about beekeeping, and, if possible, meeting a local beekeeper. They can taste different kinds of honey, compare colour, texture, and flavour, and talk about how bees collect nectar and make honey. The project may also include creating bee models, drawing beehives, or acting out the life of a bee.
- Educational value: Encourages curiosity and observation. Develops early scientific understanding and vocabulary. Promotes respect for nature and living creatures. Fosters cooperation, dialogue, and experiential learning.
- **Teacher’s role**: The educator organises experiential learning by preparing visual materials, coordinating the tasting or visit, guiding children’s questions, and encouraging reflection (“Why are bees important?”, “What happens if there are no bees?”). Using QR codes teacher can get supporting materials in the thematic and also as you see in every thematic in the book there are suggestion for parents how to continue the concrete thematic discoveries at home for the holistic approach in education in institution and at home.

Source: presentation by the MoESS of Lithuania.

Other countries' insights

PLA participants discussed the existence and content of ECEC curriculum in their countries (or countries where they work), and whether it includes a reference to digital competences or computational thinking:

- The **existence and content of ECEC curricula vary considerably** across participating countries, with some having a national curriculum (such as CZ, IE, LT, SK, SI, FI, CY, HR), while others do not (like DE, PT, BE, HU for 0-3). Where a national curriculum exists, **the inclusion of digital competences or computational thinking is also highly varied**. In some cases, these competences are **explicitly referenced and supported** by methodological resources, CPD, and national projects with varying levels of detail and practical guidance (e.g., CZ, LT, SI, SK, HR). In others, digital skills are **mentioned only in general terms**, or they are **embedded implicitly within broader domains** such as multiliteracy, problem-solving, or knowledge of the world, rather than as stand-alone subjects (e.g. IE, FI, CY, PT).
- Some countries are actively updating or piloting new curricula to better reflect digital competences and computational thinking, sometimes with an emphasis on continuity from ECEC to primary education and the development of innovative, whole-school approaches.
- **Approaches to digital competences** vary, some being **left to the discretion of individual settings or teachers**, **with limited national vision or systematic support.** In these contexts, digitalisation efforts may first need focus on supporting staff in using digital tools, and only secondly on pedagogical integration with children.
- Digital skills are often taught through both **"plugged"** (technology-based) **and "unplugged"** (non-technology-based) **activities**.
- Some research findings caution against the use of technology for the youngest children.

Box 5 – Country examples on curriculum frameworks and digital pedagogies in ECEC

Czechia has updated its national curriculum in October 2024, which is currently being piloted and will become mandatory from September 2026. The new curriculum includes digital competences with methodological support, resources and CPD for teachers, and national projects to strengthen teachers' digital knowledge. There is also an effort to ensure the continuity of competences in the transition from ECEC to primary education.

Ireland's national curriculum, Aistear, for children aged 0-6 years was updated in 2024. It now includes digital technology – in particular in relation to communicating, exploring and thinking – with a balance of plugged and unplugged activities that should be introduced to children in an age-appropriate, meaningful and purposeful way. Support for staff through government programmes is also included. While various transferable skills are referenced in relation to digital competencies, these are not explicit within the framework. Nevertheless, (digital) approaches foundational to digital literacy are embedded into problem solving, sequencing, etc. throughout the curriculum. Assistive technology for children with special education needs is made available. There is inspection of the use of digital tools and devices to ensure they add value to teaching and learning. The use of digital tools is considered as part of extended learning, but there is no systematic approach to digitalisation in ECEC. Ireland's policy statement on the use of digital technologies is going to be key to bring out what is meant within Aistear, which is based on children's rights.

In **Croatia**, digital competences are included in the curriculum.

The **Cypriot** national curriculum describes digital skills to be learned, but only in a general way. Technology and digital skills are embedded in different subject areas, with guidance for teachers on implementation.

Slovakia's national curriculum references the European framework. There are guidelines for using technology with children aged 3-6, as well as direct educational standards for using digital technologies in mathematics and information processing.

In **Finland**, digital competences and multiliteracy are mentioned in the national curriculum for ages 0-6, but not in detail. Each setting is responsible for working on these themes.

In **Belgium**, the use of digital tools depends on the initiative of individual teachers or settings. Organisation is digitalised, however, not all staff knows how to use digital tools. Therefore, the focus is on supporting and training staff in this regard, instead of using the tools with children.

In **Hungary**, there is no national curriculum for children aged 0-3 years, and for children aged 3-6, research recommends against using technology for digital skills development in ECEC.

Germany does not have a national curriculum for ECEC that includes digital tools or competences. However, the extended education mission emphasises the development of socially responsible children. Individual settings incorporate this mission into their own curriculum with the support of digital tools.

Portugal has no national curriculum for ECEC, but it has guidelines focusing on three main domains, such as personal and social development, expression and communication, and knowledge of the world. The latter includes the use of technology.

Source: summary of examples from the PLA discussions and presentations.

Challenges and opportunities

- **Risk of formalising ECEC**: there is a risk that ECEC may become more knowledge-driven, potentially undermining the play-based approach that is central to the field.
- **Focus on child-centred pedagogies:** there is concern that digital education could be seen as an "add-on" rather than being integrated meaningfully into pedagogy. In this regard, there is a need to understand which children benefit most from digital technologies and to respond to their unique needs, choosing resources and tools accordingly.
- **Need for common understanding of terminology and required digital competences**: there is a lack of common understanding and clear terminology regarding digital education, the digital competences required for adults and children, and computational thinking. This can lead to confusion among educators and parents, and may contribute to "imposter syndrome" among staff who feel they lack the necessary vocabulary or expertise. For younger children, especially those aged 0-3, it is debated whether the use of digital tools is appropriate, with some advocating for a focus on logical, strategic, and critical thinking skills rather than direct technology use. Therefore, it is key to clarify what digital competences adults, teachers and children need. Guidance is also needed on emerging topics such as AI.
- **Need for trustworthy information and data**: there is insufficient data and research on the impact of digital competences in ECEC, and a need for more evidence to guide practice. Educators also face challenges in identifying reliable information and teaching children to distinguish between valid and invalid sources in the digital world.
- **Inclusion of children's voice**: children's self-confidence and awareness in digital competences should be fostered, and their voice should be included in curriculum development and evaluation. Consultation with children is seen as an important solution moving forward.
- **Leadership** and the interest of leaders at the setting level are also important factors in supporting digital competences. In addition, leaders themselves need support in becoming responsible users of technology for administrative and management tasks, monitoring and quality improvement at the centre level, etc.
- **Possible solutions**: these include adopting a whole-school approach and related policies, CPD, and ensuring flexibility in curriculum frameworks to adapt to evolving digital realities.

Future impact, benefits and challenges of digitalisation in ECEC: Slovenian insights

Ethical considerations around digitalisation in ECEC

As emphasised by the University of Primorska, quality in ECEC is not only a technical matter but also an ethical and political one. Therefore, digitalisation in education must be considered from philosophical, pedagogical, and sociological perspectives, always **questioning why digital tools are used**, **which values are prioritised** and **their added-value for child's development.**

Technology has been part of the Slovenian kindergarten curriculum since 1979, but the nature and risks of technology have changed significantly since. While earlier forms of technology were easier to control and observe, today's digital tools present new dangers, particularly if used without pedagogical oversight. The **COVID-19 pandemic** illustrated this risk, as **many digital tools were introduced rapidly**, sometimes **without sufficient attention to their appropriateness or safety for children**.

Understanding the purpose of digitalisation, both for individuals and the society, is key. In Slovenia's current educational reform, digitalisation is one of five main goals, alongside sustainability, language and art, citizenship, and wellbeing. However, **access to digital tools** alone is not sufficient – **support and care** must also be provided. Children and teachers from different backgrounds may have **unequal access to knowledge and guidance**, which can lead to new forms of inequalities.

The **ethical use of technology in preschool education** can be conceptualised as a **relational and contextual practice guided by values of care, respect, and responsibility**, in which **children are recognised as active participants**. In line with the ethic of care, educators must observe how technology affects children's emotional and social experiences, adults should mediate children's interactions with technology to support their holistic development, safeguard privacy and wellbeing, and offer guided opportunities for children to explore and create with digital media. An ethical approach in education means making reflective and responsible decisions based on moral principles that **prioritise children's wellbeing, rights, and development**, rather than simply seeking efficiency or convenience. Whereas an **ethical decision in using technology is transparent** and **justifiable**, made **with awareness of the moral implications**, **respecting** the **values** and **dignity** of those involved, and **striving to do good** and **avoid harm**. Manipulative practices, such as **adopting technology without clear purpose or meaningful dialogue** with children and teachers, were **warned against**. It was argued that **meaningful use of technology should be based on how children learn**, integrating new information with existing knowledge, experiences, and emotions.

STEAM (science, technology, engineering, art, and mathematics) was identified as a key framework, fostering critical thinking, creativity, and problem-solving skills from an early age. The challenge is to strike a balance and take a **holistic approach**, ensuring that technology is not used for instrumental purposes alone but supports the child's development.

The **participatory and meaningful use of technology** involves both children and teachers in decision-making, professional cooperation, and reflection. Teachers need to be equipped not only with technical skills but also with the ability to critically assess digital tools and understand what is developmentally appropriate and meaningful for children. Ultimately, ethical digitalisation in ECEC requires reflective, responsible, and context-sensitive decision-making, always guided by the best interests of children and society.

Opportunities and challenges

To explore considerations around the future of digital education in ECEC, including the opportunities, challenges, and needs, three panellists were invited to share their thoughts:

- Professor at the University of Maribor;
- Representative from the Anton Martin Slomšek Institute;
- Headteacher at Kindergarten Jelka.

Opportunities in digital education in ECEC

- The **value and purpose of digital competences need to be clarified and communicated to children, families,** and **educators**. When the rationale is clear, other efforts in digital education become easier and more effective.
- Digital education in ECEC should **address** not only **the needs of children** but also of **families**, **ECEC staff** and **settings**, and other key stakeholders, preparing children for the future by fostering critical thinking, problem-solving, and various forms of literacy.
- The current period is seen as an opportunity to **focus on research and the development of evidence-based approaches in digital education**, ensuring that – through updated educational programmes – and staff are equipped with cutting-edge knowledge and competences in relation to digitalisation.
- **Creating learning communities** and promoting good practice examples **can support the meaningful integration of digital education**. Building **sustainable, user-updated communities of practice** can contribute to ensuring that AI is used to benefit the next generation, and that knowledge is updated on an ongoing basis in light of technological changes.
- **Lessons learned from projects should be recorded and built upon** / incorporated into the subsequent projects. This is also to ensure that staff and kindergartens learn from each other, and actors get to understand how to better collaborate.
- **Early and thoughtful engagement with emerging technologies** – such as generative AI – presents a chance to **implement** these tools **in a way that is ethical, personalised,** and **beneficial for all learners**.
- Certain big generic concepts such as meaningful implementation or critical concepts are not actually well understood in practice. The "**learning about, with, for, and beyond AI**" serves as a useful **framework** for both teachers and learners in this regard. Learning about AI can help teachers understand the basic concepts around the functioning of the technology. In a preschool context, this means promoting algorithmic thinking in education but without computers. Learning with AI covers digital tutoring, providing instant feedback, personalised learning, etc. Learning for AI means preparing future generations for how to use AI in their future work, such by developing problem-based learning, algorithmic thinking, interdisciplinary knowledge, and an ethical approach towards AI use. And learning beyond AI is the synthesis of all of these concepts, moving into a co-creation of new knowledge with AI.
- **Open and scientifically upgraded curricula** in ECEC can **provide flexibility for meaningful digitalisation**, fostering the development of critical thinking and **play-based learning** without relying solely on digital devices.
- There is an opportunity to educate not only children but also teachers and parents, **cultivating a mindset that values** both **digital** and **non-digital resources**.

Box 4 – The GenUI project of Slovenia

Generative AI can be immensely **useful in creating personalised learning content for children with learning difficulties**. However, teachers do not necessarily know how to use it. Slovenia has a **national project on generative AI** in education (2024-2026), involving the analysis of literature, surveys of teachers and students to understand how this technology changes teachers, teaching and learning, how it can be used effectively and integrated long-term into education. As part of the GenUI project, **concrete guidelines will be developed for introducing AI in classrooms**. Over 50 teachers are currently piloting scenarios using generative AI. The Anton Martin Slomšek Institute is one of the consortium partners, besides the Universities of Maribor, Ljubljana, and Primorska, the National Education Institute, and a primary school.

Source: summary of insights from the panel discussion and the input of the Slovenian Ministry of Education.

Challenges in digital education in ECEC

- **Fear** and **ignorance** regarding digital technologies, especially AI, persist among professionals and the wider ECEC community, often resulting in **polarised opinions** and **resistance to change**. There is also a **risk of misinterpreting computational skills** as merely screen time, which can lead to **misunderstandings about the true purpose** and **value of digital education**. These challenges can only be overcome by acquiring and promoting knowledge.
- The "**project graveyard**" effect is a significant challenge, where innovative **projects end due to lack of funding and their lessons get lost**. This highlights the need for continuous funding and sustainable development, as well as for a mindset that activities should be developed even when there is lack of funding.

- The education system is large and changes slowly, requiring the cooperation of a **variety of stakeholders** (municipalities, ministries, universities, kindergartens, etc.), making it difficult to keep up with rapid technological advancements and address emerging needs. Therefore, a **proactive approach needs to be adopted instead of a reactive one.**
- **Various gaps** exist, including digital, knowledge, geographical, and educational gaps, all of which need to be addressed to ensure equal opportunities for all children.
- Ensuring that teachers have **up-to-date knowledge** and **access to the latest tools** remains challenging. Teachers need to be equipped with **basic frameworks on the use of AI** in their work in order to allow them to substitute some tasks with the tool (or even augment, modify these or create).
- **Assessing the quality of digital education activities** and **developing robust assessment tools** remain challenging, with certain systems (such as in Slovenia) relying only on self-evaluation and inspectors, rather than external independent evaluators.
- Mindsets among teachers and parents can be a barrier, with some fearing or undervaluing digital education. **Changing** these **mindsets requires** good examples, **ongoing education**, and **inclusive environments where parents and children can learn together**.
- **Ethical and privacy concerns** remain, as well as the need to ensure that digital tools serve the interests of learners rather than commercial interests.

In conclusion, the future of digital education in ECEC will depend on various factors. A thoughtful **balance** must be achieved **between innovative technologies and foundational pedagogical values**. Digital tools should be integrated in ways that **support, for instance (play-based) learning, critical thinking, and holistic child development**, rather than being used for their own sake. **Ongoing professional development** and a **willingness to adapt mindsets** among educators and parents are crucial for maximising the benefits of digitalisation. Collaboration and knowledge sharing between kindergartens, schools, and other institutions will help to sustain progress and **ensure that lessons learned from projects are not lost but instead inform future practice**. **ECEC professionals act as role models** and should embody the meaningful use of technology, as their attitudes and approaches will shape both children’s and parents’ engagement with digital tools. Ultimately, developing a **whole-setting approach** – grounded in evidence, inclusivity, and reflection – with collaboration across institutions and a focus on both digital and green education, can be a promising direction for the future.

Key messages and conclusions on the impact of digitalisation in ECEC

As a final exercise, PLA participants were invited to reflect on digitalisation's impact on the ECEC system as a whole, on children, and on ECEC professionals. The outcomes of these discussions are summarised below.

The impact of digitalisation on the ECEC system as a whole

Benefits and opportunities

- Digitalisation can **enhance data collection, monitoring,** and **quality assurance** across the ECEC system.
- It can **facilitate interaction and active participation in decision-making** processes across different levels of governance, from policy makers to practitioners.
- Digital tools can **support professional development, better communication,** and **coordination** within the system, **enabling more effective policy development** and **implementation**.
- There is also a sense that it is still time to regulate digitalisation appropriately, ensuring it serves the ECEC system's vision and needs.

Challenges

- The **potential misuse** and **safety of data** remain significant concerns, as does the **quality of digital infrastructure** and **support**.
- There is **insufficient clarity** at the policy level **regarding the purpose of introducing digital technologies in early childhood settings**, and a **lack of knowledge and training on how to use these** tools effectively.
- The **pace of technological change** often **exceeds the ECEC system's ability to adapt** and digital solutions are **not sufficiently integrated** to address increasing challenges such as poverty and inequity.
- **Definitions** of concepts like digital literacy and computational thinking are **not always aligned across actors**.
- There is a **lack of leadership and continuity in digitalisation efforts**.
- **Financial constraints** and the risk of decisions being driven by available digital tools, rather than needs-based policy, also pose challenges.

Next steps / open questions

- **Safe**, password-protected **digital platforms** must be developed **that are freely accessible** to system users.
- There is a need to **build multidisciplinary expertise in digital pedagogy and computational thinking** in order to provide comprehensive training for all, including policymakers.
- Efforts should be made to **democratise access to meaningful digital tools**, avoiding producers' undue influence.
- **Digital literacy should be enabled and embedded into curricula and guidelines**, ensuring CPD, monitoring and evaluation.
- The ECEC system should **strive for a balance between digital and physical resources**, **focusing on the purpose** and **added value of digitalisation**. It must **maintain a clear focus on the needs of children and families**, with digitalisation guided by a well-defined purpose and rationale.
- **Quality assurance frameworks should be reviewed with a digital lens**.
- It will be important to keep sharing successful practices across borders.

Digitalisation's impact on children

Benefits and opportunities

- When used appropriately, digital tools can serve as **powerful motivational aid** for children, **helping to build competences** such as computational thinking and critical thinking skills.
- Well-designed digitalisation strategies in ECEC should focus on **preparing children for a digital world through developmentally appropriate, largely unplugged methods**. These approaches should intentionally aim to strengthen critical thinking, build early computational thinking skills, and introduce concepts of digital safety, without relying on screen-based tools.
- Digital technologies can be **particularly beneficial for children with special needs**, offering assistive communication and soothing tools, thereby supporting inclusion.

Challenges

- If not introduced properly, **digital tools can overwhelm children**, **negatively impacting cognitive and social development**.
- **Unequal access** to digital tools **can lead to feelings of exclusion**, while **overuse may result in screen addiction** and **reduced social skills**. Children may develop **dependencies on digital devices** or toys, and may prioritise digital rewards over the intrinsic enjoyment of play.
- There are concerns about **children's safety** and **privacy** in digital environments, and about the representation of social interactions that digital tools may convey.
- The **gap between digital experiences at home and in educational settings** can have negative effects.

Next steps / open questions

- Ultimately, the **focus** should remain **on the child's age, development,** and **well-being**.
- **Child participation** should be considered in digitalisation efforts, and the **purpose** of using digital tools with children must **be clearly defined**.
- It is essential to **support the adults around children** – caregivers, parents, and educators – by **raising** their **awareness of** both the **positive and negative impacts** of digitalisation and addressing their fears.
- **Digitalisation efforts must be grounded in a child-centred approach** that prioritises children's rights, needs, safety, and privacy, supported by appropriate curriculum guidance, provider practices, and regulatory frameworks at the system level.
- There is a need to **develop more unplugged activities**.

Digitalisation's impact on ECEC professionals

Benefits and opportunities

- Digitalisation has the potential to **reduce administrative burdens** for professionals and **facilitate** the **exchange** of materials.
- It can enable more **systematic approaches to planning and programme development**, while providing **opportunities for professional development** and exposure to new ideas.
- Digital tools can inspire staff, support CPD, and encourage **critical and computational thinking in teaching** practices.
- **Communication with parents** can be enhanced through digital means.

Challenges

- Digitalisation **can increase bureaucratic work** and responsibilities, making processes more time-consuming.
- Staff may be more exposed on social media, raising **concerns about potential misuse, safety and privacy**.
- There can be a **lack of self-esteem and confidence** among staff **regarding** their **digital skills**.
- **Clear guidance** for staff is **often lacking**, and mindsets towards technology can vary widely.
- **Communication with parents** through digital means **can be demanding** and **sometimes less effective than face-to-face** interactions.
- **Keeping up to date with technological developmen**ts and maintaining a clear focus on the purpose and rationale for digitalisation in ECEC are ongoing challenges.

Next steps / open questions

- The **provision of safe and useful digital tools** for professionals is a priority, as is **protecting staff privacy**.
- There is a need for **ongoing professional learning**, both **in initial teacher education and CPD**, with a focus on critical thinking, the conceptual understanding of technology, and the ability to assess the added value of digital tools.
- Professionals **need time for learning** and **reflection**, and there should be more emphasis on **sharing successful practices** and **understanding why they work in specific contexts**.

Annex 1 – ECEC in Slovenia

The Slovenian Ministry of Education presented an overview of the Early Childhood Care and Education (ECEC) system, highlighting its structure, funding, and recent developments. In 2024, public expenditure on education reached 5.1% of GDP, with nearly one-fifth of all education funding allocated to preschool education. The vast majority of children—over 85%—are enrolled in kindergartens, and 95.7% of five-year-olds attend pre-school education. While ECEC is not compulsory, Slovenia is close to meeting the ET2030 goal of 96% enrolment for children aged 3-6.

Most children attend public kindergartens, with only a small proportion enrolled in private settings. Public kindergartens are funded primarily by municipal budgets (55%), with additional contributions from parents (32%) and the state (13%). Parents' payments are income-based, and nearly 30% of children attend kindergarten free of charge. The system is designed to be inclusive, with additional support for vulnerable families and children with foreign citizenship.

ECEC in Slovenia is organised into two age groups: children under three, and children aged three to six. Public programmes must follow the national curriculum, while private programmes are approved by the Education Council. Most children participate in full-day programmes, which include meals as part of the curriculum. The Ministry of Education also funds alternative pedagogical approaches, bilingual and minority language provision, and preschool education in hospitals.

Staffing in kindergartens is regulated by the state, with qualified preschool teachers and assistants present in each group. Counsellors and management teams provide additional support, and every kindergarten is required to offer counselling services to children and families throughout the preschool period.

Recent legislative changes include new spatial norms for indoor play areas, stricter limits on group sizes, and updated responsibilities for municipalities. The law also introduces provisions to protect children in cases of domestic violence, allowing one parent to enrol or withdraw a child from kindergarten based on the opinion of social services.

Overall, Slovenia's ECEC system is characterised by high enrolment rates, strong public investment, and a commitment to quality, inclusivity, and support for families. The system continues to evolve in response to demographic trends, policy priorities, and the needs of children and families.

More information:

- Eurydice offers a description of the general organisation and governance of the education system in Slovenia, as well as a detailed description of the ECEC system in Slovenia
- Ministry of Education
    - Ministry of Education | GOV.SI
    - Early childhood education and care | GOV.SI
- Education system in Slovenia in general (video): Education system in Slovenia - Zavod RS za šolstvo
- Curriculum for kindergartens (from 2025 but only in Slovene version): KURIKULUM-ZA-VRTCE-2025.pdf
- SeePro report on Slovenia
- National Education Institute Slovenia (the main national research, development and consultancy institution in the field of pre-school, primary and general secondary education)
- Data about Education in general: Education
- Statistical information about ECEC: Pre-school Education

Annex 2 – Agenda

Tuesday, 21 October 2025

9.00	**Welcome by the Slovenian Ministry of Education**
9.10	**Welcome by the European Commission**
9.20	**Getting to know each other**
9.45	**ECEC in Slovenia: background** **Digital education in Slovenia: strategy and development projects**
10.45	Coffee break
11.15	**Guidelines, legislations and regulations: introduction** - Ministry of Education of Slovenia, OECD
11.40	**Guidelines, legislations and regulations: country example (Finland)**
12.00	**Guidelines, legislations and regulations: group discussions**
13.00	Lunch
14.00	**ECEC workforce: introduction** - European Commission, OECD, Ministry of Education of Slovenia
14.15	**ECEC workforce: the Slovenian experience** - Ministry of Education, University of Maribor, University of Ljubljana, University of Primorska
15.15	**ECEC workforce: country example (Portugal)**
15.45	Coffee break
16.15	**ECEC workforce: practice example: the GREELCO project**
16.45	**ECEC workforce: group discussions**
17.45	**Conclusions of day 1**
18.00	**End of day 1 of the PLA**

Wednesday, 22 October 2025

Morning	**On-site visits of kindergartens**
Lunch in kindergartens	
14.00	**Follow-up of on-site visits**
14.30	**Curriculum frameworks and pedagogies: introduction** - European Commission, OECD, EACEA / Eurydice, Ministry of Education of Slovenia
14.45	**Curriculum frameworks and pedagogies: country examples (Slovenia and Lower Saxony, Germany)**
15.30	Coffee break
16.00	**Curriculum frameworks and pedagogies: country example (Lithuania)**
16.30	**Curriculum frameworks and pedagogies: group discussions**
17.30	**Conclusions of day 2**
18.00	**End of day 2 of the PLA**

Thursday, 23 October 2025

9.00	**Future impact, benefits and challenges of digitalisation in ECEC: introduction**
9.15	**Ethics in digitalisation** - University of Primorska, Slovenia
9.45	**Panel discussion on the future of digital education in ECEC – opportunities, challenges, needs** - University of Maribor, Slovenia - Anton Martin Slomšek Institute, Slovenia - Kindergarten Jelka, Slovenia

10.35	**Preschool teachers' views on SELFIEforTEACHERS** - Kindergarten Jelka, Slovenia
10.45	Coffee break
11.15	**Key messages from the PLA**
12.45	**Closing the PLA**

Annex 3 – Participants

Country	Organisation / institution
Croatia	CARNET - Croatian Academic and Research Network
Cyprus	Ministry of Education
Czechia	Ministry of Labour and Social Affairs
Czechia	Ministry of Education
Finland	Ministry of Education
Germany	Niedersächsisches Kultusministerium
Ireland	Department of Children, Equality, Disability, Integration and Youth
Ireland	Department of education
Lithuania	Ministry of Education, Science and Sport
Portugal	Ministry of Education
Slovakia	National Institute for Education and Youth
Slovenia	Ministry of Education
Slovenia	Ministry of Education
Slovenia	Ministry of Education
Slovenia	Ministry of Education
Slovenia	University of Maribor
Slovenia	University of Ljubljana
Slovenia	Education Research Institute - Center for Quality in Education
Slovenia	University of Primorska
Slovenia	University of Primorska
Slovenia	University of Primorska
Slovenia	National Education Institute
Slovenia	University of Maribor
Slovenia	Zavod Antona Martina Slomška (Anton Martin Slomšek Institute)
Slovenia	Kindergarten Jelka
Slovenia	Kindergarten Jelka
Slovenia	Kindergarten Jelka
EPSU	European Public Service Union (EPSU)
ETUCE	ETUCE
Eurydice	European Commission / EACEA / Eurydice
ISSA	ISSA
OECD	OECD
Commission / OIB	European creche
ICF	ICF / VBJK
ICF	ICF
Commission	European Commission / DG EAC

KINDERGARTEN VODMAT

Vrtec Vodmat

It is a public institution for the education and care of preschool children, established by the City Municipality of Ljubljana. The kindergarten operates across two units, where the nationally approved program (Curriculum for Kindergartens, 2025) is implemented in 26 classes, including two with an adapted curriculum. Children with special needs are also included in regular programs, with appropriate adaptations provided to support their development. Organized preschool education is also carried out in hospital settings, at the pediatric departments of the Ljubljana University Medical Centre and the Rehabilitation Institute of the Republic of Slovenia – Soča.

The kindergarten emphasizes education through art as a model of exploration and learning in the preschool period. For several years, various artistic practices have been integrated into the curriculum with active involvement of artists and cultural institutions. This approach enables children to engage with the world and its content, and to express and communicate their experiences, observations, and newly constructed understandings through diverse artistic languages and media. The kindergarten promotes ontological engagement and a high level of children's participation, seeking media and approaches that foster their social activation (e.g., through animated film, graffiti, exhibitions...). We view the language of art as universal — it enables inclusive participation and opens space for communication. At the same time, it allows for first-person expression and subjective experience.

We are currently focusing on the role of the adult and on viewing the child as a morally competent being. This perspective reflects the highest stage of the child's emotional and cognitive development. Social inclusion and prosocial development of the child, active engagement with the world and community building are very important to us in this context. Considering the current situation and challenges in education – such as individualization, exclusion, rising numbers of children with special educational needs, inclusion of immigrants and migrants...), we believe it is essential to empower professionals to effectively respond to the realities of today's world and the needs of a new generation of children and families.

In addition to education through art, we also place emphasis on ecology, the importance of sustainability, and physical activity. We incorporate Slovenian cultural heritage through seasonal holidays and celebrations. By observing and recognizing the seasonal characteristics, we explore creative ways to reinterpret and update cultural heritage.

The kindergarten's slogan, **ALWAYS LIKE TO BE CURIOUS**, as described by its author, Nika Jurman, reflects the belief that "*Vrtec Vodmat is a welcoming educational environment where we understand the developmental needs, desires, and challenges of the child. We believe that education through artistic experience support the comprehensive development of the child's personality We encourage curiosity, empathy, and a responsible attitude towards the environment, culture, fellow human beings, and ultimately ourselves.*"

KINDERGARTEN JELKA

Vrtec Jelka

Kindergarten Jelka is a public preschool located in Slovenia's capital city. Our core mission is to nurture children's foundational needs and overall well-being. We provide high-quality care, education, guidance, and nutrition for children aged 1 to 6, while ensuring equal opportunities for all—regardless of gender, social or cultural background, religion, or nationality.

Our educational philosophy is grounded in the values of understanding, tolerance, friendship, sincerity, and sensitivity towards others. Children learn and grow in a safe and supportive environment that fosters play, exploration, and development, while always respecting their individual needs and abilities.

Located in an urban setting, Kindergarten Jelka welcomes around 450 children and employs 95 staff members, including 70 qualified professionals, such as preschool teachers and preschool teachers for children with special needs. We are proud of our strong cooperation with parents, the local community, and international partners.

Our program is based on the **national Kindergarten Curriculum** and is enriched with child-centred methodologies. Project-based learning brings added value, supported by innovative and integrated activities. We carry out both the regular daily program and specialized programs for children with special needs, who are integrated in mainstream groups. Particular attention is given to children from diverse social and cultural backgrounds, children from foster families and safe houses, as well as to the growing number of immigrant children. Individual adaptations of the educational program for children with special needs are designed and implemented in close cooperation with professionals, the counselling service, and parents.

At Kindergarten Jelka, we are a **child-centred organization with a strong focus on active learning.** Our ongoing focus is on:

- Responding to contemporary challenges with expertise and innovation.
- Implementing new approaches to preschool management and pedagogy.
- Encouraging staff creativity and professional growth.
- Promoting opportunities for both professional and personal development.
- Introducing positive, future-oriented changes.

We remain committed to continuous improvement, international collaboration, and providing the best opportunities for every child to thrive, learn, and develop a lifelong love of learning.

Over the years, we have carried out several innovative projects, such as:

- *Playing English (2009–2014)*
- *Therapeutic Dog Visits and Supportive Approaches to Early Mathematics (2010–present)*
- *Emerging Literacy (2013–present)*
- *Child and Play in Multilingual and Multicultural Environments (2015–present)*

In addition, we actively participate in research and development projects, including **B-RIN, RINKO, and RAČek.**

Through project activities, we place strong emphasis on introducing the **fundamental knowledge of computer science and informatics (RIN)** into preschool education. The aim is to equip children with essential digital competences from an early age, using age-appropriate methods that do not rely on electronic devices. The project develops innovative pedagogical strategies, learning materials, and training programs to empower preschool teachers in delivering RIN content effectively. Key outcomes include the creation of didactic units and open-access resources, the establishment of pilot preschool groups, teacher training programs, and a digital platform for sharing resources and best practices. By fostering collaboration among educational institutions, projects help prepare children for the challenges of the digital age while supporting preschool teachers with practical tools and professional development.

We also focus on developing **computational thinking** through the integration of **STEM (Science, Technology, Engineering, and Mathematics)** kits in kindergartens and primary schools (grades 1–5). This initiative supports the objectives of the national Kindergarten curriculum and primary school syllabi, while aligning with the **EU Recovery and Resilience Plan,** which emphasizes strengthening digital competences as essential skills for modern professions and the green transition. By integrating STEM approaches into early education, the project promotes holistic learning, critical thinking, creativity, and problem-solving. Children are encouraged to explore and connect knowledge across disciplines, building strong foundations for computational thinking and the practical application of digital skills.

KINDERGARTEN ŠKOFJA LOKA

Vrtec Škofja Loka

The Škofja Loka kindergarten is an independent public institution for preschool education and is part of the network of the unified system of public kindergartens in the Republic of Slovenia. The kindergarten is established by the Municipality of Škofja Loka.

The Škofja Loka kindergarten provides education and care for preschool children and children with special needs, as two departments are dedicated to children with special needs.

The goals of preschool education include helping parents provide comprehensive care for children, improving the quality of life for families and children, and creating conditions for the development of children's physical and mental abilities. Educational activities take place from the 11th month to the age of 6.

The kindergarten is led by the principal, who acts as the pedagogical and managerial body of the institution. Two assistant principals help her with her work, performing tasks described in the Rules on the Systematization of Jobs.

The main document that guides us in setting goals and designing programs is the national document for preschool education, the Kindergarten Curriculum (2025).

In the 2025/2026 school year, we are organized into 59 classes, with 24 classes for the first age group, 10 classes for children aged 3-4, 21 classes for the second age group, 1 combined class, and 2 developmental classes for children with special needs. Currently, 1,000 children are enrolled in the kindergarten in 11 kindergarten's locations.

On average, about 220 employees work to ensure smooth operation of the kindergarten, including 170 professional staff and 50 staff working in administrative, technical, and other areas.

Our team is distinguished by professionalism, creativity, and responsibility in the execution of common tasks. Mutual support and professional cooperation are the foundations for establishing and maintaining quality relationships and trust.

Priorities for the 2025-2026 school year

1. **Supportive learning environment - inclusive social environment and supportive role of adults within it**

Objectives:

- The child is actively involved in the process of planning, designing, and evaluating changes in the social environment, where they are seen, heard, and experience an environment of safety and trust.
- Using a variety of teaching methods, preschool teachers enable individual progress for everyone.

An encouraging and inclusive social environment is one that motivates the child to engage in activities and supports their development and progress. It is an organized environment that adapts to the diversity of children and encourages their exploration, learning, creativity, and development of social skills.

This school year, we will promote the well-being of children and their motivation for learning, social interactions among them, learning from each other, and adults as partners in the child's game through planned observation, shaping, evaluation, and modification of the social space. With diverse materials, we will differentiate, individualize, and personalize the learning process, enabling children to make optimal progress.

2. **Computer science without a computer**

Objectives:

- The child recognizes and use technical objects and processes, learn their purpose and significance, and demonstrate their operation in play.
- The child develops mathematical or computer thinking.
- With the support of an adult, the child learns how to use technology in a safe manner.

Technology is a part of everyday life for both preschool children and adults, so we will meaningfully incorporate it into the kindergarten's implementation curriculum. Children establish their first contact with new technologies in the family and in kindergarten, and the experience of adults is crucial in this process.

It is also important to develop computer thinking in children, which is one of the key skills of modern everyday life. It includes processes of abstraction, problem solving, algorithmic thinking, pattern recognition, mathematical judgment, etc. and represents an important tool for creative and critical thinking, decision making, and problem solving. In the preschool period, computer thinking can be trained without the use of a computer.

In the first age group, we will offer children activities of arrangement, sorting, seriation, orientation, and continuation of sequences. We will introduce the principles of gradualness and sequencing to older children, which are part of algorithmic thinking (a precise description of a procedure, preparing a favourite dish, planning a route, assembling blocks according to a plan, learning routine activities by breaking them down into individual steps, and learning to verbalize the procedure, social games with rules...).

3. I, you, we – Let's all act responsibly

Objectives:

- The child develops a responsible attitude towards themselves, towards others, and towards the kindergarten environment.
- Through their choices, decisions, and responses, the adult serves as an appropriate role model for children's behaviour

The preschool period is a time when children develop attitudes and behavioural patterns that accompany them throughout life. An important form of learning is learning by example. In our kindergarten, we aim to strengthen responsible behaviour among both children and staff.

By handling materials with care, we contribute to their long-term preservation and empower children to develop a responsible attitude toward material resources. Through appropriate communication, we serve as important role models for children in learning communication skills and coexisting in society.

In the process of professional growth, we encounter both praise and criticism. These are most effective when delivered thoughtfully and constructively. Giving and receiving constructive feedback are skills that can be developed through learning and practice, with the aim of supporting

KINDERGARTEN KOPER

Vrtec Koper

Vrtec Koper is the largest preschool institution in the Municipality of Koper. This year, approximately 620 children are enrolled, organized into 35 groups. Vrtec Koper comprises six geographically distinct units. Two of them are in the urban center of Koper (Kekec and Ribica unit), while the remaining four are situated in the hinterland areas. In 2026, we will celebrate our 80th anniversary.

Our educational program is designed in accordance with the national Kindergarten Curriculum. We place particular emphasis on developing children's social and emotional competencies by providing a safe, healthy, and nurturing environment that supports the growth of their skills, abilities, and knowledge.

In pursuing our educational objectives, we pay special attention to themes such as tradition, nature conservation, environmental awareness, healthy lifestyles, stimulating learning environments, collaboration, and active participation. We also introduce foundational knowledge in computing and information technology, as along with digital skills, by applying innovative approaches and utilizing modern digital tools.

Special features of our kindergarten: Since September 2023, a premium department has been operating at the Ribica unit – the Research and Development Unit for Preschool Education at the University of Primorska. Its aim is to ensure a high-quality educational process in the kindergarten and provide access to contemporary knowledge in the fields of child development and early learning. The unit also fosters scientific and professional integration between higher education, research, and preschool education in the kindergarten.

During the 2025/26 school year, the Ribica Unit hosts two departments implementing an adapted preschool education program. These departments support children in optimally developing their strengths and abilities through a curriculum specifically tailored to their individual learning needs. The program is adapted in terms of its didactic approaches, learning objectives, and content, as well as organizational standards and staffing structure.

In addition, the Kekec Unit operates a unique morning–afternoon alternating department - the only one of its kind in Slovenia - offering an innovative model of preschool organization.

Vrtec Koper collaborates with numerous institutions and organizations at both the local and national levels. We maintain an excellent long-standing partnership with the Faculty of Education at the University of Primorska. This cooperation is based on a mutually beneficial partnership, continually strengthened through various professional and research projects, student internships, advanced professional development programs, and seminars for preschool teachers and other education professionals.

Furthermore, **Vrtec Koper** actively participates in **Erasmus+ activities**, including **student and staff exchanges** (incoming students and visiting lecturers), organized in collaboration with the Faculty of Education. In 2021 and 2023, we took part in the Erasmus project "Developing the Competencies of Educators for Teaching Preschool Children With and Through Digital Technology" (DigiKid), which strengthened the field of digital education in kindergartens. The aim was to empower current and future preschool teachers to develop children's digital competences from an early age, enhance communication and critical thinking skills among young children, prepare them for digital life in a rapidly evolving world, and encourage passive users of digital entertainment technologies to actively and critically engage with digital educational opportunities.

Currently, Vrtec Koper is currently participating in the B-RIN project (Development of Basic Computer and IT Skills for Learners), co-financed by the Republic of Slovenia, the Ministry of Education and the European Union – NextGenerationEU. The project runs from 2023 to 2026.
Its aim is to enhance learners' basic computer and IT skills by introducing innovative approaches and using modern digital tools. By providing meaningful learning opportunities, to the project promotes equal empowerment helping individuals face the challenges of contemporary society and succeed in the future.

The specific objectives are to develop and upgrade approaches for improving basic computer and IT skills among learners in educational institutions, and to test and implement didactic methods and pedagogical strategies for developing basic computer and information technology skills among children within innovative preschool groups. In the 2025/26 school year, six kindergarten groups are involved in the project.