SEEDS RECOMMENDATIONS

Report on the framework, results and recommendations of the SEEDS Project

CONTENT

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INTRODUCTION

The project "Social Entrepreneurship Empowering Development in preSchools" (SEEDS) is a two year project, running from September 2018 to October 2020, and funded by the European fund Erasmus+ Strategic Partnerships for School Education.

The main goal of the project was to develop pedagogical methods for preschool education, to support early learning of relevant skills like entrepreneurial mind-sets, digital media and to insure social inclusion of all children in this learning. SEEDS aims to equip children from an early age, with the seeds for the development of an entrepreneurial compass in interplay with digital media. This compass starts from the individual as a citizen and builds on their particular skills and competences to enhance the four points of the compass; critical reflection, collaboration, co-creation and agency.

SEEDS has developed a preschool pedagogy, described through a collection of resource materials that contain the SEEDS pedagogy (the present document), educational guidelines and principles, methods and themes, best practice and a concrete toolkit with digital media resources. The resource materials were developed based on activities across local experimenting communities in the 4 partner countries; Germany, Italy, Cyprus and Denmark. These materials can be accessed at the SEEDS website. In this document you will come across references to different types of technologies like Beebots and Ozobots. You can find explanations of what these technologies are and recommendations for how they can be used in preschool activities on the SEEDS website.

This report describes the framework for the SEEDS project, the 21st century skills, the national contexts for the preschools participating in the SEEDS project and the results of the project, as well as recommendations for implementing the SEEDS pedagogy, divided in 4 themes:

1) Implementing the 21st century skills in preschools
2) Preschool education in the light of the 21st century requirements
3) Inclusive learning in preschools
4) Developing technology for and with children

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THE 21ST CENTURY SKILLS IN PRESCHOOLS

1 INTRODUCTION

This chapter addresses the framework of the SEEDS project – the 21st century skills and how they can be interpreted into a preschool context. Further below in the recommendations chapter, you can find recommendations how to implement the SEEDS Pedagogy and work with interpreting the 21st century skills into a preschool context. The background for this chapter is based on a perceived need for making the 21st century skills relevant and concrete for a preschool setting. Often, the frameworks for 21st century skills are very abstract and do not concern themselves with the concrete and tangible skills and competences that are context specific and palpable, but often leave it to the education institutions to come up with their own answers on how to implement and realise overall learning goals for the future society. Moreover, often the frameworks describe complex and adult competences that are moreover, directly linked with a work and societal function. When looking at young children aged 6 and below, you have to take a different focus: What are the important building blocks that will enable children to grow up to be the individuals that these 21st century frameworks expect them to be? How to prepare them for the education systems that also need to adapt for the 21st century societal needs?

2 THE 21ST CENTURY SKILLS FRAMEWORK

First, a little background information. The so-called "21st century skills" originates from the beginning of the 1980s where governments, educators and business organisations in the United States issued a series of reports that identified key skills and strategies to steer students and workers towards the changing demands of the workplace and society. Soon the focus on how to prepare for the 21st century spread to Canada, the United Kingdom and the rest of the world, and through international organisations like the OECD.

There are many different definitions of the 21st century skills, but they all typically comprise a list of skills, abilities and learning dispositions. They can be grouped in three main areas:

- **Learning and innovation skills:** Critical thinking, problem solving, communication, collaboration, creativity and innovation.
- **Digital literacy skills:** Information literacy, media literacy, information and technologies (ICT) literacy.

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- **Career and life skills:** Flexibility and adaptability, initiative and self-direction, social and cross-cultural interaction, productivity and accountability.

Today the 21st century skills have turned into a sort of global movement, with a concern to prepare not just workers, but children and citizens in general for the 21st century society with its rapid digitalization of work processes, increasing use of complex technology, globalisation and birth of new job types. The World Economic Forum (WEF) indicates that within the next 10-20 years, up to 50 percent of the jobs we know today will disappear. There is a need for a future skilled work force with strong creative, innovative skills that can operate in a co-creative learning economy. They need to learn to think originally and creatively, master the newest technology, be critical thinkers, take initiative and have a global mind-set. This puts pressure on education systems to equip children for a life as active and resilient participants in society and in particular, pay attention to inclusion of vulnerable children. As formulated in the UNs Global Sustainable Development Goals, we must "leave no one behind", and ensure that all children have access to relevant learning, skills and participation in society.

Preschool education is an important starting point for equipping children with competences and mind-sets, because attitudes, values, ways of thinking and behaving are moulded early in life. Preschool is a natural environment for working with creative processes due to the pedagogical principles and methods used in preschools. However, there is a need for providing tools, guidelines and good examples of practise for European preschools in order to support the integration of the 21st century skill framework. Few European countries, and as we saw in chapter 4 not all the partner countries of the SEEDS project, have a culture for facilitating creativity, social skills, responsibility, global awareness and use of digital media in their preschools. This is what SEEDS aims to provide with the development of a European Preschool Pedagogy for Social Entrepreneurship" with a special focus on the social entrepreneurship mind-set and competences, and digital media competences, which will be elaborated below.

European research based skill and competence frameworks targeting education are already available and implemented in several European countries. We will elaborate more on these below. However, there is no Pan-European level cooperation or projects focusing on the development of a distinctive methodological approach to support and nurture entrepreneurial mind-sets and skills in preschools. At most, inspiration related to the topics of creativity, digital media use and globalization in preschool education can be found on online fora.

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International projects and platforms that aim to support 21st century skills in preschools:

The Erasmus+ project *Innoentre* created an open online platform to bring together resources and education material for entrepreneurship and entrepreneurial learning for cross-disciplinary students and teachers in Higher Education.
Website: https://www.innoentre.com/

The European platform, *E-twinning,* provides a platform where schools and preschools across European countries collaborate on teaching and educational projects.
Website: https://www.etwinning.net/en/pub/index.htm

The American network P21 or *Partnership for 21st Century Learning*, have formulated a framework for 21st century skills in preschools, which comprises guidelines and definitions.
Website: https://www.battelleforkids.org/networks/p21

SOURCES

World Economic Forum 2015: New Vision for Education: Unlocking the Potential of Technology.

UN Global Sustainable Development Goals: https://sustainabledevelopment.un.org/?menu=1300.

OECD: http://www.oecd.org/pisa/35070367.pdf.

Eurydice (2016). Entrepreneurship Education at School in Europe: Eurydice Report: Education, Audiovisual and Culture Executive Agency, 2016.

3 THE 21ST CENTURY SKILLS IN A EUROPEAN CONTEXT

The aim of SEEDS is to develop a European preschool pedagogy for social entrepreneurship and digital media use, which is transferable across preschools in European countries. As mentioned above, European research based skill and competence frameworks targeting 21st century skills in education already exist. Here we will briefly present them and highlight 3 competences that are especially relevant for the SEEDS project, because they correspond to the competences highlighted in the SEEDS pedagogy.

NEW SKILLS AGENDA FOR EUROPE:

Within an EU context, entrepreneurship skills and other competences like critical thinking, problem solving and digital competences that fit within the 21st century skills framework have been highlighted as essential for preparing citizens for the labour market and for a socially well-

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functioning life as active citizens. In this context early childhood is mentioned as the important foundation for further education, participation in society and wellbeing. In June 2016, the European Commission adopted the New Skills Agenda for Europe, which formulates 10 actions that aim to ensure that European citizens develop a broad set of skills from early on, in order to boost employability, competitiveness, innovation and growth in Europe, and to support Europeans in being "confident, active citizens".

Critical thinking, entrepreneurship, problem solving and digital competences are some of the essential competences highlighted in the New Skills Agenda, as essential competences that will "open the door to personal fulfilment and development, social inclusion, active citizenship and employment", and "allow people to thrive in fast-evolving workplaces and society, and to cope with complexity and uncertainty". According to the New Skills Agenda, transversal skills or competences like entrepreneurship and citizenship are not typically incorporated in the curriculum in many Member States in the EU. Where it has been incorporated, it has not always been done consistently. To promote a shared understanding of two of these competences, the Commission has developed reference frameworks for digital competences (DIGCOMP: A Framework for Developing and Understanding Digital Competence in Europe, 2017) and entrepreneurship (ENTRECOMP: The Entrepreneurship Competence Framework, 2016).

KEY COMPETENCES DEFINED BY EU FRAMEWORKS

The European Commission has identified 8 key competences for lifelong learning that are necessary for a knowledge-based society, of which citizen competence, entrepreneurship competence and digital competence are included. These 3 competences very much reflect the competences highlighted in the 21st century skills-framework and the SEEDS project. However, the competences are very much defined as abstract, fully developed ideals for competences and skills. When looking at a preschool level, it is interesting to define the precursors and building blocks that can and should be established in the preschool age of the child.

Citizen competence:

The first key competences, called *citizen competence*, is defined as: "*the ability to act as responsible citizens and to fully participate in civic and social life, based on understanding of social, economic, legal and political concepts and structures, as well as global developments and sustainability.*"

In order to develop the citizen competence, the individual requires an understanding and knowledge of the concepts and phenomena of individuals, groups, work organisations, society, economy and culture. Not just at a national level, but also at a European level, and understanding what it means to be part of Europe, and the historical developments leading up to where we are

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today. It also requires an understanding of the social and political aims, values and movements that take place in the global world and European societies, in particular in relation to demographic and climate changes and an awareness of the diversity and the national and cultural identities that exist in Europe and the World.

If you break down the citizen competence, it requires skills like the ability to engage with others in a common or public interest, such as sustainable development of society. It also involves critical thinking, integrated problem solving, skills to develop arguments and constructive participation in community activities and in decision-making processes on all levels of society, from local to international level. It also requires the ability to access, have a critical understanding of, and to be able to interact with and understand the role of tradition and new media.

Underneath the citizen competence, which is about responsible and constructive participation in society, is a foundation of values such as respect for human rights and democratic decision-making processes. This is necessary in order to support social and cultural diversity, gender equality and social cohesion, a culture of peace and non-violence, a respect for the privacy of others and the responsibility for the environment. It is important to develop an interest in political and socioeconomic developments, humanities and intercultural communication, in order to develop a preparedness to overcome prejudices and to seek compromises in order to ensure social justice and fairness.

Entrepreneurship competence:

The next key competence we would like to highlight, *entrepreneurship competence*, is defined as: "*the capacity to act upon opportunities and ideas, and to transform them into values for others. It is founded upon creativity, critical thinking and problem solving, taking initiative and perseverance and the ability to work collaboratively in order to plan and manage projects that are of cultural, social or financial value*".

The entrepreneurship competence requires a knowledge and awareness about how different contexts and opportunities exit for turning ideas into action in personal, social and professional activities, and how these arise. This requires knowledge of and understanding approaches to planning and managing projects in terms of processes and resources. It also requires an understanding of economics and the social and economic opportunities and challenges facing an employer, organisation or society. It is also important to be aware of ethical principles and challenges of sustainable development and have self-awareness of one's own strengths and weaknesses.

Entrepreneurial skills are founded on creativity, which in turn includes imagination, strategic thinking problem solving, critical and constructive reflection within evolving creative processes and innovation. This includes the ability to work both as an individual and collaboratively in teams, to

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mobilize resources (both people and things) and to sustain activity. Here the ability to make financial decisions relating to cost and value is also important. Moreover, the ability to communicate effectively and negotiate with others as well as dealing with uncertainty, ambiguity and taking risks as part of making decisions is essential.

The entrepreneurial competences also requires a certain attitude, which is characterized by a sense of initiative and agency, a pro-activity, being able to look forward, have courage and perseverance in achieving objectives. This also includes a desire to motivate others and value other people's ideas, have empathy and taking care of people in the world and accepting responsibility taking an ethical approach throughout the process one engages in.

Digital competence:

The last key competence that we would like to highlight is the *digital competence*, which is defined as: "*the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking.*

The digital competence require an understanding of how digital technologies can support communication, creativity and innovation. Individuals should become aware of the opportunities, limitations, effects and risks of these technologies. It is important to understand the general principles, mechanism and underlying logics of the developing technologies and know the basic functions and use of different devices, software and networks.

It is important to develop a critical approach to the validity, reliability and impact of information and data made available by digital means and be aware of the legal and ethical principles involved in engaging with digital technologies. It is also important to develop a reflective and critical, yet curious and open-minded and forward-looking attitude to the evolvement of and engagement with digital technologies. It is also important to develop an ethical, safe and responsible approach to the use of these tools.

The skills underlying the digital competence include the ability to use, access, filter, evaluate, create, program and share digital content. Individuals should be able to manage and protect information, content, data and digital identities, as well as recognise and effectively engage with software, devices, artificial intelligence or robots. Moreover, individuals should be able to use digital technologies to support their active citizenship and social inclusion, collaboration with others, and creativity towards personal, social or commercial goals.

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SOURCES

DIGCOMP: A Framework for Developing and Understanding Digital Competence in Europe, was first published in 2013 and has since been updated in a new version 2.0 in 2016 and 2.1 in 2017:

https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/digcomp-20-digital-competence-framework-citizens-update-phase-1-conceptual-reference-model

ENTRECOMP: The Entrepreneurship Competence Framework from 2016:

https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/entrecomp-entrepreneurship-competence-framework

4 THE SEEDS COMPETENCE COMPASS

The interpretations of the 21st century skills often focus on preparing children to become business entrepreneurs and to adapt to the changing labour market and lack of stable job positions. In SEEDS, the definition of 21st century skills takes departure in an entrepreneurial mind-set, which focuses on preparing children to become active, productive citizens with collaborative skills, who are able to co-create value (social, environmental, cultural or economic) for themselves and others. It also looks at digital competences and how these can be approaches and developed form an early age, in order to both meet the future skill needs, but also to approach the rising digitalization of society and children's lives from an early age in a constructive and positive approach. How do we develop a healthy yet essential foundation for children's lives in a highly digitalized society?

Using an entrepreneurial process, based on effectuation, the individual uses their own competences and skills in collaboration with others, whose interests focus on the same challenge, to change the challenge to something of value. The process aims to identify and qualify challenges that are recognised by a number of individuals and thus has a social orientation. Inclusivity is central to the entrepreneurial mind-set, which is always linked to an awareness of the surrounding society, or context, in which the individual finds themselves. In SEEDS we set out to define a pedagogy that supports the establishment and building of a set of context-relevant skills in all young children. The entrepreneurial mind-set and skills developed in the project focus on a broad understanding of entrepreneurship. Entrepreneurship in these terms is about creating value – social, environmental, cultural or economic. Entrepreneurial skills and mind-sets are developed through innovative and creative processes that allow for experimentation, investigation and identification of potential value in a close relationship with other people regardless of age, gender and ethnicity (World Economic Forum: New Vision for Education; New European Skills Agenda of 2016; Thestrup & Robinson 2016).

SEEDS aims to equip children from an early age, with the seeds for the development of an entrepreneurial compass in interplay with digital media. Preschool pedagogical methods for

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entrepreneurship education are underdeveloped and lack a European dimension, in contrast to later school education, which has had a much stronger focus. When it comes to preschools, a framework that translates and integrates principles and required skills, along with pedagogical methods grounded in a theoretical framework, into the practical preschool setting is missing. The SEEDS project set out to develop a European pedagogy of social entrepreneurship into a learning and teaching framework for preschools.

SEEDS has developed a competence compass of "key competences" that can be taught in preschools across Europe as important stepping stones for the children's further development and life, as well as a methodology that can be implemented to support this. This compass starts from the individual as a citizen and builds on their particular skills and competences to enhance the four points of the compass; critical thinking, collaboration, co-creation and agency.

The 4 competences of the competence compass were chosen based on the so-called "change-maker pedagogy", which was one of the methods of the SEEDS project. You can read more about the change-maker pedagogy on the SEEDS website. The competence compass was developed from the notion that entrepreneurial competences are something that we all possess. Being able to be critically reflective are human traits that are inbuilt as a survival mechanism. Fire is dangerous – it burns people and destroys buildings. Fire warms – we need warmth when it is cold outside or heat to cook food. However having a critically reflective understanding the difference between using fire as a tool to warm or cook with and letting fire get out of hand and destroy a building or a forest and

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being able to make decisions about when and how to use fire have to be learned over time. Equally, collaboration is an important part of being human. Particularly as our education systems are built on being in a class with other people, we have to learn to establish relationships and what it means to be sociable and what unsocial behaviour is. For many people creativity is something reserved for an elite group of people that are 'naturally' artistic and able to express themselves either through words or various art forms. Current research shows that creativity is much more than this narrow understanding and is often more about being able to use the given resources to make something new or different. For example, using up left overs in the fridge to make a meal for the family is a creative project. But how many people would call themselves creative because they can do that? And for children finding new ways to play a familiar game is a creative competence that comes naturally. Further below in the results section you can find detailed descriptions of competence descriptions and statements related to 21st century skills and the SEEDS competence compass, which were developed and identified together with participating preschool educators in the project activities.

5 SOURCES

New European Skills Agenda of 2016: https://ec.europa.eu/social/main.jsp?catId=1223&langId=en

Thestrup, K. & Robinson, S. (2016). Towards and entrepreneurial mindset: Empowering learners in an open laboratory, in Papadopoulus, P., Burger, R. & Fana, A. (ed.). *Innovation and Entrepreneurship in Education*. Emerald Group Publishing, p. 147-166 (Advances in Digital Education and Lifelong Learning, Vol. 2).

NATIONAL CONTEXTS FOR THE SEEDS PROJECT

1 INTRODUCTION

In this chapter, we introduce the national contexts for the preschools who participated in the SEEDS project; Denmark, Germany (Bremen), Italy (Sicily) and Cyprus. The chapter introduce the national preschool system and organisation, the national goals and framework for the preschools, the pedagogical positions in relation to the individual child. The chapter also identifies existing work with the topic of entrepreneurial thinking, short examples of other projects of relevant to the topic of entrepreneurial thinking, play, creativity, technology and social inclusion. The aim of the chapter is to identify relevant starting points for working with the SEEDS Pedagogy and identify relevant differences and similarities.

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2 PARTICIPATORS FROM EACH COUNTRY

Participating in the project where all in all 19 Preschools from 4 countries. From Denmark, 6 preschools and 10 pedagogues were involved in the project. All preschools are public, based under the municipality of Vejle, and spread out geographical throughout the municipality - in the town of Vejle and in the countryside. All relatively strong when it comes to resources and economy and all relatively similar in their pedagogical approach, following the same curriculum. None of them came from the more poor areas of Vejle, but still have children from different backgrounds. In Germany, three kindergartens with diverse backgrounds were involved in the project. Whereas two of them are public kindergartens with different socio-economic backgrounds, the third one is a non-public institution in the technology park. In Cyprus, the project included 6 schools (2 private schools and 4 public schools) from the Nicosia district and 8 preschool teachers working with children aged 3-6. In Italy, SEEDS involved 6 teachers from 4 different kindergartens, working in heterogeneous urban contexts and with pupils aged 0-6 having different social backgrounds. The main methodology used by teachers is the “gioco libero orientato”, free but oriented game where children are engaged in explorations of their world.

Overall, this gives a wide range of Preschools with very different access to resources. This means however that when it comes to comparing, it is important to look more at the pedagogical approach than what exact technology is used.

3 ORGANIZATION OF PRESCHOOLS

If we take a look at the four national contexts of the participating preschool educators, the preschools are organized in very different ways. In particular when it comes to the youngest children (age 0-3). In every country there is a mixture of both public and private institutions, but the balance between public and private variates. In Denmark most preschools are public (around 93 %), while Cyprus, Italy and Germany are more mixed. As an example, Germany has around 33 % of public institutions and the rest is a mixture of non-profit associations and parental initiatives.

In Denmark children between 0-6 are organised in a separate day care system with their own learning goals. It is based on a partially free system, and consist of day nurseries (0-3 years) and kindergartens (3–6 years). In addition, there is local day care (“day nannies”) in which children are cared for privately. In 2014 about 90 percent of 1-2 year olds and 98 percent of 3-5 year olds were enrolled in either a public or private day care (Data from the Child and Social ministry, 2018). Children in Denmark normally start primary school the year they turn 6. In Italy children between 3-6 years mostly are organized in public and private preschools under the school systems (”Scuola dell’infanzia”). Education for children aged 0-3 takes place in nursery schools (Nido d’infanzia) but it isn’t part of the education system and mostly organized directly by local Municipalities and

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regions. In Italy, 72% of children aged 0-3 are enrolled in public institutions under the responsibility of the MIUR (See Eurodice). The school enrolment rate for children aged between 3 and 5 years is 94%, higher than the OECD average (data OECD 2019). In Cyprus the education of children between the ages of 3-6 are organized in three types of kindergartens: public, private and community. The public kindergartens are classified in the following way:

- Single teacher: Schools with one kindergarten teacher
- Teacher: Schools with two kindergarten teachers
- Multidisciplinary: Schools with three or more kindergartens

In addition to this there are kindergartens with morning and afternoon classes. When it comes to children age 0-3 there are independent institutions or kindergartens, normally stand-alone institutions but also integrated into kindergartens. Although the number of children age 0-3 attending preschool has risen slightly since 2005, over three-quarters of the youngest children are still not attending. However when it comes to children aged 4-5 years, according to Eurostat data (Eurostat, 2016), 89,7% of children that reside in Cyprus between 4 and the starting age of primary education attend Preschool. In Germany, Preschools are organised at federal state level and organization and goals variate from state to state. In 2018, most Preschools were public (32.9%), non-profit associations including clerical institutions (56.8%) and parental initiatives (7.8%).

In Germany, children between 3-6 years are mostly all together in the same group and since the time of starting and ending in Preschool depends on the childrens birthday, the youngest might be 2.6 years old and the oldest might turn 7 years shortly before leaving kindergarten[1]. As from 2013 children from the age of 12 months in Germany has the legal right to attend a kindergarten, though there is no obligation to attend an institution before school. This is mostly organized under day care centers and not schools. In Germany 93% of the children aged 3-5 attended a kindergarten in Germany (March 2019) [2], while it's a bit lower when it comes to children between 0-3 years.

As a result of that, the amount of resources variates. In particular when it comes to access to digital tools. This, on one hand, makes it difficult to make direct comparisons between preschools in the different countries. On the other hand, it provides an opportunity to see how ideas and approaches work in different Preschools with different opportunities.

4 GOALS AND PURPOSE IN THE PRESCHOOLS

The pedagogical goals and curricula of the four participating countries are designed in different ways, nevertheless there are a number of common values and goals which we will take a look at here.

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THE CHILD AS AN INDIVIDUAL

A common starting point is seeing children as independent individuals with own opinions and that the pedagogy must support children in developing this. In Denmark the Danish Daycare law (§7) says that “Day care institutions should enhance children’s thrival, learning, development and “character formation” through safe and pedagogical learning environments, where play is the foundation and where all activities take departure in the child perspective”. This is supported by the national curriculum where some of the key elements are that the children's own perspectives and play must guide the educational work.

In Italy, the child is considered an "active subject" who develops his own identity and relates to others. They identify 3 main didactical purposes in the Italian Ministerial Decree (1991): 1) Identity maturation, 2) Conquering autonomy and 3) Development of competence. This is supported by a set of National indications for pre-school curriculum focusing on “5 fields of experience”: 1) The self and the other: awareness of one's own identity, in order to discover ethic, cultural and religious differences and to learn the first rules of social life. 2) The body and the movement: children become aware of their bodies, using it from birth as a tool of self-knowledge in the world. 3) Images, sounds, colours: children express thoughts and emotions though imagination and creativity. 4) Speeches and words: language is an essential tool for communicating and it helps to express oneself in personal, creative and ever more articulated ways. 5) Knowledge of the world: children start understanding the external world, through their direct experience.

In Cyprus the New Preschool Education Curriculum for children aged 3-6 years points out that entering school level is a unique and special stage in a child's life, with an autonomous value that sets the groundwork for the years that follow. Every child is unique and special, having their own voice and should participate in democratic dialogues relating to them. It’s also pointed out that Children learn through exploration, through play and through conversation, and actively participate in the process of building their experiences and their lives. Learning should aim at the child's rounded development, and it should be holistic and intertwined. The starting point should be at what children can do, through the perception that every child is able and has the potential to develop and learn.

In Germany it varies depending on the specific federal state, but in the case of Bremen the Aims and tasks in preschool education are Care, Education, Early education for self-formation and Raising. This is supported by central pedagogical ideas and values, such as seeing the child as an independent personality and there should be attention to individual differences and participation in decisions. The diversity amongst children is to be seen as an enrichment and empathy and compassion should be qualities to promote and in general preschools should promote a democratic attitude and facilitate the coexistence of people of different political, religious, cultural or ethnic backgrounds and tolerates the differences between the members of society.

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In general this means a common approach on doing activities that give space for the individual child and as a preschool teacher are prepared to follow the children's ideas and thoughts (In Denmark referred to as “following the children’s tracks). It also means doing activities where things are seen end experienced from the children's perspective. This may be activities that allow the children to express themselves, for example through creative work. It can also be learning activities, such as exploring nature and sciences topics.

FOCUS ON PLAY

Another common thing is a focus on play in the pedagogical approach. In all the participating countries, there are a wish for the children to have the possibility to play. In Denmark the national curriculum for preschools, the so-called “New strengthened curriculum”, has highlighted this in particular in the form of increased focus on, among other things: play, children's communities and parent cooperation.

In Italy the focus on play is among others described in the “5 fields of experience”, where it’s said on the topic body and the movement: children become aware of their bodies, using it from birth as a tool of self-knowledge in the world. Searching, discovering, playing, jumping, running at school is an important source of well-being and knowledge for children. Children plays constructively and creatively with others, learning how to exchange with both their peers and the adults”.

In Cyprus Play is a learning and development process, a framework and a way of organizing learning, but also a children's right. It is a social practice which is meaningful for children and it is a means of demonstrating and strengthening their feelings, needs, motives, knowledge and dexterities. In Germany and the Bremen curriculum for preschool education, you find that Play (and Fantasy) is mentioned as part of their fields of education.

ACTIVE PARTICIPATION

There is also a common focus on activities where the children learn through active practitioners. In Denmark you see this in the descriptions for the six learning goals mentioned in the nation curriculum. Among others in goal 1: “Broad personal development”, where it’s pointed out that the educational learning environment must support that all children develop, explore and experience themselves and each other in both known and new ways and gain confidence in their own potentials. In Italy it’s about letting children understanding the external world, through their direct experience. Touching, disassembling, building and reconstructing help children identify quality and characteristics of objects and materials, so to recognize them and their main proprieties. In Cyprus in particular goal no. 3 in the “Program Philosophy”, points out that children should learn through

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exploration, through play and through conversation, and actively participate in the process of building their experiences and their lives.

In the curriculum of Bremen in Germany it is mentioned that education arises through being active, curious and keen to explore. It is underlined that education processes are not limited to taking up predetermined content, but require the active processing of perceptions and experiences, that lead to new ideas, meanings and patterns of action.

SOCIAL COMPETENCES AND DEMOCRATIC VALUES

A fourth common approach between the participating countries is the focus on social competences and democratic values. That might be how to contribute to the community or learning to show consideration for other children with different backgrounds and understand how they live. But also playing with them and collaborate with them. This is mostly done through activities where children have to collaborate and play together, but also that the preschools ensure that children from homes with few resources have access to knowledge, communities, toys, digital technology, food and everything else that helps to form the children and learn them to do well in the community. As well as having special pedagogical and educational support in relation to extra care, language learning, motoric skills, etc.

In Danish Daycare law § 1, one of the goals is to prevent negative social heritage and exclusion, by providing educational services as an integral part of the municipality's overall general offerings for children. Another goal is to support efforts towards children in need of special efforts, including children with impaired mental and physical functioning. In Italy the “5 fields of experience” among others points out that awareness of one's own identity, involves discovering ethic, cultural and religious differences and learning the first rules of social life. In Cyprus the “Program Philosophy”, points out that this stage of life gives the children a platform for learning social and cultural competences through an active negotiation of social relations within various frames like time, place, culture, sex, the classroom etc.

In Germany (Bremen) the central pedagogical ideas and values has a high focus on social inclusion and it’s among others mentioned that diversity amongst children is to be seen as an enrichment and empathy and compassion should be qualities to promote. Further on that it is important to provide all children with equivalent opportunities for development and holistic learning in different fields of activity.

In relation to strengthening the child's social competences, it is not only about the close and near relationships, but also about learning about democratic values - and through that being able to contribute to the society they are part of. In this way, preschools are included as the first link in the chain when it comes to making the children good and valued citizens of society. In Germany

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(Bremen) the importance of children learning democratic values is pointed out very specific. Here it's mentioned that appreciation of one's own person and equal rights for all involved lay the foundation for democratic attitudes and democratic action. Furthermore, that a democratic attitude facilitates the coexistence of people of different political, religious, cultural or ethnic backgrounds and tolerates the differences between the members of society.

5 THE PEDAGOGICAL TRADITIONS

The pedagogical and educational approach and tradition variates from Preschool to Preschool and from country to country, depending on whether it is public day-care institutions that follow national curricula or private ones based on particular needs or philosophies. Nevertheless, the participating countries seems to have much in common. Among others they are inspired by a European tradition that dates back to Fröbel and Montessori, but also finds inspiration from, among others Dewey, Vygotsky and Reggio Emilia.

In Denmark Preschools are often inspired by Fröbel and Montessori as well as Development psychology approaches from for Freud, Eriksson, Dewey and Vygotsky. Other later inspirations are Reggio Emilia and Howard Gardner. But also the so-called "reform pedagogues" dating back to the 1930s, has been fundamental for the Danish day care tradition. The reform pedagogues take departure in the child's natural development, understood as the child's conquest of it's own development. In Italy the national legislation takes inspiration from alternative pedagogies to classical and frontal teaching, such as Montessori, The Agazzi sisters: (similar to the Montessori method), Reggio Emilia Approach (Loris Malaguzzi) and Danilo Dolci. In Germany you will find institutions that follow special pedagogic concepts such as Waldorf-Kindergartens, Montessori-Kindergartens, Fröbel-Kindergartens, forest kindergartens etc. But also clerical kindergartens that represent religious values. In Cyprus each school is inspired by a different pedagogy, especially the private schools as this is a part of their marketing strategy. Some use the Montessori method, some use a combination of pedagogies. In general, the Montessori method is the most popular one but most schools build/or work around the method/or use the concept of Montessori but they do not follow it strictly.

This means, in different variations, that there is a common focus on a pedagogy that seeks to develop the children from a holistic point of view, where all that is learned, not only represents knowledge of the individual subjects, but also contributes to raising children who have a wide range of skills - and the ability to use the skills in interaction with each other. As an example, creative is not only a discipline in which to express one's own thoughts, it's also about learning the practical craftsmanship behind it and how to do it in collaboration with others or maybe even involve it in contexts that do not focus on creative expression.

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It also means a focus on the child as an individual in interaction with the surroundings and where a balance is created between what the children learns by being curious on their own and what the children learn from others, such as the adults or other children.

6 SUPPORTING ENTREPRENEURIAL THINKING

If we take a closer look at how entrepreneurship is represented in the Preschools of the four participating countries, there are goals directly targeting the topic of entrepreneurship, but in most cases it is represented through pre-existing focus areas that indirectly supports the skills needed when it comes to entrepreneurship. For example, working with creative forms of expression, the ability to collaborate, experiments and science.

In relation to initiatives targeted directly at entrepreneurship, it is primarily done in the form of a number of larger or smaller pilot and research projects focusing on entrepreneurship, digital media and 21st century skills. If we take a closer look at how entrepreneurship is being integrated in the pedagogical work, we can, for example, look at Denmark where it has become both part of the goals of the curricula and part of the education of educators.

When it comes to the education of Preschool teachers, it is in Denmark possible for the students to work with the topic of entrepreneurship as part of the so-called elective subjects. These can be, for example: creative forms of expression, nature and outdoor activities, health promotion and movement, media and digital culture, cultural projects and cultural entrepreneurship, social innovation and entrepreneurship, cultural meeting and interculturalism. The students finish the program with a bachelor project. As part of the bachelor project writing period, students will once again come to an internship, this time one in a short, unpaid internship, where they can, for example, collect data for your bachelor project.

It is also possible to work with it as part their 3rd internship period, where the topic is Cooperation and development. Here the focus is on systematic and knowledge-based reflection on and contribution to development and innovation in educational practice. The goals are that the student must be able to purposefully plan, implement, document and evaluate activities and learning processes that support the child's well-being, learning, education and development. In this context, the student should be able to challenge existing practice, explore and evaluate alternative opportunities and contribute to the development of educational practice.

In Cyprus they, as part of the Preschool System, has so-called Learning Centres. They refer to frameworks of certain types of play such as socio-dramatic, symbolic, imaginary, creative, structural, exploratory-experimental, kinetic, with rules, play with pedagogical materials. This includes dollhouses, grocery stores, disguising, libraries etc.

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And as part of the national curriculum it is possible to work with ”projects” where you study a topic that was suggested by the children or interests them. This is completed in 3 stages and it includes the cooperation of the student with the teacher. The three stages are: Planning and Starting, Project in action and Thoughts and conclusions. In the project the children can ask questions, set hypotheses and test them, they can explore by sharing ideas and communicating with each other. Later, they can come back and reorganize their ideas and give new meanings to their interpretations.

In Italy the “National Digital School Plan” has launched an overall strategy of innovation of the Italian school and for a new positioning of its educational system in the digital era. The focus is that education in the digital age must not put technology at the centre, but work on new didactic models for the use of technology. This among others done by working in laboratories, with the aim of making them environments associated with innovation and digital creativity in kindergartens. How ever this means that preschools need to rethink their learning environments. To do so three main solutions are proposed by the MIUR. 1) Improve the classrooms by integrating technologies and wireless connections. 2) Develop alternative spaces that can accommodate different activities, frontal teaching or activities in groups, with or without the use of digital and 3) Develop mobile laboratories with devices and tools that can be used for different learning activities and subjects (science, math, linguistics etc.).

RESEARCH AND DEVELOPMENT PROJECTS

Even though there are still only few direct references of entrepreneurship in national curriculums and the education of preschool teachers, it does not mean that there is no focus on the topic. Instead you need to take a closer look at research and development projects targeting skills such as creativity, maker spaces, use of technology collaboration, critical thinking and communication. As an example In Denmark “The Fund for Entrepreneurship” financed and published (2017) the publication “Entrepreneurship in kindergarten”, which introduces an approach to entrepreneurship pedagogy and examples of its relevance to the pedagogical work in preschools.

Another example is the national project "Character formation in a digital and global world”, where the goal was to develop a pedagogical method and practical examples on how to work with children's skills and understandings of a digitalized and globalised world. The project was done as a National research project by the University of Aarhus in collaboration with Vejle Municipality and 17 prechools from 10 municipalities from all over Denmark.

Also at a smaller scale, there are pilot projects in the field of entrepreneurship in Denmark. At local level, municipalities for some years has been supporting development of and education in pedagogical use of technology. In addition to that, the association for educated pedagogues in Denmark, BUPL, has a development fond for practice development and research projects within the

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field of the pedagogical work in day cares and primary schools. As an example in 2019-2020, the topics of the fund were:

- Gender, diversity and gender equality.
- Educational work in a digitalized age.
- Educational development and learning environments and culture of evaluation.
- An innovative project idea that can contribute with practical knowledge for new development and inspiration.

In Cyprus Digipro Education Limited has develop FUNecole Creative Learning for Students educated to work with Children Grade 1-6 in primary education. So the material is not for Preschool, but the material for Grade 1 can be of inspiration for the older children in Preschools (Grade 0).

The material is based on the concept of entrepreneurial education and provides lessons that focus on student's own concerns as they by using real-life situations. It is a holistic method for developing and assessing Computer Science, 21st Century skills, STEAM and valuable Social Emotional Learning in Education.

LEARNING ABOUT TECHNOLOGY

An important thing when it comes to entrepreneurship thinking is to understand the influence of technology on society and therefor it's also of interest to take a look on educational introduction to technology. In Italy the "National Institute of Educational Documentation, Innovation and Research – INDIRE", has explored how to integrate digital technologies in kindergartens, combining them with the work on the 5 fields of experience. This on one hand means how to use multimedia interactive blackboard in the classrooms and the use of audio and video recording tools to document the teaching and learning experience. On the other hand; Digital narration and how stories can help teaching in early education and - Digital media: the use of digital media because our children have become "consumers" of digital content. The question is how early childhood education can educate children and parents about the correct use of these technologies? What advantages and what risks? A practical example of this in Italy is the "Didattica Laboratoriale – Laboratory teaching". It's based on the child's ability to manipulate the objects and tools necessary to make new experiences, comparing themselves with objects, substances and other people.

In Germany a project with similar goals is "Media Kids" aiming at kindergartens to deal with questions of early media education and media education: What does it take to empower children in a media-dominated world for responsible, critical and competent use of the media? How can kindergarten teachers use digital media for the design of children's educational processes? What skills do the kindergarten teachers need? And how can teachers collaborate with parents? This is supported by the project „Kita goes digital"that aims at developing digital opportunities for

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advanced training and focuses on digital expansion and a more comprehensive understanding of education. By using digital media for advanced trainings, kindergarten teachers is trained in using digital media in educational practice. Further, the engagement of the teachers with digital media is strengthened in the long term and lead to the meaningful incorporation of digital tools into everyday teaching. In addition to that, worth mentioning is also “Ran an Maus und Tablet (Go for mouse and tablet)” aiming at Preschool and primary school teachers who want to establish media work in their institution without special previous knowledge. The project started in 2006 the materials are still updated and available in Germany.

Another important topic when it comes to entrepreneurial thinking, is working with social skills and democratic values. This has been a focus area in particular in Italy from 2009/2010 where teaching of "Citizenship and Constitution" was started in all schools, including Preschools. An example on how to transform this to action is “CRT - Confidence, Responsibility, Trust”, an action game focusing on giving the children confidence in themselves and learn to achieve goals. As part of that, work with trust, cooperation possible between young children and prepare children (4 to 6 years old) for the transfer from kindergarten to primary school.

KNOWLEDGE SHARING PLATFORMS

In Denmark for the last 8-10 years, there has been a growing focus on developing a pedagogy that involves the use of digital tools. Much of it is share online at the Ministry of Children and Education's digital learning portal, emu.dk. The platform provides information about rules and frameworks, knowledge and research as well as teaching activities, practice examples and tools conveyed in text, sound and live images. Another large scale examples on knowledge sharing is several annual learning conferences, such as Denmark’s Learning Festival (Danmarks Læringsfestival). Here more than 8.000 teachers, consultants, students, pedagogues and managers participate workshops, presentations, exhibitions, knowledge sharing, networks, etc.

In addition to that, you will find several both local and national networks of teachers and consultants. An example is “Municipal network for knowledge sharing about the work with implementing technology in day care”. Here some of the topics covered are character formation, didactics and play with technology. The participants representatives from municipalities in Denmark (consultants, day care managers, companies and other stakeholders if relevant for a specific topic), that work with technology and day care can join the meetings. The network meets 3 times a year where they present projects and activities, offer support and inspiration for each other and potentially develop new projects together. In addition to that you will find private organized events, such as Denmark’s Robot Festival (Danmarks Robotfestival), promoting the interest in robots, among children and young people.

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FOCUS ON CREATIVITY:

Finally it's important to point out a general focus on creativity and creative skills. This goes through the curriculums of all the participating countries and here it's also important to point out creativity is not just understood as an artistic competence, but more as a general competence in line with flexibility and enterprising skills, which are very influenced by political agendas in society.

There are different approaches to how to promote creativity in anything from very artistic activities to problem-solving, learning and inventing. Sensory and artistic expressions can stimulate ideas and insights that can be transferred to other topics like science. It is also a wide-spread concept that creativity is something inherent in children and their approach to the world, and it is the task of the pedagogue to enhance and stimulate this through the pedagogical environments and activities they set up around the child.

As an interesting example on that, it is worth to mention the general German approach when it comes to the field of education. Here the importance of bringing in "Rhythm and music, Body and movement, Play and fantasy, Verbal and non-verbal communication, Social learning, culture and society. Building and designing, Nature, environment and technology. Approaches that opens up for being creative. This you will find in all of the four countries in different variations.

7 SOURCES

Denmark:

The Danish Day Care Law: https://www.retsinformation.dk/eli/lta/2020/1326

The new national curriculum for day care institutions – "Den styrkede læreplan – rammer og indhold": https://emu.dk/dagtilbud/forskning-og-viden/den-styrkede-paedagogiske-laereplan/den-styrkede-paedagogiske

The 6 themes of the national curriculum for daycare institutions – "De 6 læreplanstemaer", EMU: https://emu.dk/dagtilbud/de-seks-laereplanstemaer

Thestrup, Klaus, et al., 2015: Dannelse i en digital og global verden: https://tdm.au.dk/fileadmin/tdm/Publikationer/DANNELSE_I_EN_DIGITAL_OG_GLOBAL_VERDEN-DELRAPPORT-FINAL_26.11.2015.pdf

Denmark's Learning Festival: https://danmarkslaeringsfestival.dk/

BUPL Facts and numbers: https://bupl.dk/presse/talogfakta/

The Danish Fund for Entrepreneurship 2018, "Entrepreneurship in preschool – wow is it for children?": http://ffe-blog.dk/entreprenoerskab-i-boernehaven-noeoej-er-det-for-boern/

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Italy:

Eurodice, Italy: Education Information Network (Eurydice): https://eacea.ec.europa.eu/national-policies/eurydice/home_it;

OECD Statistic: Organisation for Economic Co-operation and Development (OECD): http://www.oecd.org/education/

Ministerial Decree Italy, 1991: http://www.aetnanet.org/scuola-news-122.html

“The Five fields of experience”: MIUR decree no. 254: http://m.flcgil.it/leggi-normative/documenti/decreti-ministeriali/decreto-ministeriale-254-del-16-novembre-2012-indicazioni-nazionali-curricolo-scuola-infanzia-e-primo-ciclo.flc

New Curriculum of the Ministry of Education and Culture on Preschool Education for Children aged 3-6 years old, http://www.moec.gov.cy/

”The three main didactical purposes in the Italian Ministerial Decree (1991): http://www.aetnanet.org/scuola-news-122.html

Cyprus:

University of Cyprus, Nursery Curriculum: https://www.ucy.ac.cy/nursery/en/curriculum/kindergarten

New Curriculum of the Ministry of Education and Culture on Preschool Education for Children aged 3-6 years old, http://www.moec.gov.cy/

Digipro: www.digipro.com.cy

Germany:

Rahmenplan für Bildung und Erziehung im Elementarbereich - Bremen. Retrieved Dec 9th, 2019 from: http://www.soziales.bremen.de/sixcms/media.php/13/Jugendsenatorin_Rahmenplan_2012_web.pdf

Website Statistisches Bundesamt, Retrieved Dec 9th, 2019 from: https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Soziales/Kindertagesbetreuung/Tabellen/betreuungsquote-2018.html

Ran am den Maus: http://www.rananmausundtablet.de/index.php

Kita goes digital: https://www.froebel-gruppe.de/kitagoesdigital/

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Media Kids: https://www.blickwechsel.org/angebote/fortbildungen/bremen/377-medien-kids-bremen

PROJECT RESULTS

1 INTRODUCTION

The methodology and pedagogy for the SEEDS project were based on a combination of two innovative approaches i) the methodology of digital and physical *'experimenting communities'* with ii) the pedagogy represented by the *change-maker model*. You can find more about these methods on the SEEDS website. Furthermore, through the development of experimenting communities the project sought to support and enhance *entrepreneurial competencies* mapped out as critical thinking, creativity, collaboration, and being able to carry out our intentions, understood as active citizenship and the *use of digital technologies*. In this project, entrepreneurial competencies were articulated as four competencies and made up the entrepreneurial compass, as described earlier.

Therefore experimenting communities, enhancing entrepreneurial competencies and engaging teachers and children in preschools with digital technologies are central to the focus of the SEEDS project.

The following questions were formulated;

- What are experimenting communities, how do they work and why are they needed in learning situations?
- What is the change-maker pedagogy, how does it work and how can this process support development of entrepreneurial competencies?
- What are entrepreneurial competencies and which ones are important in preschool?
- What digital technologies are easy to access and how can they be used developmentally in the hands of teachers and children in preschools?

2 STARTING FROM FOUR DIFFERENT NATIONAL SETTINGS

The SEEDs project has, over a two year period, been able to establish criteria for supporting and training teachers in each of the institutions. These were i) close and intense physical support from national partners ii) two training workshops, held in Denmark and in Germany iii) recording of activities and practices throughout the period iv) international webinars v) inspiration by researchers on social media outlets and vi) sharing and collaboration through dissemination of practices on Etwinning and on FB as well as other digital media.

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The aim was to establish connections between the institutions and teachers national level and to establish connections between the institutions at international level that relied on the digital for communication. Establishing connections at national level meant that the participants could exchange their experiences, practices and visions for their institutions in their native tongue. The development of strong bonds within each national group was essential to finding out what was possible in each context. The bonds were further strengthened as the national group shared not only experiences but also expertise across the institutions. Establishing connections between international institutions required a different way of thinking about communication and collaboration. This meant bringing in digital media for sharing, inspiration, and developing ideas.

It was clear from the start of the project that preschools in Cyprus, Sicily, Germany and Denmark would be different from each other, culturally, socially, and in many other ways. Each national partner also expressed the differences between the individual national institutions themselves; some were private, others publically funded, some were well resourced others were less so. These differences were illustrated by the manner in which resources were allotted and organized at the national level. For example, in Germany, there was no access to wifi connections at any of the institutions, although there was one institution that had easy access to a Fablab. Furthermore, the German teachers struggled to find time to allot to the project that was so technology based. In Cyprus, there were differences between how many children were assigned to one teacher, as some institutions were private and some public. This also had an influence on the digital resources available to the teachers. In Sicily, children came from refugee backgrounds without prior screening with little if no language skills and the physical and digital resources varied greatly between institutions. In Denmark, there were differences between how the days were structured and what time was available to allot to project work. Therefore, each national institution dictated the starting point for the project; their cultural practices, their available resources whether these were human, non-human or digital. While the goal of the project was to articulate a European methodology and pedagogy these approaches needed to be designed to allow for the kinds of differences mentioned above.

3 THE EXPERIMENTING COMMUNITY

At the heart of the experimenting community is a mindset of open experimentation, genuine curiosity and openness to the expertise of others. If one sees a group of people as a culture, that both has the ability to change and to maintain simultaneously, then this community encourages the ability to change and, based on that the ability, is able to establish new practices. The experimenting community is constantly fluid, in a process, where all those involved might have something to show and share. All the members of the community have something they know about, an expertise that they can share. Sharing became an important part of this project. Not only did the teachers gain a

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deeper understanding of their own practices but found that by listening to others they were inspired to change their own practices or to begin experimenting with new processes and materials. Equally, everyone is interested in what others know and in seeking new knowledge and ways of doing things. This kind of thinking and doing is often compared with free play and indeed children instinctively form experimenting communities as these are already familiar to them. In the preschool, play is a central element and the teacher's role is often to direct play in particular ways to achieve certain goals. Nevertheless, children´s own play culture is important here. All the teachers were surprised by the high engagement and motivation that the children demonstrated when they were part of the experimenting process.

In a learning situation, the teacher will often have something to offer in the process but in the experimenting community must be prepared to take on different roles. She must also be prepared to listen and to ask open questions so that all the group members are able to express their understanding and desires about what could be done. Sometimes, when the experimenting community is rather new, or if the children are younger, the teacher is central in initiating activities that encourage children to experiment, use their imaginations and be curious. The findings show that the teachers scaffolded the learning through a series of steps. Their role changed as the process became more open. As the community develops its knowledge together teachers find that it is often the children' own ideas and interests that stimulate the teacher to think about introducing new materials or processes into the learning situation. Teachers were again surprised by the interest the children showed and their prolonged concentration to work with digital technology that engaged them in new ways. Typically, however teachers instigated a process, set up guidelines initially and controlled to some extent the outcomes. Moving from determining the outcomes to a more open process had to be practiced. Many teachers felt uncomfortable 'letting go' but being inspired by what others had done encouraged them to try. The more they opened up to the children's ideas the more they were surprised by the learning the children achieved. Many teachers commented on the unforeseeable outcomes and the high levels of activity in the classrooms. They learned that in an experimenting community what could be achieved could not be predicted beforehand.

Traditionally the teacher is the one who determines the content and form of learning processes. She exercises a degree of control of content and outcomes. However, the experimenting community allowed for the teacher and children together to be inspired, to share, not only resources but also to share ideas. For example, when a teacher showed the children an app where they could make their drawings talk she did not realise that the children would come up with the idea that they wanted the drawings to talk to each other together on film. Together the teacher and the children worked out how this could be done to satisfy the children thereby making the learning meaningful and collaborative. The competencies creativity and collaboration were central in this process. However, the inclusion of a diverse range of children, the inclusion of those who did not have for example language skills, in the activity was a surprise to the teacher.

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4 EXPERIMENTING PROCESSES AT THREE LEVELS

To develop an environment where experimenting communities and entrepreneurial competencies can be supported and thrive requires the development of the individual teacher, teachers in groups and institutional growth. What is required at each of these levels is summed up in the following.

Micro – individual teacher;

- self-assessment and reflection with peers – teachers were able to articulate what they are good at and what their preferred practices are
- collaboration and dialogical professional inquiry – teachers were be able to share openly both their successes but also when they feel they have failed, and they need to have a language and vocabulary that allows them to do this in a nuanced way
- observing and recording practices – teachers became aware of what they do, and record and reflect on processes as they are developed in order to understand what has happened and what could be improved
- experimenting and changing practices – teachers were able to experiment where the outcomes are not determined and focus on processes that were developmental rather than instrumental
- self-efficacy – teachers were able to articulate their own ability to be creative in different arenas and to communicate their expertise to others in collaborative and positive ways that resulted in empowering them as agents of change.

Meso – groups of teachers;

- working together and peer collaboration – teachers were able to establish teams, or communities within their institution where time was given to reflect on practice and be inspired by others
- experimenting with new (old) technology – teachers were able to articulate how they experimented with digital technology and allowed themselves to be open to new ways of working as well as to new technologies.

Macro – institutional learning;

- institutional cultures developed to allow for sharing and collaboration, as well as reflection on the use of materials, technology, space and time
- institutional growth; the institutions were able to begin to articulate their own values and visions around the use and integration of digital technology and the development of entrepreneurial competencies.

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Activities that promote Experimenting communities and Entrepreneurial competencies:

- Reflect on and discuss i) their role in the activity ii) how digital technology was used iii) what (entrepreneurial) competencies they thought that the children were developing through the activity
- To showcase processes that involved flexible pedagogical roles and were linked to digital technology as a tool for creativity and collaboration with the children as the instigators of experiments (Show and Tell)
- To discuss the teacher mindset that allows moving from expert to learner, and the challenges of allowing the children to ask the questions as the experimenting community of practice becomes established and flourishes
- Hands-on work with diverse digital technologies. Allowing experimentation without instruction. Learning to collaborate, observe and listen to others
- To make use of a well-known narrative – for example the Musicians of Bremen tale – as inspiration to instigate experiments and challenge the way in which digital technology can be used to combine physical materials, story-telling and 'hidden' expertise.
- To discuss how to make the entrepreneurial competencies visible through an exercise called 'noticing and wondering'. Encouraging teachers to observe children at play and to question the children about what they did, why they did it and who and what inspired them.
- To ask children to articulate their activity allows for a critical reflection on their skills and competencies and will assist teachers in reflecting on how ideas come about - who is motivated by what and what children are curious about and inspired by.

Realizing that other countries worked in similar ways and had similar challenges was important in creating cross border collaboration. Equally important was becoming aware of differences. For example, the teachers found it amusing that the children in Cyprus did not play outside when it was cold, whereas the children in Denmark, who live in a colder climate, play outside all year round. The Danish children were regularly allowed to cook over an open outdoor fire while the children in other countries were not familiar with cooking over open fires and, in fact, fire was regarded as dangerous and not something the children should be near.

There were of course also differences regarding resources. Some of the teachers had no access to digital technology in the form of robots, while others had no wifi and could not download apps. Even those with access to ipads were unaware of the array of apps (cheap and free) that were designed to be creative and that the children could work themselves. Only a few the teachers thought that they had great expertise in using digital resources with the children and felt comfortable using technology in their daily practices. The majority were curious about the potential and were willing to try out the whole range of digital tools. The experimenting community allowed them to begin developing their expertise alongside the children instead of having to be the one who had all the answers.

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5 NEW PEDAGOGIES – DEVELOPING THE SEEDS PEDAGOGY TO ENHANCE ENTREPRENEURIAL COMPETENCIES

The experimenting community is, in this project, firmly anchored in a new and innovative pedagogy called the change-maker pedagogy. It has developed from research into entrepreneurship education, the potential of the entrepreneurial mindset and a decision-making logic used by entrepreneurs that has been developed by the entrepreneurship researcher, Sara Sarasvathy. The change-maker pedagogy has been developed in university settings for students but has never before been tested with preschool teachers or with young children. The change-maker pedagogy has as its starting point the individual. The individual is central to their own learning and learning must be meaningful before the individual will engage and become motivated. Another central element of this pedagogy is the development of social relations, being able to communicate and collaborate with others. When working together groups, or in this case, experimenting communities, they will quickly find out what it is they find important, what they value and therefore this pedagogy is about creating value for others. The teachers in the SEEDS project were keen to work with this pedagogy as it made sense to their way of working.

What was of interest to the teachers and the children was the extent to which the physical and digital resources could be used to create something of value to the group. It was also about getting to know the expertise of the group, finding out who was good at what parts. Who comes up with ideas? Who was good at bringing different resources together? What could the different children bring to the process? Whether it was particular skills and competencies, for example, building, or whether it was introducing new ideas and ways of working. The teachers recorded the enthusiasm that they saw when the children worked in this way and how some children took the lead, and how others, who had previously been on the periphery now became part of the community.

The change-maker pedagogy allowed children to investigate, be empowered and find their own autonomy. Experimenting together allows everyone to 'be on the same page' even when there are different levels of expertise. It was therefore, important for the teachers to listen, to observe and to be actively involved as the learning processes developed and became more open.

6 INCORPORATING DIGITAL TECHNOLOGY INTO NEW PRACTICES – DEVELOPING A SEEDS TOOLKIT

APPS AND QR CODES

A range of digital technologies were tested in the SEEDS project. Teachers sometimes began with a technology and experimented with the children to find out its potential and what the children

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wanted to do with it. The aim of the project was not to teach children to use digital technology but instead to familiarize children with the potential of such products so that the children became 'prosumers' rather than consumers of the product. The teachers also had to learn how to investigate the potential of a product so that they did not just stay within the limitations of the manufacturer but began to ask questions about what hidden elements could create value for them. Other teachers began with activities and processes that they were familiar with, the environment, the family, for example. One teacher wanted to bring the children into the outdoors, to think about what can grow but also to be able to bring this knowledge to others. From growing vegetables in a garden plot with the children she was able to link children's drawings, their knowledge about vegetables to a QR code which others could read and watch thereby creating value for other people. The linking of an app that animated the children's drawings to QR code can be used in a whole range of situations. As an extension of this idea, the teacher discussed with her colleagues about putting up QR codes at different places in the institution. The children then made drawings about the different contexts and animated these using the app. The children taught each other how to use the app and how to animate the drawings. The children were involved in deciding what areas were important to give information about as it would useful for new children or for visitors as a way of informing them about the organization of the building and its rules inside and outside in the play area.

Apps that animated for example, and changed children's voices encouraged talk and the development of language skills. They gave meaning to making drawings and creating figures. A range of apps could easily be combined to bring children together to create narratives and to express their emotions. The children quickly became familiar with them and were able to work independently of the teacher. In fact, the use of the apps encouraged more robust collaboration between the children and allowed for a hidden expertise to become visible as some children were more interested in finding out the potential of the app and others were more interested in developing narratives around their figures. The children become prosumers through their experience and experimental approach both inside the institution and outside in nature.

Another way of thinking about technology was through the introduction of LED lights. Children quickly learned how these worked and then began to experiment with them and connect them to all sorts of things for example to their drawings to create different effects. The teachers found that they needed to show patience when children began experimenting. Rather than solving the problems for the children, they found that if they let them work through the problems that often the results were much more interesting. A number of teachers concluded that it took courage to let the children test things out without interfering. The teachers noted that when they did this that in one example a child worked on their project involving the LED lights for the whole day. This kind of motivation and concentration surprised the teachers.

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BEEBOTS AND ROBOTS

At the beginning of the SEEDs project, a decision was made to lend a number of robots to the institutions that did not have access to them so that everyone had a starting point for trying something new and for experimenting with technology. These were Beebots and Ozobots. The simplest robot is the Beebot which the children quickly learned to program to do what they wanted it to. Teachers were generally surprised that the children were willing to watch each other and take turns in using the Beebot. The teachers noted that the children communicated with each other and helped out when there were problems. They also noted that the children seemed to be able to be patient and wait their turn. This could be due to the fact that there was no expertise so they were watching each other and learning from what others did. In this learning environment, the children felt able to make suggestions for other ways to do things with the Beebots. The teacher noted that some suggested decorating the Beebot. They wanted to make hats for them so that they could see which one was which. On the introduction of mats that link together for the beebot to move across the children began to experiment with drawing different objects on the mat – a flower for the bee or a spiders web to catch the bee. The teachers commented that the children had fun and were engaged in the activity. They also note that when the Beebot did not get to the destination this was not seen as failure. It seemed that children were persistent, 'The children just helped each other and tried again'. The Beebots seemed to 'bring the children together', they had a 'connecting function.' The children introduced what the teachers called 'meaningful objects', a house, into the environment bringing in the reality of the outside world.

When the focus was on practices that were meaningful for them (linked to recognized context, resources and/or technology) the teachers generally felt a heightened collaboration, inspiration and will to learn. They found that their curiosity was piqued and that they were not only able to learn about the use of new/different technology e.g. beebot, ozobot and botley, but felt able to bring their new experiences back to their own institutions afterwards. They will work with green screen, new apps and QR codes. They saw the same learning happen with the groups of children they worked with.

They were particularly interested in the use of narrative as a structure and stimulus for learning. In the exercise based on the four musicians, based on the training in Bremen, stories unfolded that were created 'in the moment' and which inspired the whole group. Not only was there untold potential in narratives but combining these with music also unlocked emotions and feelings. The teachers were keen to use familiar narratives to inspire experimentation with both technology and physical resources in combinations that they had not thought about before.

During the Bremen workshop, the teachers collaborated to develop a prototype of the SEEDS toolkit. This toolkit was given to each national partner at the end of the workshop. All the teachers found the SEEDS toolkit inspirational and liked the combination of LED lights and physical resources

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in the form of the mats for the Beebot. They were intrigued by the potential of the mats and even though they might not have access to a laser-cutter, many had access to other resources that could cut shapes and make stencils for what they might like to do. They did not regard the fact that they did not have access to precisely the same materials and technology as a problem but intended instead to use the ideas and the activities to inspire their own practices by using the resources they have available in their own local context. This mindset is something that we have seen gradually develop in each of the national contexts throughout the project.

The majority of teachers wanted to see other teachers work from other schools – and maybe also to be with those teachers for a period to learn from them. The most influential part of the training workshop was the experiences of others who are actively experimenting and developing new activities that focus on digital technology and entrepreneurial competencies.

7 ENTREPRENEURIAL COMPETENCIES DEVELOPMENT STATEMENTS

The change-maker pedagogy was originally developed from the belief that entrepreneurial competencies, critical thinking, creativity, collaboration, and being able to carry out our intentions, are something that we all possess. Being able to be critically reflective are human traits that are inbuilt as a survival mechanism. For example, distinguishing between when fire is dangerous – it burns people and destroys buildings and when fire is a necessity, fire warms – we need warmth when it is cold outside or heat to cook food. However having a critically reflective understanding the difference between using fire as a tool to warm or cook with and letting fire get out of hand and destroy a building or a forest and being able to make decisions about when and how to use fire have to be learned or even experienced over time. Equally, collaboration is an important part of being human. Particularly as our education systems are built on being in a class with other people, we have to learn to establish relationships and what it means to be sociable and what unsocial behavior is. For many people creativity is something reserved for an elite group of people that are 'naturally' artistic and able to express themselves either through words or various art forms. Current research shows that creativity is much more than this narrow understanding and is often more about being able to use the given resources to make something new or different. For example, using up left overs in the fridge to make a meal for the family is a creative project. But how many people would call themselves creative because they can do that? And for children finding new ways to play a familiar game is a creative competence that comes naturally. These and other examples were discussed with the teachers when the researchers introduced the entrepreneurial competencies.

A major aim of the project has been to work with entrepreneurial competencies. Through discussions with the teachers at the first and second training workshop, the researchers have tried

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to distinguish what it means in practice to be a critical thinker, to be creative, collaborative, and able to carry out your intentions. It has been important for the partners that the teachers are involved in articulating the competencies in their own words and begin to see these appearing in their practices and the activities that they ask the children to participate in. This is why we talk about – making competencies visible. The teachers were asked to question the children about what they did when they carried out an activity. They were asked to categorise the statements from the children under the competencies so that they came up with a list of statements, in their own language, that made the competencies visible. This was work that they will continue with. It was emphasized that articulating these statements and talking about what they meant would not only make the competencies visible to the teacher but equally important to the child themselves. This task was supported by an exercise on noticing and wondering which was practiced at the training workshop and was followed up on by each of the partners when they visited the institutions individually after the workshop. The aim is to develop a set of statements from each national context that illustrates the kinds of things children think and say about the process of developing and producing. Finally, the teachers felt they were better able to articulate what being creative or collaborative meant having a new awareness of what children do and how they get ideas by for example, observing others or working alongside others. They have been inspired to start making the entrepreneurial competencies visible in their daily practices by engaging children in conversations about their own processes.

Through discussions with the participating educators at the first and second training workshop and evaluation meetings in the project the partners have tried to distinguish what it means in practice to be creative, collaborative, to think critically and for children to be agentic. It has been important for the partners in this project that the educators are involved in articulating the competences in their own words and begin to see these appearing in their practices and the activities that they ask the children to participate in. It was emphasized that making these statements and talking about them would not only make the competences visible to the teacher but equally important to the child themselves. The aim was to develop a set of statements from each national context that illustrates the kinds of things children think and say about the process of developing and producing.

The aim in phase one of the project was to make teachers aware of the kinds of competences that the children were developing through the activities initiated by them. By asking the teachers to reflect on the extent to which the competences were integrated into the activities when reporting on them afterwards the intention was to identify them and make competences explicit and visible. This part of a process which involves being able to identify competences and make them explicit and visible in the activity and with the children. The educators were asked to consider which entrepreneurial competences they were working with in a given activity. All the educators evaluated that the 4 competences in the SEEDS competences compass (creativity, collaboration, critical thinking and agency) were important competence to develop in the preschool setting. The following

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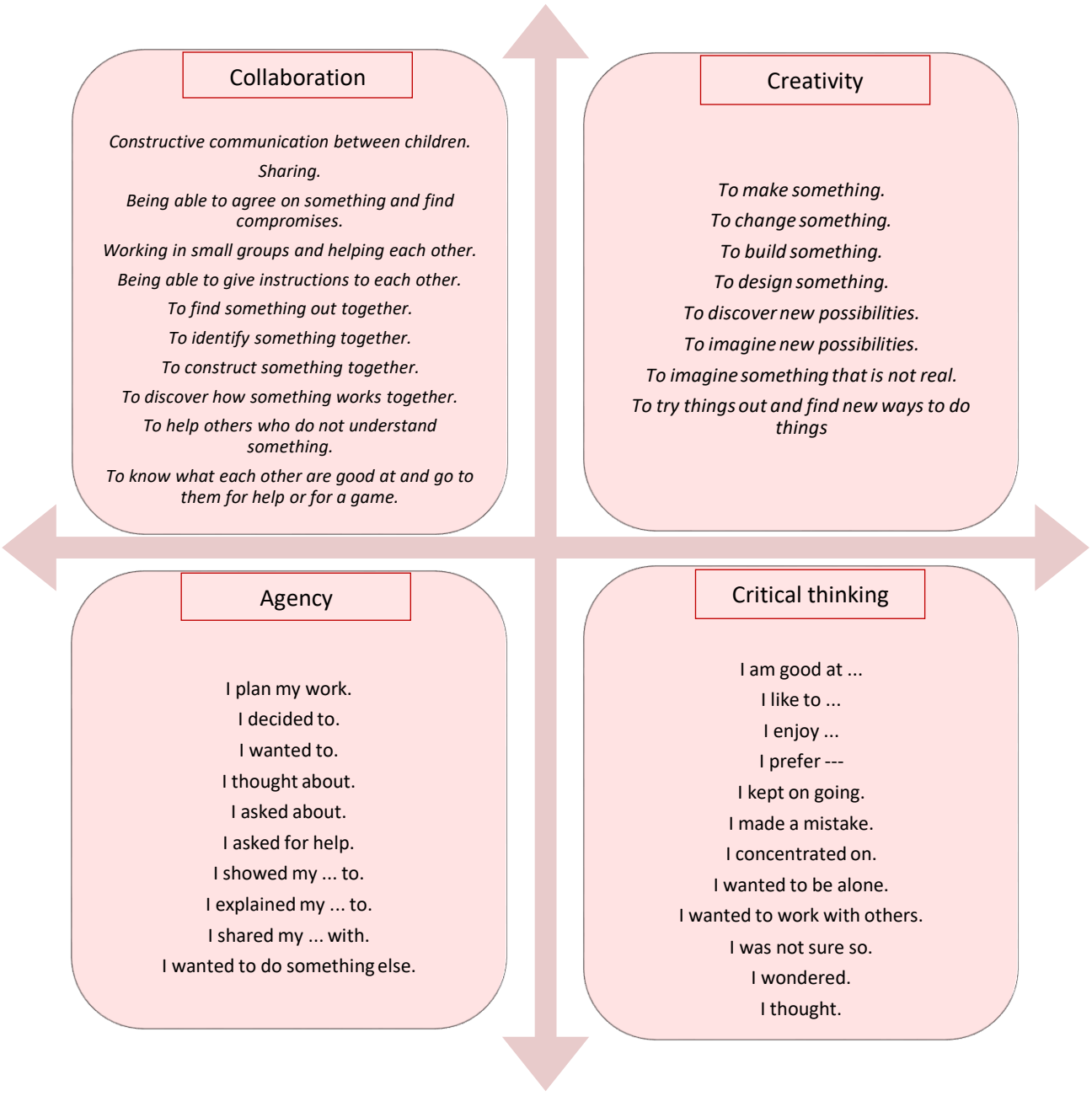
list highlights examples of the multiple ways entrepreneurial competences are articulated by the educators in their everyday practices:



All interviewed educators agreed that the 4 SEEDS key competences (creativity, critical thinking, collaboration and agency) are crucial for children in order to prepare them for the future. It was a general experience that the educators already work with some aspects of these competences in their preschools, however through the project they have become more aware of this and gained new tools to actively target and work with these competences. For example, most said that they always work with cooperation skills among the children in all their activities. Some highlighted that

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critical thinking and agency were the most difficult to work with, because they are the most difficult to observe in the children.

In the evaluation meetings with the educators, they also highlighted that outside of the 4 key competences in the SEEDS competence compass, other fundamental skills and competences were essential in a preschool setting, in order to support and prepare children for their future life in the 21st century society. These are in a way fundamental for developing the 4 key competences highlighted in the SEEDS project. Here is a list with examples of what the educators highlighted:

Cognitive competences

Abstract thinking and imagination: Understanding that things can do something else.

The ability to focus.

Experimenting, curiousity and exploring, for example finding different solutions and thinking of other possibilities.

Acquiring knowledge through research and learning how to learn.

Factual knowledge about the world.

Basic skills skills using different tools and materials.

Problem solving and logical-mathematical skills.

Personal and emotional competences

Understanding and feeling of self-worth.

Life proficiency skills.

Consciousness.

Curiousity about life and the things they will encounter.

Courage to try things out and not be afraid of failure.

Motivation and zest for life.

Being able to commit to something and immerse themselves in something.

Having patience for the boring learning as well as the fun.

IT competences

Know and be able to use the different available technologies.

Technology as a natural tool along side scissors, pens and paper.

Courage to use IT and be curious about it.

Critical use of the technology: When do I/we want to use it, what do I/we want to use if for, is this use ok?

Social and intercultural competences

Self-awareness in a social context: Who am I and who am I with others?

The ability to create and maintain relationships.

The ability to understand and recognize social rules.

The ability to express emotions and communicate about them.

Courage and desire to experience and play with the unknown.

Understanding that there is a world outside the family and the local community.

Awareness and curisority of different cultures and languages.

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8 SOCIAL INCLUSION AND VULNERABLE CHILDREN

The entrepreneurial competencies that become visible in practices that included children experimenting with digital technology include collaboration, critical thinking and creativity to some extent. However, what is also visible is how many of these practice created value for others. For example, when VR glasses were used to 'bring' a handicapped child into the woods, or when the Beebot helped children with language problems to be included in games with other children. The children became more attentive to seeing the world from the perspective of others. Technology used in the hands of the children who were part of the experimenting community was a vehicle for presenting new perspectives and crossing physical and emotional boundaries. The boy who is handicapped is now included in multiple activities as the other children now think about recording their experiences for him. Children whose language skills excluded them from games and from interacting with others were able to be part of the experimenting community as they could use their hands and carry out activities that showed off skills that the other children did not know they had. These children became part of the community and were included in the activities.

RECOMMENDATIONS

1 INTRODUCTION

In this chapter we follow up on the results and inputs developed through out the SEEDS project and round off with a line of recommendations. As previously mentioned, the aim of the SEEDS project was to develop a European pedagogy for social entrepreneurship, to support early learning of relevant skills like entrepreneurial mind-sets, digital media and to insure social inclusion of all children in this learning. In line with this we developed 4 thematic areas of recommendations:

1) How to implement the 21st century skills in preschools
2) preschool education in light of the 21st century requirements
3) inclusive learning in preschools
4) Developing technology for and with children

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2 IMPLEMENTING THE 21ST CENTURY SKILLS IN PRESCHOOLS

INTRODUCTION

We have formulated a list of recommendations that aim to support preschools in implementing the 21st century skills framework and more concretely working with the SEEDS Pedagogy and resource materials developed in the project. You can read more about about these on the project website.

RECOMMENDATIONS

1) Make the competences and strengths of the individual child visible

It is important, as an educator to challenge one's own bias and assumptions, be it based on the perception of an individual child, an age group, gender or ethnicity. Often in the preschool, the educator will make assumptions about what the child can do, what they know already and sometimes about what they are able to do in order to prepare the learning activities. However, children are not all the same, they are not all good at the same things, or capable of achieving the same progress. Some children take longer to learn something than others. Some children are capable of doing some things (climbing trees) and not of others (cutting with scissors).

When working with competence development, if be beneficial to set up learning environments and arenas where the child's individual competences and strengths become visible for educators and children alike. Working with different roles for the children in cooperation and making their strengths and competences visible for themselves and each other can support their cooperation, relationships and self-confidence. It will give the child more self-confident to become aware of what it is good at, but also making other children aware of it can be beneficial, which can promote a better cooperation and social inclusion among the children. Moreover, it will support the educator working with the child perspective and supporting the learning path and development of the individual child.

2) Learning to make value starting with the individual

When learning takes place, the individual is always at the centre of their learning. It is from the individual that motivation to learn comes and meaning making with respect to linking to what prior knowledge the individual has. The SEEDS project targets *a social entrepreneurial mind-set,* which is about making value for others. The change maker pedagogy, which is one of the methods of the SEEDS Pedagogy, was developed from research into entrepreneurship education, and describe different levels of activity that can support the development of an entrepreneurial mindset by finding solutions to problems in a dynamic between an individual and collective perspective.

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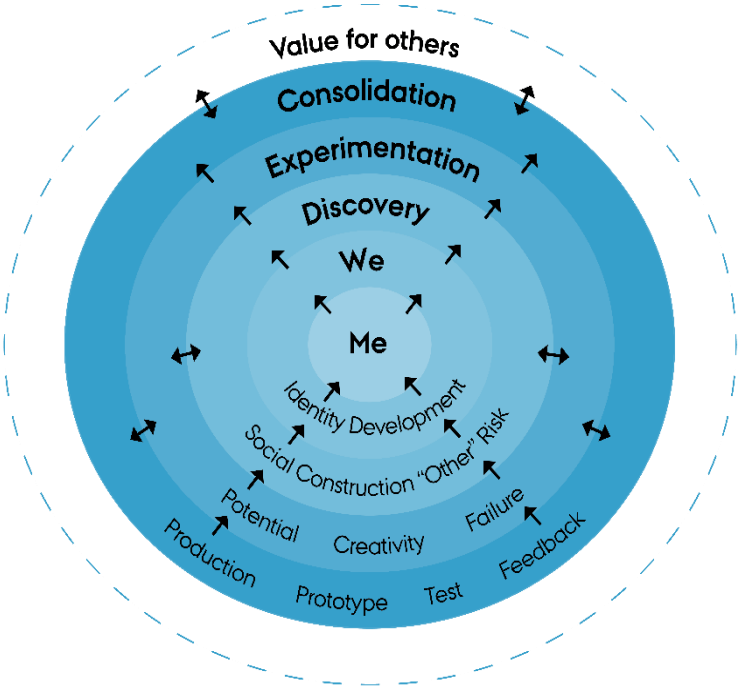

Change maker pedagogy (Robinson, 2020)

The process starts with **ME**, which is the centre and starting point. Here you focus on the child, who they are and what is important to them. What are their motivations and interests? Then you move on to **WE** and bring the children together in a group. When groups work together, they are constantly articulating and reflecting on their own understanding in relation to the others in the group. It is here that community is established, that identity is constructed and challenged, sometimes even threatened. This is why there will always be space for movement between who I am, in relation to who I am as a member of the group. WE are not just about the group, but also about the whole preschool, the local community or other communities that the children are part of. Then the process moves on to **DISCOVERY**, which is characterized by asking, observing and even trying out the limitations of different methods, materials and tools. In the discovery phase the group explores and investigates a problem or a situation. There will be a focus on:

- *what resources and technologies* are used,
- *who are involved, their skills and expertise as well their relationships* with each other,
- *where the practice takes place*, in a particular context and lastly,
- *how the practice happens* in the given situation.

Next comes **EXPERIMENTATION**, where the educator and children begin to experiment with what could be done to the specific problem with a combination of different methods, materials and digital tools that has not been tried before. The final step is **CONSOLIDATION**, where there is room for

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testing and trial. The problem is solved when the group as a whole agrees that the solution works for them. This is when value is created for the individual and for the community as a whole. This means being able to experiment, seek new and innovative ways to solve the problem and to test potential solutions together. The experimenting community moves back and forth in the change-maker model, creating value for themselves and others through all the phases.

3) Nursing curiosity as a driver for playful learning

The creative entrepreneurial mind-set is playful, explorative and experimenting. In order to foster this in young children, it is important to set up learning activities and environments where these approaches are possible. When working with children's learning, starting with their own perception, curiosity and motivation is a useful way for making the learning process active and meaningful. The pedagogical traditions that most preschools in Europe share are based on playful learning, exploring and following the curiosity and interest of the individual child. Some educators talk about following "the children's track" when planning and conducting preschool learning activities.

In the project, this was illustrated in activities where the children had more or less full influence on the content of the activities. Sometimes a child expressed a question or an interest in a topic and the educator took departure in this, in their activities, for example planning a whole activity around that topic. In other cases, the educator set a frame and let the children decide which direction to go and what to explore within that topic.

Some educators expressed a need to change their role in the activity depending on what type of learning they wanted to facilitate. Sometimes, they would walk "in front of the children" to show things to them or tell them things they needed to know. Other times they would walk "beside the children" and engage in activities with the children, where they took on an active role and became curious and exploring together with the children, but not leading, but following and working together with the children. At other times the would walk "behind the children" and let go of control and let the children play and do as they wanted in the activities, and only give support when needed, to give place for free play.

4) Give the children courage to explore, test and fail

In order to develop an entrepreneurial mind-set, it is essential to have the courage to put yourself in positions where you might fail. In order to be creative and innovative you have to be able to explore and test things out and this leads necessarily to potential mistakes. In fact, we learn more from our mistakes than our successes, because this leads to new discoveries and can inspire other solutions or possibilities that we did not see before. This however, requires an environment where it is accepted to fail and where it is just seen as part of the explorative process. So in order to inspire children to engage in explorative activities, it is important that the educators puts value on the

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process of exploring and testing, rather than looking for a right answer, and explore with the children what they learn, when things don't go as planned or indeed fail. It can be beneficial for the educator to let go of the control of the activity and let the children explore on their own agency. They learn more from finding answers themselves than from getting the answer told by someone else.

When trying out ideas, it's important to create a space for open discussions. Try not to give the answers or solutions, but support the children in finding them by asking open questions. Follow up on questions with concrete try-outs and follow up on the try-outs with reflections and sharing of learning among the children. It can also be beneficial to work with collaborative learning among the children. They can share their perspectives and insights among each other, and help each other find solutions. Always make sure to create a safe environment where there are no wrong answers, but all answers should be encouraged as potential solutions and learning opportunities. When you ask the children to reflect on open questions and to share their perspectives and learning with each other you can also support the development of their communication skills, and teach them democratic skills like listening to each other's perspective, accepting that there are more than one potential solution to a problem or question and critical reflection about whether they agree or not.

3 PRESCHOOL EDUCATION IN LIGHT OF THE 21ST CENTURY REQUIREMENTS

INTRODUCTION

Based on the evaluation of the first and the second workshop, the general conclusion was that we should make the competences more visible. What are the most important competences identified through the project and the experimenting communities? How could educators make these competences more visible? How are citizen competences, entrepreneurial competences and digital competences could be integrated in the overall framework? What elements could be included in these competences to address social challenges and promote social inclusion?

RECOMMENDATIONS

1) Making competences more visible

The process of reporting the activities in the activity reports has helped teachers to reflect on how they have integrated these competences into their activities. This process is making competences more visible, and therefore helping them integrating them in the school curricula. This was further

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explored in the second workshop were schools had the opportunity to communicate and exchange ideas around a common pedagogical understanding at national and a European level.

Making competences more visible, also means that they are more easily measured and manage impact. As the skills become more visible, children are more equipped to solve problem creatively and cooperate, collaborate and communicate in creative ways. Children also feel empowered to act on their own, take responsibilities and actively participate in making decisions.

2) Giving children the freedom to express freely

Observing children and their reactions during the experimentation process as well as how they interact with each other could be a great opportunity to make questions to explore their thinking process and reasoning, individual competences, communication skills, creativity and other. Learning how to direct a question without expecting a specific outcome is very important at this stage as it allows children to express freely without limiting their reasoning or way of expressing. This process might uncover scenarios or aspect that were hidden or not so clear to the teacher and might encompass a series of competences and skills.

3) Using technology to connect with other schools and children

Based on the recommendations of the educators participating in the experimenting communities, children like to interact with other children online and particularly with school from other countries. Online interactions with other schools could help children learn about other cultures, find alternative ways of communicating with children that do not speak the same language, learn more about the use of technology as a tool to connect with the world, etc. This could also have an impact on how accepting they become of different cultures, how they creatively solve challenges both with communication and with technology, how they collaborate and cooperate with other children to solve challenges and how they take initiative to solve these challenges. Connecting with other schools and cultures online and interacting with people from different backgrounds will contribute to the promotion of social inclusion and the promotion of diversity.

4) Using technology as a tool to exchange ideas and practices

Children could use technology to connect with other schools both on a local level and at an international level. Learning about how other schools use physical and digital resources could be fun way to explore and create new activities. Interacting with others online, will increase children's curiosity to explore and experiment with different elements.

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5) Using technology to learn more about relevant topics and organisations

Children could learn more about other organizations by connecting with them online. They could have digital tours to places that can not visit physically or interact with experts that share information about interesting topics. They could use this opportunity to ask questions and learn more about the subject explored.

6) Promotion of group activities and peer-learning

The nature of group activities requires collaboration and cooperation among participants. However, if they are not managed carefully, they could increase the risk of social exclusion. Therefore, educators should create an environment that facilitates interactions which does not limit the means of communication. The role of the group activities should be to allow children to participate in a group setting where they feel supported. They should have the means to help them express and communicate with each other. Children should be encouraged to participate, not just in terms of communicating with each other but by playing and experimenting with the resources or material available and ask questions within their groups.

7) Importance of reflection

Group activities should provide a space for reflection. This could be facilitated by asking children to respond to questions about the process within their groups or within a broader group of discussion. The reflection could be used in sub-sequent or follow-up activities. It could also be in a form of self-reflection during the implementation of the group activities.

8) Promoting experimentation

As we have seen in the description of the experimenting communities, experimentation could happen either by having the teacher controlling the process which could have a guided outcome or it could happen by having the teacher participating in the process as a learner without expecting a specific outcome. Experimentation could be seen as tool to facilitate inclusion as it allows children to experiment in their own ways and learn more about the object. Experimentation is a form of participation.

9) Promotion of cultural diversity in education resources

The development of resources that promote diversity and promote different cultures could help with the development of more inclusive societies. Children from diverse background will feel accepted and will be feel more confident to participate and engage in the different activities. A

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curricula that promotes diversity will also help children be more accepting of other cultures and develop empathy. Technology is great way to get children excited about learning about the other cultures and increasing the engagement of children in different activities.

4 INCLUSIVE LEARNING IN PRESCHOOLS

INTRODUCTION

There are some aspects on which society and preschools, as the first educational institutions, should focus in order to foster social inclusion. In this paragraph, we tried to elaborate some recommendations to address this challenge. In particular, on how preschool educators can be provided with the relevant skills and awareness of the use of methods, activities and tools for social inclusion in relation to digital media use, combined with facilitation of social entrepreneurial competences and mindsets.

RECOMMENDATIONS

1) Preschool should work on make the child "socially well-functioning":

Teaching the children to socialize and build relationships is very important to promote, nourish and safeguard a social inclusive dialogue. It is preschools' responsibility to improve the interpersonal skills of children, since parents do not prepare the children for this in the same manner as before.

2) Preschool, transformed in learning communities, should use technology as a means to encourage and facilitate social inclusion:

SEEDS educators expressed how they have experienced new social inclusion potential and benefits of using technology. For example, the Danish preschool Paddehatten that has a child with ALS used a 360°-degree camera to give him inclusion in activities he could otherwise not participate in. Several Danish institutions, like Skibet, have talked about a method of educating super user children, which gives them a special social position, as well as highlights their competences. Another aspect on which teacher must focus is to adopt a gender-free approach to technology. In fact, some preschools think that the gender difference in terms of technology is getting smaller, but there is still a gender difference in their approaches to technology and their interest in it. However, activities realized as part of the SEEDS project, proved that children, when left to explore alone technology and to be creative, tend not to form groups based on their gender.

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3) Society should provide mental health support for inclusiveness of all young people:

We would recommend implementing mandatory weekly meetings for school students held by trained school specialist about mental hygiene. The workshops could include topics about stress, building self-confidence, time managing, being productive and focused, emotional intelligence etc.

4) A socially inclusive dialogue must be promoted at European and local level.

We encourage the EU to coordinate and fund an agency providing a dialogue between diverse social groups on a local level promoting and improving European values throughout providing a platform for all people to speak their minds and strengthen social cohesion.

5 DEVELOPING TECHNOLOGY FOR AND WITH CHILDREN

INTRODUCTION

Here we would like to reflect on our design process and derive recommendations on how to develop technologies for and with children and preschool educators. Research suggest different ways to involve future users of technology in the design process. In this case both children and preschool teachers participated. We involved both groups as so-called “informants” and they took part in the design process at different points, but not as much involved as designers. This was done by shared design sessions in the kindergarten, the Fabrication Laboratory and the University, leading to a common understanding of each other’s environments, potentials, wishes and needs. Ideas were created and scrapped within those sessions.

Nevertheless, designers should define goals on each activity and keep in mind when they need input and what resources are available. So the first recommendation is to **involve future users in the design process at different points and in all working/learning environments** by keeping in mind both expected fruitfulness and efforts in order to balance costs and values. This might be difficult, but it is beneficial when designers want their products to be suitable for the target group(s).

Further, we have presented the concept of digital transformations on Fröbel and Montessori-inspired materials. That is, children learn while playing with physical objects that incorporate abstract concepts or the design of real-world objects. In order to support those pedagogical principles also in the digital world, our next recommendation is to **draw on established pedagogical principles and to add technology** such as interactivity or programming to it, in order to add value to existing materials. In this sense it is also advisable to involve teachers in the design process since they have the knowledge on appropriate materials as well.

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Last, we referred to ten principles to follow when designing a construction kit for children. As those principles are to be applied to construction kits for children, they can not necessarily be applied for every technology for children. Nevertheless, in the SEEDS context and from our experiences we would like to highlight some of them and also outline how they can be applied when following the first two recommendations (see below).

Finally, as the design was implemented in a FabLab we would like to **encourage sharing ideas and further development** of what has been designed so far.

RECOMMENDATIONS

Summing up, we consolidated many suggestions into three major recommendations on how to design technologies for and with children and preschool educators:

***1) Involve future users in the design process at different points and in all working/ learning environments* which should include**

- To iterate again and again, e.g. by sharing progress online
- To give children and teachers what they want, e.g. by observing (and discussing) wishes and needs
- To support many styles, also by observing diverse wishes and needs / allow for many different ways to use it
- To invent things that you would also want to use yourself
- To draw on children's and teacher's ideas

***2) Draw on established pedagogical principles and to add technology,* which includes**

- To design for designers / offer a starting point to work and create with
- Easy ways to get started with the technology and diverse ways to use it (low floors and wide walls)
- Keep the technology simple and make ideas salient

***3) Encourage sharing ideas and further development* which (again) includes**

- To iterate again, e.g. by sharing new ideas online
- To invent things that you would also want to use yourself
- To involve more teachers or children or any future users and by that to create more diverse developments and reach more people in general

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The SEEDS toolkit can be regarded as a starting point to become creative with technology in preschool settings. As it is based on the idea of open educational resources to be used, adapted and further shared, we would like to invite future designers to follow the recommendations, to further design new parts for the SEEDS toolkit, and to share them within the community.

WANT TO READ MORE?

On the SEEDS website (www.seeds-project.eu) you can find more resource materials from the SEEDS project. For example, you can read about the developed SEEDS Pedagogy, find best practice examples that elaborates how the SEEDS pedagogy looks in practice and more about the project methods “experimenting communities” and the “change-maker model”.

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