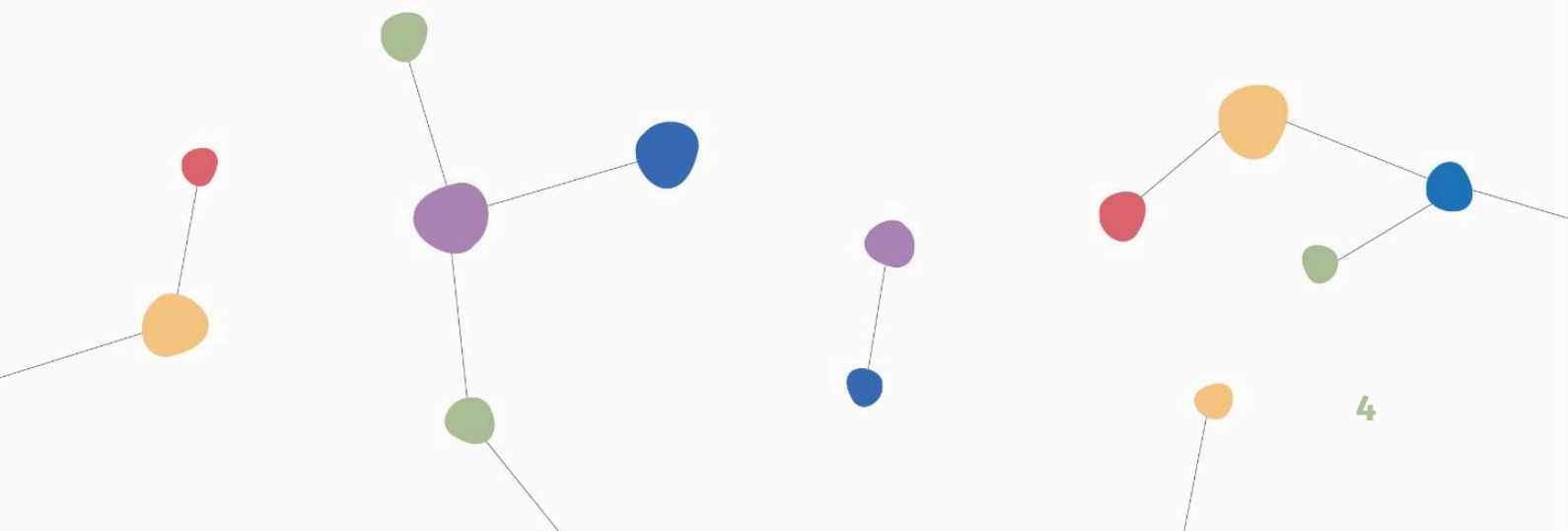# THE HERMMES APPROACH

BACKGROUND AND RATIONALE

Introduction

One of the greatest challenges of our time is to help children and young people in the development of their media maturity and digital literacy.
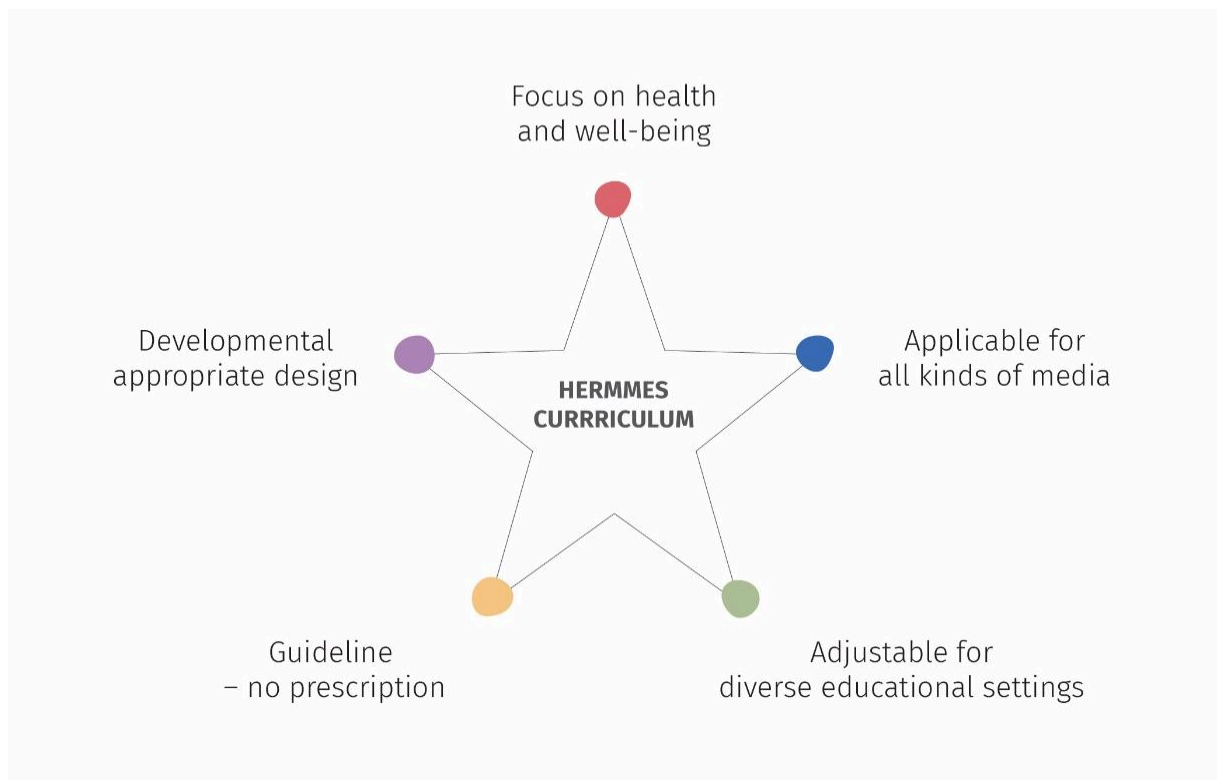
Technology is evolving every day. Parents and (pre-school) teachers are confronted with the fact that the children and young people in their care are using technology and are moving in virtual worlds that the adults responsible for them can hardly comprehend.
However, the question arises HOW they are using it, whether they are able to digest the contents and whether they are aware of the dangers and pitfalls lurking in the digital world and how to deal with these at different age levels.

In its resolution "Shaping digital education policy" of 25 March 2021, the European Parliament suggests to "introduce digital technologies in a learner-focused, age-appropriate and development-oriented way" insisting that "digital learning strategies need to take into account research on the effects that early use of digital technology may have on the development of young children".

This strongly resonates with values and beliefs shared among all partners in the HERMMES project. At the end of their school career, all pupils should be able to use a large range of analogue and digital media in a conscious and selective way for their own education, participation in civil society and the labour market. In addition, they should be able to make informed choices on how much time to spend on digital tools, for which purpose, and always with a conscious and critical approach to the content shared or consumed through media. In order to reach this goal, the timing and form of using digital media in education should be closely aligned with children's and young people's developmental phases. Therefore, parents, teachers, and researchers have joined their resources and worked towards helping children and young people become resilient and media mature citizens who can make their own informed choices on HOW they use digital technology.

The five focal points of the HERMMES project and its curriculum

Focus on health and well-being

Applicable for all kinds of media

Adjustable for diverse educational settings

Guideline – no prescription

Developmental appropriate design

HERMMES CURRRICULUM

1. Health and well-being

Every parent/caregiver and professional educator today is aware that children grow up in a world permeated by all types of media. To become media mature, to use digital media in a free and responsible way, we focus in this curriculum on a learning path that supports media literacy and prevents media risks. From a holistic view, the HERMMES curriculum promotes a sustainable pathway to digitisation and pedagogically meaningful media concepts in educational settings, based on academic research and on consolidated practice that focuses on health and well-being in the short and long term. We aim for human-friendly technology environments and show that healthy alternatives are possible.

2. Applicable for all kinds of media, analogue and digital

Ever since culture has existed, humans have communicated and expressed themselves using media - clay, paint, music, dance, images, text, and many more. Healthy media use is based on human abilities with a wide range of media: digital is just the youngest member in an age-old family tree. The HERMMES guidelines and curriculum are broadly formulated and therefore very versatile. This means that you can apply the learning path to all possible media, analogue and digital.

3. Adaptable for diverse educational settings

Every family and every educational setting is unique and different, also when it comes to media literacy. To give media literacy a place in a broad development of the child, we look at each step in the media pathway from a holistic perspective. The practical examples, connected to life and world, are intended as inspiration for teachers and parents, so that they can give their own interpretation to this in their local settings.

4. Helpful guidelines, not prescriptions

The design of a media curriculum and guidelines can never be a prescribed recipe that fits all but will always have to be creatively adjusted to meet the needs and potentials of the individual learner and within the educational setting based in its specific socio-cultural context. The curriculum is designed to give guidance on the kinds of things pupils can learn and suggestions for how this might be taught. Within this framework, schools and teachers are encouraged to exercise creativity and innovation, and with the guidelines, to work together on this theme.

5. Developmental- and phase-appropriate design

The approach to and the development of media competences is based on the broad question "what is needed to be ready for a digital age?" The division we propose according to age/phase is indicative, not normative or prescriptive. Nevertheless, the pathway can give teachers and parents a clear direction to know how they can work on media literacy and prevent risks at any age. Among other things pupils need to learn how to use and understand media, but to really function freely in a digital world, other competences and faculties are also required in line with the child's and young person's natural developmental stages. The HERMMES results are meant to give an overarching line through the development from the age of 0- 18+ years.

Media as all means of communication
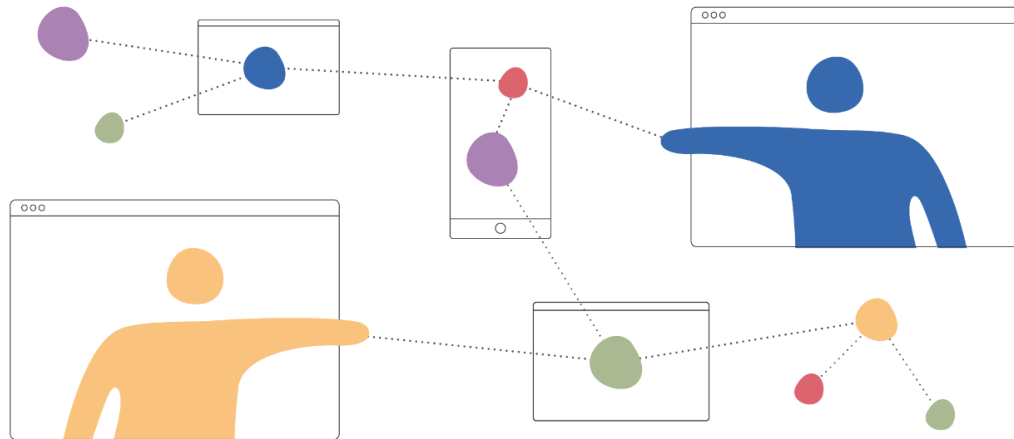
Our modern lives are filled with real, artificial, and virtual contacts. Because of the various connotations linked to these adjectives, there can be much debate about what is the difference between them. However, what they all have in common is that they describe a certain quality of contact. In order to find a common ground of understanding, we can use the explanations from the Oxford Languages dictionary:

REAL: actually existing as a thing or occurring in fact; not imagined or supposed (...) not imitation or artificial; genuine.

ARTIFICIAL: made or produced by human beings rather than occurring naturally, especially as a copy of something natural.

VIRTUAL: not physically existing as such but made by software to appear to do so.

Although these ways of contact are very different, all of them can elicit strong experiences. For example, if we examine the effect of the experience we might have through being in contact with the different forms such as being in nature (real), looking at a painting (artificial), or watching a movie (virtual), all three forms of contact can have a deep impact on us that feels very real. However, we need to first fully develop our senses to avoid experiences in the virtual world that are not comprehensible, manageable, or meaningful to the user.

Analogue media

Nowadays, we mostly associate the concept of media with the news and the different digital media types through which we can acquire knowledge and communicate with others. In doing so, we tend to forget that from the beginning, when we enter this world, our lives are already filled with a rich variety of analogue media that helps us to connect with our caregivers and our immediate surroundings. Through singing, rhymes, and stories we are comforted, through simple play we are triggered to explore and develop our motor skills, and through looking together in picture books we learn to understand that the beings and phenomena of the natural world can be represented by images that have a certain shape and colour. The rich palette of analogue media allows for multifaceted sensorimotor experiences which are foundational to develop the perceptive potential of the senses into capacities for observation and learning. Once our children enter the school, other analogue media are used, such as learning to work with a pen, paint brushes, scissors, handicraft tools, 3D art practice, and so on. In later years still more can be added, such as printing, magic lantern, analogue photography, shadow theatre plays, live experiments, technical tools, more art practice. Also in secondary school analogue media stay important, even though slowly media start to take over some of their learning activities.

For the infant and toddler, the learning process is still primarily dependent on the immediate contact with the world. From nursery and kindergarten age, the progress of sensorimotor integration increases the possibility to use various types of analogue media. During the primary school years, the use of various artistic activities and crafts expands and helps to deepen the learning process through the connection with feelings and the possibility of individual expression. During secondary education, the various types of analogue media continue to be important for the development of personality and a sense of autonomy. In addition, through experimenting with mechanical processes, young people will increasingly learn to analyse and understand the technical processes that underlie digital technology.

Digital media

Digital technology is increasingly becoming an important factor in our lives and in the way society works. It is also present in most families, and becoming the most important way of communication and spending leisure time. Time spent together offline has to be consciously wished for and agreed upon. Towards the end of the primary school years, most children will have access to some type of digital technology. It is important for the parents and the teachers to acknowledge this reality and work together for the best way forward in accompanying the child. Digital media create incredible possibilities which we all use, depend on, and can be grateful for. However, it also comes with a set of serious challenges that we need to be aware of and learn to deal with in a wise and healthy way.
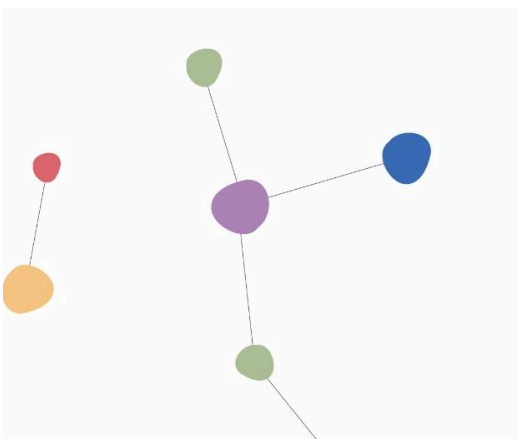
If we look at what kind of sensory experience digital media offers, we have to recognise that it operates within a narrow bandwidth of sound and vision. This means that all the other senses' perceptive potentials are not stimulated and nourished, which, if not counterbalanced, can lead to a numbing of our perceptive abilities and with it an impoverishment of our experiences.

Another challenge digital media brings to our doorstep is the infinite and unlimited availability of the online world: it simply never runs out of time or material. It brings the risk of needing ever more and stronger stimuli and the risk of becoming trapped in the virtual world and disconnected from our natural environment.
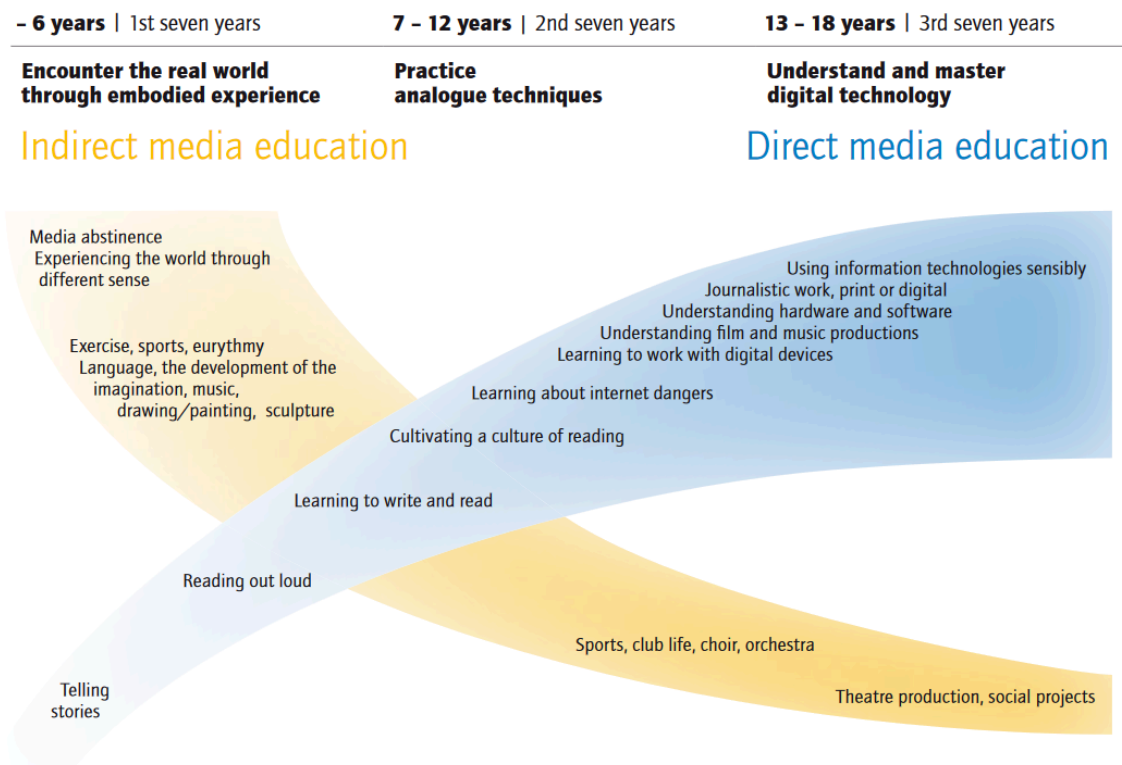
The risks of digital media range from disconnection and decreased focus to extreme behaviours - the loss of empathy, escapism, and digital addiction such as in video gaming or even in the use of apps on the phone. These phenomena can increasingly be observed today in teenagers, adolescents, and adults.

But there are more and more children in this risk group. Setting limitations on the time spent with digital media (or avoiding digital media for young children), making a critical choice between the endless possibilities, and staying focused on the goal are capacities that need to be learned and depend on a certain maturity that comes with age. We should not expect that competences that require a certain degree of regulation, abstraction, and maturity can be applied by young children in the use of digital media. In this case, it is the parents' responsibility to regulate vicariously through selection and restriction until the child has reached the necessary maturity.

Social media on digital devices in particular bring a huge potential of connecting with others as well as big risks. The younger the pupils are when they start with smartphones, the bigger the risk of addiction as well as bullying and false information. It is no coincidence that several countries have decided to start regulating the use with school bans on smartphones and regulations connected to age. It is normal in Europe that a driver's licence can only be acquired after the age of 18 years, because of the developing insight into dangerous traffic situations. We now see a tendency to also think about such maturity for the use of social media. We need legislation that establishes the age of "internet adulthood". Haidt (2024) argues that the rise of smartphones and overprotective parenting have led to a "rewiring" of childhood and a rise in mental illness and advocates a childhood filled with non-digital activities. So although we are all part of a digital revolution which changes our world more rapidly than the industrial revolution ever did, we need a thorough grounding in the real world in order to being fully human between machines.

Direct and indirect media education

– 6 years | 1st seven years	7 – 12 years | 2nd seven years	13 – 18 years | 3rd seven years
Encounter the real world through embodied experience	**Practice analogue techniques**	**Understand and master digital technology**

Indirect media education · Direct media education

Media abstinence
Experiencing the world through different sense

Exercise, sports, eurythmy
Language, the development of the imagination, music, drawing/painting, sculpture

Cultivating a culture of reading

Learning to write and read

Reading out loud

Telling stories

Using information technologies sensibly
Journalistic work, print or digital
Understanding hardware and software
Understanding film and music productions
Learning to work with digital devices

Learning about internet dangers

Sports, club life, choir, orchestra

Theatre production, social projects

The HERMMES approach to media education builds on the developmental stages of childhood and adolescence. As visualised in the above image, this development is divided into three phases of seven years with a gradual shift of weight from analogue to digital media as age progresses. In the HERMMES curriculum and guidelines we chose to break down this into six stages in order to make the results more layered. This developmental approach is based on two pillars:

a. **The implicit or indirect media education, using media as tools for general development;**

b. **The explicit or direct media education, oriented towards media competences.**

The differentiation made is between learning activities that indirectly support the development towards media literacy and learning activities that directly work on developing aspects of media literacy. Within this approach there are two important things to consider: do not force anything too early; do not encourage anything too late.

Indirect media education

Indirect media education has the task to provide learning opportunities through which children and young people can develop fundamental skills that they will need when (later on) dealing with digital media. These skills, however, cannot be developed through direct use of digital devices. First, there needs to be a focus on children's sensorimotor and social development, as they develop an understanding of themselves, the world and other people. The older the child gets, the more the cognitive skills which will help them to deal with the virtual world will gain importance. The capacity to deal with information in a meaningful way is a fundamental skill that needs to be practised through learning experiences facilitated through embodied experiences and analogue media. It ensures that young people learn how to acquire knowledge, and how to create a meaningful whole from the many individual pieces of information provided by media.
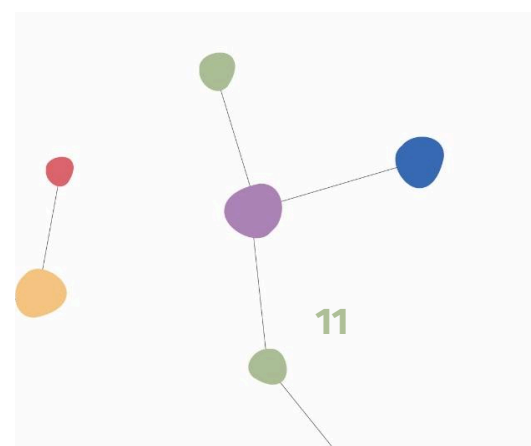
Indirect media education is also necessary to develop social skills, such as respect, cooperation, and tolerance that are needed to behave ethically in social networks.
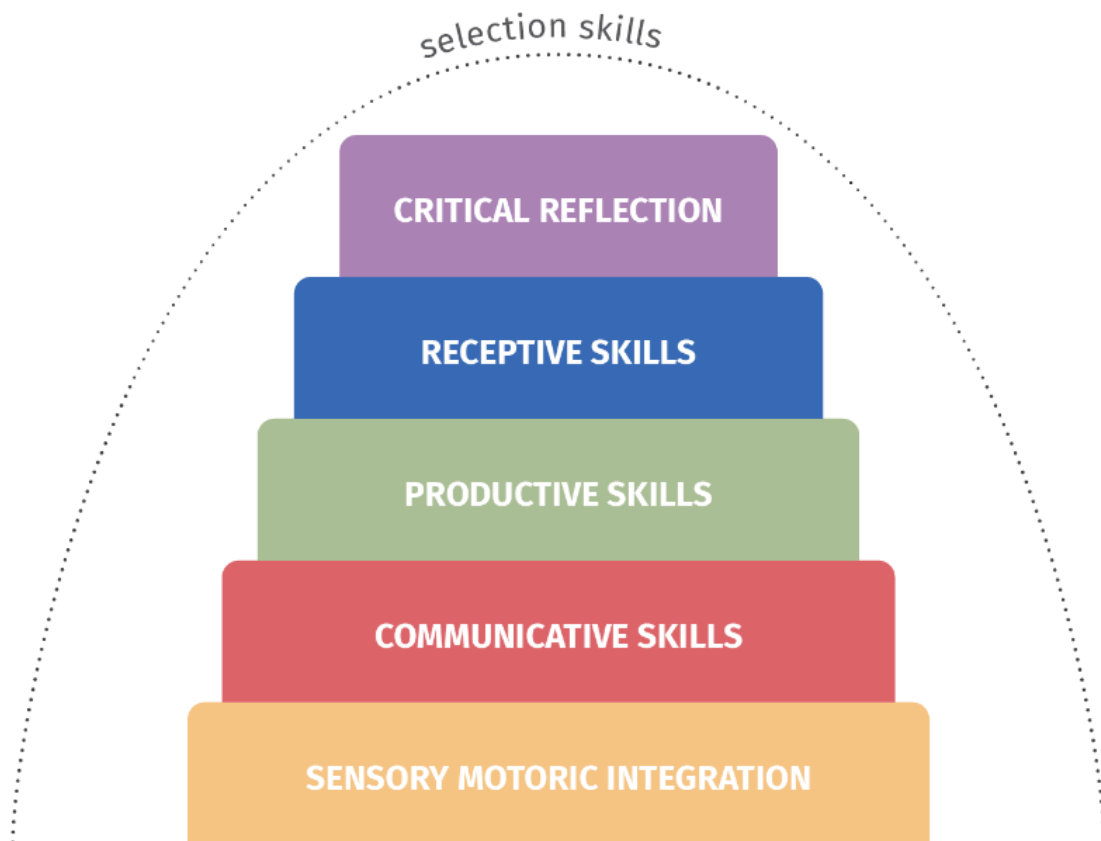
Direct media education

Direct media education has the task to help children understand how the different media work, how they affect people, and how they can be used sensibly. Educational settings have an important task to balance and give a meaningful counterweight to the use of media by children at home.

The meaningful, independent use of the computer requires the development of independent judgement, which most children will have only gained around their adolescence. Only then does the use of computers become pedagogically meaningful and necessary.

Within the term "media" at least three categories of media forms can be distinguished: the content (topic), the form (written, images, sound), and the carrier (book, song, painting, screen, radio, computer, smartphone). A curriculum for media education needs to address all these levels and can use these categories as a guideline to develop a pathway towards reaching media literacy.

Developing a variety of skills and abilities

selection skills

CRITICAL REFLECTION

RECEPTIVE SKILLS

PRODUCTIVE SKILLS

COMMUNICATIVE SKILLS

SENSORY MOTORIC INTEGRATION

The goal of a sustainable, well-grounded media education at home and in the educational settings is to help guide and support learners in their quest of developing and becoming media mature adults. But what is a "media mature" adult?

A media mature adult is able to choose to spend time with or without screen media (time sovereignty), according to which option best fits his or her personal goals and needs, and additionally knows how to use media in a limited, active, creative and technically skilled way. (Bleckmann, 2012)

According to Bleckmann, this selective ability is the result of previously developed skills that build on each other. To integrate different historical approaches in media education and to simplify a complex model, Bleckmann (2012) developed the media-maturity tower. It is an image of the sequential developmental steps a child has to take in order to reach

media-maturity. The skills represented by the bottom storeys of the tower require unmediated experiences in real life, whereas the top storeys require a balance of both analogue and digital activities to be developed. In the 'Echt Dabei' manual for early childhood educators, Bleckmann and Mößle (2018) describe these different stages as follows:

1. **SENSORIMOTOR INTEGRATION**

   The first storey of the media maturity tower focuses in the first years of life on the development of sensorimotor skills, meaning the combination of manifold sensory perceptions integrated with the child´s intentional movements, which are essential for a healthy brain growth. Digital screen media, or in other words VDUs (visual display units) directly address only the visual and auditory senses, plus some movement of the hands in case of interactive digital media. Brain growth is stunted due to the understimulation of sensory neurons. Therefore, ideally after birth, there begins a stage in which the infant is protected both from sensory overload of the ear and eye, as well as sensorimotor deprivation by VDUs.

2. **COMMUNICATIVE SKILLS**

   The second storey of the media maturity tower is about the basic ability to communicate. For infants and young children direct human contact, through touch, gestures, facial expressions, and speech are essential experiences which foster secure attachment as well as language acquisition. Building on this foundation, older children acquire further communication abilities such as reading and writing. In general, the focus here is the ability to perceive other people and to communicate with them. While learning additional languages later on can be supported by digital learning tools, direct contact with other people is essential for the first language(s) a child learns. Furthermore, digital media can have negative effects on young children's language acquisition.

3. **PRODUCTIVE SKILLS**

   The more a child goes out into the world, at first crawling, then running, the more they actively engage with their environment, thus actively shaping it. We are often surprised at the ingenuity with which a small child in many situations is able to create almost anything with the most simple things. A single piece of paper and the hat of an acorn can become a boat with a passenger. In producing and creating, the child also develops other important skills, such as dealing with frustration and tolerance because their creations may not work out right away. The "product" should be something for which young children can literally "grasp" all steps in the process of production, not a "black box" of hidden workings within a technological device. (Good examples are painting, handcrafting, sawing, hammering, kneading, singing,

acting). This creates the ideal basis for understanding the workings of later productions with digital media, such as recording audio, making stop motion-movies, writing code, etc.

4. RECEPTIVE SKILLS

Receptive abilities, meaning the ability to perceive, comprehend and to process, may also be acquired in real life. This happens when a child is read to or when looking at and appreciating a drawing or a picture book. Recipient-oriented media research has discovered that many movies, unfortunately many children's movies as well, lack an adjustment for the receptive abilities of the younger audience. Therefore, early exposure to screen media results in a dulling instead of a training in perceptual abilities. For older children, the use of screen media together with adults and the sharing and exchange of what they have seen and heard can contribute to the development of receptive abilities. For young people and adults, deep and critical reading skills form a part of critical information literacy as well as a foundation for democratic citizenship (Ljubljana Manifesto 2023).

5. CRITICAL REFLECTION

The fifth storey of the media maturity tower, the one of critical reflection, contains the complex skills of reflecting critically on (digital) media on many levels: starting with reflecting one's own media use, but also reflecting on the role of digital media and corporate interests in shaping public perception, understanding and resisting even very sophisticated types of manipulation. Historically, an example of a fully fledged critical reflection theory is the "critical media theory" in the tradition of "critical theory" of the Frankfurt school, which was developed as a reaction to mass manipulation tactics used in Nazi Germany in the 20th century.

6. SELECTION SKILLS

The final part of the media maturity tower is not an additional storey, but an overarching set of skills, the selection skills. Because the ability to choose, to be able to make a decision, is of overarching importance for an autonomous human to make decisions in a media-saturated world, this skill is illustrated in the media maturity tower as a binder that ties all stories together. Preserving and fostering non-digital options is crucial for the ability to choose the option that best serves a certain intention. So this selective ability covers a large range of options (e.g., "Do I visit a friend?", "Do I listen to music?", or "Do I play a video game?") and not a narrow selection limited to digital media ("Which Youtube video or which movie do I want to watch?" or "Which content management software do I use for my website?").

Bleckmann and Mößle (2018) make a difference between skills that "can be acquired by training on a computer: The thumb and index finger representation in the brain is more pronounced than ever in the "Generation Game Console" on the one hand and the above described fundamental skills that are necessary for long-term success in learning on the other. They furthermore state that:

"The ability to create inner images through imagination, to develop and pursue one's own goals, and frustration tolerance and perseverance tend to atrophy by using screen media. It promotes rapid stimulus-response action and extrinsically motivated action, which measures success, for example, by the rewards given within the video game." (Bleckmann & Mößle, 2018).

Designing a media curriculum that follows the developmental stages of childhood thus bases itself on the psychosocial maturity of the learner to decide what kind of media use is appropriate.

But there is a great discrepancy between the ideal and reality. Bleckmann and Mößle (2018) show a significant increase in the discrepancy between media accessibility and psychosocial maturity between 1975 and 2005. We are now almost two decades further, and since then the first IPhone came on the market in 2007, which was the first device that offered a full, unwatered-down version of the internet with the ability to browse the web just as one would on a desktop computer. While the developmental stages of psychosocial maturity have stayed the same, the omnipotent presence of the smartphone in our lives has increased the media accessibility enormously. This puts a huge pressure on parents and educators to take a conscious stance against this modern trend and create environments that support and meet the psychosocial maturity of the children in their care.
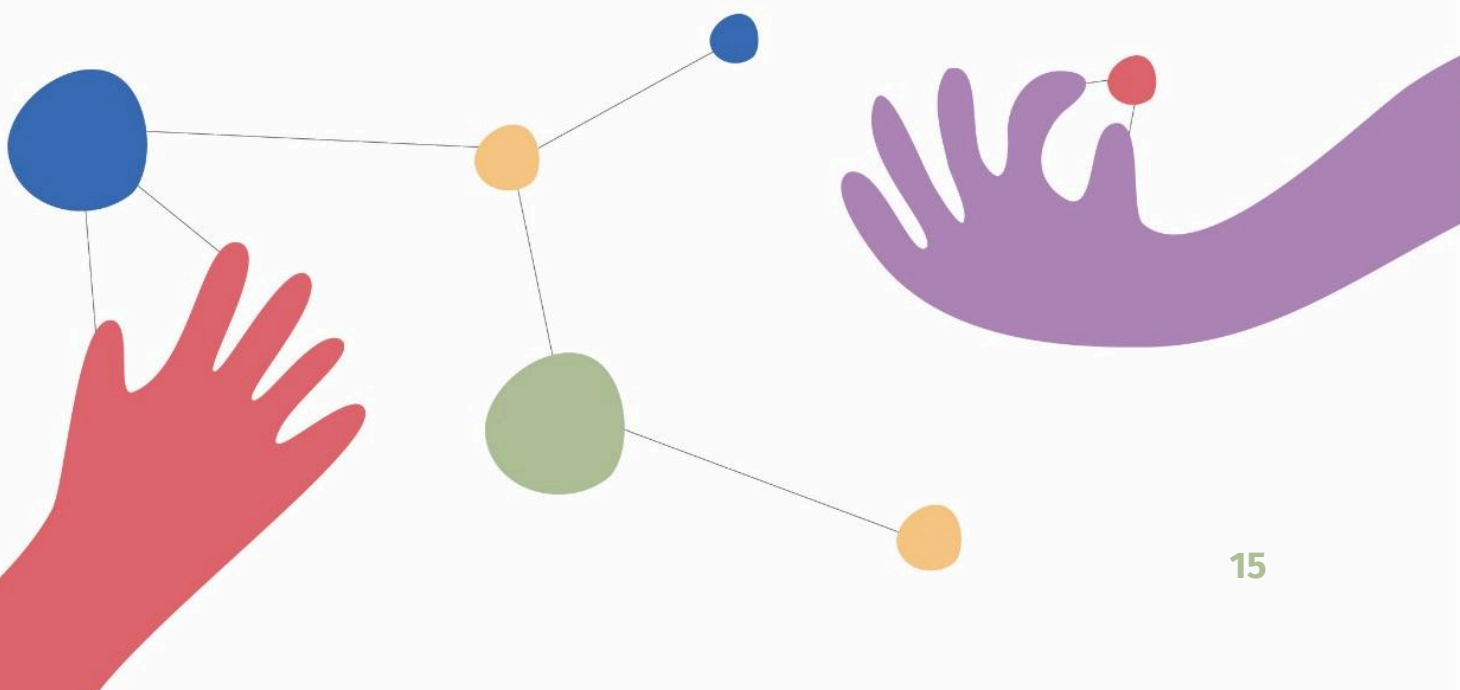
Fundamental aspects of a well-balanced media education
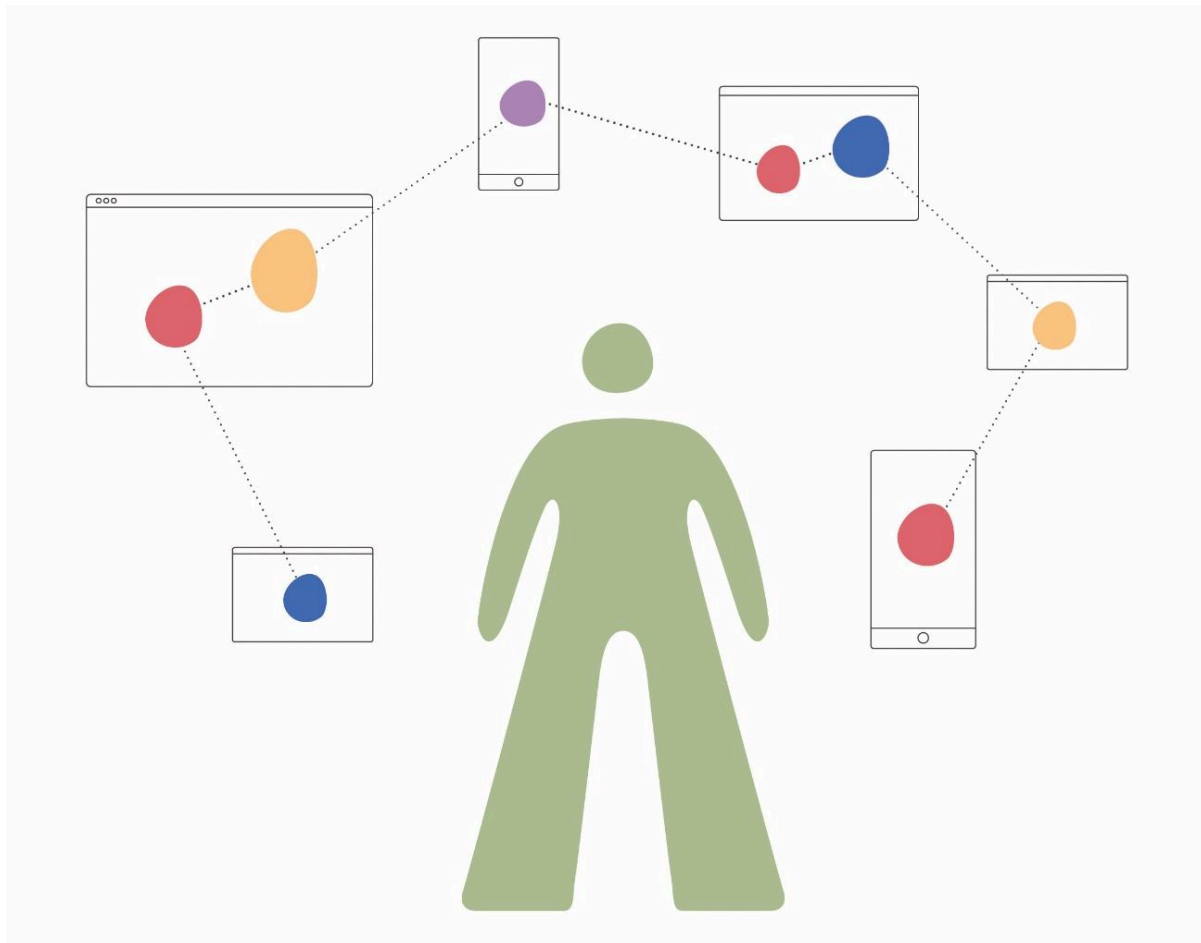
Well-being and health

A solid approach to media education addresses aspects of well-being and health. In the Unicef report: What makes me? (2021), well-being is defined as "realising one's unique potential through physical, emotional, mental, and spiritual development in relation to self, others, and the environment". Unfolding our human potential can therefore be understood as dependent on a harmonious development of body, mind, and an emerging identity. The acquisition of this harmony can be seen as the basis of health.

An educational community that aims to offer a holistic education puts the health and well-being of the learner in the centre of attention. This goal should also be reflected in its media curriculum.

With the advancement of technological possibilities there is always something to be gained and also the danger of something getting lost. Digital technology offers us a wide range of expanded possibilities to acquire knowledge, work, trade, communicate, and collaborate. At the same time, we are also challenged to become aware of, value, and nourish the social forms and modes of learning that cannot be supplanted by digital technology. Evaluations after the lockdowns due to the Covid-19 pandemic showed very clearly that online learning cannot replace the learning that takes place when educators and learners are together in real time and space.

Resilience

In this rapidly changing world, we need to be aware that in the present we cannot teach our children all the knowledge and skills they will need in the future, nor can we protect them from the challenges they will meet in their lives. However, we can predict with some certainty that life for them will only become more challenging and complex. The best that education can offer is to help them become resilient so that not despite of, but rather thanks to these encounters they are urged to unfold their human potential and make their lives richer.

Drawing on the salutogenesis theory developed by Aaron Antonovsky (1987), resilience depends on a person's sense of coherence (SOC). A person generally experiences the world as understandable (comprehensibility), influenceable (manageability), and purposeful (meaningfulness). Antonovsky further stresses that: "SOC develops mainly during the first years of life as a result of the relationship between the child and the caregivers. During adolescence and adulthood, the relationship with friends, teachers, school, community, and work also become important…. teaching and learning processes rooted in salutogenesis may make a valuable contribution to the development of SOC by taking advantage of the crucial years that children and adolescents spend in school." (de Oliveira & Kiss, 2022).

Applying the SOC principles to a learning situation offers educators a critical lens to plan, review, and adjust activities and lessons.
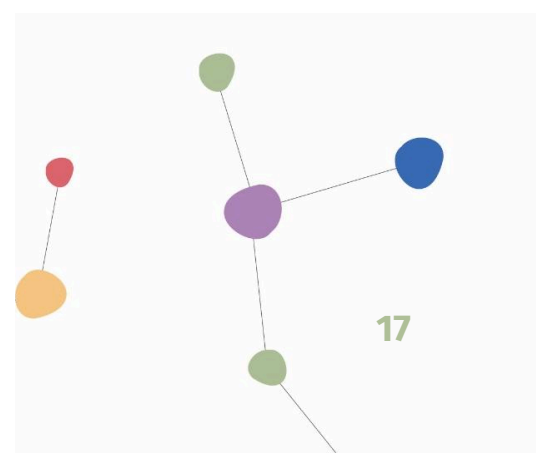
Attention to attention

The ability to pay attention is a human capacity that forms a cornerstone in education. To understand the message of others through vision or sound, we need to be able to direct and hold our attention. This self-directed activity requires a certain degree of consciousness and presence of mind, which is an effort of will. We pay attention more easily to what interests us. If we look at browsing behaviour when we are online, we can ask ourselves how much of the time spent online is self-directed or voluntary attention, and how much is directed by others or involuntary. The success of businesses has always been dependent on getting the attention of people to market their products. Computer technology, however, has made the span of their reach almost infinite and without time limitation it can now enter our homes. Through the development of the smartphone this reach for our attention has been extended to wherever we find ourselves and whenever we have our devices turned on. More importantly, with the possibility to analyse our browsing behaviour, the companies behind the search engines can sell information about our interests to these businesses who on the basis of this will feed us more similar products to keep us hooked on. As a result, our attention has become a commodity that is harvested and sold by others at the cost of our own voluntary attention. "In an information-rich world, the wealth of information means a lack of something else: a scarcity of whatever that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention and a need to allocate that attention efficiently" (Simon 1997).

If adults' attention is already captured by others, then how is this for children who are still so dependent on them being present? Research on attachment theory shows how children's sense of security is dependent on the quality of the caregiver's presence and attention. The younger the child, the less able they are to share this attention with others. Today it is very common to observe situations in which the attention of the adult is with their smartphones rather than with their children. The child will do anything to win back the attention of their caregiver but is often diverted with a surrogate pacifier such as handing over the smartphone or tablet to let them watch something. No wonder children are mesmerised and attracted to this magic black box that has the attention and interest of their caregivers.

Young children learn through imitation, so what is the example that we want to give them? Do we show in our behaviour that we value and prioritise human encounter in moments of togetherness? Are we representatives of mastering the use of our devices? Do we make time in our lives for being fully present and direct our attention with devoted interest to what our children want to show us? The formation of some of our essential social abilities is based on the cultivation of this self-directed attention, such as the capacity to really listen to the other, connect to the other with all our senses, and give attention to the other's needs. Especially during the first years of life, the foundation for development of these social abilities is being laid through developing the senses. To this needs to be added the importance of the good example of the caregiver. This is all essential in building resilience and a healthy sense of self.

Phase-appropriate education
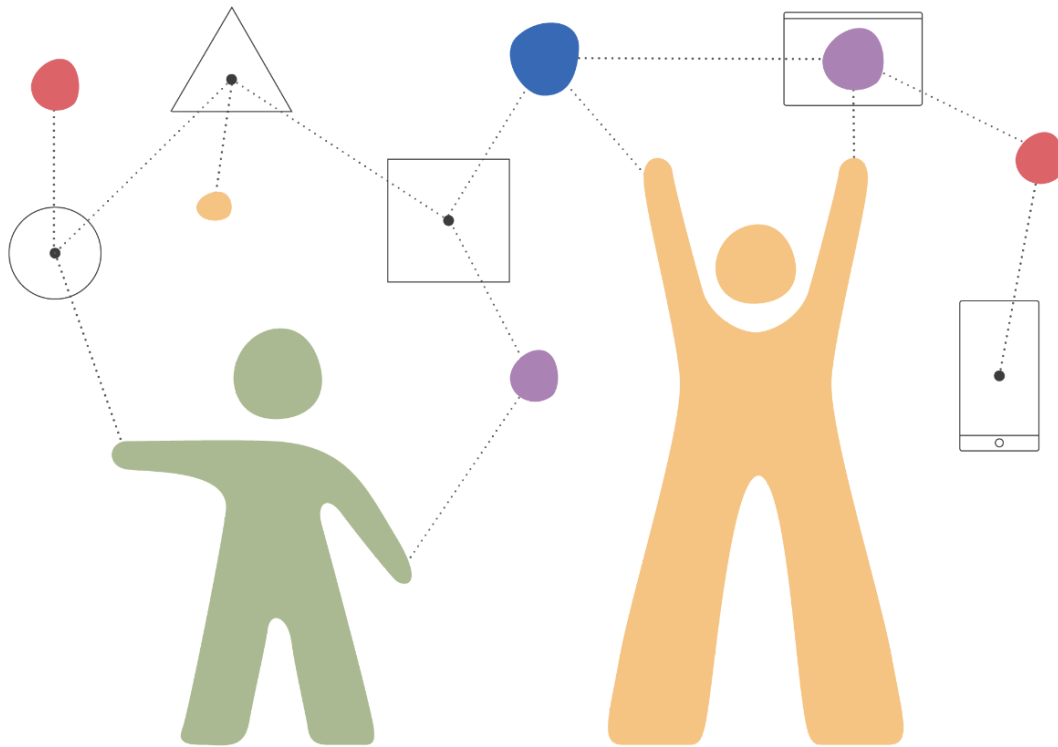
Around the world, teachers and schools are in the process of finding ways to deal with the so-called "digital transition". There are different perspectives that can be taken on how this can and should be managed, but one approach is to consider children's development - physical, emotional, social and academic. This creates a generative principle (a principle which generates practice) that children's salutogenic, healthy development can be supported by a curriculum that meets their developmental needs and interests at each stage. This includes both what is taught, and how. For example, in early childhood, children learn most effectively through play, exploration and real life, practical activities. In adolescence they are interested in issues of social justice, and want to find out answers through their own research. A curriculum that prepares children for the digital transition in society should follow these same principles - its content and delivery should be appropriate to the learning needs and interests of the age or phase of development.

It is clear that it is not possible to say that, for instance, all 6 year olds are at the same stage in all aspects of their development. However it can be helpful to consider an "ideal-typical" developmental sequence: a broad picture of child development which can be used as an orientation, whilst retaining an understanding and acceptance that each child is an individual and any divergence from the typical is not a deficit. This approach is

supported by Remo Largo (2017), who concluded from a thirty year longitudinal study that a balance between ideal-typical sequencing and individuality is beneficial: every child needs support in their own individual path within a shared picture of child development. These ideas are the basis of much of what is presented in the HERMMES media education curriculum.

From 0 to 3 years old

Never in our lives do humans develop more quickly than in the first months and years after birth. Overwhelming changes take place in the body. Sensomotoric development is crucial and it supports brain development. Learning to move, to speak, and to think for ourselves are the most important "learning outcomes" of the early years. No technological input is needed for this impressive development. Human contact, however, is vital. Babies and toddlers need healthy and warm social interaction with familiar, adult caregivers. The consequence is that all screens should be avoided, to give maximum time and opportunity to explore secure and peaceful surroundings.

Obviously, the parental role cannot be underestimated in this age. Ideally, they have the opportunity to dedicate themselves to the care of their children without too many compromises because of economic or other reasons. A good relationship between parents and other caretakers with common principles regarding, for instance, the effects of digital technology is a huge bonus.

From 3 to 6 years old

Usually, children enter kindergarten at this age. They need to have experiences which form a foundation on which life-long learning can be built. Imitation is a primary way in which the young child learns. They thrive on rhythm and repetition including daily routines as well as children's verses, songs, finger plays, gestures, singing games and round dances. All of this asks for a human connection which a screen cannot replace. Only then does imagination develop and every stone or stick, every piece of cloth can become the expression of the "stories" in children's heads. They play out their own thoughts which prepares them for creativity throughout their life. Stories and fairy tales, shared in person, give an extra dimension to the ability to become active in their thinking. Ready-made pictures on screens do not have the same developing power of the imagination, as everything is fixed already.

To offer the children a healthy context for development, it is very helpful if parents, other caretakers and kindergarten teachers have a common understanding of what small children need. Ideally, the home culture and the school culture can strengthen each other. When this is not possible, the (pre)school still has the responsibility to offer as much as achievable to support each individual child's needs.

From 6 to 9 years old

One of the main characteristics of children between the sixth and ninth year is their desire to learn, without any need to form their own judgements. Memory, imagination, enjoyment of rhythmical repetition, and a desire for universal concepts presented in pictorial form come to the fore at this stage. A key change in their learning is to move from imitation to listening and doing, i.e., translating verbal instructions into their own actions.

Children actively seek guidance from the adult world. Whilst they continue to imitate what they experience, their behaviour is modelled on how significant others are, including the teachers in the school. Children start observing those around them for signs of how to be. They look to the teachers for guidance in all aspects of being in school and learning. Gestures are a powerful means of gaining their attention. Words have to generate images in the minds of the children. The way the teachers act in all things great and small shows children how things can be in ways that foster well-being, social awareness, and moral authority. So human contact is essential for their learning.

Often parents are focused on what their children are taught in view of the opportunities later in their schooling. But there is so much more to consider for healthy learning to take place. It is extremely helpful if teachers can explain to parents how their children are taught in school and why it is done like that. Dialogue between teachers and parents will help the children in their development.

From 9 to 12 years old

In this age, the forces of an autonomous inner life are beginning to emerge in individualised ways. This manifests itself as embodied emotional energy and the ability to imagine other worlds. This can be both disorientating and uplifting. Children begin to experience the need to regulate and shape their own relationships and follow their own interests. They respond with great interest to narrative accounts of a wide range of psychological types and the complexity of their relationships, for example in legends and myths. Friendship becomes more personal and exclusive. The journey becomes a quest with companions. Key themes include relating the parts to the whole and dealing with the relationships between the parts (e.g., in fractions, in sentence structures, in the range of different animal types, singing in canon), exploring the locality, making and using maps.

The end of this period marks the start of puberty. Children are in a transition from childhood to puberty, though this is very individual and girls tend to enter puberty before boys. Their new-found depth of emotion needs and seeks a new relationship to the natural and cultural environment that involves their active participation, alone and with others in the fields of sport, music, nature, art, and technology - and especially digital technologies.

In that sense the end of this age is a natural entry point for digital devices to enter the classroom.

In this age not only dialogue between school and parents or caretakers is important, also agreements, especially when it comes to the use of technical devices such as smartphones. Nowadays, in many countries, a legal ban is installed for this age. But there is more to talk about and agree upon than the use of smartphones.

From 12 to 15 years old

Physical puberty begins today at an average age of 11-12 (although 9-14 is considered to be within the norm). This process changes into adolescence. The physical processes of puberty have long since changed the young person's relationship to their body, in particular in the growth of muscles and bones. The fact of this growth means that their bodies feel significantly heavier and sometimes clumsy. Their relationship to their body changes correspondingly and they become much more conscious of what power their body has both in terms of physical strength but also in terms of its psychological effect on self and others. Our culture places a strong emphasis on the body, its appearance, its fitness, how we use it to express our gender identities and social roles. This presents young people with a major set of challenges related to adapting their sense of self to their perceptions of their body, others' bodies and how others see them. Thus they are often preoccupied with the identity work of adapting, being accepted, relating, which can manifest in a wide range of challenges from eating disorders, sexuality, lifestyle issues, but also addictions to electronic media, etc.

Young people feel that their inner world does not correspond to the perceptible outside world. They also want to get to know new things and push boundaries. Still, the familiar "safe havens" also remain important. Gradually, they gain security and also dare to take risks of which they cannot imagine the consequences. The digital media are therefore both very attractive and also dangerous. This has to be taken into account in how pupils of this age are introduced to digital media, so that they can develop towards strong media maturity.

For parents this is not the easiest part in the upbringing of their children. Typically, young people blame, for instance, the school for a lot of what is happening inside themselves. That may be even true, when bullying is an issue. Which, of course, is even worse when digital media play a role. Parents and teachers still need to cooperate in a healthy way to be able to deal with the challenges.
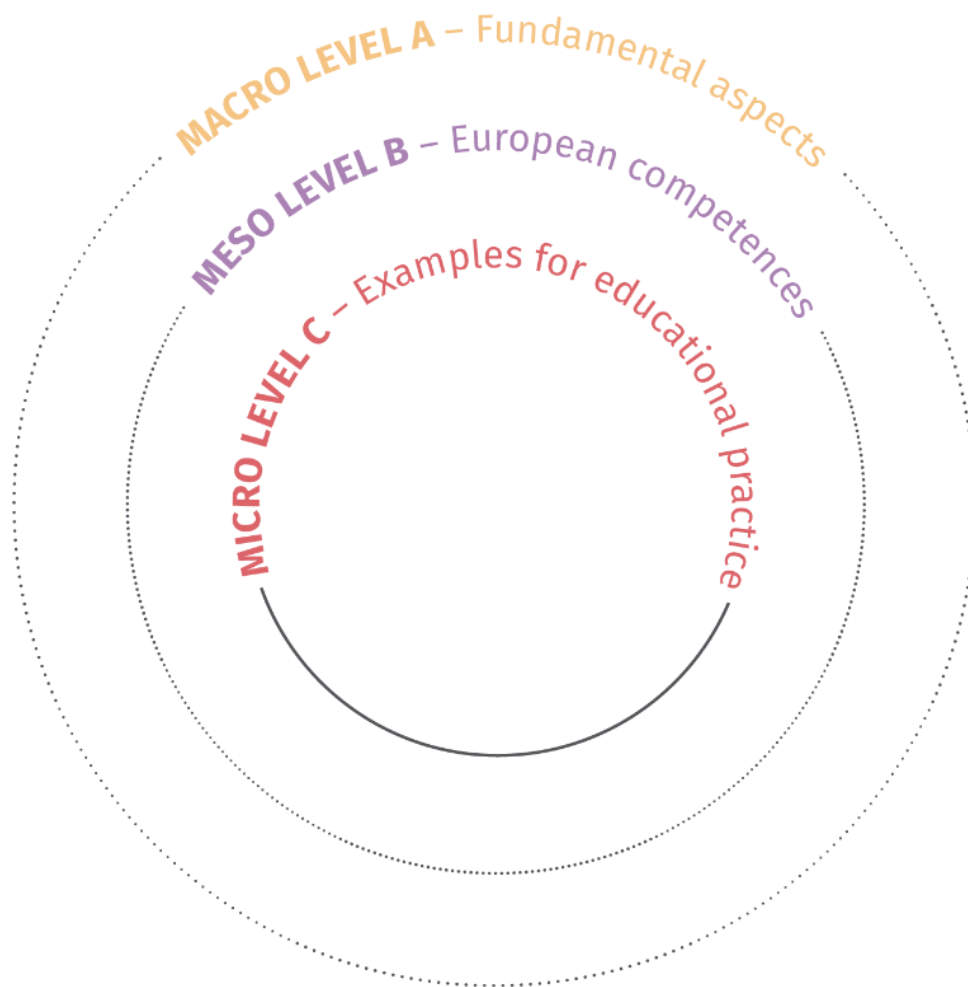
From 15 to 18 years old

The developmental tasks of adolescence include developing a coherent and stable, though dynamic, I-identity, including establishing a personal sense of gender and sexuality, a process which evolves in the interactions between an emergent inner psychological life and the demands on young people in contemporary society. It is important that adolescents have the opportunity to find an inner source of meaning and spirituality (understood as the sense of being part of a meaningful whole). They have to develop their powers of holistic thinking and judgement, particularly as a basis for ethical behaviour including taking responsibility for one's actions and having resilience against forms of manipulation. Modern neurobiology has demonstrated that teenagers undergo a process of "neural pruning", where connections between emotions and their frontal lobes - the seat of empathy - are temporarily reduced. Adolescent education should support the development of a high level of social, empathetic, and intercultural skills, the ability to form reliable relationships, the development of personal values, and the capacity to overcome the temptations of dishonesty, egotism, fanaticism, fundamentalism, xenophobia, and nationalism. All of this has always been important but even more so now that the influence of social media and artificial intelligence in society has become so enormous.

So young adults should not only be capable users of technological devices but they need especially to acquire fully fledged, healthy media maturity. Particularly important in this process is the development of the prefrontal cortex in the brain, which starts developing early in childhood, but takes until early adulthood for it to reach full maturity. This part of the brain is important for the ability to differentiate among conflicting thoughts, determine good and bad, future consequences of current activities, working toward a defined goal, prediction of outcomes, expectation based on actions, and social "control". All of this is of huge importance when navigating in the virtual world.

In adolescence, the role of the teachers and parents transforms significantly compared to that in earlier years. As young people grow into adults, they require a different kind of support, but both the school and the parents still need to be a safe haven to which the adolescent can return when they encounter difficulties on their adventure towards adulthood. As young people are often quicker at adapting all new technologies without the necessary critical sense than the adults who raised them, this fall back position when they are in trouble, is hugely important.

A multilayered approach to building a curriculum

MACRO LEVEL A – Fundamental aspects

MESO LEVEL B – European competences

MICRO LEVEL C – Examples for educational practice

A child's development is viewed as a complex system of relationships. These relationships are affected by multiple levels of the surrounding environment: from immediate settings of family and school to broad cultural values, laws, and customs (Bronfenbrenner 1979). Designing a media curriculum that aims to further the well-being of the individual learner will therefore also have to take all these different layers into account. This means being aware of the potentialities and needs of the learner at the different stages of development, and of the socio-cultural and local context in which their learning takes place. This is also highlighted in the HERMMES guidelines.

MACRO LAYER – the fundamental aspects of development

Between birth and adulthood children's needs and potentialities transform and metamorphose widely. In general, there is a universal pathway of development that can be observed in human beings across cultures and nations. These fundamental aspects of development are important to know when designing a media curriculum and have been used in the HERMMES curriculum.

## MESO LAYER – the European Digital Competence for Citizens

The socio-cultural context in which the development of potentialities into capacities takes place will influence what needs to be learned and when.

The HERMMES curriculum is set within the socio-cultural context of Europe. Although educational policy at present still belongs to the European member states, the influence of guidelines set by the European Commission is increasing. Educational settings will, however, always have to relate the design of their own media curriculum to what is required by the educational policy in their own national and regional location.

MICRO LAYER – practice examples

Every human being brings their own set of biographical needs and potentialities. In an educational setting groups of learners form together the unique community in which learning takes place. Good pedagogical practice will need to meet these unique constellations.

The examples given on the HERMMES website aim to inspire educational professionals to strengthen and enrich their educational practice in order to help the learners in their care to develop towards media maturity. These examples can be used in their current form, but educators can also create their own practices aligned with the needs of their group of learners.
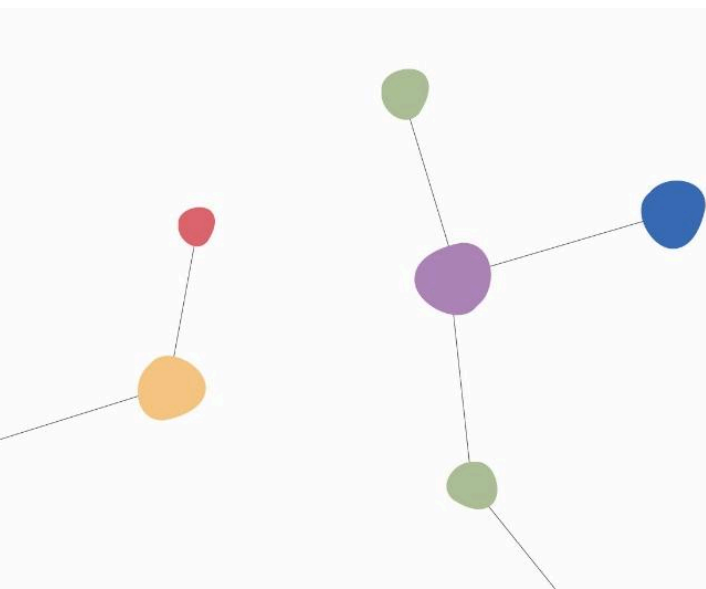
A meandering unfolding

In the 'Multi-layered curriculum' (2022), Rawson & Bransby describe "learning and becoming as a transformation of potential into enhanced capacities". They start from the notion that people have an innate variety of potentials which are "both emergent and open-ended, being a life-long process involving incidental, informal and formal learning and is also situated in a particular historical, social and cultural context".

The interplay between people and their environments is seen as a lifelong process that is important for "securing stable identities and developing personhood, thus enabling relatively sovereign, autonomous agency, in particular in relation to learning opportunities" (Rawson & Bransby, 2022). These human potentialities are described as manifesting themselves in 12 ways which can be used by educators as a lens for assessing pupils learning and development:

However, the unfolding of these potentials into abilities or enhanced capacities, is dependent on a set of requirements. At the basis of all development and learning lies the health and vitality of a person (life processes). We all bring with us individual biological health and challenges. In addition, the environment we grow up in will support this health or bring more challenges to it. Based on this biological and biographical given, we need to develop our senses as portals for observation and experience and learn to master our motoric system to explore and engage with our surroundings (sensorimotor system). Depending on the fine-tuning of our senses and our motoric abilities we will have the tools to unfold our innate potentials.

On the other hand, there is a set of requirements to be met from the environment in which we develop and learn. The dispositions and habits that construct these realities will also support or hinder the unfolding of our potentials. But humans are capable of change and in "their transformed mode in adults, potentialities can change the conditions under which children grow up and how society is shaped" (Rawson & Bransby, 2022).

The possibility of transformation is hopeful, but it also puts on educators the responsibility to shape children's learning environments into places where they are supported to become the best version of themselves. In such environments they can develop their potential into knowledgeable skills that will enable them to draw on as an ability or enhanced capacity in situations where they are needed.

Following this meandering unfolding as a path of learning and development, gives way to design a media curriculum along the same route and in sync with the different stages of development.
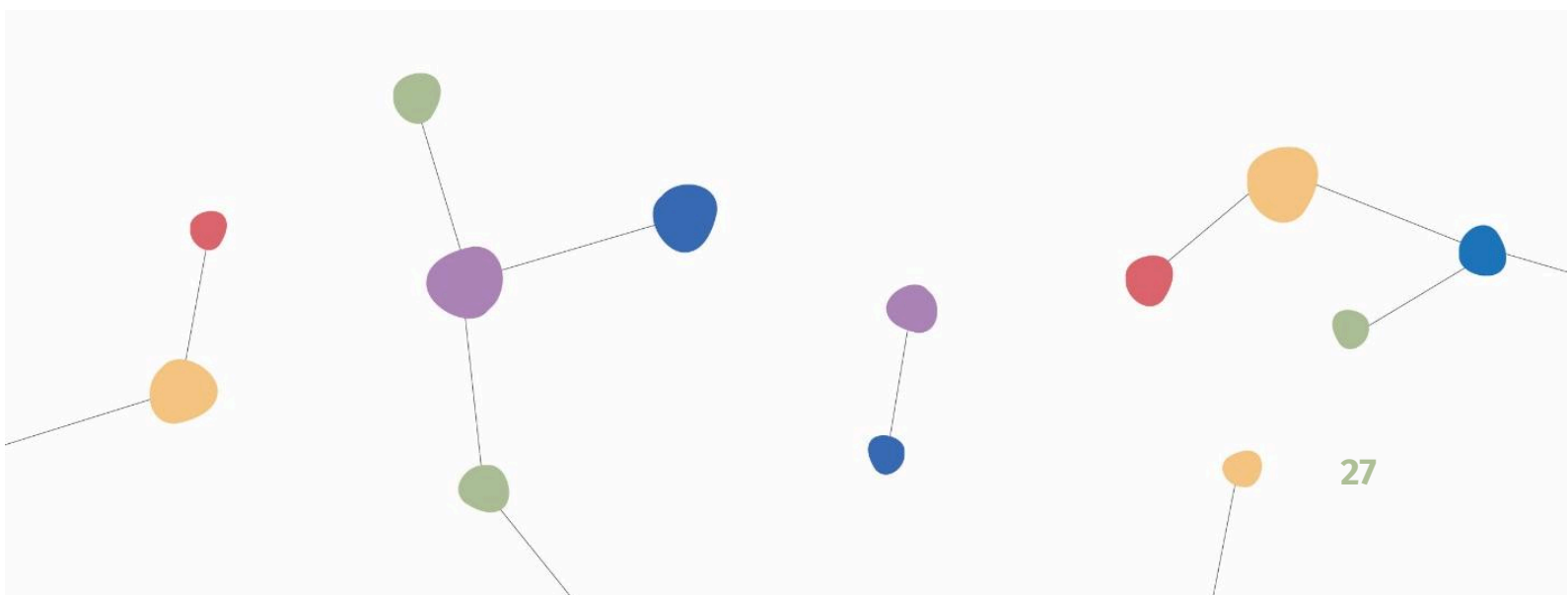
Immediate and mediated contact with the world

It is becoming clear that technology and artificial intelligence are changing the world beyond our imagination. The speed with which technology is taking over in many spheres of life is phenomenal and much of what is happening is still some kind of an experiment. The children of today live in a different world than some 20 to 25 years ago. Most parents and teachers alike grew up without smartphones and the huge variety of social media and we do not know yet the full scale of the effect these will have on next generations. Let alone the fact that now also open source advanced chatbots like ChatGTP are available with its conversational AI. All these new technologies will influence society, and certainly also education, in profound ways. It is a large-scale experiment and we can only guess what effects it will have on children, young people, and adults. Much will be beneficial but there are also negative effects that we can already witness now, such as excessive use of smartphones by young people which causes problems for their concentration and even mental health.

In this context, it is of the utmost importance to understand that the effect of (digital) media on children is different than on adults. Adults have prior knowledge from previous sensory and embodied experiences that they can rely on. In the digital world, their previous real world learning mitigates the lack of sensory experiences. It is crucial that today's children are given the time and space to build these sensory experiences sustainably. They are the lifelong foundation and resonance to give experiences in the digital world meaning and to support the ability they later need in the virtual world to differentiate between what is important and what is not, what is true or fake, what is ethical and moral, and what is not. It is of utmost importance that children have enough embodied experience to prevent future estrangement from the real world through "living" in the virtual world.

Natural broadening of the media spectrum with age

We connect with and participate in the world in various ways. These encounters form the learning experiences through which we can develop our human potential into skilled capacities we can put to use. The first mode of encounter that forms the basis for all others is the immediate contact between ourselves, the world, and others. Immediate in this context refers to direct contact without the use of digital tools. With the progress of development and on the basis of the embodied knowledge built through this immediate contact, extended forms of media communication and learning with the world and others become possible and meaningful. The next extended mode of encounter and learning is through the wide variety of analogue media which is already a first abstraction of reality.

After this come encounters with the virtual world through digital media which are digitised representations of reality. Nowadays, these encounters with digital media may even occur before the young child is able to grasp the distinction between the real and the virtual world.

Media-pedagogy is based on the art of connection with ourselves, the world, and others, and our senses are the gateways to this. Through these connections we can develop a sense of success or self efficacy, a sense of belonging, and a sense of autonomy. Research into video game addiction shows that the quest for these three foundational human needs is so strong that if children and young people cannot establish them in real life encounters, they will look for them in the virtual world (Bleckmann & Jukschat, 2015). The following elaboration on the senses is intended to illustrate how the healthy development of the senses is central and crucial if we want to support the development towards media maturity and avoid digital enslavement (based on Schoorel, 2002; Steiner, 1921 and Van Gelder, 2008).

Immediate contact: our senses as gateways

Our senses are gateways or bridges through which we can connect with our inner world and with the world that surrounds us. They give us the instruments to perceive and experience the activity that takes place in these worlds and to make meaning of these experiences. In addition to exploring and getting to know our own inner world and the analogue world around us, there is now also the virtual world we need to learn to connect with and make meaning of. In order to grasp, understand, and make meaning of all these diverse realities, we need to develop the perceptive abilities of our senses as a point of reference. This point of reference for each individual is the self, which has its physical base in the body. Especially in early childhood, enough time and effort should be dedicated to the development of the senses, as this is the most sensitive period for this to happen. But it is clear that we need to guard the physical base of the self throughout life and keep our connection with the real life intact. An excess of digital media use during the corona crisis made us all aware of the importance of a healthy balance between the virtual and the real life.

Traditionally, five basic human senses were taken into account: touch, sight, hearing, smell, and taste. But when observing carefully other ways of bodily interaction with the world, one can add more senses to this list. Contemporary research has indeed added more senses. Some add the sense which deals with how our brain understands where our body is in space. This is called proprioception. Then there is the so-called vestibular system which explains the perception of our body in relation to gravity, movement, and balance. The sense related to the physiological/physical condition of the body such as hunger and thirst is known as "interoception". Others add thermoception, feeling the temperature, and nociception, the ability to feel pain.

Building on the connection with ourselves, the world, and others, Rudolf Steiner distinguishes 12 senses, grouped into three categories (Schoorel, 2002; Soesman, 1999; Steiner, 1921): senses oriented towards understanding and connecting to oneself, to the world, and to others. Martyn Rawson (2024) formulates it slightly differently and adds the modern terminology to these senses.

SENSES THAT PRIMARILY MEDIATE INTERNAL STATES OF THE BODY	SENSES THAT MEDIATE THE OUTER WORLD	SENSES THAT MEDIATE EXPERIENCES OF OTHER PEOPLE
Touch (tactile sense)	Smell (olfactory sense)	Hearing (auditory sense)
Sense of life (vitality, interoception or visceroception)	Taste (sense of gustation)	Sense of word, speech or gesture of the other person, linguistic-kinesic sense
Sense of self-movement (Proprioception)	Sight (visual sense)	Sense of thought of the other person, sense of concept
Balance (vestibular sense)	Temperature (thermoception)	Sense the other person as a self

The twelve senses according to Rudolf Steiner with the modern terminology (Rawson, 2024)
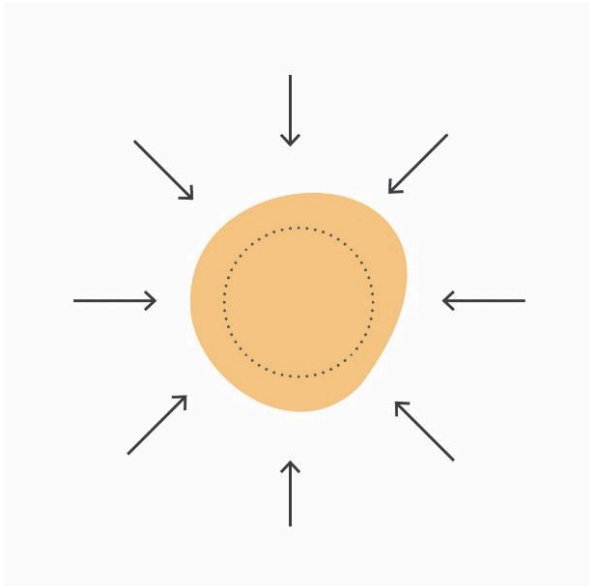
Senses oriented towards understanding and connecting with ourselves

The formation of the self or identity depends largely on how we learn to connect with and master the reality of our own bodily world. In general, the time window in which the development and anchoring of the bodily based senses of self takes place in a natural way is during the first seven years of life. These primal learning experiences build a network of synapses in the infant brain. The strength of the development of this neural system depends on the quality and diversity of the sense impressions through immediate contact with the natural and analogue world. Sensorimotor integration is the embodied cognition that arises from the tireless practice and repetition with which young children learn by doing. For this reason these bodily oriented senses are also seen as educators of the will which expresses itself in long-term foundational skills of among others concentration, patience, independence and memory,

During the first years of life, the brain is the most pliant and has its major growth. Therefore, we should use this window of opportunity as much as possible for this purpose. Compensating for hiatuses in childhood and adolescence requires much more effort later in life. In what follows, the twelve senses are described one by one to show the importance of developing them in the real, analogue world. With strongly developed senses the child has a strong foundation for all further learning and will especially be able to develop its digital competences in a healthy way.

The first world to explore , learn to understand, and use is the world of our own physical reality. During the first three years of life we need to conquer gravity by coming into uprightness and take control of the three-dimensional space by learning to walk. We learn to connect to the community of people we are part of by learning to listen to them, and then also to learn to speak their language. As a consequent step, we learn to understand

and make meaning of what we perceive, and on the basis of this we develop our own inner space of thought. Throughout the rest of childhood, we develop further mastery in using our sense perceptions and our motoric system on the basis of what we start to develop in early childhood. Exploration and play offer endless possibilities to practise touching, sensing, moving, and balancing. As a result, we learn to understand, inhabit and take control of our own body and motoric abilities. The tools for this learning path are the four bodily orientated senses that help us to understand and develop our corporeality as the physical basis of what makes us:

SENSE OF TOUCH

This sense teaches the boundaries of my physical existence and provides the foundational experience of having a physical space that I can call my own. As an image, we can think of having a house on earth. It also helps me to understand that others carry their own inner world inside their space. This bodily experience offers the foundation on which I can develop a deep-rooted feeling of safety.

SENSE OF LIFE

Teaches me about the condition of my inner state, where there is well-being, there is peace, and quiet. This bodily experience is the foundation on which a feeling of trust and being at home in my own bodily world can be developed and anchored in my corporeality. If there is discomfort, sensory receptors in internal organs send out bodily signals that urge us to take measures to restore well-being. The sense of life is tightly connected to our life processes of breathing, warming, digestion, and growth. It is an important teacher that helps us to understand and respect our own limits and possibilities based on our own health. In contemporary research, this inner monitoring is referred to as interoception and is seen as a prerequisite to learn to master one's inner state (Ceunen, Vlaeyen & Van Diest, 2016; Craig, 2015; van der Kolk, 2014). Learning to understand one's own inner world can be seen as a prerequisite of learning to understand the other's inner world.

SENSE OF SELF-MOVEMENT

Teaches me about the movement and position of my limbs in relation to each other and about the movement/shape of objects in space. It helps me to grasp and master my self-movement and, in doing so, lays down the bodily experience on which a feeling of self-empowerment, self-confidence, and a feeling of freedom can grow. In contemporary research, the sense of self-movement is referred to as proprioception and increasingly recognised as an important factor in learning (dis)abilities.

Teaches me the position of my body in relation to the three-dimensional space and of being centred within the periphery. This bodily experience lays the ground for a feeling of being me wherever or however I find myself in space. It is the bodily experience that lays the bases for a feeling of independence and unicity (whole, unique in its kind).

The above described bodily-based human abilities are foundational and key to the formation of our own identity and sense of self as a point of reference. They are also the bases on which we develop a sense of self-efficacy which gives us the trust that we can become the co-creators of our own lives. It will help to develop digital competences in a healthy way if the child has been given ample opportunity to anchor these senses during the first seven years and beyond.
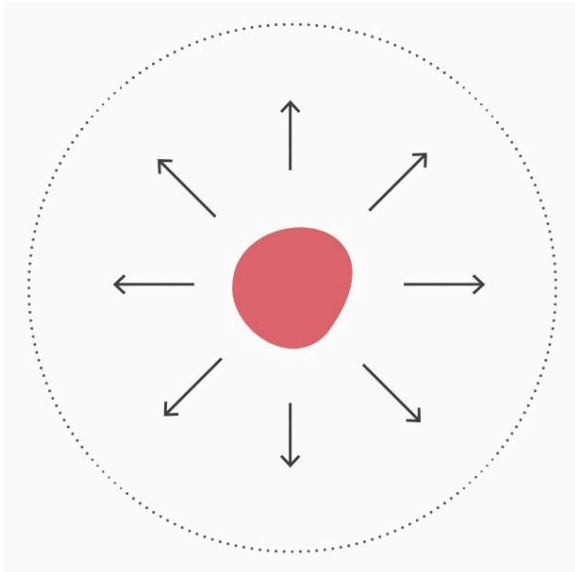
Senses oriented towards understanding and connecting with the world

The formation of the self or identity is furthermore also dependent on our ability to understand and connect with our surroundings. We meet, learn to understand, and make meaning of the surrounding world through smell, taste, sight, and temperature. Encounters and learning experiences within the richness and diversity of these multifaceted worlds of sense impressions highly influence and support the fine-tuning of our perceptive abilities. These abilities need to be developed in the fullness and multitude of sense impressions based in the natural and analogue world, so that the depth of these foundational experiences can resonate and support their virtual representations later on. For example, taking a walk through the forest, experiencing the sounds of the quiet or the singing of the birds, feeling the coolness of a breeze, smelling the earth, watching the light peer through the leaves, sensing the magnitude of its space is a foundational experience that will give meaning when later in life watching a film of someone walking through a forest. Nature and art offer us a rich pallet to practise and support the healthy development of these environmental-oriented sense organs. They offer worlds of detailed nuances in shades of colour, fragrances, flavours and warmth that support the fine-tuning of these sense perceptive abilities.

The development of these senses already starts from birth, but they are at first still primarily developed through immediate contact with the surrounding environment. During the first years of life they are dependent on the educator's facilitation such as the offer of exploration time and play in nature, telling stories, singing. During nursery and kindergarten age, a wide range of additional analogue media increasingly offers possibilities through which children can connect with the surrounding world. Out- and indoor play, storytime, ringgames, handcrafts, artistic and domestic activities make up the rhythmical life of a kindergarten day, coloured and diversified by the cycles of nature. The repetitive returning of the cycle of the year allows these experiences to sink in and become embodied

knowledge. During the primary school years, the main focus remains on the sensorimotor integration but now also on the transformation of the potential of these environmental-oriented senses into a skilled capacity that can be put to use. A wide range of analogue media offers a rich pallet for learning activities to develop these capacities. Through listening to stories, reading books, performing drama, making music, drawing, painting, handcrafts, we increasingly learn to understand our surroundings and the many layers of human expression. At the same time, we also learn to use these different forms of analogue media to express our inner world to our surroundings. The more we use the perceptive abilities of these senses, the richer the world will become to us. For this reason, these senses are also seen as important educators of our feelings. As such, these senses provide us with information in two directions: related to the physical experience, they tell us something about the physical quality of the object we perceive; related to our inner experience, we resonate with the perceived quality on which basis we develop moral and emotional judgments about this. If given enough time and opportunities to develop these senses, a strong basis for life-long learning and a healthy interaction with digital tools is laid. So what can be developed in the early years will benefit the potentialities in the later years in school education, including working with digital media.

SENSE OF SMELL

Teaches me about the inner state of things, whether things are alive or dead, fresh or rotten, good to inhale or harmful. Because of its tight connection to breathing and the nerve system, our perception is immediate and cannot be blocked out, only integrated after having been exposed to the scent for a short while(Van Gelder, 2008). We can distinguish about 2000 smells, but have very few words to describe them. Mostly we use an association based on a previous experience such as the smell of roses, a warm summer night, a forest after the rain. Smells are tightly connected to our memory and can instantly, unconsciously, and without warning throw us back in time. Our sense of smell is strongly connected on the one side to our instincts, and on the other side to our moral judgement. We intuitively have a sense if something is good or bad, which is often still reflected in our sayings such as 'something smells fishy' meaning there is something wrong about it; 'smelling blood' meaning to detect a weakness or vulnerability, or 'coming up smelling like roses' meaning to overcome and come out stronger after a difficult situation the latter often used in a cynical way. This shows how there is a transfer from a sensation in the outer world to our inner world. Our metaphorical use of smell sensations gives evidence of how important the connection with the real material world is to us. Now that progress is being made in digitising smell, it is all the more important to start with strong and abundant real life experiences as a preparation for transfers into the virtual world.

SENSE OF TASTE

This sense teaches one about the inner quality of things. We can distinguish different kinds of taste: sweet, salt, sour, bitter, and umami (or savoury). In contrast to smell, we need to put effort into releasing the taste of something, we need to dissolve the matter in

fluidity, such as our saliva. The sense of taste is furthermore also strongly dependent on the sense of smell to bring out the full palette and identify the objects they belong to such as the taste of chocolate, oranges, tomatoes. In addition to giving us information about the physical inner quality of things, we also use the categories of taste to express our emotional judgement of an experience. Experiences can metaphorically be called sweet or bitter and relations can be called sour or sweet. But taste is still part of the real life experiences which can be individually very different and are not fully objectifiable. Or as the French say: "les goûts et les couleurs ne se discutent pas" (there is no arguing about matters of taste).

SENSE OF SIGHT

This sense teaches one something about the surface of an external object expressed in shades of light and darkness and colour. The shape is perceived through working together with the sense of movement. In colour something of the nature of the outer objects is revealed to us which does not belong to us. Compared to the sense of smell or taste, the sense of sight allows us to keep our distance. As such it enables us to objectify what we observe and contributes to our awareness and conscious thought. For these reasons it is mostly used in science as the way to acquire knowledge. At the same time this strong connection between what we see and what we think can be the cause of deception: our thoughts (and opinions) often determine what we think we see and hinder us to really see what is there. Therefore, it is extremely important that young people practise analogue art, so that they can experience how their eyes can deceive them in real life, let alone in the virtual world.
Although we live in, move through, and see a world of three dimensions, most of the representations of that world are two dimensional. 3-D movies for instance use two images superimposed on the same screen. However, such pictures give only the illusion of depth, as the canvas or screen always remains flat. The virtual reality devices go even a step further and create the impression that you are in the middle of it all. Again, a strong foundation in real life experiences is necessary in order to prevent estrangement from the real world.

SENSE OF WARMTH/TEMPERATURE

This sense teaches one about the temperature of outer bodies or the surroundings. Because the sense organ to perceive this is our skin, we can sense temperature throughout our whole body. Temperature can therefore also penetrate our whole body and has a big effect on our inner mood. Our well-being is very much dependent on the balance between our own body temperature and that of our environment: if our surroundings are too hot or too cold, we don't feel well and the discomfort can hinder us from functioning properly. In addition to perceiving the physical temperature of our surroundings, the sense of temperature is also a monitor for perceiving the social temperature. Encounters, relationships, communities can radiate warmth or cold. We feel good in the warm embrace of someone's love or attention and we feel rejected by someone's coldness, indifference or neglect of attention. Young children especially respond very intuitively and immediately to

the quality of presence of their surroundings, but also older pupils and even adults are still very much affected by it.

The development of the above described perceptive abilities are foundational and key to disclose the qualities of the world around us and enrich our inner life of feelings. They are also the bases on which we develop a sense of belonging which gives us the security that we are connected with the world around us in which we can participate and express ourselves. It will help to develop digital competences in a healthy way if the child has been given ample opportunity to anchor these senses in their body as a connection with the world.
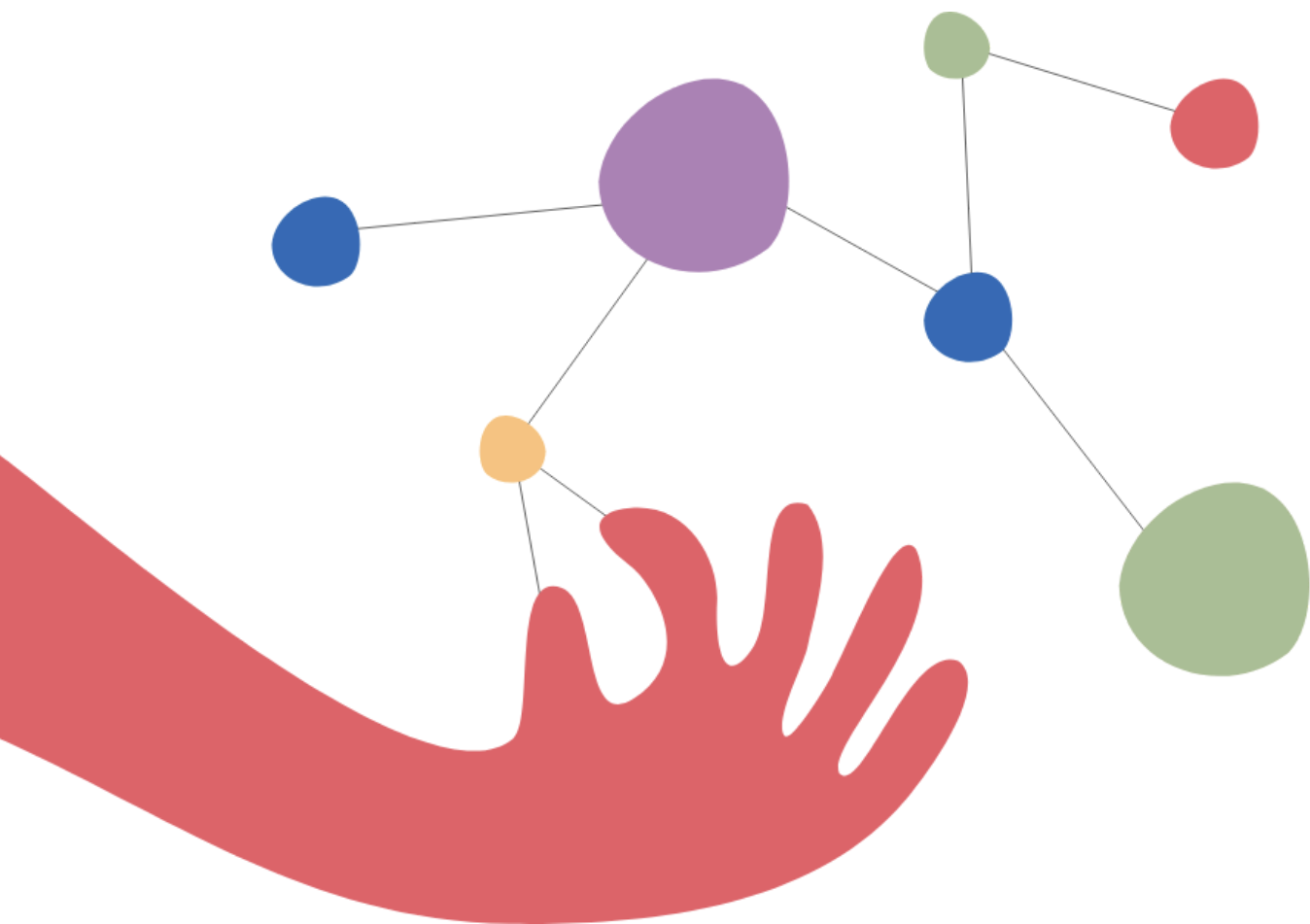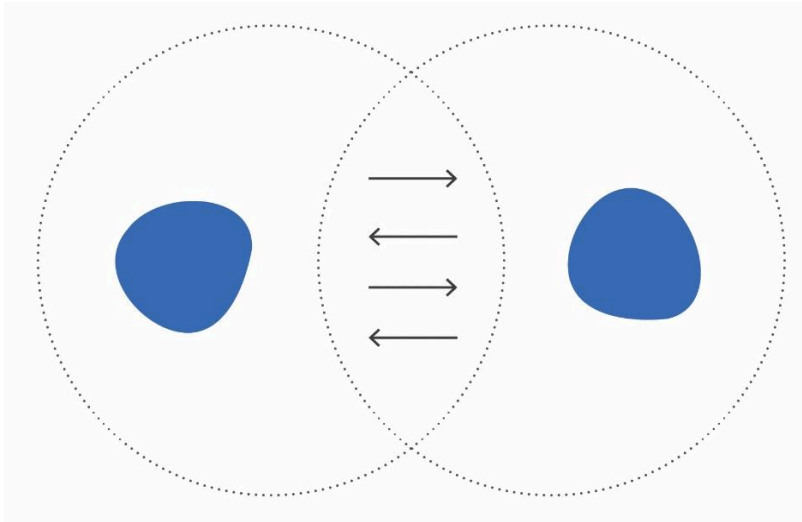
Senses oriented towards understanding and connecting with the other

We experience and become aware of ourselves through our encounters with the other. In this sense we also need the other to develop our identity and sense of self. Like Martin Buber (1970) already pointed out, in the 'I-Thou' relation both are changed in a reciprocal relation and create new worlds of experience between them. This being 'touched' by the other is further underscored by Rosa's (2019) resonance theory in which all actors open themselves to the possibility of change. Through this potential of transformation new ways of perceiving the other and being perceived by the other can arise. To make this connection with the other four perceptive abilities are described which allow us to sense the inner world of the other.

SENSE OF HEARING/TONE

Teaches me something about the inner nature of objects, natural phenomena and ensouled beings (animals and humans). Through the sense of hearing we can pick up the sound they make when touched or played on (wood, glass, instruments) or produced by themselves (wind, rain, animal sounds, human voice). Contrary to the sense of sight we cannot close our hearing, however, to really observe we need to develop listening which is only possible by becoming silent yourself. The ear is the sensory organ for both hearing and balancing, so these senses are strongly connected.

Where the sense of sight can still mislead us through its outer appearance, the sense of hearing allows us to perceive the inner sound that intrinsically belongs to the other. For example a table does not reveal from its shape or colour what material it is made of, only by knocking on it we can hear whether it is made of real wood or imitation wood. Our sense of hearing or tone also allows us to understand non verbal messages of animals or human

beings. Through the sounds they make or the pitch or volume of the voice we can perceive something of their inner worlds, their happiness, pain, anxiety. These unspoken messages help us to understand their true meaning and reveal something of their inner reality. As such the sense of hearing can help us to distinguish for example between what is true or false, what is really meant or said in a cynical way, or when a cry for help from the other is hidden in expressions of anger.

SENSE OF LANGUAGE/SPEECH

Teaches me to understand the various words used by other human beings. Where the sense of hearing/tone captures the music and sound of human speech, the sense of language or speech helps me to grasp the meaning and gesture of the words themselves. Not only the language itself, but also body language and mimics are perceived and understood in this way. Our whole body resonates and makes micro-movements with the gestures observed in body language, mimics and the articulation of the words themselves. While listening to others speaking, people form the words of the other in imitation, inwardly and some even also outwardly. Because of its strong relation to movement, the development of the sense of speech is strongly connected to the sense of self-movement.

The words chosen in addition tell us something about "someone's opinion, judgement, experience and personality" (Van Gelder, 2008). People who are inclined to mostly use 'strong words' reveal a different personality and way of forming opinions and judgements than those who carefully weigh and choose their words. Words can lift up people's spirits and build worlds, but they can also put people down and cause conflicts. Because the sense of speech or language helps us to reveal something of the inner gesture of the other, it helps us to see through the mechanism at work and distinguish between good or bad influences their opinions might have on us. Words are, so to speak, the 'body' in which thought and understanding are given a home. Especially adolescents need to become aware of the influence the way they speak has on other people. The tone of the voice, but also body language, is of utmost importance for correct communication. This is partly or even fully lost when using digital means. Misinterpretation, lack of emotional connection, stereotyping, and security risks which can all play a part in bodily communication are a much higher risk in digital communication. Learning the difference between live and digital use of language needs enough time and effort in education as a basis for life-long learning. Now that interaction with artificial intelligence tools such as chatGTP can mimic real friendship, there is a risk of anthropomorphism, attributing human characteristics and behaviours to non-human entities Users "forget" that ChatGTP or other AI tools are computer systems and feel a connection that in reality does not exist. The words without a real-life bodily experience risk isolating the user from real-life connections.
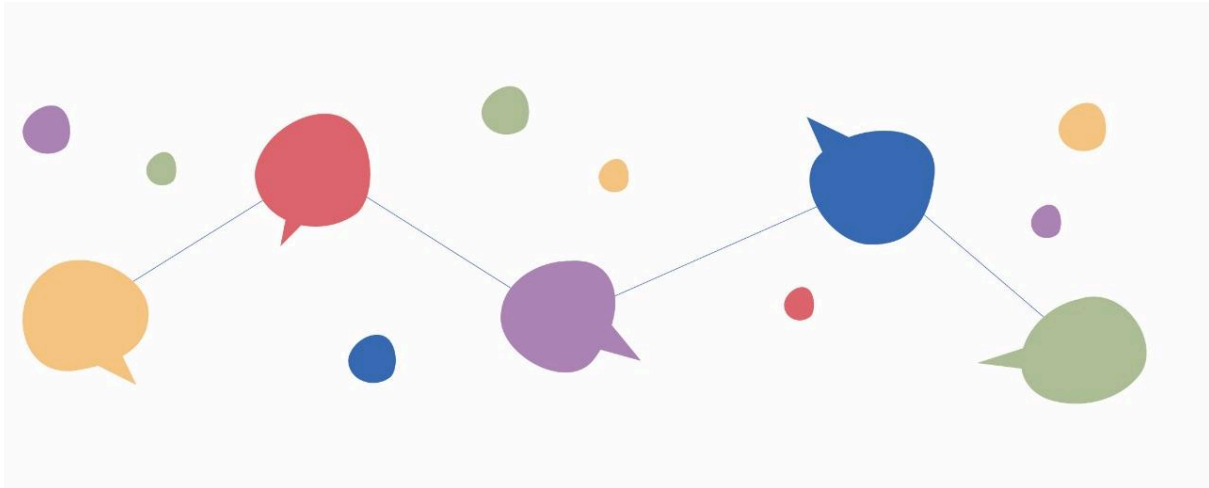
SENSE OF CONCEPT/THOUGHT

Teaches me about the thoughts others have, specifically their view on things, their questions and ponderings. Where the sense of hearing focuses on the sound, and the sense of speech on the words, the sense of thought observes the line of thought expressed through the composition of the words. If the language used is descriptive and full of images, images will arise automatically in our own minds. These images are built on previous experiences, and therefore they are very personal and diverse between people. But if we want to understand more abstract thoughts we need to hold back this imagery and pay focused attention to be able to follow the line of thought of the other. The activity of thinking is closely related to our vitality: if we are tired it is very hard to formulate clear thoughts, or understand the inner thoughts of others. The development of the sense of thought is strongly dependent on the sense of life that teaches us about the health and well-being of our life processes.

To understand the thought line of others we are dependent on the concepts we already know. At the same time the sense of thought enables us to develop new concepts, and thus broaden our horizon of understanding. To do this, we need to practise focused attention. As for other senses this means that enough time and energy is dedicated to using the sense of thought in an analogue way. Real focused attention is much more difficult when using digital media and without enough real-life practice it becomes difficult to hold the attention to larger and more difficult bodies of knowledge, let alone the formation of new knowledge out of your own understanding.

SENSE OF EGO/I

Teaches me about the personality or individuality of the other. It helps me to understand and recognise the other's 'signature', their style or way of being. In life we are mostly preoccupied with ourselves and do not often take the time to really let the individuality of the other work on us. To do this we have to allow the other's ego to imprint itself on our own inner being. This means we have to make space and put our sense of self momentarily

aside. Our own ego can only allow this for a short period of time, and so a swing arises between attraction and repulsion. Equally, the observed other will only for a short period of time allow someone else to dwell in their inner being. Because of this alternate movement we can also compare it to breathing or sleeping.

The expression that the eyes are the windows to the soul help us to understand that looking into someone's eyes is a portal through which we can gain access to a person's individuality. We directly notice if someone is looking back or not, and the intensity of such encounters can be only brief before a feeling of discomfort makes you turn your look away. Contrary to older children, youth and adults, young children are not yet self-possessed and have an open gaze. They are still very much looking for the gaze of their caregivers, and like to dwell in their attention, because in their eyes they feel affirmed in their own existence. When growing up they gradually acquire a more conscious sense of self.

The sense of ego or self, needs to be developed step-by-step throughout childhood in real life. The so-called *homo digitalis* seems to be more and more connected but it is a false feeling of connection if there is no bodily-centred basis for the connection. The alienation caused by the AI technology is even masked because our ability to recognise the bots as non-human is being taken away as they are taught human-like behaviour in their responses. But this is a false feeling. An AI-system allows for example continuous interruptions and adopts a very docile attitude. This is not a very helpful way of communicating in real-life encounters. Humans need interaction with other humans in real life to strengthen their capacity to develop autonomy and to cope with life's expectations.

The perceptive abilities described above are foundational and key to understanding the inner world of the other. Through this increased awareness and understanding we in consequence also develop a stronger sense of who we are ourselves. Digital competences need to be developed with the firm socially oriented basis these senses offer.

The senses oriented towards the other are also the basis on which we develop our thinking capacities and the foundation for a deep sense of autonomy, necessary for a healthy development towards a fruitful adult life. This sense of autonomy helps us to develop a critical view and judgement in determining when and how to use digital media in an appropriate and meaningful way and to set and respect healthy boundaries for ourselves.
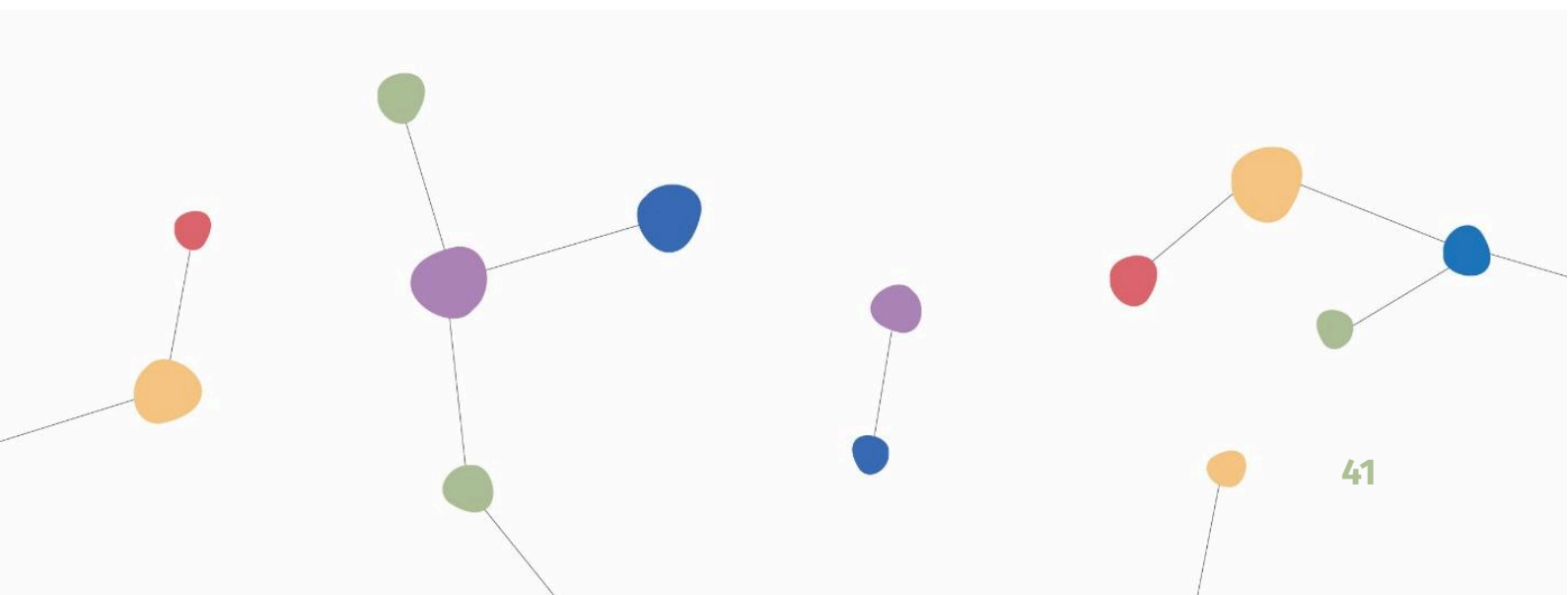
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