ALT-ER 2.0

Animated Learning for Transitions -
Early Recognition 2.0

PEDAGOGICAL FRAMEWORK

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Table of Contents

Preface to the Updated Framework

Given the tumult of the recent past and the continued fallout of the global pandemic resultant from the COVID-19 outbreak, the partners involved in and the supporters of the work undertaken in the initial Alt-ER project thought it relevant and important to recontextualize the understandings developed in the first iteration and update them for new realities which have an impact on Early Childhood Education and Care. At the same time, this was an excellent opportunity to address several issues that had come to light since the conclusion of the project, allowing the team to make the Alt-ER Framework and Platform more representative in their presentation, inclusive in their scope, and more effective in reaching their goals.

In the following revised Framework, you will find important considerations related to public health and social responsibility based on an updated literature review and a number of interviews with psychologists, teachers and parents in regard to the effects of COVID-19 and its various implications on not only ECEC and schooling, but society at large.

During the course of this work the novel Coronavirus was a threat that fluctuated in its seriousness, and at times so did the seriousness of the response that governments, institutions, and people have had to it. The team was aware that while the exact and specific case experienced might be one that lessened in severity and importance, the issues underlying safe practice and our individual role in the social construct remain very relevant and important, especially for young people entering into an uncertain future. The project Platform therefore does not frequently mention Coronavirus or COVID-19 directly, but does characterize behaviors both recommended and advised against as best practices in a socially responsible post COVID-19 world.

To this end the reworked Alt-ER Platform for storytelling has been expanded to include new scenes that act as conduits to and catalysts for discussion about the role we play in a safe and healthy society, and highlight behaviors that will be a benefit to generations to come in a world of increased likelihood for pandemic outbreak.

While this period of history has been difficult for everyone, the mixed messages and uncertainty have been a pronounced source of confusion and even anxiety in young people. As the COVID-19 pandemic worsened in countries across the globe, most governments took the precaution of closing their schools in an attempt to contain the spread of the virus. The confinement period enacted during the pandemic has had a major influence on the social life of children and young people, exacerbating a critical period in their development and growth during which there is an inherent difficulty of remotely maintaining or building a social circle in their network of cohorts. In this study on relevant aged students which collected perceptions and narratives about COVID-19 children's questions reflected this concern, evidenced by the following examples: Why does coronavirus exist? (Boy, 5 years old) – Why did coronavirus close my school? (Girl, 4 years

old) – Why do I have to wash my hands all the time? (Girl, 5 years old) – Why can't I go to my grandmother's house? (Girl, 5 years old) – Why were there no birthday parties? (Girl, 4 years old).

It has become clear that special attention must be paid to the fact that children of this age range have missed a significant part of their social development along with their in-person teaching, and the impact of this is one that may take some time to fully realize.

Teachers were put upon in this period as well, with remote schooling being shown to have been more challenging in regard to monitoring student well-being and addressing children's needs. Therefore, teachers' training needs to encompass techniques on how to better identify problems under these new and complicated circumstances. (OECD, 2020) This is even more true for young people who are already feeling lonely, having trouble making social contacts, or those with mental problems.

During lockdown, children and young people with mental health problems reported that their psychiatric treatment had been altered, interrupted, and in some cases stopped altogether due to COVID-19 measures, which has had marked negative effects on the wellbeing of already vulnerable children. (OECDa, 2020) In response to the potentially destructive effects of this dramatic change, the project group has conducted a series of interviews with psychologists, teachers, and parents which have informed the writing of this revised and updated framework and a separate report on which can be found as an addendum to this work.

As a result of this further study, and in line with initial findings in the Alt-ER project, subsequent evidence supports indications that children can learn from well-designed educational applications which can be effective in creating understanding in these times (Tal, Tish, and Tal, 2022). Alt-ER is highly functional in this milieu as it provides a context for the tumult in their lives while still allowing for previously arrived at understandings that children learn best when they are
cognitively active and engaged, when learning experiences are meaningful and socially interactive, and when learning is guided by a specific goal (Hirsh-Pasek et al., 2015). Alt-ER also benefits from an understanding that to be as effective as possible educational apps must provide opportunities for children to create their own content and participate in rich and dynamic learning contexts, (Kucirkova 2014c, 2015) in this case related to COVID-19. (OECDb, 2020)

In a series of interviews with teachers about assumed best practice in returning to the classroom,
teachers believed play was an especially important pedagogical tool in supporting young children's social-emotional development, learning, and transition back to school after the lockdowns. Despite this, over a third highlighted uncertainty regarding their capacity to use play upon school reopening given COVID-19 regulations. (McNally, 2021) This emphasizes a declared need for greater guidance to support teachers' commitment to play-based pedagogical strategies. Similarly, the role of play in helping children make sense of the unprecedented changes that have occurred in their lives during the pandemic, and process the associated trauma has been highlighted by David Neale at the Play in Education, Development and Learning Centre (Neale, 2020). The multi-modal functionality of the Alt-ER application, the justified Framework for Transitions, and its suite of attendant activities are thought to be an excellent 2

manner in which to address these concerns, and allow for playful consideration of and communication about the lasting after effects of COVID-19.

As reported in a number of studies, analysis has indicated strong support for play as a pedagogical strategy during school closures and in anticipation of the reopening of schools. Christina O'Keefe of the Institute of Education at Dublin City University in Dublin, Ireland conducted a study in which the vast majority of teachers (81.6%) either agreed (42.6%) or strongly agreed (39.0%) with the statement that they had encouraged parents to play with children during school closures. An even greater proportion of teachers (86.7%) either agreed (33.2%) or strongly agreed (53.5%) with the statement that play will have a significant role in supporting children's return to school. Almost all teachers (98.7%) viewed play as an important pedagogical tool within their classroom upon school reopening, with 80.3% indicating it would be a very important pedagogical strategy. Thematic analysis of 301 responses to the open-ended question on the importance of play as a pedagogical strategy upon the reopening of schools was conducted to gain deeper understanding of teacher's view of play in the pandemic. Responses were organized, coded and subsequently assigned into themes. The themes identified in the responses were: (1) play as a support for children's social development; (2) play as a support for children's emotional development; (3) play as facilitating children's learning; (4) play as a support for children's transition back to school; and (5) concerns around implementing play in light of COVID-19 regulations. (O'Keefe, 2021) These issues will serve as jumping off point for further investigation and justification of the Framework in light of the impacts of COVID-19, and are representative of the studies undertaken in the project which showed overall that notwithstanding national differences in the measures taken to limit the spread of the virus, almost all respondents identified effects on children's well-being and learning. Social isolation was cited as a condition that impacted children's emotions and social skills, and the interruption of regular school attendance particularly affected the learning of the most vulnerable children. Resultantly, communication was considered important to help children especially at the time of re-entry when face-to-face interactions gave them the opportunity to explore their emotions and talk about the situation, while creativity was seen as an important part of educational and therapeutic work in general and shown to be specifically useful in finding new ways to interact with children returning to school after the period of lockdown.

Alt-ER Framework

Importance of the Transition between Kindergarten and School

One of the main objectives of the Alt-ER project is to foster resilient learning environments in order to prevent early school leaving and help to provide children with the best possible start to their education. The following work will lay out the case for and against certain strategies as policy and practice recommendations for using Information and Communication Technologies (ICT) and storytelling to do so. When looking at the schedule around Early Childhood Education

and Care (ECEC) there are several important phases that can be identified as crucial and valuable in setting a course for an activated, engaged, and inquisitive life.

The transition phase between kindergarten and school is one such phase, profound both socially and psychologically, and represents a time wherein self-directed narrative creation can be an effective tool in building resilience and creating engagement with learning. In addition, there is evidence that ICT has a specific and marked potential in effectively engaging this important type of meaning making through its novel, multimodal, and collaborative nature. (OECDb, 2020)

In this continuation of previous work Alt-ER sets out to further develop the prescribed framework for using ICT and storytelling - two separate but complementary strategies - to create opportunities for self-directed creativity on both sides of the transition out of kindergarten and in to primary school, and in doing so attempt to create a better and more equal school start for children across Europe. Alt-ER achieves its goals by creating a student-centered App for self-directed creativity while also providing a high-quality Toolbox of other apps, games, and activities that can help to enhance the efficiency of ECEC while supporting children's development and motivation to learn.

Alt-ER also works towards, in the face of skepticism, establishing a framework that justifies and explains the use of ICT in doing so. The pedagogical framework described below presents a basis for understanding the thought behind learning activities centered on digitally delivered narrative and aesthetic knowledge based on animation and game-based learning (GBL) which are known to have a strong, visual language with many positive didactic forces. Through use of the Alt-ER platform and framework, the quality of ECEC can potentially be enhanced, ideally improving learning outcomes, helping to ensure a positive beginning to formal schooling.

When using animation and GBL teachers can involve children actively in their own learning processes. Being active, students go behind given phenomena; they learn, understand, control and in the process of doing so they feel amused in the course of learning. Cognitive psychology and pedagogy emphasize that new creative tools have remarkable potential because of their open, diverse, and multi-modal character and in this way Alt-ER aims to be beneficial for all children in a learning context as teaching goals and strategies become more inclusive.

While ECEC is essentially a responsibility of the member states, and educational guidelines differ between countries, there is a considerable scope for the EU to add value to ECEC by facilitating the identification and exchange of good practices. Creating and carrying out Alt-ER as a transnational project helps to ensure that the developed deliverables are built on varied understandings and will be applicable in multiple countries.

As evidenced by the associated reporting package, Alt-ER used workshop environments and the extensive external networks of each partner to determine solutions that are applicable in each partner country and beyond meaning that the outputs will have the potential to be integrated into the existing educational guidelines and daily learning activities of a range of locales. As such, and in order to develop a pedagogical framework and user-friendly tools that are inclusive and

embrace children from varied social and cultural backgrounds, Alt-ER involves and integrates new people, skills, and understandings that exist across national borders.

The vital transition between school and Kindergarten has been immeasurably disrupted for a large swath of the globe as a result of the pandemic and its attendant school closures. While online structures and processes were in place to mitigate the effect, there remains a great deal of work to be done and understandings to be determined regarding the full implications on the lives of these young people.

Teaching and Creativity

In the current climate, there are a number of concerns that compete for the direction of Early Childhood Education and Care. A great deal of educative practice focuses on high-stakes and state mandated testing, which results in a lack of consideration of creativity as a tactic in learning. This is supported by the absence of assessment requirements on creativity, which is a substantial contributor to the undervaluation of creativity in education (Lucas, Claxton & Spencer, 2013). This is particularly interesting when considering the widespread concern for raising the level of educational achievements to meet the global demand for an educated, 21st century workforce.

A workforce able to meet the demands required for future economic development is one for which creativity stands as a central competence valued as one of the most important by 21st century employers, as: "[...] creativity in education enables a country to compete in a global market, having a flexible workforce, facing national economic challenges, feeding the 'creative industries' and enabling youth to adapt to technological change." (Lucas, Claxton & Spencer, 2013).

There is an increasing demand for creative minds in this future workforce, and it is only natural to accommodate this demand through education, and increasingly so, through digital means. Research is still needed in order to identify structures for and ways to develop creativity through technology in education, starting critically with a need for training programs for educators (OECDb, 2020). As research has suggested that creativity can be developed and that all children have creative capabilities not to be neglected by schools by limiting education to mere transmission of knowledge and skills, (Cheung & Leung, 2013) the demand then falls to teachers being properly trained and experienced in using creativity in their efforts.

"Teaching creatively" is a term presented by Cheung and Leung (2013) within Creative Pedagogy, which, simply put, is teacher-focused pedagogy with the aim of using imaginative approaches to make learning more interesting and effective. On the other hand, there is teaching for creativity, which is learner-focused with the aim of fostering creative thinking and behavior among children through different teaching methods and strategies. These two creativity aspects are argued to be closely interrelated, and many different approaches for teachers to develop creativity in children have been determined. Malaguzzy (1993) concludes

"that the optimum conditions for developing creativity in children are interpersonal exchanges in which conflicts are negotiated, ideas are compared, and actions are the decisive elements [...] teachers can act as supporters and coaches, facilitators, and models of creativity for children".

Alt-ER draws from and is based upon these two modes of creativity, but focuses on exposing educators to new strategies and focusing on steps teachers can take to build relationships on the individual level with their students. In studies, drawing and decoding artistic works have been
shown to provide insight (in that it comes directly from the children) into the knowledge, perspectives, and interests of young people (Einarsdottir, Dockett & Perry, 2009) through the creative process, which presents connections to and insights on the mental state of the children in question.

Given this largely accepted relationship between creativity and learning, it makes sense that there were a large number of creative activities enacted during the school closures and distance learning, to various degrees of success. One report which showed that 70% of students reported that more creative tasks had taken place during home schooling than had normally, with the most enthusiasm being shown by the youngest pupils. (Bubb and Jones, 2020) Leaders of the schools involved in these studies agreed that in the future they wanted pupils to experience more creative structures in their return to in person schooling and were open to exploratory methods for teaching, such as the self-directed creative works engaged by Alt-ER.

The Interplay Between Kindergarten, School, and Family

Internationally, there is growing attention to the transition from kindergarten to school and the effects it might have on children going through this shift. The importance of this period has been recognized in the OECD Starting Strong 2 report, which highlights both opportunities and challenges in this transition, with an opportunity defined as a stimulus to growth and development, and a challenge defined as the risk of regression and failure if the transition is too abrupt or handled without care (as referred in Dockett et al., 2014). Thus, the transition from kindergarten to school has no one-size-fits-all solution and is understood and implemented in many different ways and in different contexts. Despite this, communication between the different institutions and the direct involvement of families to aid in teaching young people to learn in different socio-cultural settings have been shown to effectively smooth transitions for children. (Dockett et al., 2014) With the standard and expected processes being upended by confusion and the application of remote strategies during the Corona outbreak, this transition and strategies for strengthening it are all the more important.

Alt-ER works to build bridges between kindergarten and primary school environments by being deployed on both sides of the transition, but is also meant to create a shared space for learning in both the home and those formal school environments, scaffolding learning across contexts. Social interaction is crucial in a child's development and children should be seen as: "[...] inherently engaged in the social world even from birth, advancing throughout development in their skill in independently carrying out and organizing activities of their culture." (Rogoff, 1990, 6

as cited in Vogler et al., 2008, pp: 10). Guided participation is a concept that includes communication as a vital part of encouraging child development, building on Vygotsky's zone of proximal development, which mainly focuses on cultural mediation. The concept takes into account not only the active engagement of children but also the role of peers and caregivers (i.e. adults), between whom and with communication has a significant role in children's transition between institutions (Vogler et al., 2008).

Looking at children and the many transitions they face in their early life, life course theory focuses on and understands human development as occurring through involvement with social institutions and organizations and in addition, it emphasizes that social history and human development cannot be detached (Vogler et al., 2008). The life course perspective places tremendous weight and importance on time, context, process, and meaning making on both human development and family life (Bengtson and Allen 1993). The family is perceived as a micro social group within a macro social context—a "collection of individuals with shared history who interact within ever-changing social contexts across ever increasing time and space" (Bengtson and Allen 1993, p. 470). As such, life course theory reflects an intersection of social and historical factors with personal biography and development. Alt-ER ensures that these diverse social contexts value each other and work together to promote education with its cross deployment across contexts thought to create the best results.

Supporting young children and their caregivers, both at home and in school, is a vital part of successful school-transitions and there exists evidence that with proper consideration and training, that ICT programs and properties hold the potential to create success in this area. Without professional and political commitment, though, it may affect the well-being of children in the transition phases (Vogler et al., 2008). This reflects core values of this framework and the project built upon it, as the use of Alt-ER in both home and classroom contexts which will create opportunities for engagement and self-actualization through new constructs for learning.

With the effects of Corona and the period spent learning at a distance, the relationship between schools, parents, and the larger school community is increasingly vital to provide effective and pertinent quality education. With the confusion of the last few years, an open and fluid interaction between the school staff and parents has now become more important than ever.

In relevant studies it has been shown that parents played a double role of motivators and facilitators of learning, especially when teachers were not present, but that their level of preparedness to play these roles and the level of support received from schools were not always perceived as satisfactory and could contribute to increasing inequalities in access to education. (Carterro, 2021) Parents' and caretaker's support for students in early years of education has been shown to be crucial, with children in the first years of primary education needing specialized pedagogy and an extensive time investment. During the first COVID-19 lockdown, younger students seemed not to be autonomous enough in accessing digital technologies and using them, which therefore demanded parental support as crucial even to attend classes, access learning platforms, and understand instructions provided by their teachers. (Carterro, 2021) Parents and caregivers were also expected to act as motivators and teacher helpers in monitoring children's learning processes with some studies showing that teachers observed

that children who were supported by their parents in their learning process, with either time or knowledge, performed better. This is thought to add to the traditionally noted difference in learning progress between students without parental support compared to their peers who have and benefit from parental support.

These are issues faced not only by parents, though, with challenges of implementation having been a major issue as learning and collaborating in an online environment might not come naturally as well to both teachers and students. Reports have made clear that in weighing policy responses to the school closures, policy-makers need to consider ways to balance digital and traditional (screen-free) activities as simply replacing the schooling hours with online lessons and interactions is said to likely take a toll on students' health, and as such it is recommended that lectures be shortened and combined with non-digital learning activities. (OECD, 2020)

The reality of Corona and subsequent school closures has the potential to be unsettling and disorientating for students and demands that both teachers and parents work together to take the pulse of students' emotional health. Technological solutions, such as the Alt-ER application and its Framework for transitions and the creative storytelling each engage are well suited to provide connection, interaction, and support both at home and in school locales whilst learning is happening, particularly in a time of uncertainty.

Learning through Dialogue

The importance of dialogue between children and adults lies within the social interaction taking place, with research showing that any adult understanding of children's needs and priorities is bound to the attention paid to both the messages and communication style of the child. This is to say that attentive adults are more likely to engage in dialogue, and dialogue in turn fosters a better understanding of a child's learning needs and potential concerns (White & Redder, 2014). This emphasis on communication (both among children and between child and adult) being critically important is shared by Samuelsson and Carlsson who go on to say: " *A teacher must be aware of both child's and her/his own perspectives - this is of paramount importance; both the child and the teacher must be involved/engaged in the process; the teacher's goals, directions, and sensitivity to the child's perspective have to work simultaneously; and both the communication and interaction between teachers and children and between children are necessary*". (2008, p:4)

To clarify the view that they present - ECEC should be organized in such a fashion that it supports the greatest amount of interaction possible between children, as well as between children and adults, keeping an emphasis on the importance of them having grounds for discussion and full consideration of the perspectives of each. The content or object of learning, in the case of Alt-ER - the artifacts that make up the world - constitute the foundation from which the interaction processes take place, such as dialogue, thus creating a solid platform for learning through conversation which goes beyond the simple aspects of verbal communication. There is an underlying social intercourse taking place during conversation and storytelling, one

that ranges between verbal communication and visual communication through gestures and body language (White & Redder, 2014), which adults would be wise to include when considering fully effective ECEC. Considering the shift seen today with an ever-increasing use of digital technologies in not only the home, but also the labor market and in educational institutions - and considering the high demand for autonomous, problem solving individuals needed for any future workforce, it would be logical to consider the development of learner autonomy and the importance of digital pedagogical tools that support the development of those necessary skills.

In his paper about learning as dialogue, Little (1995) points out the negotiation of the meaning of the learning material between learner and teacher - constitutes the teacher making a decision about what is possible for the learner to determine as learning objectives on their own. In the negotiation of this, communication takes place between learner and teacher - both verbally and non-verbally. The sense of this lies in adults and educators "[...] *of having a strong sense of personal responsibility for their teaching, exercising via continuous reflection and analysis the highest possible degree of affective and cognitive control of the teaching process, and exploiting the freedom that this confers.*" (Little, 1995, p:179).

During the period of remote schooling, it has been reported that monitoring students' well-being and addressing children's needs has been more difficult, and that teachers' training needs to encompass techniques on how to better identify students' problems under these circumstances. In the specific cases of vulnerable students and families, individual approaches are needed to address the diversity of mental health needs that have arisen. (Carretero, 2021) Alt-ER has a pronounced functionality in this area, allowing teachers and parents to gauge and monitor perspectives and opinions over time by virtue of readings and interpretations of the scenes in the Alt-ER world.

Learning through Inquiry

In a considered process of inquiry-based learning, concepts and activities focus on moving students away from the traditional step-by-step instructions, rote memorization, and reproduction of expected results practiced in many educational institutions. Inquiry-based learning is about teaching students how to be scientists; e.g. the emphasis is on how to think scientifically – or become self-directed problem solvers (Tan, Yeo & Lim, 2005).

With an increasing focus on creativity in education, and the shift from teacher-centered teaching method to a social-constructivist approach, using play and games as teaching methods proves an important strategy for development, especially with creativity as the main learning goal (Sullivan, 2011). This type of creativity is vital now and, in the future, as "*professionals in many scientific, mathematical, and engineering fields articulate the need for creative and innovative thinkers in their professions and advocate for the use of playful learning methods to assist students in developing the intellectual abilities required for excellence in these fields.*" (Bergen, 2009) and for the way it provides for the demand of a workforce with 21st century competencies presented earlier in this paper.

It has been posited that inquisitive play may have a pivotal role in supporting children's development and learning during and after the global COVID-19 crisis. Jack Shonk of the Centre for the Developing Child identified it as the most important way in which we can support children during this pandemic, reduce stress and build resilience. Similarly, the role of inquisitive play in helping children make sense of the unprecedented changes that have occurred in their lives, during the pandemic, and process the associated trauma has been highlighted by the Play in Education, Development and Learning Centre (Neale, 2020).

Learning through Creative Expression

When considering creativity in children and attempting to develop creative thinking through teaching and subsequent learning, it is important to keep in mind that most learning requires children to be actively engaged in experimenting and raising their own questions and finding answers, how this process fits the definition of creative thinking - during which children should be able to express their own styles and personalities (Zachopoulou, 2007). The age of the child plays a major part in their creative development, as those in the early stages of life easily travel between the worlds of fantasy and reality, which promotes the development of their creative skills - important considering that Tegano et al. (1991) stated (as cited in Zachopoulou, 2007, p. 15) that: "when children engage in fantasy they are free from the influences of evaluation and are more likely to think of unconventional ideas" It is imperative that one consider a common existing intent to focus on including play as a way to make learning fun with the aim of children not realizing they are learning, hiding the educative intent of a given practice. There is a risk that free and creative play in this manner is pushed into a tight corner, creating the assumption that it is advantageous for children to not be aware when they are learning. However, the reality is that children are eager to learn and enjoy when they realize they have done so - thus, free play should not be seen as freedom from adult involvement (Schousboe, 2013) and without mooring to educational goals.

Adult mediation is a way for children to be equipped with appropriate tools to focus on the intended learning outcomes in the creative processes they undergo in different contexts, giving them the necessary foundation for expressing themselves, with intent, through creative engagement. Creativity provides children with a means for expressing themselves in ways sometimes unapproachable in other constructs; i.e. movement, free thinking, and an active process of exploration. Encouraging imaginative thinking and providing the tools necessary for children to do so is highly beneficial for their individual development and as skills training for complex problem solving. This is coveted by 21st-century employers as creative thinking skills and critical thinking strategies could: "[...] improve children's ability to generate different movement patterns." (Schousboe, 2013). One can see how children learn a great deal through discussing, arguing their points, and exploring each other's ideas and ways of thinking, but also how they experience an investigation into and a transference of culture in this process.

Understandings of the importance of creative expression continue to develop and grow, including during the period of and following the pandemic where school closures have disrupted

the education of children worldwide. As a critical process in supporting young children's resilience, play and self-expression are increasingly recognized as a valuable pedagogical strategy within a shifting educational landscape during the pandemic. In a study reporting findings from a survey on play in early childhood education of 310 early childhood teachers during primary school closures in Ireland, 82% of teachers recommended expressive play strategies to parents during remote teaching and home and almost all teachers (99%) intended to use them as a pedagogical strategy upon school reopening. (O'Keefe & McNally, 2021)

Learning through Digital Technologies

Information and communication technologies have a major impact on the people and environment that surrounds children as well as their process of learning - and research shows that ICT provides many opportunities to strengthen early childhood learning (Bolstad, 2004). When addressing the opportunities for implementing ICT in early childhood learning, Bolstad lists three points to highlight what technologies offer, which are:

- Opportunities to support and enhance children's learning and play experiences;
- Opportunities to support and strengthen practitioners' professional learning and development;
- Opportunities to support and strengthen relationships and communication between early childhood centers, parents, and other people connected to the early childhood education setting.

Interestingly, when children are left alone, in most cases they tend to engage in fantasies and create imaginary worlds through play or games. Looking at the degree to which ICT supports children's learning and play, educators are eager to implement this aspect of children's play into their practice.

Williamson and colleagues (2020) explain that discussions on what constitutes teachers' "digital literacy", "digital competence", "digital fluency" had been taking place for at least 30 years before the pandemic. Some experts recommend that teacher training should cover several dimensions: instrumental, pragmatic, psychological and organizational to fully contextualize how to use digital technologies in education. The aim with this would be to allow teachers not only to produce and design content but also to innovate and lead digital transformation in education (Espino-Díaz et al., 2020). Other studies also identified a need to foster the development of teacher competence in digital-related teaching, both in initial teacher education and continuing professional development. (Konig et al., 2020)

School leaders who engaged digital learning methodologies during the pandemic found tremendous benefit to and expected to continue using them in a number of scenarios such as digital meetings with staff, parents/caregivers, and other agencies as well as differentiation in

their teaching strategies, providing student feedback, and using them as an extra resource for vulnerable pupils. (Bubb & Jones, 2020)

Best practice during the pandemic was thought to be most effective through synchronous digital learning sessions, which worked better in smaller rather than in larger groups, but most often was not technically possible to organize synchronous digital learning activities for large groups of students. Despite this, even when the technology allowed for it, it was found to be less effective as teachers could not focus on each student as they would do when physically present in the class. Learning in smaller groups seemed to augment the one-to-one (almost in-person) time teachers spent with each student, and increased students' attention and motivation. Synchronous teaching in smaller groups also allowed teachers and students for more active communication and exchange of information, important to an ability to revise exercises, answer students' doubts, ask questions on the lesson, and give feedback on student work.

As seen with proactive engagement with learning, uneven levels of parents' digital competence can also widen inequalities. The first COVID-19 lockdown not only tested teachers' and students' preparedness to efficiently teach and learn online, but also the level of digital competence of parents and carers, who became more involved in the learning processes of their children. Families being diverse in their digital maturity, ranging from IT professionals who sometimes also offered their assistance to local schools, to those who had very low or no digital skills (Carretero, 2021) is an important aspect to consider.

Reporting goes on to say that despite all its positive features, digital learning also has several drawbacks. One of them is the difficulty in monitoring students' understanding, which requires teachers to prepare very clear and well-structured instructions. The sharing of good practices, especially in digital teaching and learning inspired less prepared school leaders and teachers who eventually were able to improve their teaching practices and developed new skills, but there were some who felt unable to make the jump to digital structures, creating worse outcomes for themselves and their students. (Bubb & Jones, 2020)

Perspectives on ICT

In the modern, wired world, young children encounter ICT technologies long before they start primary education, and in many cases before they go to preschool. With this in mind, it can be assumed that they are exposed to both positive and negative impacts of digital technologies in this period. With the growth of digital educational structures and learning tools it can also be assumed that ICT will continue to represent a significant part of children's learning throughout their education and into their adult lives. Studies on ICT in the execution of early childhood education have shown that (Bolstad, 2004):

1. ICT has an effect on the people and environments that surround young children's learning

2. ICT offers new opportunities to strengthen many aspects of early childhood education practice
3. There is strong support and interest across the whole education sector for the development and integration of ICT into education policy, curriculum, and practice.

To the first point, the current period does mark the infancy of ICT and an incomplete understanding of its effects. While there might be a tremendous potential for growth and learning, there is also a distinct need for considered investigation into the effects that ICT has on everyone, especially young people. What can be done, in the face of uncertainty, is make best efforts to use ICT in responsible and thoughtful ways. This leads nicely into agreement with the sentiment of the second point, that there are effective strategies that can ensure ICT is an overall benefit to young learners – and that self-directed creativity (as is laid out and facilitated by Alt-ER) is one effective strategy for its deployment.

Alt-ER fosters communication and collaboration between teachers, parents, and classmates, and in doing so bridges the gap between the home and schools as atmospheres for learning with a focus on personally directed narrative creation, a deeply important exercise in building young minds. The project team hopes that this framework and the engaging storytelling made possible by the Alt-ER application and Toolbox are suitable solutions that work to justify the strong support and interest that have been evidenced in the third point to exist in the education sector for thoughtful and effective integration of ICT into education policy, curriculum, and practice.

An important consideration put forth by Siraj-Blatchford and Whitebread (2003) suggests that it is highly valuable for young children to start developing their technological literacy, increasingly considered to represent an essential point of curriculum in any broad and balanced educational training for the twenty-first century. In doing so, it is extremely important to have well defined procedures and strategies for how to engage ICT to effectively achieve learning objectives with a clear understanding of the purposes, practices, and social context of early childhood education. Alt-ER, being based on years of research and activity in the field of ECEC represents a novel approach that builds on longstanding tradition, and which takes self-directed storytelling - a celebrated tactic for creating engagement - and moves it into a digital frame. One measure of the important role ICT can play in education is based on the context it can provide for children's activities and any resultant cognitive development. Not only does it represent a learning rich environment that can help to motivate children to engage in education, ICT can deliver content and activities that engender and support strong and productive emotions for children (Unesco, 2010).

Alt-ER is designed with great care as regards socio-emotional understanding and development.

Many of the scenarios presented will produce emotion through their demand that students think not only about the action depicted, but possible catalysts for it as well as the inevitable consequences. Studies suggest that ICT use can provide a context for collaboration, cooperation, and positive learning experiences between children, or between children and adults (Bolstad, 2004) and to this point Alt-ER is supremely capable of creating an environment for sharing, collaboration, and cooperation between young people among themselves or with adults,

be they parents or teachers. In the development of the Alt-ER platform, particular attention was paid to the ways in which ICT helps to support learning environment by fostering:

Communication and collaboration

ICT provides a variety of ways for children to weave together words, pictures, and sounds, thereby providing a range of ways for children to communicate their ideas, thoughts, and feelings (Bolstad, 2004). By using ICT, children naturally touch on collaborative frames for problem solving, drawing, video recording, or construction, and using screen-based applications (Siraj-Blatchford and Siraj-Blatchford, 2006).

Creativity

According to Siraj-Blatchford and Siraj-Blatchford (2006), well-designed ICT applications assume a wide variety of possible responses from a child and allow a child to try different things out and, if they do not work, to try something else. There is an immense potential in ICT applications that offer the possibility of open-ended decision-making and problem solving. According to Edwards and Hiler (1993), in order to support creativity, children need to be encouraged to look playfully for alternative ways of doing things, to see that there is always a choice, to make connections between things, to make unusual comparisons, and to see things from the point of view of others. These ideas are supported by The Next Generation Forum, an American-based research group, which states that new technologies can be very powerful in supporting the creative potential of young children (Siraj-Blatchford and Siraj-Blachford, 2006). By presenting ICT usage as technological and creative toys, it can help to change a number of important aspects of children and learning, for example, can help to improve learning relationships between children and teachers; ICT usage empowers children by granting them a voice they have never had before and opens new ways of designing dynamic methods which can help to put children in touch with ideas and concepts that might formerly be beyond their reach.

Cultural awareness

According to Danid Masoumi (2015), ICT helps to enhance children's cultural awareness by reacting to social needs for intercultural and multilingual approaches. In addition, it helps teachers to exemplify cultural and ethical differences and similarities. According to Thuston's research (2004), such opportunities help enhance young children's understanding and appreciation of cultural diversity, and thus reduce social stratification and therefore increase social inclusion.

Learning to learn

As the Siraj-Blatchford and Siraj-Blatchford study (2006) suggests there is strong evidence that computers can be applied to help the development of metacognition and learning to learn. A number of studies support this idea, and add that well designed and appropriately used ICT applications help to encourage discussion, problem solving, risk taking and flexible thinking. It allows children to engage in self-directed creativity and can be tailored to children's individual needs and as a result reduce barriers for children with special physical or learning needs. In order
for any ICT tool to be determined to enrich the learning environment, its development values must be carefully examined. The New Zealand Council for Educational Research (2004) in its recommendations for ICT implementation in ECEC, suggest assessing software and the contribution of computer games according to Verenikina et al., 2003 as presented below.

Theories about the purpose or value of play	Relevant questions for practitioners to assess software
General Characteristics of Play	
Play is a spontaneous, self-initiated, and self- regulated activity Children are actively involved in creating their play and are in control of it Play includes a dimension of pretend	Does this computer game allow children to freely engage in play? Does it provide freedom of choice? Does this computer game allow children to create their own scenarios, rules, and characters of the play? Does this computer game enable children to act in an imaginary, “as if” situation?
Classical Theories of Play	
Play discharges natural energy of the body Play alleviates boredom while the natural motor functions of the body are restored Play restores energy that is expended in work Play affords opportunities to develop skills necessary for functioning as adults	Does this computer game allow for discharge of natural energy? If so, in what sense? Does this computer game engage the interests of the child (with particular children in mind as this criterion is considered)? Does this computer game allow for rest and relaxation in an enjoyable and engaging way? Does this computer game provide opportunities for developing adult skills?
Modern Theories of Play	
Play reduces anxiety by giving children a sense of control over their world and an acceptable way to express forbidden impulses y Play consolidates learning that has already taken place, while	Does this computer game enable children to gain a sense of control over events that they could not control in their lives, including traumatic experiences? Does this computer game have the potential to consolidate existing learning? If so, what kind of learning? Does it have the potential to develop new concepts and skills?

allowing the possibility of new learning in a relaxed atmosphere Play promotes the ability to comprehend multiple layers of meaning Play promotes sense of self in terms of personal identity and social relations with others	Does it engage the child in such approaches as problem-solving and self-discovery? Does this computer game operate at literal and figurative levels of meaning? Does it enable children to reflect on the rules and means of communication? Does this computer game develop a sense of a child's own identity? Does it develop a child's sense of his/her own social identities in relation to others? If so, how?
Socio-cultural Theories of Play	
Play promotes abstract thought by separating meaning from objects and actions and using actions and objects in symbolic ways Play allows children to reach beyond their actual development in their cognition and self regulation In play, children achieve mental representations of social roles and the rules of society	Does this computer game involve and develop use of symbolic meaning? If so, in what ways? Does this computer game allow children to engage in their zone of proximal development and function above their everyday abilities in cognitive and socio-emotional areas? Does this computer game provide children with an opportunity to act out and explore the roles and rules of functioning in adult society? Does it allow for group work and collaboration?

Table 1. Questions for assessing the contribution of computer games to children play (adapted from Verenikina et al., 2003 as cited in Bolstad R., Early Childhood Education New Zealand Council for Educational Research, 2004)

Alt-ER is thought to be effective as measured by this agenda, as evidenced by the commonality between the platform's functionality and the ideals described therein.

As regards to General Characteristics of Play - Alt-ER allows children to freely engage in play and provides freedom of choice, and does so with a dimension that promotes children acting out imaginary "as if" scenarios, important to development. Even when used without prompts, the Alt-Er world is built in the pursuit of building a space for young people to make meaning through self-directed creativity via an exploration of whatever can be imagined to be taking place in each of the presented scenes.

As regards Classical Theories of Play, Alt-ER allows for restful relaxation while providing opportunities for developing adult skills, and does so with a focus on engaging the interests of the child - as the game and its assigned meanings and determined course of actions are self-directed. Alt-ER presents training not only in emotional and social development areas made possible by its use of common scenes from life, with the added benefit of providing a means to discuss the point where screen engagement becomes too much, and why and how it should be limited.

As regards Modern Theories of Play - Alt-ER is an effective tool in the development of a sense of self and one that operates on a literal and figurative level to create opportunities for comprehension of multiple layers of meaning. It also functions as a means for consolidating

existing learning in the sense that the totality of a child's understandings will be used to create meaning in the Alt-ER world, drawing on both formal and informally derived knowledge to build a world of stories from the prompts and scenes.

As regards to Socio-cultural Theories of Play - Alt-ER develops use of symbolic meaning, provides children with the opportunity to explore the roles and rules of functioning in an adult society, and can be collaborative in its deployment. Each scene is open to interpretation and point of view, particularly interesting in the sense that children achieve a mental representation of social roles and the rules of society by assuming the role of the “other” in this context. The toys, characters, and stories utilized in children’s play are seen to be significant artifacts from their social and cultural settings; thus, in play, children are acquiring the tools and meanings of their culture.

Over the past few years, the amount of computer software targeted at young audiences has significantly increased. To make it appropriate to the target age of children, such software is usually presented in a playful manner. It can range from educational software, designed to enhance literacy and numeracy skills, to commercial arcade games produced for recreational purposes. To make the educational content of these software packages more attractive for children, they are often presented in a play-oriented manner often equating play with fun, thereby diminishing the potential developmental value of such software in enhancing children’s generic, higher order cognitive skills for the best impact upon which the learning should be fun.

On the other hand, there is a significant underestimation of the potential developmental value of computer play designed for the purposes of children’s recreation and entertainment. Educators still typically perceive computer games as a recreational or ‘toy’ technology only (Buchanan, 2004). This is not surprising, as children’s spontaneous play sometimes, and traditionally, is seen as an activity which is opposite to work.

While the Alt-ER framework represents a starting point, there is a need to further develop a theoretically-based set of criteria that will allow educators to assess individual pieces of computer software and judge their developmental value when choosing particular products for their classroom settings, or advising parents on the purchase of computer play packages for their children. The above issues, concerns, and intents - which were considered at each stage throughout the development, testing, and ultimate creation of Alt-ER - are thought to be in line with The New Zealand Council for Educational Research (2004) and the myriad researchers consulted in this process, creating valuable framework and practice that conforms to existing recommendations for ICT implementation in early childhood education. When taken as a package, these understandings and guiding principles outline a strategy that can justify the use of certain ICT solutions, provide teachers and parents with a roadmap for judging their efficacy, and create meaningful engagement across contexts to further the educational benefits of self-directed creativity.

As the Coronavirus outbreak highlighted areas of concern in relation to ICT and access, a number of recommendations have emerged including an examination of the role state governments play in ensuring equal opportunity in this area. One resounding and repeated note in these

recommendations is that National level structures should support poorer families to participate equally in online education through the provision of digital devices such as laptops and secure WIFI connection. (Van de Werfhorst, 2021) Additionally, countries may provide or facilitate teachers with online teacher training resources on how to teach online but also with online collaborative platforms that allow them to share their resources and give and receive peer feedback. (OECD, 2020)

Although there were cases of schools well prepared for this situation, this sudden shift to remote schooling has created many challenges for education systems in the EU and has affected teachers, students and parents alike. Many schools and teachers were not entirely prepared to continuously teach in a remote and mostly digital way, with existing but sometimes much underused digital means. Subject to high pressure and sometimes lacking digital competence, some teachers also struggled to prepare digital content and deliver digital classes. Also, not all students were prepared to learn in the home environment, while being isolated from peers, and they struggled to stay motivated and regulate themselves to focus on study. Parents had to continue working as usual, sometimes tele-working from home, and at the same time, they suddenly became responsible to actively support their children in the remote schooling process. (Carretero, 2021)

These challenges were felt equally by parents and teachers, and while top-down instructions to organize remote schooling were generally lacking, networked bottom-up processes allowed teachers not only to improve their knowledge to face the challenge, but also to overcome the feeling of abandonment and loneliness they felt at the beginning of the lockdown. Digital networking proved to be a successful strategy to cope with the emergency situation, especially when it involved external local actors, such as NGOs, ICT companies, pedagogy and psychology experts. (Leary & Asbury, 2022)

Developmental Appropriateness

According to the 2010 UNESCO report “Recognizing the Potential of ICT in Early Childhood Education”, the guiding principle in major literature reviews on ICT in ECEC is a concept referred to as Developmental Appropriateness. It provides guidelines for teachers, decision makers and software developers for determining the appropriateness of ICT applications in the early years (Blatchford J. & Whitebread D, 2003). The guiding principles will be presented below (UNESCO, 2010; Blatchford & Whitebread, 2003, Bolstad, 2004) and afterwards discussed in relation to Alt-ER Toolbox development.

1. The ICT tool should be educational. This principle states that ICT tools in general have to be educational in nature, and therefore this effectively excludes all applications where clear learning aims cannot be identified. In addition, it is supposed to be developmentally appropriate - in order to encourage development - including aspects of creativity, self-expression, and language.

Alt-ER strives to use pedagogically valid and proven strategies and underlying goals in the pursuit of educational experiences for children. Alt-ER focuses on the power of creativity and storytelling to allow for these opportunities for learning. By providing a blank slate for meaning making in each scene, Alt-ER unlocks personally driven and conceived thinking and understandings. These will not only allow for socio-emotional growth on the part of the student, but also present a valuable opportunity for understanding of the students themselves by teachers, parents and pedagogues. The glimpse that the stories chosen to be told gives into the mind of the child is invaluable as an effective tool to help judge a student's mindset, but also track growth and development. The categories chosen for inclusion in the scripting of the scenes are based on valuable areas for development in young minds, and adhere to important milestones for learning. With each of the five categories practitioners can tie the material and conversations back to important areas for personal growth - Health and Personal Hygiene, Knowledge of the World, Social Skills, Cooperation, and Emotional Control which have been found to be important areas for development in young minds. Teaching correct and acceptable Health and Personal Hygiene principles is vital to achieve life-long habits in the prevention and spread of illnesses and infections, but also to maintain a suitable appearance and avoid offending others, bridging both health concerns and a specific aspect of socio-emotional development.

Knowledge of the World is an overtly general category that was chosen in the belief that the more children know about the world around them from an early age, the more suited they are to grapple with new ideas and concepts in the future. It is important for children to understand social structures and how they work, but the investigation that goes on in determining this is a skill in and of itself. Inquisitiveness will develop children's abilities to think issues through for themselves and breeds a resilience in learning contexts that will serve them well in life.

Cooperation is a classic and vital part of learning to function in society and will be a crucial skill to have developed in these important years. To value the contribution of others as part of a team and respect the responsibilities that individuals have to the others around them are critical skills that benefit all. Emotional control or self-regulation has become recognized for its foundational role in promoting wellbeing throughout life. Talking about and practicing self-regulation can engender resilience and goal-oriented thinking with the effect of establishing the best possible habits for physical, emotional, and social growth and educational excellence. Emotional control and the resilience it can potentially create are especially valuable for consideration in this transition phase from kindergarten to primary school, where children are faced with one of their first periods of tumult.

2. ICT tools should encourage collaboration. According to Light and Butterworth (1992), joint attention and children learning to share provides more effective cognitive challenges for young children. When children are engaged in collaborative play, it provides an environment for children to express their personal constructions and articulate their thinking. Collaboration is well suited to providing opportunities for cognitive conflict and efforts to reach consensus and for the co-construction of potential solutions in creative processes of problem solving.

Collaboration is a valuable aspect of and context for learning, and as such Alt-ER was created to embrace and provide opportunity for collaborative use. Alt-ER allows for a multitude of modes of deployment, both in the classroom and at home, but also functions as a singular, paired, or group activity. Collaborative use of the platform and the Toolbox are highly recommended and will create opportunities not present in solo use, as engagement with Alt-ER in a group setting will create the grounds for training in group dynamics and social integration. Alt-ER provides prompts and leading questions for teachers and parents to use with students, but these are a starting point for discussion and meaning making that has been shown to occur naturally when Alt-ER is presented as a group activity. The associative play at work in group deployment of Alt-ER creates engagement, cooperation, communication and marks the start of learning how to negotiate and get along in a group for children in the lower range of the appropriate age band, while the cooperative play makes it possible for them to work as a team, develop an interest in their peers, and strive towards common goals for children in the older segment.

3. The ICT tool should support integration and play. ICT applications should be integrated as thoroughly as possible with other established early education practices in order to make the curriculum relevant to children (UNESCO, 2010).

In order for children to understand and most benefit from educative aspects of ICT, it needs to be used in a meaningful context, with real purpose and in pursuit of real problem solving. Computer applications provide means that help children to interact and engage in a much wider range of “virtual artifacts” and environments that would otherwise be possible. Play is considered the leading activity for young children as well as the driving force in the child's development of new forms and motivation, and as such, ICT tools should have a strong focus on integrating aspects of play in their application. ICT tools need to be designed for and applied to particular purposes - but it is important to note - the inappropriate practice is to integrate ICT tools as a reward or punishment (Blatchford & Whitebread, 2003).

Alt-ER is built with a distinct “openness” that allows not only for deployment with a wide range of ages, but which also makes it complementary to nearly any curriculum or learning area. When used under the direction of an adult, be they parents or teachers, scenarios in the Alt-ER world can be tied back to issues and concerns that dovetail with agendas set forth by both kindergartens and primary schools. If the students in question had begun formal training in counting, for example, the scenarios presented in the Alt-ER world can be used to simply illustrate, train, and test the learning and knowledge of the child on that subject. On top of this the Alt-ER platform and Toolbox represent, at their core, playful and expressive means for having conversations and sparking realizations that will open young minds and can impart important learning by way of their playful structure.

There are no winners or losers in Alt-ER, just a wide range of opinions and voices that are equally valid and valuable, and which can give clues to a child’s development and any potential areas of concern. The integratory value of having a group exploration of the space is thought to be one of the most exciting aspects of use of the Alt-ER platform. Alt-ER allows for each member of the group to assign importance and meaning, while also giving the experience of stating it before

the group, a valuable action in knowing and believing in oneself, but also in understanding the importance of listening to others.

4. The ICT tool should leave the child in control. It is suggested that the ICT applications should be controlled by the child; they should not control the child's interaction through programmed learning or any other behaviorist strategy or structure.

In accordance with thinking and practice that outlines student-centered and controlled learning as deeply valuable for its ability to create independent thinkers, Alt-ER is built to be primarily directed by the young people using it with intuitive controls and a minimum of external resources demanded of it. With a brief introduction to the Alt-ER world, most children will have no trouble moving between scenes and making personal meaning of the presented scenarios. These scenarios, it is important to add, do not prescribe any specific goal, but rather present a nearly blank slate for students to interpret and infer what they will. In the same way that the scenarios are open to interpretation, the gameplay is not regimented or beholden to a set of rules, leaving the child to determine where to go on the map by virtue of which scenes are of interest to them personally.

5. The ICT tool should be transparent and intuitive. It is advised that ICT tools should be transparent so their functions would be clearly defined and intuitive (UNESCO, 2010).

In creating a platform and experience that would be suitable for the age range in question, it was imperative that it not be too difficult to understand or use for the lowest section of that band. As such all unnecessary steps and segmentations have been removed. The written prompts and questions are simple enough for many new and developing readers in the first year of primary school, and are thought to be motivational and effective in regards to reading and writing skills development.

6. The ICT tool should avoid violence or stereotyping. It is extremely important to be alert for violence, stereotypical depictions, or actions related to social class, ethnicity and gender in developing or activating ICT tools for children. Particular importance should be placed on matters of violence and sexual violence - materials must not condone nor encourage anti-social behavior of this kind; nor should they play on the fears of the vulnerable (ASA, 2002). Whenever ICT applications fail to meet the presented criteria, it cannot be justified for the use in educational context.

Violent and antisocial behaviors are minor, rare, and only ever presented in the Alt-ER platform and Toolbox as opportunities to investigate their inappropriateness, meant to make children think more about why some people engage in them. Specific examples show a negative correlation with violence, like a horse who reacts poorly to the threat of being whipped and which is thought to spur a tangential conversation for different audiences - about appropriate, calm reactions, for example with older children, and the importance of being kind to creatures great and small for younger ones. There are a wide variety of races presented in the platform, and great care was taken to avoid stereotyping or insensitivity as regard the depictions of any race.

7. The integration of ICT should support the development of awareness of health and safety issues. It is suggested that the time spent using any computer application by a child should not extend beyond 20 minutes at a time in case of 3-year old's and maximum of 40 minutes by the age of 8 (UNESCO, 2010). If the child, or group of children, are very much engaged in an ICT activity and the completion requires a longer period, this should be allowed but it is not desirable to encourage children to do this regularly. In addition, it is important that, while learning about
ICT in their world, children also learn how to manage their own space and select the right tools to use when sitting at a computer. Use of the computer or other ICT tools, should not be at the expense of outdoor opportunities and experiences (Siraj-Blatchford & Siraj-Blatchford, 2000). Any ICT strategy is going to be problematic and divisive when the question of "screen time" enters the debate, but Alt-ER is thought to be less egregious than other tools in this regard as it is not a passive experience. Much the opposite in fact, as Alt-ER demands self-directed creativity, investigation, and storytelling as the platform itself simply presents scenarios, but makes no value judgements and prescribes no meaning to the events. Alt-ER can easily be used in short deployments where several scenes are set out as a framework for tackling specific topics, or students can be left to explore on their own for longer but age appropriate periods. Alt-ER is an easy process to break into segments of any length as there is no "finish line", but it instead functions as an ongoing exploration which can be brought to a close at any time without the problem of reaching a certain point or saving any progress first.

8. The integration of ICT should support the involvement of parents. Research shows that when parents, teachers and children collaborate, it leads to improved academic performance (Siraj-Blatchford et al., 2002). According to UNESCO research (2010), ECEC centers reported that when using ICT with support of teachers and parents, children showed a more positive attitude towards learning and were better behaved.

Creating an environment open and inviting to parental involvement was a guiding principle of the Alt-ER platform, and one that has been a primary pursuit from the beginning of the work undertaken to create the platform, Toolbox, and this framework itself. Alt-ER creates a simple way for learning and education to bridge the gap between home and school, functioning in much the same way when used with teachers or parents, and creating valuable links between the two settings. This framework itself is an effort to make the ideas behind Alt-ER and the benefits to using it clear to a variety of audiences including parents, justifying the platform and hopefully encouraging them to use Alt-ER in a process of talking with their children. Engaging with and exploring Alt-ER in both the home and school, with parents, siblings, teachers, and/or friends allows for learning to become a more holistic and naturally occurring process, that is thought to make life-long learners out of activated and engaged young people.

The above outlined principles as developed by UNESCO provide an excellent guide for planning and providing ICT learning opportunities for children and present considered curriculum guidelines for use across Europe (Nutkins et al., 2013). It is suggested that educators and parents engage in a discussion in relation to each recommendation and discuss how it can fit best in the general philosophy, practice and learning curriculum in each particular setting. It is strongly suggested to use the presented principles as an evaluation tool for programs or other

ICT applications (Siraj-Blatchford & Whitebread, 2003). Developmentally appropriate practices can help to ensure that age appropriate, individual, and culturally appropriate educational material is well used in the teaching environment and adapted in teaching curriculum, especially now in the rapidly changing early childhood education environment. To each of these points, the Alt-ER platform and Toolbox represent effective and considered engagement with ICT in pursuit

Recent findings emerging internationally from the lockdown suggest that some young children may need additional support in overcoming some of the negative impacts of the COVID-19 crisis on their socio-emotional development, with one strategy for ensuring developmental appropriateness being more effective ECEC through age appropriate self-directed creativity and storytelling. (Eagan, 2021) Alt-ER is particularly effective in a reconsideration of these guidelines after COVID-19 in that it directly supports an awareness of health and safety issues, a critical part of considering its developmental appropriateness in this construct.

Importance of Storytelling

From early childhood, young people use narrative creation and storytelling as a way of thinking, constructing stories and explanations in their search to understand and make sense of the world. Storytelling is recognized as a critical aspect of human thought and development - it positively affects social, emotional, and lingual development and has a heavy influence on identity formation (Engel, 1999, 2005; Fox, 1993; McCabe and Bliss, 2003 as cited in Cremin et al, 2017).

The educationalist Rosen (1984) argues that story plays a profoundly important part in children's cognitive and emotional development and puts forth that there is a great importance in narrative creation, claiming it “is nothing if not a supreme means of rendering otherwise chaotic, shapeless
events into a coherent whole saturated with meaning” (Rosen, 1988: 164). Narrative creation also fosters imagination development, making an imaginative space to play and ponder which enables thinking about the world, people, and relationships (Egan, 2005; Vygostky, 1978). It enables young people to assume widely varied roles, engage in “what if” situations, and use a variety of symbolic resources to construct potential worlds (Nicolopoulou, 2005; Baumer et al. 2005, Gupta, 2009 as cited in Cremin et al., 2017). The “what if” and “as if” concept as regards children aged three to eleven is called “possibility thinking” (Craft, 2001).

A number of studies (Chappell et al., 2008; Craft et al., 2012a; Craft et al., 2012b as cited in Cremin et al., 2017) analyzing possibility thinking reveals that reciprocal relationships exist between questioning, imagination, and narrative with all three building on the back of formal educational structures and practice. Storytelling helps to form and sustain a shared culture of collaboration, experimentation, and a cross-fertilization of ideas that serves as a powerful matrix for social, cognitive, and linguistic development (Nicolopoulou et al., 2014). These were considered to be vital pursuits of the project and each has been carefully considered as valuable results of the open ended and self-directed creativity at work in Alt-ER. With regard to the transition period and the desired effect of lessening early school leaving, research shows that

early narrative competences help to create a secure foundation for emergent literacy and long-term success in schooling (e.g. McCabe and Bliss, 2003; Tabors et al., 2001 as cited in Cremin et al., 2017).

Studies report that early narrative skills are linked to and predictive of reading comprehension in later primary school years (Dickinson and Tabors, 2001; Griffin et al., 2004 as referred in Cremin et al., 2017). Additionally, storytelling supports the development of important skills that are required for success in the twenty-first century – skills such as creativity, risk taking, and coping with uncertainty (Fisher et al., 2011). When retelling and re-enacting stories in the early years (regardless of whether these are based on traditional oral stories, printed texts or life experiences), play enriches the language children use as they improvise and adopt perspectives on the world around them (e.g. Rowe, 1998, 2000; Sawyer, 2003 as cited in Cremin et al., 2017). This is one of the true strengths of Alt-ER, that when deployed in a group setting, meaning making is paired with presentation in the form of expression of the ideas and concepts to the group, parents, or teachers. This presentation is a vital part of young people finding their voice and having pride in personally directed active engagement with the group through narrative/storytelling. Moreover, research suggests that an oral language approach to emergent literacy can help to bridge the gap between home and school, and there is a strong body of research evidence suggesting that participation in storytelling and story acting can significantly promote young children's oral and narrative development (Cremin et al., 2017). This is particularly interesting in consideration of the ease with which Alt-ER can bridge the classroom and the home by providing a simple interface that can work in either environment and embraces the oral language approach with the shared resources of both teachers and parents.

The storytelling and story-acting practice demonstrates the following characteristics of a learning ecology (Nicolopoulou, Cole, 2010):

It has tasks or problems that children are asked to, or want to, solve (e.g. make decisions about how the stories should develop) - It encourages particular kinds of discourse (as when children disseminate their stories) - It establishes particular norms of participation (e.g. turn-taking, the number of children on stage, active listening to other people's stories) - It provides specific cultural tools and material means (e.g. the tools used to record the stories, the 'story stage') - It offers teachers practical means to orchestrate relations among these elements.

More specifically, storytelling can be used to support the literacy skills of children (Phillips, L.1999) by:

- Exposing children to a broad range of narratives
- Providing opportunities to play with words, with story, and with text - Inviting children to retell or reenact a story after a storytelling experience
- Employing effective questioning to extend retelling and comprehension skills
- Embracing the creation of personal stories expressed in any form, be it orally, by depiction, or written down

- Extending their skills by playing with the story in a number of different forms (visual arts, dramatic play, stop motion film-making)

A number of studies analyzing story-telling practice and implementation at schools suggest that there is compelling evidence of the contribution this practice can make to children's language development, narrative skills, cognitive abilities, and social and emotional competence. It has been shown that storytelling plays a crucial role in children's identity formation, and in their efforts to explore complex concepts that they encounter in their daily lives, particularly when offered in contexts that are genuinely meaningful, engaging, and stimulating for the children themselves. Finding ways to bridge the gap between home and school through verbal and self-directed storytelling exercises is a valuable step in creating the best possible start to studies for young people.

The Alt-ER App uses narrative creation and storytelling as the basis of its function, and in doing so can activate these and other potential benefits for young minds, while the Toolbox consists of numerous other platforms and processes for narrative based and self-directed creativity. Areas for exploration include sender and receiver roles of messages and content, depiction of complex issues in a symbolic manner, and understanding emotional stimuli and response mechanisms. Each of these are valid and worthy of exploration in a creativity and student based pedagogic model as they instigate the activity as a jumping off point to larger issues and development areas.

As regards the fallout from the global pandemic, from a structural perspective, many parents mentioned how the children missed the routine and structure provided by the early childhood or school setting. Noting that her 3-year-old daughter "has gone to the childcare setting since she was 6 months", one parent articulated how her little girl "strongly misses the social aspect of it, the routine and all the activity". Although this parent had provided "paint, playdough etc.", and they "make things together at home", her daughter "has said she has more fun painting and creating with her friends. She is very sociable". Another parent stated that her 7-year-old daughter "definitely misses her school friends and the routine of school". Another noted her 5-year-old son was "not going out as much, usually he loved going to school as he needs routine". (Egan, 2021) Some limited studies have begun to focus on planning children's return to school post COVID-19, yet much of the literature has centered on the impact of transmission and medical implications (Ludvigsson, 2020; Melnick and Darling-Hammond, 2020; Viner et al., 2020). While it is essential to discuss such aspects in planning a return to schools, plans should also be put in place to activate pedagogical strategies that will support children's social and emotional development and learning, thereby potentially mitigating the detrimental effects of lockdown and school closures (Graber et al., 2020).

In their report on Irish teachers and their concerts, social interaction skills were referenced as a key aspect of social development and one that many teachers felt play offered the most natural way for children to do this highlighting a need for interaction. In this case, where children have experienced a traumatic period, they are thought to need to play with each other again, with a tremendous benefit to social and emotional wellbeing coming from that type of interaction. The urgency of focusing on such skills was compounded by the social isolation experienced by

children during home confinement. Some respondents described children as being starved of natural social interaction and communication during lockdown whereby children may have had limited engagement with children of their age or maybe no interaction with any children at all for an extended period. Some teachers, as a result, made reference to the need to relearn social skills whereby children may need to be reminded how to play and interact with their peers. (McNally, 2021)

Arguments against ICT Usage

The following section presents the prevailing arguments against the use of ICT in schooling contexts, vital for presenting the most complete framework and best practices for ICT use and game-based learning. A consolidation of these arguments will be found in the recommendations section as they inform the best possible deployment of Alt-ER and other game based, creative pursuits in the classroom. The question of how to implement and most benefit from the use of information and communications technology in teaching is central to realizing the ambitions demanded by 21st century skills. Although there are many opinions as to what skills, exactly, will be demanded by the labor market of the future, ICT usage has been identified as a crucial component for achieving standards of competence. There are two sides to this need for ICT
usage and training. First, as the OECD report (2015) states, “Students unable to navigate through a complex digital landscape will no longer be able to participate fully in the economic, social and cultural life around them”. In light of the widespread and revolutionary integration of ICT in the modern world, there is simply a need for students to learn with, though, and by means of such technology. Second, students will have to become more capable in general. For example, the Partnership for 21st Century Skills argues “It is imperative that the [Common Core State Standards] be considered the “floor”- not the “ceiling” - when it comes to expectations for student
performance in the 21st century.” (OECD, 2011).

The abilities necessary for critical thinking, creativity, collaboration, and communication must be enhanced further in order to enable complex problem solving of the major known and as of yet unknown challenges of society. In short, ICT usage is recognized as both a core subject matter and an enabler for reaching higher standards in other core subject matters. It is no surprise, then,
that a considerable amount of research has gone into figuring out how to use ICT in practice. In the following paragraphs, a systematic overview of the case against current ICT practices will be presented, in order to identify the challenges to overcome in order to successfully obtain the benefits outlined above, and thereby present the most complete and considered framework possible.

Two general categories regarding arguments of ICT practice will be presented. The first category concerns research evidence. On the one hand, it identifies common mistakes in positive ICT writing, where at times the case for ICT is overstated. On the other hand, it presents results from the latest longitudinal studies and literature reviews in order to shed some light on the macro evidence for the efficacy of current ICT practices. There is a lack of macro-level evidence

concerning the efficacy of ICT usage in educational contexts. The second category concerns the attitudes and skills of professionals and practitioners in teaching. This research aims to examine the obstacles expressed by those responsible for the ground level work and implementation of ICT. Practitioners express a need for both technological and pedagogical knowledge regarding ICT usage.

This following part of the framework aims to present the meanings of different claims. The table below outlines different ways to understand the strength and content of a claim:

Statement Modality Assertive Commitment	Possibility	Actuality	Necessity
Doxastic	I believe P is possible	I believe P is the case	I believe P is necessarily the case
Epistemic	I know P is possible	I know P is the case	I know P is necessarily the case

Table 2. Analysis Framework

The 'Assertive Commitment' aspect refers to how strongly a claim commits to what it asserts. A doxastic commitment starts and ends with a belief about the proposition P while an epistemic commitment requires knowledge about the proposition P. The important element here is not exactly what knowledge or beliefs are, but that there is a significant difference between a doxastic assertive commitment and an epistemic assertive commitment. The 'Statement Modality' aspect refers to the strength of the either explicit or implicit modifier linked to what the claim asserts. A possibility claim is a claim that the proposition P could be the case. An actuality claim is a claim that the proposition P is the case. A necessity claim is a claim that the proposition P must be the case. In order to separate actuality from necessity, this study will regard actuality as expressing contingency i.e. that while P is the case, it might not have been. Necessity, on the other hand, expresses that P is always the case. The variations of the table are arranged such that moving up, or to the left makes a claim weaker, while moving down or to the right makes the claim stronger. What is of interest in the coming analysis is whether initial claims and further representations of those claims are consistent in accordance with the aspects outlined above.

Research evidences initial presentation and analysis of the general ICT-positive argument with the positive attitude towards ICT usage in teaching has been captured particularly well by Lindahl and Folkesson: “Research has shown positive effects on children’s learning and development, thus justifying the intensified use of ICT in the educational system.” (Lindahl, Folkesson 2012: p:422).

There are two components to this argument. The first part of the sentence expresses a descriptive epistemic actuality claim: “It is known that ICT usage has positive effects on children’s learning and development”. The second part of the sentence adds furthermore a normative epistemic actuality claim: “because of the first part of this sentence, it is known that we are justified in intensifying ICT usage in the educational system.

This study will refer to these as “the descriptive claim” and “the normative claim” from now on. In short, it is known what ought to be done in light of what is known to be the case. Unfortunately, further analysis of this claim also captures a pattern in the writings of ICT advocates. It is rare that research is in agreement with both the descriptive and normative claims of the general argument outlined above. The three sources intended by Lindahl & Folkesson to demonstrate the quoted point have this to say about their findings: “Given numerous potential confounding factors and the wide developmental stages of children being affected, it is almost impossible to make a broad-based general argument for or against computer use at school and home.” (McCarrick, Li 2007, p:91) “One should bear in mind the small size of research samples, which will have affected the results of the intervention programs.” (Vernadakis et al., 2005, p:103) “There has been a proliferation of reports, articles and websites that make claims for the benefits to be derived from children using computers but the evidence base for much of this writing is weak.” (Plowman, Stephen, 2003, p:150) The study by McCarrick and Li is a meta-study of existing empirical research between 1985 and 2004 on preschool ICT usage. The quote from their text does not support the epistemic actuality claim expressed by Lindahl and Folkesson.

Rather than claiming epistemic actuality for both the descriptive and normative claim, McCarrick and Li find it “almost impossible” to make the normative claim due to the enormous complexity of the descriptive claim. The paper by Vernadakis et al is a brief literature review concerning specifically computer assisted instruction between 1996 and 2003. While their overall conclusion is positive towards ICT usage in education, they urge that the small sample sizes undermine general arguments towards ICT usage and instead justify further research. This means that Vernadakis et al. might support the descriptive claim expressed by Lindahl and Folkesson but would find the normative claim too strong.

Plowman and Stephen deliver a literature review of research between 1996 and 2002 on specifically pre-school children using ICT. While they might agree with the normative claim, they question the evidential basis for the descriptive claim. They express that “ fundamental design problem for educational applications is the lack of an explicit pedagogical model to underpin use.” (Plowman, Stephen, 2003, p: 160).

There is a need for good models for understanding what sound pedagogical ICT usage is.

According to Plowman & Stephen (2003), ICT usage in education has the possibility of resulting

in positive effects, but it cannot be said that ICT usage as such will result in said effects. In summary, the general argument for ICT usage in education justifies a normative claim concerning its use with a descriptive claim concerning its efficacy. The validation for those claims, however, have been shown to not agree with important aspects of the general argument. This is one example of a general problem with ICT-positive research.

The conclusions drawn in one paper are enlarged to cognitive actuality when cited and are thus overstepping their justificatory reach. This weakens the overall credibility of ICT-positive claims until their evidential basis has been thoroughly assessed.

Macro-evidence of ICT efficacy

Assuming that epistemic sliding is an unfortunate pattern that takes place in enough ICT positive research to be relevant. If the strongest evidence concerning ICT usage is still positive, then surely some writing habits are not enough to overturn the descriptive claim. In the end, the crucial point is whether the evidence does stack up in favor of the descriptive claim and not how accurately it is represented elsewhere. What follows, therefore, is a look at some of the newest research at a high level of generality.

The 2015 OECD report provides an international perspective on the usage of ICT in the educational system and its impact on PISA scores. The executive summary is clear: “But where [information and communication technologies] are used in the classroom, their impact on student performance is mixed, at best. In fact, PISA results show no appreciable improvements in student achievement in reading, mathematics or science in the countries that had invested heavily in ICT for education. [...] But while PISA results suggest that limited use of computers at school may be better than not using computers at all, using them more intensively than the current OECD average tends to be associated with significantly poorer student performance.” (OECD, 2015). This poses problems for the descriptive and normative claims. Recall that the descriptive claim is rooted in research on current ICT practice showing that said usage benefits children and thus justifying future intensified ICT usage.

The findings of the report undermine both claims. It shows no appreciable improvement from heavy investment into ICT, which is counter to the claim of epistemic actuality that research shows that ICT usage has positive effects on the development and learning of children. On the other hand, even if it assumed that had said positive effects, the report still finds that more intensive use trends towards significantly poorer student performance.

This undermines the normative claim independently of the descriptive claim. It states that the above considerations are just for the descriptive and normative claims as such, but they are competing against other claims concerning what to do to improve the education system as well. The report finds the following: “And perhaps the most disappointing finding of the report is that technology is of little help in bridging the skills divide between advantaged and disadvantaged

students. Put simply, ensuring that every child attains a baseline level of proficiency in reading and mathematics seems to do more to create equal opportunities in a digital world than can be achieved by expanding or subsidizing access to high-tech devices and services." (OECD, 2015, p:3).

So, in order to make sure that every student is well suited for the labor market of tomorrow, the first step would not be to intensify ICT usage, but rather to improve the didactic processes necessary for baseline proficiency in reading and mathematics. If current ICT practice was the answer to this problem, then the report would not have found the results discussed above. Indeed, as the report finds, "[...] technology can amplify great teaching, but great technology cannot replace poor teaching." (OECD 2015, p: 16). In order to exploit the potential of ICT, it must first improve the level of teaching. ICT usage is not a fix or a substitute for investment into teachers, rather it seems to be the case that investment into teaching is a precondition for good ICT usage.

In summary, the OECD report finds that current ICT practices do not show appreciable improvements in student achievement and the potential of future ICT practices are limited by current teaching proficiency. Improving the general level of proficiency in teaching is a precondition for exploiting the potential of ICT in education. The priority of good teaching over simply using ICT is echoed in the 2009 report "How are digital games used in schools?" which encompasses a survey of teachers, policymakers, some case studies and a literature review: Research into using games for learning carried out over the past 20 years, but with very mixed results, shows that skills, knowledge and attitudes can be improved by means of Game-Based Learning (GBL), given the right environment. However, the choice of game along with the environment in which it is situated and the teacher's role as moderator are vital if the desired learning outcomes are to be achieved, meaning that video games can supplement traditional learning but not replace it (Wastiau et al., 2009).

The first thing to note is that the main takeaway from the report is an epistemic possibility claim: "We know that it can work under the right circumstances". The learning environment and the capabilities of the teacher are placed on equal footing with the correct choice of technology. The ideal use scenario indicated by the report is also limited to "supplementation" rather than replacing or wholesale transformation of traditional learning. The report also cautions against extrapolating too much from this result: "The practices analyzed confirm the positive impact of the classroom use of digital games. They nevertheless remain small in number, and more in-depth analysis, including cases where the use of digital games did not match the teacher's expectations, would be required for a more precise evaluation." (Wastiau et al 2009: 5).

Here, in other words, is an initial indication of the potential of using ICT enabled game-based learning in classrooms to supplement traditional learning. Rather than verify the truth of the positive effects of ICT usage and then justify an intensified presence of ICT in the educational system, the conclusion here is to justify further research into determining how game-based learning can supplement traditional learning at a more general level of abstraction. Game-based learning is further investigated by Boyle et al. in the 2015 "update to the systematic literature

review of empirical evidence of the impacts and outcomes of computer games and serious games" which included a focus on digital learning games.

The authors present the following point for discussion: "Since games are frequently championed as a novel, engaging and active new method for supporting 21st century skills and behavior change, it is disappointing that games for learning are still used most frequently to support knowledge acquisition. This seems to be a rather pedestrian use of games compared with the speculation about their potential." (Boyle et al., 2015, p:187). Knowledge acquisition is understood as acquiring "know-how" in this case, which does fall short of the ambitions described in the 21st century skills. Important to note here is that while the authors do find evidence of positive outcomes from using games and games-based learning, ICT usage resulting in those outcomes is far from living up to the speculated potential and innovation they could offer.

The 2004 literature review by Rachel Bolstad in "The Role and Potential of ICT in Early Childhood Education" is focused specifically on preschool children in New Zealand. The main finding regarding the efficacy of ICT usage in that professional context is the following: "Case studies show that ICT can be used to support aspects of learning including language development and mathematical thinking, and can also provide unique opportunities for scaffolding and supporting learning for children with special learning needs, and children from diverse cultural or language backgrounds." (Bolstad, 2004, p:72). Note the use of "support" for "aspects" of learning, which again places ICT usage in a supplemental role to some learning. This is much weaker than the descriptive claim, although it might still substantiate the normative claim. Bolstad's review identifies preconditions for good ICT usage similar to the two reports we have already presented: The value that ICT can add to young children's learning environments depends on the choices practitioners make about which tools to select, and when and how to use these; and their understandings about how these tools can support children's learning, development, and play. (Bolstad, 2004, p:72)

It is seen here again that teacher competence is marked as a necessary condition for exploiting the value of ICT usage in working with preschool children. One last thing to note about the evidence presented by Bolstad for the positive effects of ICT is the following: "Case studies show how early childhood education practitioners have used ICT to support a range of practices they believe to directly or indirectly support children's learning and development." (Bolstad, 2004, p:73) In other words, this is evidence of doxastic actuality claims from among practitioners. What can be concluded based on this is that those working the ground floor believe that ICT can have positive effects on children's learning and development, not that it necessarily has those effects. The belief that something is effective does not establish the knowledge that it is effective.

Overall, what the review shows is that ICT usage has proven compatible with educational practice and that educational practitioners believe it to be worth using for some tasks. The final piece of research to be presented here is the "Association Between Screen Time and Children's Performance on a Developmental Screening Test" study by Madigan et al., (2019). The lagged cohort study observed relations between child development and the amount of screen time the child was exposed to. They present the following finding: "Results suggest that screen time is likely the initial factor: greater screen time at 24 months was associated with poorer

performance on developmental screening tests at 36 months, and similarly, greater screen time at 36 months was associated with lower scores on developmental screening tests at 60 months. The obverse association was not observed." (Madigan et al, 2019, p:5)

It was previously unclear whether the directionality between development and screen time went towards children with slower development having more screen time or more screen time leading to children with slower development. Screen time being the suggested initial factor puts further pressure on proper ICT usage in education, particularly so for early education and childcare. Taking this result as an argument against ICT usage in general would be overstating its impact, but it certainly highlights the need for good ICT usage. With poor usage of screen time being detrimental, it is imperative that ICT activities for young children are structured and carried out in accordance with best practice pedagogy. Looking at the review findings of this category, the overall argument is that the level of pedagogical proficiency is the limiting factor in exploiting the potential of ICT usage in education in order to facilitate the creation of 21st century skills as well as better learning outcomes in general. That is to say the skills of educational practitioners must be increased and the pedagogical models for ICT usage must be improved.

Challenges for Practitioners

The challenges for practitioners category identifies the challenges facing the educational practitioners responsible for carrying out the ICT usage discussed in the previous section. This will be done by reviewing three studies about the obstacles expressed by the practitioners themselves.

Magen-Nagar & Firstater (2019) aimed specifically at uncovering beliefs about ICT usage from kindergarten teachers. Their study reveals three distinct categories of obstacles to better and more considered ICT usage: developmental, pedagogical, and didactic obstacles. The developmental category refers to worries regarding the natural and social development of the children. Here practitioners worry that computers in particular may "[...] enable [the children] to avoid coping with their difficulties." (Magen-Naga, 2019, p:175). The difficulties mentioned here are particularly social in nature i.e. the ICT (computers, in this case) enable children to escape from social interactions with other children. This runs counter to the ambition of the teachers to foster healthy social relations among their students.

Thus, there therefore exists a need for a framework describing how to integrate ICT usage into teaching without hindering the children's development. The didactic category refers to obstacles regarding teaching methods and environment management. The teachers expressed a need for guidance in organizing the use of the computers e.g. how much time a child should spend on the computer, what they should be doing while they are on the computer, etc. They also lack a didactically sound and standardized way to assess and evaluate what goes on when the children are using the ICT: "The majority of the teachers in this study do not track the children's activities systematically, and instead assess their work spontaneously and randomly. [...] The teachers'

reports indicate that even when they do keep track of the children's activities on the computer, they only monitor the children's behavior without assessing their learning, achievements, or what use they make of the activity." (Magen-Nagar & Firstater, 2019, p:174) The general takeaway from this worry is that teachers need help with evaluating the children's ICT usage as well as knowledge regarding the goals and methods of ICT-assisted learning.

Additionally, the didactic category also contains two worries regarding the technology itself. First, older teachers specifically expressed that they lacked sufficient knowledge to use the computer in question. Their own lack of familiarity with ICT translates to a lack of confidence in using the technology, which results in very conservative and safe usage in the classroom. Second, the teachers expressed worries regarding the maintenance of the computer. The user permissions are set such that the children can change various things about the software, which the teachers either have to spend time correcting or do not know how to actually correct. The software itself was also reported to freeze from time to time, which the teachers were not sure what to do about (Magen-Nagar, 2019).

The pedagogical category refers to learning theories and classroom management methods. This category revealed two main attitudes towards ICT usage: "First, they think that kindergarten education has more important roles (e.g., "I think there are many other important activities in the kindergarten") and that time should be spent on other things (e.g., "These nine hours we devote to things outside the domain of this square," "What they have in kindergarten, they won't have later on, such as social play and crafts, working with their hands"). [...] Second, there are the negative implications of ICT for child development, mainly social development." (Magen-Nagar, 2019) This is a fundamental concern. The teachers do not see the presence and use of ICT as having a central part to play when it comes to the core functions and objectives of the kindergarten. They are very particular about wanting to protect their vision of an ideal childhood; maintaining that the children can always intensify their ICT usage later on. Note that this worry about social development is different from the one highlighted earlier. The first issue regarding social development concerned how to implement ICT in practice. This worry about social development concerns the theoretical compatibility between pedagogical knowledge, ICT usage, and childhood ideals. In other words, the first concern is about practical compatibility while the second one is about theoretical compatibility. Fenty & Anderson (2014) also targeted practitioners in early childhood settings aiming to uncover the knowledge, beliefs, and current processes present in their practice.
The following results were revealed:

- Participants generally recognized the value and potential of ICT in early childhood settings
- There is a lack of technological knowledge to realize that value and potential
- There is a lack of pedagogical knowledge to realize that value and potential
- There is a lack of updated technology with which to realize that value and potential
- There is a lack of consensus regarding how to implement ICT in practice

While the participants in this study were generally positive towards ICT and recognized the need to incorporate technology into daily lessons, it shows a pattern similar to the findings of Magen-Nagar & Firstater. Interestingly, the level of technology available to Fenty and Anderson's participants was significantly higher than Magen-Nagar and Firstater, suggesting that the solution is not to simply introduce more widespread access to more advanced ICT devices (Fenty & Anderson, 2014). It should be noted, however, that while Fenty & Anderson uncover a generally more positive attitude towards ICT among their study participants, they also uncover many of the same expressed obstacles and worries noted in and reported by Magen-Nagar & Firstater's less ICT-positive teachers.

This is not to say that positive attitudes towards ICT has no role to play. Teachers with personal interest, experience with technology, and comparatively more experience with teaching were found to have a much higher chance of using ICT during instruction (Fenty & Anderson, 2014). Lindahl & Folkesson further expand the picture of ICT usage among educational practitioners by exploring tensions between different norms present in teaching. They identify that there appears to be a problem concerning how educators need to find balance between the child's independence and need for guidance. (Lindahl & Folkesson 2012).

This delicate balance remains a concern in the post pandemic age, where teachers have been shown to find it difficult to be flexible and dynamic in their control of the learning situation, questioning how much freedom they should allow children to have and how much assistance they can/are able to give within the learning environment (Bubb and Jones, 2020). This again highlights the need for a technological-pedagogical model of how to use these tools in educational contexts, much like the one presented herein.

In summary, the picture presented here is that the biggest obstacles to exploiting the value and potential of ICT in education during distance learning is a mixture of pedagogical and technological knowledge. Whether the practitioners were personally for or against ICT usage, both before and after the COVID-19 lockdowns they expressed a common desire for detailed and proficient guidance in how, when, and why to implement ICT usage in teaching.

This suggests that personal prejudice against ICT usage is not a leading factor in the lacking ICT results since worries and obstacles expressed by both ICT-positive and ICT-negative practitioners were very similar. While a number of issues with overstating the ICT-positive case have been identified - a lack of macro-level evidence of ICT efficacy in educational contexts has been discovered, and a lack of pedagogical as well as technological knowledge of how to make use of ICT were determined to be mitigating factors.

The macro-level evidence concerning educational ICT efficacy shows that once ICT access and usage reaches the OECD average, further increase in access or usage do not result in appreciable improvement in learning outcomes. At the ground level the research conducted here has identified a general expression of a need for more knowledge both regarding the technology and the pedagogy associated with it.

The sudden shift from classroom-based to remote learning is shown to have had a significant effect on the uses of education technology in schooling. (Bubb and Jones, 2020) Due to the complex and multifaceted nature of early primary education, the shift to remote teaching and learning proved to be quite difficult for teachers, parents, and students. (Timmons, 2021) As is to be expected from established understandings, the pandemic has highlighted the limitations in professional preparation related to the use of technological tools.

Many teachers have expressed a need for more training in teaching online, but those that already utilized digital learning platforms and strategies had fewer barriers to remote education processes. Given the peripheral understandings already established, a wide range of training is necessary, and this training should include how to utilize the different platforms as well as how to work with families online. Teacher training should include development of the knowledge, skills, and dispositions necessary to successfully reconsider and participate in distance teaching and learning, and needs to be comprehensive including not only how to plan developmentally appropriate activities that can be implemented distantly, but also how to work with caregivers with various levels of skills and education. (Atiles, 2021)

Alt-ER Participatory Model for Transitions

Overall, the research and activities conducted during the execution of the Alt-ER project have determined that there are barriers to the use of ICT and creative, student centered learning strategies in the periods before and after the transition from kindergarten to school environments. A number of potential concerns can be addressed through the use of properly considered activities and a concerted effort to make their value and harmony clear to pedagogic concerns. This demands a thorough mapping of the pedagogic tenants at work, the potential benefits of ICT, and the ways self-directed creativity can be a part of Alt-ER and other existing applications, which can be used in the classroom.

The following Participatory Model for Transitions has been developed by Lisa Gjedde - a task complementary to her long career in working with media and children as a Researcher at Aalborg University in Denmark - to create a base understanding of and address skepticism about the use of ICT in ECEC, while at the same time drawing important connections between self-created storytelling and valuable pedagogic intent.

Additionally, the framework makes considered effort to highlight the possible benefits which come from multi-modal deployment of the Alt-ER strategies across the contexts of school and home to scaffold the potential benefits and engagement with learning. This framework and model are not specific to Alt-ER, but rather they lay out a process for using storytelling to validate and expand the potential of any ICT property, as long as the whole is taken into consideration in the selection of the given activity. The model below consists of six areas, Creative and Narrative Explorations, School Family Communications, Artifacts as Prompts for Dialogue, Resilience

through Socio-emotional Development, Developing Shared Dialogues, and Continuity Across Contexts, each of which will be further described below.

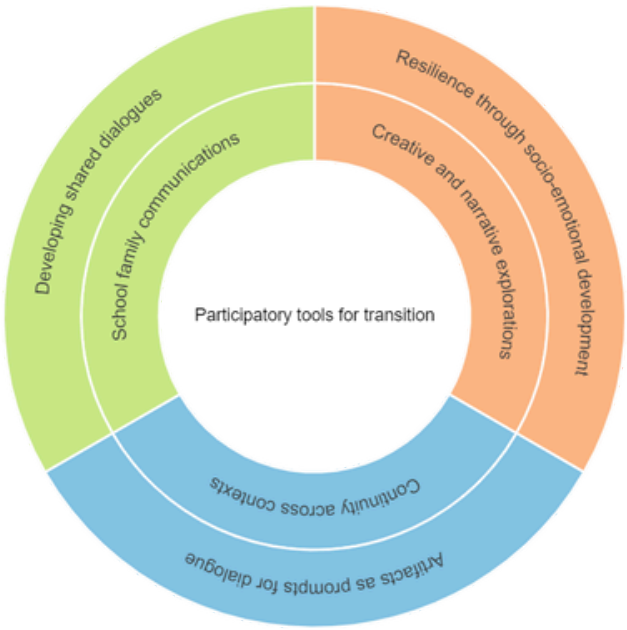

Fig. 1 Participatory Model for Transitions, Lisa Gjedde, 2018

Creative and Narrative Explorations

Creativity stands as one of the central competences most valued in 21st century employees. As such, it is deeply important to accommodate this increasing demand for creative minds through education, starting with training programs for teachers. Teaching creatively and using imaginative approaches to make learning more interesting and effective, and provides opportunities for children to express their own styles and personalities. Teaching for creativity aims to foster creative thinking and behavior among children through different teaching methods and strategies, while Storytelling supports development of creativity, risk taking, and coping with uncertainty. Early narrative competences are linked to and predictive of improved reading comprehension in later primary school years and help to create a secure foundation for future literacy and long-term success in schooling.

School Family Communications

Communication between different institutions and the direct involvement of families, as well as teaching children to work in different social and cultural settings have been shown to smooth

transitions for children. Guided participation takes into account not only the active engagement of children, but also the role of peers and caregivers between whom communication plays a significant role in easing transitions. Using ICT with the support and cooperation of teachers and parents, can result in a more positive attitude towards learning overall and improved academic performance with learning as parents, teachers and children working in collaborative ways together leads to greater engagement.

Artifacts as Prompts for Dialogue

Both surface level and symbolic levels of meaning can be explored through dialogue based on depictions. Artifacts are items and depictions reflective of the real world with which young people in the transition period are still coming to terms and building their understandings of. Narrative creation fosters imagination development, creating an inventive space to play and ponder which enables thinking about the world around them, people and relationships. Encouraging creative thinking and providing tools necessary for children to think imaginatively is highly beneficial for individual development and for complex problem solving.

Developing Shared Dialogues

Adults' understanding of children's needs and priorities is linked to the attention paid to the communication style of the child, and attentive adults are more likely to engage in dialogue, which in turn fosters a better understanding of a child's learning needs. A teacher must be aware of both child`s and his/her own perspectives, possible only through dialogue with that student which demands that both children and the teacher must be involved/engaged in the process and present. In cases of shared dialogue, the goals of the teacher and a sensitivity to the child's perspective have to work simultaneously to develop meaningful exercises.

Resilience through Socio-emotional Development

Social interaction is crucial in any child's development and children should be seen as inherently engaged in the social world from birth. Social engagement prompts development of skills in independently carrying out and organizing activities as a part of society. Adult mediation is a way for children to be equipped with appropriate tools to focus on learning outcomes in the creative processes they undergo in different contexts, giving them the necessary foundation for expressing themselves. Storytelling is recognized as a critical aspect of human thought and development, it positively affects social, emotional and lingual development and has a heavy influence on identity formation, which builds resilience and grows a sense of self-worth.

Continuity Across Contexts

Teachers are ideally meant to act as supporters, coachers, facilitators and models of creativity for children. The family is perceived as a micro social group within a macro social context, acting as a collection of individuals with shared history who interact within ever changing social contexts across increasing time and space. Parents and teachers working in the same mediated

space benefit retention and engagement, while supporting and creating links between young children and their caregivers both at home and in school is a vital part of successful school transitions. There also exists a marked importance for collaboration and communication between kindergarten and preschool environments to ensure a smooth and successful transition for children

As can be seen here, there are important considerations behind the conception and execution of the Alt-ER Framework, App, and Toolbox which relate to a variety of relevant and interrelated aspects of ECEC and transitional phases for young students. The framework and model present the importance of self-directed creativity in the form of narrative building and communication, and tie those to concrete aspects of the life and developmental schedule of young learners.

Alt-ER takes the additional step of laying out how ICT can be a successful mechanism for engaging those activities, based on thoughtful consideration of the technology in question, the reasons for using it, and the potential benefits that can come of the process. The core takeaways will be featured in the following section which can be regarded as recommendations for just such thoughtful use of ICT and storytelling in creating a successful start to education for young people.

Reflections on the Participatory Model for Transitions During and Following COVID-19

The Alt-ER Participatory Model for Transitions has been effective in creating a context for understanding the role and efficacy of creative strategies as employed by digital means, and holds up in the wake of massive tumult resulting from the pandemic. Being that it meets the demands of so many of the emergent needs of young people in the transition, the Framework developed in the first iteration of Alt-ER is an effective lens through which to confront and engage with an unpredictable future while maintaining high standards for the transition from kindergarten to primary education after COVID-19. The demands of schooling at home, the effects of isolation from social networks, and the confusion that young people have experienced in an uncertain time are all things that the Participatory Model for Transitions is well suited to address, and it remains an effective framework for considering and engaging with new social constructs existing in the world.

Artifacts that allow children to engage with the pandemic and its lasting effects are a valuable tool for working through the shared trauma of the event, and in especially confusing and unsettled times, the need children will have for meaning making is even more pronounced than initially posited in the first iteration of this project. Not only does the Framework address this by instigating narrative explorations to explore feelings and perceptions, but it creates resilience through socio-emotional development based on building shared dialogues to express and explain the coronavirus and its implications on society. It can be argued that the connection between school and home are similarly more relevant in the worlds of children who will always

previously have been subjected to the closures the world experienced as a result of the pandemic, and that communication between school and home and creating continuity across those contexts may be more important than ever given the precariousness of traditional educative structures in a world where global outbreaks have a potential to become more common.

Reflections on the Alt-ER Toolbox During and Following COVID-19

As mentioned earlier, the uncertain nature of this pandemic and the varied responses across the globe have been difficult to manage in ECEC, and remain so with no guarantee that there will not be another outbreak and another round of public health implications. As such Alt-ER has focused more on the individual role in public health and safety, and the importance of scientific knowledge and recommended practice as opposed to specific reference to this particular emergency. Being that it meets the demands of so many of the emergent needs of young people in the transition, the Framework developed in the first iteration of Alt-ER is an effective lens through which to confront and engage with an unpredictable future while maintaining high standards for the transition from kindergarten to primary education after COVID-19. The coronavirus pandemic has allowed for an opportunity to make meaningful change in the way the world addresses education, and can be seen as a chance to create more equitable, resilient, and meaningful education systems.

The links and suggestions provided in the Alt-ER Toolbox represent a furtherance of many of the concepts inherent to the Alt-ER App and have strong resonance with the associated Framework. They exemplify student centered learning activities that can help promote socio-emotional development through creativity, agency, and collaboration and take the Alt-ER construct into an even deeper level of personally directed creation. Whereas with the Alt-ER App children play the role of interpreter, the additional Toolbox actions function in a more productive capacity where new content is conceived, developed, and created.

While the concepts presented in the Toolbox are effective and attainable, as we have seen in the reporting there is sometimes a mismatch between the digital skills of teachers and parents and the demands of ICT processes in education. As such, a series of primer videos for many of the Toolbox elements have been created which feature prominently in the Toolbox itself. These videos and the tactics explored in them will help the Toolbox function with more efficacy and help teachers, students, and parents create more and better films.

Stop Motion

Stop motion animation is a great medium for activating creativity and storytelling in young minds as it allows for any conceivable story to be convincingly brought to life. The process involves drawing and artistry in a way that film does not, but still has the peripheral benefits of

stage-based progression through scripting, storyboarding, and final production. Groups are best suited to undertake production considering the varied roles demanded of creating a stop motion animated piece, but individual efforts can also be highly rewarding. Alt-ER based character sheets are available for use in the execution of stop motion productions, creating further continuity across concepts in fully activating Alt-ER as a learning platform. As with live action film, the final piece is an excellent bridge to the home and activates the parents as viewers, ideally sparking further productions outside the school environment.

Video Editing

Film Production functions in many of the same ways that stop motion animation production does, film production will allow young people to find a voice of their own in the creation of a short live action film. Filmmaking and video editing exercises will create opportunities for students to make a narrative film that depicts scenes and actions they find relevant, and will allow for a presentation aspect in showing the films in the classroom. The skills and understanding of film media will be a benefit to young people in the future by providing them with tactile skills in film production, but also give them a head start in understanding the increasingly important role of media in the modern world.

Sound Editing

Sound editing is an important part of filmmaking, but it is also a valuable art in and of itself. Creating and editing sound and music will allow for a different creative exploration and can activate subtle learning with deep impact on emotional development. Sound editing places importance on the tone and feeling made possible through sound. The main areas of sound editing are dialogue, effects, and music. Students can use scripts to record dialogue for short films, create sound effects for specific actions in the films, and make soundtracks to accompany the film. Fun exercises can include sound hunting, where students armed with a recording device search for relevant and interesting sounds or get background soundscapes for use in the film. Examples include crinkling a bag of chips to simulate a fire or rustling a ball of tape to mimic footsteps in the grass.

Photo Editing

Photo editing will provide an ample space for exploration and creativity, allowing students to make personally driven alterations to existing or new photographs. Photography in itself needs no introduction as a deeply creative pursuit, one where attention to detail is greatly rewarded. The process of taking photos and altering them in a photo-editing program though, expands those creative possibilities. Photo editing exercises will allow students to apply filters, flip and zoom images, and engage with the subtlety of framing an image in different ways. An interesting overlap between this and the filmmaking apps could be to have students create posters for their short films.

Game Creation

Video games are an emergent media in terms of engaging self-directed creativity, but one that will resonate thoroughly with young audiences who are very familiar with gaming constructs. Assuming the control of the creation of a game though, changes perspective and expands the thinking about the media as a whole. The skills developed in creating a game/experience in the suggested apps will not only be a creative exercise, but can also inform and expose young people to hard skills demanded of programming. Activating areas that deal with risk/reward, goal orientation, and patience, creating games can be a fantastic means for engaging children with curriculum through carefully planned use.

Scriptwriting

Scriptwriting represents an activity most closely tied to traditionally considered storytelling, simply creating a narrative from a single child or the shared minds of a class. The process encourages far more opportunities for cooperation and collaboration in group settings, but is still productive in solo or one on one use. Determining motives for and skills in reading human behavior are beneficial aspects that can be easily affected in the process of scriptwriting. Describing the why behind the actions is a positive and generative way to develop and describe rationale, influence, and intent.

Green Screen Studio

Green screen, or chroma-keying as it is also known, is a process where you work with a colored screen to create a background for video, allowing anyone to place actors or actions in fantastic settings. The term green screen comes from the traditional green color used for the screen, allowing you to replace everything that is green. For example, if you have a green background, you can change the background into a beach by putting a picture of a beach in the background using an app. If you wear a green shirt, only your neck and head would be visible allowing the green covering your body to disappear into the wall, essentially becoming the chosen background.

Recommendations for ICT Usage in ECEC

The research and exploration of ICT and storytelling in ECEC undertaken in this project has led to a base of understanding about its use in practice. Analysis suggests that the main obstacles to ICT use is attitudes towards the technologies and how teachers use them. This is evidenced by their use not as a technological means to renew and refresh their teaching, but simply to search for information, replace the traditional books with digital alternatives, and for purposes of illustration. Such use creates limited learning that leads to a mismatch between ICT use and students' achievements (Hsu, 2016). It also neglects to contextualize ICT by way of student-centered pedagogy, and the important role it can play in self-directed creativity. The conclusion emerging from this finding is that schools and teachers do not always realize the pedagogical potential of ICT, and do not use it to implement new pedagogies or develop thinking and

creativity, and so the didactic tools being used remain traditional (Noga & Firstater, 2019). The following paragraphs will serve as a guide to the most effective use of ICT, storytelling, and the Alt-ER platform itself in Early Childhood Education and Care contexts, and will prescribe a process for the application of ICT in educational pursuits in advance of, during, and following the transitional phase.

As evidenced earlier, effective ICT implementation mainly depends on attitudes and knowledge related to the use of ICT and the specific ICT property in question. The importance of professional development by teachers as regards ICT competence is publicly acknowledged and widely supported (Unesco ICT- CST, 2008). A 2019 report The Obstacles to ICT Implementation in the Kindergarten Environment: Kindergarten Teachers' Beliefs (Noga & Firstater, 2019) reveal three main obstacle-related categories, of which the first two are most salient: 1. Pedagogically, despite acknowledgment of its value, ICT does not play a key role in the kindergarten teachers' education philosophy; 2. Didactically, ICT is used mainly as a source of information and for instructional illustration, rather than as a means to new teaching strategies; and 3. Developmentally, in that computer use affects children's social development, especially those with special needs, but not always positively.

The main conclusion is that kindergarten teachers neither overcome these obstacles nor utilize ICT potential to its fullest; hence, teachers should be encouraged to participate in ICT-related professional training to understand the didactic opportunities ICT offers early childhood education and its developmentally related pros and cons in order to adopt innovative ICT-related pedagogies.

The New Zealand Council for Educational Research (2004) suggests that effective ICT implementation in ECEC is highly dependent on choices that teachers/practitioners make – which tools to select, with what purpose, and when and how to use it. Effective professional development in regard to ICT incorporates teachers `own inspirations, aspirations, skills, and knowledge, using ICT to provide different opportunities for teachers to learn and explore ways of working in their own early childhood education settings. This is to say that it is of vital importance that teachers and parents come to terms with underlying pedagogic theory and goals that put forth and show how ICT can act as valuable tools for young people.

Effective implementation also depends on practitioners' knowledge of contemporary theories about learning and development, and emergent linkages between them and ICT. This is to say that practitioners need to be familiar with contemporary theories and recognize how ICT usage can be integrated and utilized to create the desired effects. In this regard, a sampling of the pedagogic theory at work in the Alt-ER Framework is a suitable start, highlighting the importance of story-telling and creativity as a potential for social-emotional development and presenting digital strategies for activating those areas. ICT tools should not be seen as a way of superseding or displacing other educational activities.

According to Siraj-Blatchford and (2006, as cited in Kalas, 2010), ICT usage should not come at the expense of other activities. To the contrary, ICT implementation in ECEC should be seen as a complementary activity that is best used to support children in their learning and play (see

advantages of ICT usage in ECEC above). This is to say that ICT should not be used to replace a currently running and effective strategy, but rather that it should be considered in existing contexts to determine methods by which it can best be used to further and scaffold the learning areas and goals prescribed for the period. According to DATEC (Siraj- Blatchford & Whitebread, 2003), time spent using ICT applications should be comparatively short, normally not meant to exceed 10 to 20 minutes at a time in the case of 3-4-year-olds while it can be extended to a maximum of 40 minutes by the age of eight.

Practitioners should ensure that screen time be used in moderation and remember that the most effective way to enhance children development is "through high-quality caregiver child interactions without the distraction of screens". (Madigan et al., 2019) This is to say that use periods for any ICT tools should stay within reasonable constraints, and that their use should be offset by engaged discussion with students about the process, its reasoning, and values that are critical to its use.

It has been determined that creating a strategy for learning that bridges the home and school environments is a strong tool in heading off disruptive and negative issues common in the transition phase. Alt-ER is meant to be used in both the school but also the home, with the benefits multiplying across the different settings and contexts for learning. More than two decades ago, Staker (1993) proposed a list of possible strategies how to promote collaboration among parents, schools, and children in related to ICT at ECEC, which follow:

- Workshops for parents in small groups, where they could talk about children's work with ICT
- Allowing parents observe children at work with ICT applications
- Displaying children's ICT-related work in the school entrance hall to inform parents and stimulate their interest
- Parents being invited to work with groups of children in the classroom
- Children being able to borrow ICT equipment from schools
- Parents being offered advice on the software, which could be specifically purchased for use at home

As the Unesco report on ICT usage in ECEC (2010) states, at times parents have various misconceptions with regard to ICT usage in ECEC, resulting from parents' concerns and anxieties that their children will be exposed to aggression and violence. Parents fear that they will not be able to help and/or understand their children in the ICT area, they will fail to protect from potential threats and will not understand why and how their children are using ICT. Therefore, there is a great need for parents' closer involvement and better understanding of ICT usage at schools and kindergartens. The Unesco study (2010) in relation to ICT usage in ECEC presents the following strategies regarding how to improve parent's perception and knowledge of ICT:

- Encourage parents to enter (both metaphorically and in real life) the classroom, to be active along with their younger children, to get involved in and experience ICT activities

- Arrange open classes for parents (and teachers from other settings) to demonstrate approach and activities engaging ICT, so parents may familiarize themselves and experience different ICT applications
- Organize special workshops for parents, where they are presented with the appropriateness of 'rules of action', which they should follow at home as well
- Clarify the importance of early childhood education and the potential role of ICT in it to ensure systematic cooperation with families
- Organize presentations of educational activities of a class followed by analysis and recommendations
- Make clear the educational goals, learning strategies, and activities in relation to ICT integration as well as presenting examples of videos, recordings, and different project and activities outputs
- Collect and present electronic portfolios of children`s products and distribute them to parents

These prescriptions aim to help parents understand the value of ICT activities in early childhood education and to consider and critically assess the process through which they are utilized. Moreover, it helps to build cooperation across home and school contexts, creating learning opportunities from the experience, as well as adopting valuable rules and procedures for safe and productive use of ICT in the home. Finally, it helps to create a dialogue regarding educational programs, intents, and forms that can inform an understanding of the goals of and strategies for their accomplishment that underpin education for years to come.

The literature review and analysis conducted by Standford et al. (2015) regarding teaching with computer games in formal education suggests that the following factors play an important role in shaping how teachers understand the potential of games in schools and how they are able to implement it:

- Technical infrastructure - Institutional and professional factors, such as time, space, cultures of collaboration, knowledge sharing, classroom rituals etc.
- The extent to which games can be 'disaggregated' and appropriated to meet specific needs. - Teachers personal experience of game play and their personal and professional identities as teacher
- Cultural expectations of children's attitudes to and expertise in playing computer games

Standford et al. (2015) continues, suggesting the following factors to take into account for teachers and school while implementing ICT activities:

- Teachers should have clear knowledge about learning objectives they are aiming to achieve and identify the precise role that ICT plays in it
- Games should not have to be used in their entirely to support educational goals – in some cases, certain elements of the games and be extracted and applied for specific purposes
- Teachers and students should have sufficient time to get familiar with the game

- There needs to be sufficient time for reflection and review of game-based activities to be systematically implemented into curriculum, being aware that some time might be needed to assess any technical issues that might exist
- Working with "expert" student groups could be beneficial while implementing new teaching and learning approaches.

As regards policy in the European Union and beyond, the project group have determined corollary outputs from The Early Learning in the Knowledge Society conference held in Brussels in 2003, which proposed the following policy recommendations for effective development of ICT competence of ECEC teachers (Siraj-Blatchford & Siraj-Blatchford, 2006):

- to include Early Childhood Education and Care in national ICT strategies for education
- to provide initial training and ongoing professional development for all practitioners
- to optimize ICT policies by supporting parental involvement
- to support knowledge building and cooperation at all levels for practitioners, policymakers, and parents

Alt-ER Specific Recommendations

- Familiarize yourself with the framework, App, and Toolbox to create the best opportunity for benefit
- Consider presented theories that highlight the benefits of learner based and creative strategies for learning and development
- Discuss the framework, App, and Toolbox with colleagues, staff, and parents to create a unified front
- Discuss the application and its intent with the class prior to its deployment, including the learning goals
- Do not "hide" the learning, seek and embrace opportunities to point out lessons in the activity - Act as a supporter or coach for creativity, with an open mind to the suggestions from the children
- Scaffold the experience – consider the home an extension of the classroom and support further use of the app with family and friends outside school –
- Pay attention to the cues that may come from the inputs, consider their implications and when possible build on those notes Embrace the benefits possible through exposure to
- both the technology but also the varied viewpoints of the others in the class Seek opportunities to encourage and facilitate collaboration and communication - Allow
- time for unstructured exploration, a valuable path to self-reliance
  Encourage storytelling and the development of narrative, both fictional and from
- personal experience

- Look for opportunities to discuss the agenized learning goals of your curriculum through the ICT lens
- Look for opportunities to discuss symbolism as well as practical depictions
- Mix groups to encourage further integration of the students and presentation to new
- audiences
- Train social norms through turn taking, attentive listening, and presentation/feedback
- Consider screen time guidelines for the age group question
- Look for opportunities to teach “how to think”
  When in doubt, ask them why!

Reflections on the Recommendations and ICT Usage During and Following COVID-19

In light of an extensive literature review and wide-ranging interviews about the effects of the pandemic on ECEC carried out with relevant informants the project team have developed the following recommendations for ICT use in the wake of COVID-19:

Prioritize in-person attendance: Firstly, priority should be given to in-person attendance for children in this age group. As was widely discussed in the literature, the abrupt interruption of kindergarten attendance, although needed, negatively impacted on cognitive and socio-emotional development of children and particularly that of the most disadvantaged (see for example La Valle et al., 2022 and UNESCO, 2020). Additionally, students under six years old have difficulty maintaining attention and engagement for long periods of time, which can make distance learning challenging. Importantly, children in this age group require significant social interactions and structured learning environments that cannot be ensured in remote education

Ensure technological support and financial accessibility for distance learning: the experience with the pandemic showed the inequalities in terms of access to digital technologies (both infrastructure and equipment) and how they can lead to the exclusion of some groups of children in the case of a need for distance learning (Carretero-Gomez, et al, 2021). To contrast the increase of inequalities due to the different opportunities, governments should provide the necessary technological support to children and their families. In particular, governments should support those who cannot afford the cost of computer devices and reliable internet connections. This could include the provision of free or low-cost computer devices and internet connections for low-income families

- Provide support for parents: During the pandemic parents found themselves significantly involved in the educational activities of their children (Benigno et al., 2020), and they were not always ‘equipped’ to answer the school's demands. Parents should be supported in helping their children participate in distance learning (and in general in dealing with ICTs) by providing them with the necessary information and resources to fulfill their role effectively (Carretero-Gomez, et al, 2021). Schools may set up online meetings both to

share educational objectives and strategies and to familiarize parents with ICTs adopted with their children

- Ensure constant communication between the school and parents: school-parents communication is paramount to allow a fruitful collaboration. It is necessary to maintain regular communications (through phone calls, mails, chat, online individual/group meetings) with parents, providing updates on the progress of the school and suggestions for helping children learn at home
- Attention to setting during online lessons: It is necessary to ensure that children have access to a safe and secure environment so that they can participate in online school activities without any distractions or interference. Additionally, it is important to ensure that the computer or device they use for school is up-to-date, secure, and suitable for their use. In this case, as suggested by Carretero-Gomez et al., 2021, training on digital safety should be available for teachers, school leaders, students and parents
- Take care of the mental health of children during and after the distance learning period: significant behavioral changes have been noted in children due to a forced distance from the class group and their peers, such as anxiety, restlessness, aggression and sleep or mood disorders. With remote education, teachers experienced the lack of personal contact and computer-mediated communication limited their possibility (in terms of times, opportunities, but also knowledge) to explore their students' wellbeing and needs, and families were called to manage the impact of the pandemic without any help (Carretero-Gomez, et al, 2021). Children's mental health should be carefully monitored and professional support is desirable in case of psychological distress. Teachers can provide support especially when children come back to schools setting up activities to help children cope with their experience (e.g. activities based on reading, storytelling, and conversations about emotions)
- Improve teachers' pedagogical practices: the pandemic highlighted the need of ensuring adequate training for teachers at methodological and technological level for integrating ICTs in the teaching practice. Indeed, teachers should have clear knowledge about learning objectives they are aiming to achieve and identify the precise role that ICT plays in it. Other aspects that might be improved are promoting collaboration and dialogue among peers and mastery of learning. In this line, Carretero-Gomez, et al, 2021 suggest also supporting the development of social and emotional skills by teachers, which appears to be important especially in remote schooling. Indeed, these skills should help them both to work on students' motivation and engagements and to support their own mental well-being
- Online session organization: During online lessons, teachers should focus on hands-on and experiential activities that can help children in this age group better understand concepts and learn more effectively. It is recommended to organize teleconferencing teaching sessions with a duration appropriate for the child's age and attention span, and to organize interactive online learning sessions with teachers and other children of the same age, so that children can maintain a sense of belonging to their class and learn through interaction and collaboration. Asynchronous activities to be carried out with the help of parents should be also designed and made available

- Improve the policy in the European Union about ICT: to include Early Childhood Education and Care in national ICT strategies for education, to provide initial training and ongoing professional development for all practitioners, to optimize ICT policies by supporting parental involvement and to support knowledge building and cooperation at all levels for practitioners, policymakers, and parents

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Addendum 1 - Report on Interviews

Author of the report: ITD-CNR Interviewers: Francesca Maria Dagnino (ITD-CNR) and Santeri Koivisto (Teacher Gaming)

Introduction

One of the expected results of Intellectual Output 3 (IO3) is the study of the use of ICTs and the role that creativity plays in Early Childhood Education and Care (ECEC). To collect data about these two topics a series of interviews were carried out with figures that cover an important role in children education and care: teachers, parents and psychologists. Given that the Alt-ER 2.0 project is specifically focused on the impact of the COVID pandemic, interviews investigated the use of ITCs and creativity in particular in relation to the events and needs of that specific period. Moreover, interviews represented a valuable opportunity to collect experiences and opinions regarding the impact of measures implemented by governments to contain the spread of the pandemic on children wellbeing and learning.

It is necessary to premise that the interviews were carried out in two countries in which measures taken were very different. In Finland the government issued an Emergency Powers Act, first time after the world wars, on 16th of March 2020. All students, excluding daycare and preschool, were moved to remote education. Only exception was students from families where parents worked in a field that was crucial for society's functions, such as healthcare. Remote schooling started 18th of March. The 29th of April the government decided to move back to classrooms and normal school routines in comprehensive school started the 14th of May. After spring 2020, the Finnish comprehensive school functioned normally with only minor limitations regarding social distancing and school trips.

In Italy, an administrative order called the Decree of the President of the Council of Ministers (DPCM) on March 9, 2020 decreed the school closure. The schools remained closed till the end of the school year and remote education was set up. In September 2020, schools opened and, at kindergarten and primary school levels, remained open for the entire school year. The government established strict measures (Ministry of Education, 2020a) related to social distancing, temperature control, protective masks (for children older than 6 years), and hand hygiene. A quarantine period was established for children with the infection and their classmates.
For kindergarten specific measures (Ministry of Education, 2020b) were established; children were organized into stable groups that could not mix and had a dedicated area in the school. Children ate lunch in the classrooms. Measures related to social distancing, protective masks, hand hygiene and quarantine remained in place in the 2021-2022 school year.

Method and Participants

In the spring 2023 a total of eighteen one-on-one semi-structured interviews were carried out in Finland and Italy. Among them nine addressed parents (seven from Finland and two from Italy),

six addressed teachers (four from Finland and two from Italy) and three addressed psychologists (from Italy).

Procedure

The text of the interviews was prepared by the project partners and covers the following areas: (1) children's wellbeing and learning during and after the pandemic, (2) topics and tools for conversating (about the pandemic); (3) creativity. Finally, the interviewees were presented the Alt-ER 2.0 app and were requested to state if they would consider it useful and if they would have used it in their work or with their children (see texts of the interviews in Appendix 2). The Italian interviews were recorded and transcribed verbatim while the Finnish ones were transcribed in real time during the interviews. Before the interview, Italian participants gave informed consent to the recording, processing, and use of the material collected.

Transcriptions were analyzed using a thematic analysis approach that aimed to identify and analyze patterns (or themes) within a set of data (Braun & Clarke, 2006; Kelle, 2007). Basically, the analysis was carried out in an inductive or bottom-up manner, namely who analyzed the transcriptions and coded the different parts of the interviews starting from the text without pre-existing categories or hypotheses; themes were not identified beforehand but resulted from clustering codes that convey similar meanings.

Interviews were coded by two researchers experienced in thematic analysis; one of them also conducted the interviews. The coders familiarized with the transcriptions reading them and then started with the coding process. They coded the texts independently and generated individual code sets for the interviews and then they compared their code category sets to develop a single one. Differences in the interpretation were resolved through discussion and negotiation. Finally, a "code book" (a set of codes) was built (available in Appendix 1). This two-step process – individual parallel coding and subsequent negotiation of differences in the generated codes -ensured the consistency of the process. Interviews were read again and coded for the last time with the final set of codes and finally themes were defined aggregating the codes.

Results

Results will be presented and discussed for each category of respondents and then compared in a 'Discussion' section. Excerpts from the interviewee's sentences are reported using the interviewees ID which include: abbreviation of nationality (ITA [Italy] or FIN [Finland]), and of group (Psy [psychologist], Tea [Teacher], Par [Parent]) plus a number.

Psychologists

The interviewees were three educational psychologists, females, with a range of experience between five and nine years. They work especially with children with learning disabilities and autism spectrum disorder. Two of the three collaborate on a permanent basis with kindergarten teachers and one of them is a supervisor of the educational services managed by the Municipality. The three of them carry out research in the field of developmental psychology.

As written in the previous section the interviews covered three areas, themes will be presented within each area.

a) Children's wellbeing during and after the pandemic

One of the aspects that affected children wellbeing was undoubtedly the abrupt interruption of the school attendance. The first theme that was identified was, then, 'Remote education' The necessary premise that one of the psychologists made was about the difficulties met by teachers in activating and carrying out remote educational interventions, situation that clearly affected the continuity and quality of educational activities. According to the interviewee, this was due both due to the lack of clear indications and guidelines from the Italian Institutions for kindergarten and to the lack of technological skills of teachers.

As far as the first point the psychologist said:

"During, let's say the lockdown period, kindergarten actually remained a little bit more isolated compared to all the other grades and this, [...], because there was a lot of focus especially on distance education on the compulsory schooling, from the primary onward. But kindergarten had to 'invent' itself a little bit... "(Psy1)

This has led in most cases to sporadic and unorganized interventions, although specific attention seems to have been given to children with disabilities, thanks to support teachers:

"There were some schools that tried to do some activities and then also maintain a minimum of contact with children, with families by maybe doing some online meetings by doing some networking with families, especially when it came to cases with disabilities, because I was also in contact with some families of children, for example with autism spectrum disorder, rather than other intellectual disabilities. And however, what emerged, especially that there was mostly the voice of the support teacher...". (Psy1)

On the other hand, one of the interviewees pointed out that the pandemic favored the use of technologies in primary school and reported also positive experiences in which remote education proved to be useful to support children during the lockdown:

"*I also have some works made by teachers who created stories and sent them to children to tell them a little bit about the lockdown period and not make them feel lonely* ". Psy1)

The role of the families in the children's attendance to remote educational activities was highlighted by the three psychologists. The lack of devices and the possibility for parents to support children in attending the online activities were core issues:

"Disruptions even with respect to the program, with respect to access to training that emerged precisely as a result of the fact that there was a lack of tools or because maybe there were

multiple children in the house and the computer is there, only had it -- there was only one computer that had to be shared among the children at different times, so it became really complex from that point of view". (Psy2)

"*Then of course it takes the mediation of the adult, so the family has to be involved, because a 5-year-old child is not that yes, OK, that they are good they are technological, however, it is not that at 9 a.m. one turns on the computer by himself and log on to the online meeting*" (Psy1)

A last issue raised by one of the interviewees is about school-family communication that was hindered by distance. Indeed, during the lockdown but also in the first months of the following school year, parents were not allowed to enter the school and meetings were held on line. The type of communication (instant messaging) and the linguistic problems exacerbated by distance limited the possibility of networking with the families with a consequent impact on children.

Another identified theme was 'Main difficulties met by children during the lockdown'; the interviewees identified several aspects having consequences at emotional, relational and educational level.

One psychologist pointed out that the lockdown was difficult to understand for children (due to the fact that also adults were not aware of the events). It caused a sense of exclusion and an emotional distress difficult to contain:

"*There was a sense anyway of danger, of upheaval, let's say, of life as one knew it and so let's say the emotional aspect, [...] especially with respect to the fact of...fear, nervousness anxiety, these are all emotions that are difficult to contain*". (Psy2)

Social isolation was cited by the three interviewees as a difficulty. Technologies were considered useful to allow the older children to keep in touch with their friends:

"*From my point of view, the greatest difficulty was the lack of interaction with others, because those who had no siblings were in a state of complete isolation from other children*". (Psy3)

Another aspect that was raised by the three psychologists is the change in (lack of) routines; one of them highlighted how time was no longer paced by commitments and that caused boredom or in some cases led to an overuse of video games. Again, parents had a fundamental role in regulating the activities of the children:

"Because they no longer had a structured time, and the child is not able to self-regulate, they need their time at school, sports time, maybe time to visit their little friend, grandparents and so they found themselves with days that no longer had a container nor anything paced except then fortunately online classes and homework, that is, without the intervention of the parent who then maybe often worked online as well, they didn't really know how to occupy the time, they certainly didn't get into homework or games without the adult's intervention more". (Psy3)

The interruption of school attendance caused the children to experience deprivation from stimuli considered essential for children learning and development; this was more true for children living in families with a low socio-economic status or whose parents can't take care of them. One of the interviewees stressed the fact that during the lockdown differences due to socio-cultural and socio-economic backgrounds became more pronounced:
"...but it is also and above all a deprivation at the level of stimulation, at the level of support that school gives with respect to stimulation as well no, because in any case for many children who perhaps come from families with a background, let's say lower socio-economic, school acts as a buffer, with respect to the lack of stimulation that there is at home" (Psy2)

According to the three psychologists this impacted the children growth and learning, especially for the children in the transition phase (last year of kindergarten and first year of primary school):
"...entry to school, even to elementary school, is a turning point even at the level of cognitive processes, because the structure of elementary school is different from the structure of kindergarten and so there is just an adaptation also to the context and an environmental stimulation that changes and goes to structure, missing (because even children who have primary in lockdown have done it completely differently with respect to how it would have been if there was no lockdown and coronavirus) that window there is an important critical period where important stimulation was missed" (Psy2)

This analysis is strongly related to the following theme that was the long-term effects of the pandemic on children mental health, well-being and learning.
Consequences of the problems discussed in the previous paragraph can be seen at level of cognitive development especially for children who may have already existing frailties. One aspect that emerged is the difficulty in emotions regulation that was ascribed to the above-mentioned deprivation of school attendance and of structured interactions with peers and adults:

"Children in this sense are also in an important stage of emotional sensitivity, because they learn to regulate themselves; in the preschool and early school age there is really a learning with respect to self-regulation with very complex skills, right? So, the ability to regulate my emotional state with respect to the context in an adaptive way. If I'm missing in this sense the experience of the structured context with constant feedback no, there's even just the teacher telling you now we have to sit, now we have to do this, it's a structure, a structuring, no, that requires the child to learn to exercise control even with respect to I don't know his desire to get up and run or do other things and this aspect, missing clearly when then there's a major emotional activation of one maybe even...".(Psy2)

Psychologists reported the increase of attention deficit and hyperactivity disorders, a tendency to isolation and fear of confrontation with peers, as well as detachment anxiety.
One interviewee highlighted that relational problems may derive from a delay in language development caused by social isolation:

"*Children who are attending kindergarten now were blocked in the initial socialization phase (because of the pandemic), and so what is very noticeable now in the 0-6 sector, in all the 0-6 services, is that these children often, besides relational problems [...], have also language difficulties and this represent an obstacle. There are a lot of children, speech therapists confirm to me, who go to speech therapy. Then, the verbal channel is missing; a lot of three years old children who entered kindergarten after the lockdown did not speak or little, due to the social distancing that limited the stimulation on the language side. This impacted social and relational abilities, because if I don't speak I'll give you shove...if I can't tell you 'it's mine', 'no thank you', I mean I'll take it because I don't have another medium, the child to express himself, or I cry in the corner*". (Psy1)

At level of learning, especially for children attending the first year of the primary school, the interviewees highlighted a considerable impact, due to the fact that many of them did not have the possibility to acquire or consolidate the basis in reading, writing and math:

"*And then the big impact on school learning as well, a lot of children with big difficulties in school, so in the long term. I'm talking because then children who were either at the end of kindergarten or the first year of primary, who then experienced just this block at the beginning. And now so many children have difficulties*". (Psy1)

"*Then on the children of the first two classes, yes, because however learning just the basics of reading writing, of the part. In short, the foundations of mathematics were things that should have been that should have been consolidated in school [...] and so there was really a lack of practice there and also a lack of control of the action*" (Psy3)

Anyway, also children who were attending the following classes misses something in terms of acquisition of study method and autonomy. One interviewee pointed out that the impact was greater on children with learning disabilities, increasing the gap with peers.

b) Topics and tools adopted for discussing about the pandemic with children

During the lockdown period and the following months many psychologists carried out their therapy at a distance. Then, a further theme identified was 'Topics discussed with patients in therapy'. Interviewees agreed that social distancing and the fear for relatives' illness, especially due to the inability to see them, were the most frequent in case of children. Adult patients often brought concerns related to their children, such as how to explain the situation in general, how to communicate a loved one's illness, whether and what information share with children to protect them.

As far as tools, two interviewees reported the use of technologies for therapy and remote rehabilitation.

"*...for example, to follow the patients in telerehabilitation I used precisely the technologies.... screen sharing, the possibility of using my commands to them...if I also had a rehabilitation CD I would make sure that they could also play remotely with my software*". (Psy3)

To talk about the pandemic, the interviewees used both structured materials provided by others (e.g. professional associations) or brought by patients, in order to start from their previous experience. They also prepared materials and stories for and with their patients.

Then, we would start from that material a little bit just to stay in line with what was what they knew, [...] and then from there we would also start with the work that could be therapeutic if we had to work more on emotional and relational aspects and also to talk about the situation, especially the little ones, usually they were the ones who would bring me the material and then I would start from there for the narration of their experience (Psy1).

'Then it happened to prepare stories with families or with teachers, because sometimes even teachers had had difficulties, in short, prepare materials and we had prepared precisely stories to explain (Psy2).

c) Creativity in therapy

All the interviewees state that creativity is really important in their work, both in terms of being creative in doing their work and of using it with patients. As far as the first point one of them stated to use materials in an unconventional way and create materials on purpose, by using technologies:
"[...] most of the materials that I have, especially games, I use them in an unconventional way, changing the rules, using certain structured materials for other purposes, using pictures from some games to build stories, to elicit certain discourses or I create materials with Wordwall with
Learning up with Genially, Canva [...]" (Psy 3)

Storytelling is used by the three interviewees with children; stories may be created by the patients using also images (visual stories) or by the psychologist:

"Another aspect that I use a lot as a therapist is to write stories that I write let's say though I use them, I write them based on the family history to convey information that both children and adults need and that are already let's say put in a context where they can recognize themselves and usually the ending is very open because each of them can attribute and find the solution [...]" (Psy2)

The interviewees also rely on visual arts, by making their patients drawing, painting, creating collages. One of the interviewees cite also coding and robotics.
During the pandemic the interviewees kept using creativity both for finding new ways to interact with their patients and to make the patients express themselves through creativity. One interviewee, for example, digitized board games to play with children at a distance or used digital resources already available (virtual manipulatives) to substitute the physical ones; another created a visual story with one patient:

"[...] Because we were at distance and we used a little bit of this creative strategy (visual stories) to get us connected; he would create all the stories, the comics, then he was into [name of a videogame], so he would just take characters, cut them out, take screenshots from the Internet and then we would create our own stories with the comics (Psy1)".

Teachers

The interviewees were six teachers, four from Finland (primary school teachers) and two from Italy (kindergarten teachers), with a range of experience between four and twenty years (average 8,6). Four of them were females.

The interviews covered three areas: a) teaching after COVID; b) tools for conversation and c) creativity in the classroom.

a) Teaching after COVID 19

In this area the interview explored both the period of the lockdown and the following school years, asking the teachers what was the impact of the pandemic on children and their teaching. As for psychologists, one theme identified was 'Remote education'.

The experiences reported by Finnish and Italian teachers present some differences, this may be due to two orders of factors, the first one was the duration (from two to four weeks in Finland, more than three months in Italy) and the school grade (primary in Finland and kindergarten in Italy).

Italian teachers reported that remote education was mainly characterized by asynchronous activities, with the sharing of teaching materials or videos with families. One interviewee (ITA_Tea1) stated they shared materials that they usually adopt in their educational activities to ensure continuity. The other explained:

"We created, with the Municipality, private groups on Facebook and Whatsapp, we as teachers found the system of starting a blog giving the link to the parents where we would upload stories, rather than simple activities that we found useful we at home, that they could do with the children but without the teacher". (ITA-Tea2)

According to both the teachers, synchronous activities were less frequent (once a week) and managed with difficulty by children and families.

'*There was a lot of fatigue on the part of parents and children, the children in particular at the time of closing*". (ITA-Tea1)

One interviewee referred age related differences in remote education acceptance (surprisingly the older children were more reluctant to the remote modality). Children and families' familiarity with technologies and the availability of devices affected children attendance to these activities. In this line the socio-cultural background resulted to be relevant:

"In the sense that while I was working in [neighborhood name] we tried more than once to make online connections teacher-children, do even some very simple creative activity, like video lessons, there was absolutely no total adherence of the children,[...], less than half, maybe 1/3 of class always participated, in this neighborhood here [neighborhood name], I didn't experienceit myself but they told me that instead every time they tried to do even a videocall no one ever connected". (ITA-Tea2)

One further issue was the stress deriving from the difficulty to get feedback from children at a distance

"I mean, for me more than having to use a different mode, was being more concerned about passing a message or a mode of working. When I came back, having them there, I didn't have it. I mean I think an activity, I organize it, I structure the material and how and when to do it however I have them there and I see them. If they're not interested in, I'm ready to change my approach and get involved. Behind a video, no. In the video-calls all together a little bit you could perceive the faces [...], we were struggling to understand what they wanted and if they were listening even though we knew them all". (ITA-Tea 1)

The Finnish teachers reported a similar teaching routine for remote education: they would start each day with a synchronous activity (video call), some of them would discuss the previous day assignments, and then, after class, give new assignments for the afternoon. The teachers would remain available for the entire day online.

Teachers reported that younger students had difficulties in consistently and attentively follow lessons in front of a computer, and in parallel their difficulty in monitoring the effectiveness of distance learning, although some teachers tried to maintain a one-on-one relationship with each student (FIN_Tea3 and FIN_Tea4):

"Obviously, it was really hard to follow the comprehension of students. Students did return their homework etc. done as per usual, but the normal conversations next to the student to verify they are understanding the topic was tough. I tried taking some 15mins private calls with each student during the brief lockdowns just to make sure things are well"(FIN_Tea4)

One teacher highlighted the difficulty of younger children to attend remote education. The availability of devices was mentioned by the same teacher as an issue while another one stated that the school provided children with devices, showing that probably schools approached remote education having different resources.

As for psychologists a second theme was 'Main difficulties met by children during the lockdown';

According to some of the interviewees, both from Finland and Italy, the lack of information and the novelty of the situation caused fatigue and emotional distress in both children and adults. In fact, they lived a new and unprecedented situation that had not been experienced in living memory. This caused that some parents couldn't provide the adequate support to their children:

'Also, not understanding the whole pandemic as a new phenomenon caused stress, anxiety and uncertainty both parents and children' (FIN_Tea2)

Social isolation was identified as an issue, together with the change (lack of) routines, due for example to the interruption of hobbies and of the school attendance; this last caused difficulties in students' self-regulation with school-tasks, and of course families had to take a supporting role.

'Many students had major issues with the rhythm of their day. Some worked very late at nights or didn't do all the assignments. Remote teaching really challenged the student's self-organization. Some students did the tasks very fast and poorly and 'deep learning' and understanding the topic was left very thin (FIN_Tea3)'

The educational impact was highlighted mainly by Finnish teachers. One Finnish teacher highlighted that pre-school (6 years children) was not operating and that resulted in lack of skills on 1st grade. Indeed, this situation emphasized differences in students' skillset in the first year of primary school. The role of families became paramount:

"*Parents' role increased tremendously and some students knew how to read, write and count before coming to school and some had no support at all, mainly screens at home*". (FIN_Tea1)

The Italian teacher who mentioned the lack of pre-literacy activities due to the lockdown downplayed the consequences during the first year of primary school.

Another identified theme was 'Lasting effects since the return to class'.

In Italy, the long period of lockdown and the rules at the re-entry had impacts at emotional, relational and educational level.

Speaking of emotions and relationships, according to one interviewee, at the re-entry children showed difficulties in managing relations with peers:

"What they definitely struggled on was really, both positively and negatively, managing the relationship with others because for them those four months of closure was an eternity. And so, in a lot of situations, I mean some children, even more, because some children didn't do the 'summer re-entry', so then from February that we said goodbye we saw each other again in September and then resuming the daily routine with a group of other children was for some tiring".(ITA_Tea1)

The interviewee highlighted that children's emotions seemed to be amplified and ascribed these difficulties to the long period of kindergarten closure:

"We ascribed it to the fact that really it had been months, that they were no longer in contact with each other in a reality that no matter how hard you try, you can't replicate in the gardens rather than in the family with siblings, because the dynamics of a classroom by numbers and by

let's call it habit, because you're the same every day certainly are different from dealing with children in the gardens" (ITA_Tea1)

The other interviewee detected effects on relationships with adults. Indeed, she reported greater distrust of strangers after the lockdown and highlighted difficulties in entering in relation with children due to the face mask, which hinder non-verbal communication:

"Unfortunately, the smile with children--the eyes communicate, but the smile says more. The fact that you make a serious face rather than a smiling face when you only see me from here up (i covered the mouth with the hand) either you are a person who knows how to use the eyes, well,
with such a small child it is difficult." (ITA_Tea2)

At educational level, one interviewee stated that, despite the long interruption, the majority of children accepted the new rules and recovered the old habits without problems:

"No, not in a generalizable way. That is, in some (children) yes, in some we certainly noticed the difficulty banally of participating in an activity, of jumping in and doing something, an activity, but also things we always did, [...] many were almost inhibited by having to do something, however I read it a little bit more as a 'I have to get back into habits' rather than as a real difficulty, that is, once we then got back into the school mode, that is, in school you do all these things, at this time you do this, then there is this, then we go wash our hands, then we go to lunch, etc...once
we got back into the rhythm then it more or less all flowed." (ITA-Tea1)

The same interviewee was particularly confident in the flexibility and resilience of younger children compared to older ones:

"...maybe because in certain things they are quicker and they are more...they understand...they don't understand, they receive more and therefore the time frame to catch up the let's call them gaps is a little bit shorter..." (ITA-Tea1)

The second interviewee highlighted greater children's attraction for technologies with a consequent impact on the kind of games they made at the re-entry (more imitative game):

"This year we participated in a Lego project that was supposed to stimulate so much creativity, instead you could see them always holding the tablet (made with Lego) and if you ask them 'what is it?' they would say 'the iPad'". (ITA_Tea2)

Another issue raised by the second interviewee is the increased use of the mother tongue by immigrant pupils, due to the long permanence at home.

Most of the Finnish interviewees, who teach at primary school, identified effects at learning level.

A delay was reported for children attending the first year of the primary school, this had effects also on the possibility to carry out other activities:

"It took us 6 months of hard work to catch up when things got to normal. It impacted how much soft skills you can do and how much you can invest time into 'enjoy being at school'. Learning to read and write turned into a grind since getting the whole group to do that at a satisfactory level got very close to the end of the year. 1st grades main goal for me always has been to guarantee every kid reads and writes well. This year it was hard". (FIN_Tea4)

Other two interviewees highlighted that the lockdown increased the differences among students, in one case this difference was considered still present, while the second one stressed the importance of the resources put by the school to fill in the gap:

"With limited hours the difference between student levels is still there. The gap between best performing and worst performing has increased". (FIN_Tea1)

"*Time has passed and our school has had good resources to support students who have had challenges in learning and I believe currently there is no damage to be seen anymore because of that period of time*". (FIN_Tea2)

Only one of the Finnish interviewees minimized the consequences:

"I didn't notice any long effects after the covid. Of course, some routines and settling back to the classroom were challenging for some and there were learning gaps in what they knew, but nothing too major. Just more practice and learning, and it got fixed". (FIN_Tea3)

The impact on the pandemic was not visible just on students, interviewees explored also the theme of 'Impact on teaching'.

In Italy, teachers needed to adapt their teaching to new praxis and tools during lockdown and the summer 2020:

"Definitely it was different both during the COVID moment and the summer ... because ... trivially ... due to the different ways and tools to use, and therefore an adaptation on my part and ours in coming up with things..." (ITA_Tea1)

"*For example, one day I found myself with only one little girl in my small group...and she was saying*

'Teacher can we go over there and play?' 'No, according to rules we can't', however the day is long...and yes you are teacher, you are there for her, however she with an adult all-day is tiring...so that was a little more critical element. (ITA_Tea1).

After this first period, the interviewees reported they came back to the teaching praxis they had before the lockdown, even though they declared some small changes especially under the relational view point:

"...now I think we need to go back to the slower times [...]. But maybe seeing the children like this on the way back, anyway we were talking about viruses, these things here, they were a little scared anyway, they needed to talk about this thing, to tell what was there, the things they were

feeling, and so let's calm down, let's take a slower pace, let's move forward calmly we need to get there with them and let them talk and play listen definitely". (ITA-Tea2)

One interviewee regretted not using technologies more after this experience:

"*So, yes .... But maybe not as I would have liked to, I would have liked to but I was not able to work through digital tools on the pre-graphics, and the requirements, with the logic and comprehension part which I think with a digital tool would have helped because it's very intuitive for them and it would have helped them to work on logical-mathematical skills that you can experience with physical materials but certainly at this time in history with a digital tool would have been in line with the development of society, I was not able to do it though*" (ITA-Tea1)

Also, the Finnish interviewees did not report major changes in their teaching practice, but even them declared to have acquired awareness about some important issues on which they focused more at the re-entry. For example, one of them declared to be more aware of the importance of being brief and accurate in teaching, due to the students' limited attention span, and of the value of normal school days:

"Covid has made me understand to value normal school days where I can interact face to face with students and read their body language and expressions whether the topic was being understood or not" (FIN-Tea2)

Another stated to focus more on children self-regulation. Apparently, both for Italian and Finnish teachers, technologies became central for the period of the lockdown but returned to be marginal as soon as school 'normal' activities started again. Only one interviewee reported a greater confidence with technologies as a result of the lockdown period.

One interviewee reported an impact at level of team-work, stating that they had to be more precise in keeping track of homework and absences.

b) Topics and tools adopted for discussing about the pandemic with children

The lockdown period and the subsequent re-entry with tight rules affecting relationships led teachers to confront and search for the most appropriate methods for dealing with students on the subject of the pandemic.

According to interviewees, children did not need to talk about the COVID pandemic in general at the re-entry, also because children seemed well aware of what was happening:

" *Our luck has been the families because we had extremely attentive families at that time, so actually both during the pandemic and the lockdown and when they went back to school, the children were all aware of what was going on ... the fact that there was a virus, then each parent had used their own tools a little bit to explain what was going on, some cartoons etc.*". (ITA_Tea1)

Most of the interviewees opted to talk every day about the problems students were experiencing regarding the new rules applied in daily life, explaining the importance and how to use safety devices and the new rules:

" *Students needed to talk about the practices, why to wear a mask etc. Not about the general situation, but about why someone is in a quarantine etc. Those clearly made students think and ask questions".*(FIN_Tea1)

"...who took at face value what they were told mostly by their parents so 'I have to be careful, I'm careful', who really... questions that were difficult to explain really arose from there because then for them physical contact still is extremely important, extremely necessary, both with each other and with the adult, so telling them 'Alright, wait, let's stand a little further apart' 'Alright, wait I'll take you by the hand and I won't hug you' i.e. they had more difficulty understanding...more than understanding to accept...."(ITA_Tea1)

One teacher declared to have discussed the consequences of COVID at family level (e.g. problems at home, overuse of games) (FIN_Tea4).

Mainly Italian interviewees felt that children, especially at the re-entry in the summer 2020, were searching for normality and ask questions about the return to precedent routines:

"Their concern was that, I mean, knowing if they could go back and do the things that they would normally do with the class group not with these few children that they didn't even identify as a

class because they were so few". (ITA_Tea1)

The majority of teachers reported that they did not use tools provided by the school or other agencies to talk about the pandemic, preferring to rely on their own sensitivity and competence, sometimes using some of their own creativity for this purpose. Some used videos or paper tools to talk about coved and organized a few more specific lessons on the topic.

c) Creativity in teaching

All the interviewees affirmed how creativity is fundamental in their profession, that it is of great value for the human development and useful to interest and support students:

"Yes it (creativity) is what is needed the younger the children are, because you often find yourself doing similar things every year, because cyclically you repurpose similar activities and similar workshops but necessarily readjusted to children you have there at that time and it is unthinkable to repurpose the same activity year after year especially in kindergarten, this leads
you to have to unhinge an activity that works so much because you propose it to a different group of children, this applies to activities and workshops that persist throughout the years but
especially to activities and new proposals". (ITA_Tea1)

I think these methods bring change and fun to normal school routines. Some topics have better retention when done through play. Especially students, who learn by experimenting and doing most easily, benefit from these. Also, overall class spirit is higher with these and students can show sides that you might not know otherwise (FIN-Tea3)".

"*It's an important part of human development and being a human. It's important to be able to express yourself. Important future skill*". (FIN_Tea1)

"*Well, isn't it (creativity) the most important trait we have and what makes us human? I just think students have some much more opportunities if they have an open mind*". (FIN_Tea4).

Interviewees linked the discourse on creativity both to the ways in which they propose activities to students and to the activities they carried out with them:

"I also use creativity in my own pedagogical design. I try to incorporate creative tasks to all subjects". (FIN_Tea1)

"The creativity of the teacher in my opinion is a little bit that, that is to work on so many aspects not at the 'school level', that is not "now let's all do the jumping because we have to learn how to jump" but let's do an activity, for example, the competition with the flashcards. "what animal is this" "the first one who comes says what animal is" wins the point. [...]. I do... it's kind of the 'seasoning', the way you propose things, you actually achieve the same goal of making them jump, but in a somewhat easier way "now let's play" and not "now I have to do this thing" (ITA-Tea1)

Different creative expressions are cited as part of the everyday teaching praxis like visual arts (drawing, painting), hands on activities, storytelling and reading, acting, dancing and in general motor activities, yoga, music, games, and also pedagogical approaches which stimulate students' creativity like problem-based, collaborative, and discovery learning. One teacher reported to carry out coding activities and to use building sets like Legos and Strawbees (FIN-Tea1).

The pandemic emergency required teachers to rely on creativity. This was in order to be able to interest and facilitate students both during the lockdown period, which required remote education, and at the time of re-entry with the new distancing rules:

"*Covid forces us to think outside of the box and specially try to come up with ways of studying phenomena by doing something concretely (like math while baking and cooking) and biology by exploring the surroundings*". (FIN-Tea2).

It is worth repeating that interviews were administered to teachers in two countries that have seen quite different periods of lockdown and school closure or remote education. Indeed, Italy was forced into this form of teaching for several months while Finland just for some weeks.

Dealing with creativity during remote education, it is evident from the interviews how it was Italian teachers who were called upon to make a greater creative effort to make up for the criticalities of distance learning and to make the hours of remote education with students useful and interesting.

"Then during (remote education) yes, in the sense that finding a new way to do things, because behind a device and not with them, certainly involved having to bring out all the tools possessed and all the creativity possible". (ITA_Tea1)

For remote education, teachers proposed hands-on activities using the materials students had at home, synchronous and asynchronous reading, writing, drawing or painting, and storytelling activities. To help themselves, teachers used resources, video conferencing programs, videos, games or activities found on the Internet. These resources were also used to talk creatively about what was happening and more specifically about the coronavirus:

"I'm thinking for example of the book reading that I always worked on so much and the children always enthusiastically accepted. That part there and those videos there were done with my mode of reading and proposing a book because it seemed useful for them that they see that anyway 'I see it on the video I don't see it live however it remained the same that little piece there". (ITA_Tea1)

"...very nice videos that have served in my opinion to talk about covid because precisely in these goodwins that helps and we used to. I personally used this story to be able to talk about things says there is a character that is called Virus genius, the virus so it's a kind virus, it is just a funny little cute character that children like, and he on the other hand being a kind virus, it's a (ITA_Tea2)

Some teachers have also offered, even on certain holidays or celebrations, videos with practical activities to be replicated, suitable to be performed with the support of a parent. This aspect produced highly variable results depending on the skills, availability and knowledge of the parents, to which was added the not always homogeneous and suitable equipment of computer materials to be able to profitably follow the lessons at a distance:

"For the Mother's Day, we made and sent a video to dads with a suggested craft for moms to do that we wouldn't do at school because being us with them we would do something different...because we said, even if they don't do it we are glad to tell the dads that they could have done something". (ITA_Tea1)

In general, teachers found that using creativity during remote education was more challenging and required more careful and timely planning of activities, with the need for more reflection and inventiveness than usual (FIN_Tea 3):

"Nonverbal communication is hard and group works in same space is many times needed for creativity. It is very hard to support a creative process from the distance. But please keep in mind we only had like a week of lockdowns for small students". (FIN_Tea4)

"Remotely it is very hard. I think big part of creativity is the interaction and the most natural interaction, especially in groups, happens face-to-face" (FIN_Tea4)

Many teachers admitted that creativity to be effective needs continuous improvement work (FIN-Tea2). Some in this regard also stated that they had benefited from specific training:
"I've done a number of courses, I'm a teacher anyway of yoga for children, I've done various courses also of music this one of theatre and so I put it all together always trying to draw the positive side to create in school a peaceful climate with children" (ITA_Tea2)

One interviewee referred to the rapid change of children in relation to societal challenges as a stimulus to creatively integrate technologies in their teaching:
"*Society and children in today's society are changing fast and we have to adapt, such as for example for the use of tablets and cell phones that until a few years ago were not considered* and instead now we necessarily have to consider. [....]. As a teacher it's something that necessarily stimulates creativity because for us adults they are objects that are not always easy to use, so you have to challenge yourself, experiment and bring out everything you can". (ITA-Tea1)

Parents

Interviews were carried out with nine parents (two Italians and seven Finnish); as for psychologists and teachers, the Italian interviews were recorded and transcribed verbatim, while the Finnish were transcribed in real time; in some cases, parents answered the interview in writing. Average age of parents was 40 years (the Italian parents were a bit older, average age 45,5, while the Finnish average age was 38). Parents reported to have from two (seven parents) to three children (two parents). At the moment of theg pandemic, the average age of the youngers was 4 years old, of the elders 11 years old.

The interviews covered 3 areas: a) Children wellbeing during and after the pandemic; b) topics and tools for conversation and c) creativity at home

a) Children wellbeing during and after the pandemic

The first theme which was identified in this area was in line with the first question, 'Behavioral and emotional changes in pandemic'. Parents' experiences were quite different due to a series of factors (e.g. presence or absence of remote education, age of the children) that have been explored in the interviews.

As indicated by teachers, two parents highlighted the sense of uncertainty and confusion lived with the breakout of the pandemic:

"*When the pandemic started, there was a lot of confusion and uncertainty. It became obvious that the children react to things very differently*". (FIN_Par2)

Six out of seven Finnish parents declared they did not spot any difference in one or both their children, among them two highlighted that it was true for the youngers, but the older ones (adolescents) displayed changes being that worry and upset for the situation or tendency to closure.

"*My older child, however, at the later stages of pandemic started to prefer online learning and staying at home, and this attitude remained longer after getting back to "normality". Now it is slowly disappearing*". (FIN_Par4)

Only one parent declared that both the children felt stressed for the pandemic.

The possibility to rely on a social network even during the lockdown was considered positive for the children wellbeing:

"*He also is into gaming, so the social network did not suddenly disappear. They could continue playing games online just like before*". (FIN_Par2)

The experience was completely different for the two Italian parents. The first one did not identify negative changes, on the contrary the relationships between siblings (usually difficult) became better over that period. In this case it seems that the capability of the family to establish new routines and the possibility to go out on a large terrace to play helped children to deal with restrictions easier:

"*We established a little bit, so also for fun, to put in some more cute, nice elements, during the lockdown we had established some rituals that...I thought...I remember Wednesday was pajama day in the sense because Wednesday I was doing the pajama change and then then they on Wednesday they were pajama day and it was a very.... a very welcome thing*". (ITA_Par1).

On the other hand, the other parent highlighted important changes in the younger child's behaviors, in terms of an initial continuous research of contacts with peers that in the long term resulted in the opposite (closure), changes in playing habits, nervousness due to boredom.

Two related themes were 'Remote education' and 'Long term effects at the re-entry'

When parents were asked to answer questions concerning the period of remote education during the lockdown the experiences were really different if not opposite. In Italy, especially during the first phase of the lockdown, schools were left free to organize and schedule remote lessons with widely varying results. Indeed, parents reported considerable disparities in the remote education provision.

One parent reported an immediate school response to the lockdown with a quick activation of remote education with synchronous and asynchronous activities:

“ I premise I think I was quite lucky because our school activated the DAD (remote education) immediately basically...immediately...mixed DAD because there were times in let's say in real DAD that is now I don't remember how the difference was because anyway...live (Interviewer: in synchronous) here in exact synchronous and then also so much asynchronous especially for first graders”. (ITA_Par1)

On the contrary, another parent reported that the school their children attended did not activate distance education with adequate celerity and quality:

“*Look, for what I remember little and nothing they were doing, maybe exaggerating once a week. Exaggerating, I mean, there was just very little attendance...*” (ITA_Par2)

This difference was caused by various aspects, such as the skills and technological infrastructure that the school but also the families could provide, as evidenced by the same parent who did not consider remote education sufficient:

“*Then there were serious connection problems or lack of equipment from a good part of the classroom, so there were always anyway problems inherent the connection or the presence of teachers and so on and so forth*”. (ITA_Par2)

Another parent, on the other hand, reported that they also perceived differences within the same school, considering very important and therefore variable not only the quality of the school but also of the single teachers who therefore greatly influenced the quality of remote education for the specific class in question:

“*However, I was fortunate one both for the school that took action immediately and for the teacher because then even within the school there were very different realities*”. (ITA_Par1)’.

So, thanks to very competent teachers and very well-organized schools some parents reported that their children easily finished the program of the school year and sometimes even went beyond it:

“... the little one finished the first year of primary school exceeding the program that was planned, in the sense.... therefore, going even beyond doing also not only let's say pure didactics but also little jobs a little bit more playful things(ITA_Par1)

Conversely, other parents noted major difficulties in some of the teachers, who, in their opinion, were not in the best position to handle the distance education period:

*“I think the teachers were not very well prepared for online teaching at his school, and it seemed like they had fewer online lessons as the high school student*s (FIN-Par8)

Among the strategies implemented by teachers, some parents reported that they used to divide the class into small groups to conduct synchronous lessons, based on each individual teacher's decision:

"...I remember teachers dividing the classroom because in the sense twenty first graders keeping them all on time was not possible, I remember math dividing it into groups of 5 very instead the Italian one divided them into two (ITA_Par1)"

Parents were called upon to support their children in the daily performance of homework, in following synchronous lessons, and especially in performing asynchronous activities. Although, some reported that they did not have to intervene much, noting how their children were actually autonomous and able to self-manage much of the homework and activities remotely.

"...I didn't have to either let's say supplant, that's because the big one worked in complete autonomy, the little one I followed him a little bit more because he was in first year of the primary school, but not because I had to explain concepts to him, but maybe just to follow him in his homework here (ITA-Par1)."

Parents were later asked to specify whether they had observed any effects in their children's education and psychological well-being caused by the lockdown period.
The majority of the parents, both Italian and Finnish, reported that they had not observed any particular long-term effects from an educational standpoint, motivating this also by the children's strong resilience and adaptability:

"*We put a lot of effort to avoid any of the educational gaps, so hopefully not*". (FIN_Par4)

Some also said they were lucky because their children were not attending crucial school years (the entry into the new schooling or the last before the transition to the next). Only one parent reported that their children had difficulties in school upon return (delay in reading) due to the child's characteristics and the teacher's negative disposition.
"*No, I'm saying absolutely no patience, absolutely no desire to wait for each child's time. That is, it lacks this attention, that is, since they are not all equal, those who are 'a little bit more in difficulty', therefore lazier and with low self-esteem, are not considered (ITA_Par2)*."

Even from the point of view of personal well-being, the majority of parents reported they did not notice any particular long-term effect. The presence of a good social network was cited as a central factor:

"*Not really. We are fortunate with relatively good network of close friends with kids, so we did have quite a good number of interactions with them even during the most severe times*". (FIN_Par1)

Unfortunately, it wasn't valid for all the interviewees, indeed some reported long terms issues, due to the lack of a social network or difficulties in learning:

"Yes, I do believe that kids isolated themselves from others and we were moving to a new city at the same time. It was very hard for them to find friends. So, kids stayed at home and it shows in a way that they don't find things to do outside". (FIN_Par 5)

"In my opinion, yes, because until I can find an appropriate tool to resurrect the self-esteem that he has .... that he has lost". (ITA_Par2)

One parent pointed out that their children particularly suffered from the quarantines established in the 2020-2021 school year, mainly because they were aware that it was not a generalized lockdown but aimed only at a small percentage of students:

"I saw them also less interested and... or maybe even the thing that they knew that they were the only ones or little was a small percentage, in short that the others could be outside maybe made them a little bit more uncomfortable and unhappy about being at home because they did a lot of their own the next year anyway." (ITA_Par1)

Lastly one parent highlighted that probably they were not suffering long term effects since the family was not significantly affected by the pandemic:

"*We were fortunate enough not to be affected too much by the negative impacts the pandemic had. Both parents could continue working, the kids could continue studying online and no-one from our family got severely sick or died*" (FIN-Par2)

b) Topics and tools adopted for discussing about the pandemic with children

The most common topics dealt with children were COVID prevention measures (e.g. hand hygiene), social distancing and also medical issues (the infection, vaccination, etc.). Parents reported that they talked about the news on the TV, sometimes to re-assure children about what they were hearing. With older children parents discussed about their concerns as far as the pandemic and the severity of the situation at the global level. Children shared with parents also their nostalgia for friends.

According to the majority of parents, conversations started naturally listening to the news, therefore the interviewees stated not having used specific materials, simply because they did not need them:

"No, not really. We just discussed current events and explained what is happening. I don't know. I guess there were enough things around which you could use as examples. . Some parents pointed out that they limited the overexposure of younger children to information about the pandemic". (FIN_Par4)

A couple of parents used videos, also found by the children; one helped children in creating a comic proposed by others:

"Look, he had been shown a video by his brother that was very nice. It was sung, explained, indeed, then it was the little one who showed it to me because the brother showed it to him and he had it to me". (ITA_Par2)

More than one parent pointed out to have searched to limit the children overexposure to COVID related news:

"Not really. The constant news bombardment was enough to spark conversations. In general, there was some much of this covid covid covid, that we just wanted to focus on something else when spending time with the family". (FIN_Par1)

c) Creativity at home

All the parents agreed about the usefulness of creativity:

"It is. Especially for children, who might have difficulties in expressing their feelings. Children might not reply to direct questions, but through playing or other activities, it is easier to fish out their opinions and feelings". (FIN_Par2)

But just one parent made some examples on how they used it with their children:

"I did, I always used it with them, I always tried to get them to do manual things, from puzzles to coloring, to brick creations". (ITA_Par2)

Some of them wanted to point out that it's useful but not essential:

"*Yes and no. Creativity is helpful for sure but they know how to express themselves by speaking*". (FIN_Par7)

Just one parent out of nine used creativity to address contents related to the pandemic, but not on his own initiative; indeed, they helped the child creating a comic strip as requested by scouts. They found it very useful:

"*Well yes that is for the children definitely yes, then in those moments it was a way to engage them and then anyway when you write the comic you reflect on the issue and questions and curiosities can come up and then you elaborate a little bit what is the issue...*". (ITA_Par1)

One parent said that they haven't thought but it could have been very useful.

Discussion

The information collected by these sample of psychologists, teachers and parents gives us an insight of how the pandemic affected the children's life of the two countries. Of course, the sample is small and not representative, therefore our aim was not to draw conclusions at a general level but to deepen some topics. The two contexts examined (Finland and Italy) represent quite different situations in terms of the measures taken by governments to contrast

the virus. The two countries also had pre-existing differences in lifestyle and education. All these aspects obviously influenced the experiences of our interviewees and make us be very cautious in discussing the differences found. Going to the interviews results, we can say that social isolation, the interruption of school attendance (substituted by more or less effective remote education) and of other aspects of life (hobbies, sport, leisure) were recurrent topics emerging in the interviews with all the groups of interviewees. According to psychologists, these had short- and long-term impacts at all ages, like delays in language development, difficulties in emotions regulation, impacts on learning especially for those who were living transitions phases. Of course, this impact was judged greater for those with individual frailties. Kindergarten teachers from Italy seemed less prone to highlight long term effects, while recognized the impact at emotional and relational level during and immediately after the lockdown; primary teachers, from Finland, expressed quite different opinions maybe linked to the classes they were teaching that period. Parents, overall, reported mild difficulties during the pandemic and limited long-term effects. As in many situations, the socio-cultural context and the individual characteristics were cited as protective or risk factors by psychologists and teachers, but also parents' testimonies clearly reflected these differences. Families in which parents had time and capability to support the children and may rely on a good social network report less distress compared to others. Children with pre-existing frailties (at motivational, emotional or cognitive level) were mainly affected by the pandemic because they suffered the absence of structured interactions with adults and peers. The regulatory work that adults do in settings such as school or sports has been lacking, leaving it all on the shoulders of families, who were not always able to play a vicarious role. Children with pre-existing learning problems suffered of the lack of adequate support with a consequent increase of the gap with classmates. An impression drawn from teachers and parents' interviews is that distress was greater and with more lasting consequences as age increased and especially for teenagers.

Remote education was not adequately managed by schools and often let to the ability and goodwill of educators and teachers; according to one interviewee this was particularly true for kindergarten (In Italy, since in Finland day care did not close) but the parents reported problems at every age. Teachers' teaching practices seem to have been influenced in terms of enhancing the possibilities offered by presence; regarding technologies, only one teacher stated that they felt more confident with technologies, while another reported that they would have liked to use them more even in presence but could not.

The interview investigated also the main topic addressed with children about the pandemic. Social isolation and preventive measures turned out to be quite common topics especially with the younger children. A recurring response given by parents has been an attempt to protect children from the constant and alarming news from the outside world. The desire to ensure the youngest children a return to normalcy was also reported by some teachers. As far as the use of materials, it was most spread among psychologists while teachers and parents relied more on spontaneous dialogue.

Finally, creativity was valued by all the three groups; psychologists and teachers gave the question a double interpretation and highlighted how they need to be creative to carry out their work and not just how they use creativity with children. They pointed out that the pandemic with

the restrictions put in place by governments required them to be creative in order to be able to carry out their work in a totally new condition, the distance. This required them to rely on technologies and the opportunities they give to transform materials and to collaborate.

As far as creativity with children during the pandemic, both teachers and psychologist put the creative expressions (visual arts, storytelling, etc.) they usually use at the service of the specific content, but especially the Finnish teachers claimed that remote education made using creativity very hard. As for the tools, almost all the parents reported that they did not use creativity to talk to their children about the pandemic, but just the traditional dialogue.

The Alt-ER app: opinions of psychologists and teachers

In the final part of the interview, psychologists and teachers were showed the app and asked for comments. Two of the three psychologists (Psy 2 and 3) expressed appreciation for the graphic style of the app, the drawings, and highlighted that the app proposes a variety of sceneries that is considered an important feature to give a sense of novelty. Finally, one psychologist appreciated that the app allows unstructured exploration:

"I really like the interface, because now there are all these APPs that can be very useful if used let's say with a purpose, however where everything is very graphic, very hyper stimulating, super colorful, lots of sounds and lots, lots of stimulation. In my opinion, especially for young children, it's not ideal because anyway there's a need to instead help the child to be in a somewhat more reflective, more calming activity in some way, so I really like the drawings that are so simple and that just look like a drawing that could be done by a particularly good child or kid and so I really like the interface (Psy2).

I like the fact that you can navigate different environments and that it's not structured, because anyway there's an aspect of exploration that makes it maybe even a little bit, how to say, always new no because today I go click on the beach, I do activities on the beach, tomorrow I go to school... (Psy2)'.

The app is considered useful for working on social abilities not only with kindergarten children but also with older ones with disabilities.

'The graphic part actually does because it gives you scenes that often happen and you often find yourself having to intervene because the reaction to that stuff there is that the person who has had the stuff stolen starts crying and is desperate and you as an adult have to intervene somehow. And ... through that you can do preventive work also so a kind of education ... civic? shall we call it that? (ITA_Tea1)'.

'it's based on existing apps and also a little bit on what you find in vignettes in books or cards that are used for teaching pragmatic skills, socio-relational skills, especially for children who have Asperger's syndrome and so are materials that we use...the cards with questions with respect to

lived scenes of daily life or inherent in various aspects from relationships to situations that one should be able to handle emotionally... I would use it (the Alt-ER app) with my children in my practice very willingly (Psy 3)'.

The three psychologists pointed out that this is based on the visual channel that is particularly useful with children with autism spectrum disorders.

So, a work in my opinion on social skills of this kind, with a visual support and that there is no obligation, let's say to work only on the verbal, but you can also use another kind of channel, teaching certain skills also with a visual channel in my opinion could be very useful, even for proposing projects in schools (Psy_1)'.

Finally, one of the teachers had the chance to use the app with the students. For using it with small kids they suggested to show it on the whiteboard and discuss. They judged that it might be useful also for creative writing (indeed children found certain characters and wrote their day or their story...or their interpretation of a certain situation). The interviewee considered the app fun.

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Appendix 1: Codebooks

Link to codebooks: Code_books

Appendix 2: Text of the semi- structured interviews

- Preschool teachers and teachers
- Personal data
- Name
- Job title and experience
- School
- Country
- Which classes do you teach?

Teaching after COVID

- According to your experience, what were the main difficulties for children during lockdown under Covid?
- (To ask in case the teacher does not mention spontaneously distant learning). How did you carry out your educational activities/teaching during the lockdown?
- Have there been lasting effects that you can describe since the return to the classroom?
- Have Covid changed the way you teach? If yes - to what extent?

Tools for conversation

- Did you experience that the children needed to talk about the Covid situation? If yes - how did it become clear?
- Has your school provided you with specific tools or methods for talking about Covid with the children?
- If yes – which?
- Have you integrated tools or methods for talking about Covid yourself?

Creativity in the classroom

- Is creativity a part of your teaching? If yes -How?
- Why do you find it important?
- What is your experience with using creativity in teaching under and after Covid?

Question about the app In the Alt-ER framework, we developed an app aimed at supporting communication with children
about general emotional and social situations, among them special attention has been given to health issues (with a focus on COVID). I'll show you some scenes of the app and how it works.

(after having shown some pre-defined scenes).

- What do you think of the app?
- Do you think it could be useful to communicate with children?
- Psychologists
- Personal data
- Name
- Background
- Years of experience
- Country

Children's wellbeing during and after the pandemic

1. According to your experience, what had been the main difficulties children experienced during the lockdown?
2. Have you noticed long-term effects on children's mental health and wellbeing as a result of the corona pandemic?
3. Do you think that the corona pandemic has had long term effects also on children's academic growth?
4. Which of the pandemic related topics did and do you deal with your patients more frequently (e.g. social distancing, infection, etc....)

Tools for conversation

1. Did you use any specific support material to deal with these topics (e.g. stories built on purpose, videos, etc.)? If not, why?
2. (If not, because not available) Would you have liked to have tools to support you in talking to children?

Creativity in therapy

1. Do you use creativity in the therapeutic work with the children?
2. Was creativity a useful therapeutic tool during the pandemic?
3. (if not) Would you consider using creativity in your therapeutic work? Why/why not.

Parents

Personal data

Age
Number of children
Age each child

Children wellbeing during and after the pandemic

1. Are there behavioral and/or emotional changes that you noticed in your child/children after the pandemic onset?
2. Do you think that what your child/children experienced during the pandemic had long-term effects on their mental health and wellbeing?
3. Do you think that the corona pandemic has had long term effects also on your child/children's academic growth?
4. Which of the pandemic related topics did/do you discuss with your child/children more frequently (e.g. social distancing, infection, etc....)

Tools for conversation

5. Did/do you use any specific support material to deal with these topics (e.g. stories built on purpose, videos, etc.)?
6. If not, Why?

7. (If not, because not available) would you have liked to have a tool to support you in talking to your child/children?

Creativity at home

8. Do you think that creativity is helpful to make your children express their emotions and feelings?
9. Did/do you use creativity with your children to address pandemic related topics?

Animated Learning for Transitions – Early Recognition (Alt-Er) focuses on building a bridge between preschool and kindergarten by providing a considered pedagogical framework and toolbox for promoting the use of technology to create opportunities for self-directed creativity. The Alt-Er pedagogical framework contextualizes the importance of the transition from kindergarten perspectives on preschool, and presents Information and Communication Technologies in Early Childhood Education and Care and presents research based recommendations for its usage both in general, and specifically for the Alt-Er application and toolbox.

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