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ABILITI

ABILITI
Teacher eHandbook

Telepresence Systems for Social Inclusion of Children and Adolescents in Times of Chronic Illness

A handbook for teachers and practitioners

die Berater ZUKUNFT LERNEN
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Introduction

The diagnosis of a severe, chronic, or long-term illness of a child or adolescent significantly affects the individual's life and family dynamics. It causes behavioural and emotional reactions that affect the individual and group functioning of the family and social environment. Changes during the very stressful illness process mean the interruption of usual social and school routines due to treatments and hospitalisation. These circumstances mean navigating unfamiliar surroundings that can cause discomfort and uncertainty. This handbook primarily uses the term chronic illnesses; however, many other illnesses exist in a young person's life. In this respect, chronic illnesses can involve treatments that have a negative impact on the pupil and those around them, both physically and mentally. In addition, changes in appearance can affect relationships with others and lead to withdrawal. Furthermore, it must be remembered that the illness hits the child or young person at a time when school is a means of development and socialisation. Regular contact with classmates and teachers is especially crucial for the pupil's daily life during this phase. During the school years, a person's abilities and potential are developed to a great extent. Therefore, it is important that they continue the normal process of cognitive, emotional, and social development.

However, even more important is the sense of belonging to a group or place. It is a central human basic need (Ryan & Deci, 2000) and is shaped by personality, biographical experiences, and circumstances. In early childhood, the first caregivers, such as parents and close family, are of central importance. Increasingly with adolescence, the age between 12 and 18, friends and peer groups take on a larger role. In this context, the importance of schools and teachers should not be underestimated. Additionally, they are of great importance and influence for the sense of belonging and well-being of a person. Consequently, "belonging has been related to higher levels of well-being and life satisfaction and less distress and mental illness; healthier behaviours, and better physical health, social relationships, and educational and occupational outcomes" (Allen & Kern, 2017, 5). This eHandbook explores the concept of a sense of belonging in detail, with a particular emphasis on its role in fostering the inclusion of children with chronic illnesses. Therefore, the question arises how children with long absences from school due to their health condition could be given access to school activities so that they feel they belong and do not experience social isolation and school exclusion.

As the concept of inclusion (Prengel, 2019) is known to postulate the participation of all people, regardless of their differences and needs, it is central to consider these aspects in this context. The unrestricted right to education and participation in society becomes striking here. A long absence from school should not be a reason to exclude, discriminate, or stigmatise someone. Rather, it is a reason to create structures that enable individuals to participate equally in all areas. It is therefore a social, political, and all-encompassing task that must be implemented in the school system (Ziemen, 2018). Greving, Reichenbach and Wendler (2019) interpret the statements of the 1949 UNESCO Conference that all learning opportunities and interactions must be designed to meet the interests and needs of the pupils and that they do not have to adapt to the system.

In recent years, telepresence systems such as avatars, virtual classrooms, and mobile robots have been discussed in educational psychology work to prevent academic, social, and emotional problems caused by school absence, and have been described as a promising approach to improve school participation of children with chronic illnesses (Gilmour et al. 2015; Newhart et al., 2016; Soares et al. 2017). The use of these telepresence systems should enable children to participate in class and interact with their classmates, thus reducing the negative effects of absence, such as feelings of social isolation and a low sense of belonging.

Therefore, during a more intensive treatment phase, the support network (doctors, psychologists, teachers, family, and friends) is called upon to organise all the necessary help for the pupil who is denied regular school attendance to maintain relationships and learning opportunities. The role of the teaching staff is to coordinate with the different professionals involved in the process to create an educational plan with an individualised educational path that responds to the needs of the children and aims to keep them integrated into school and society. In this context, it is necessary to be sensitive to distinct types of diseases. They require different expertise as well as pedagogical approaches.

The ABILITI eHandbook was developed within the ERASMUS+ project „Avatar Based Interaction and Learning in Times of Illness“ (2021-1-AT01-KA220-SCH-000023769). The project aims to make the use of telepresence systems in schools as effective as possible for children with chronic illnesses and long absences from school.

The experiences and research from the partner countries have helped to gain new insights and show possibilities for the use of telepresence systems in schools and to prepare teachers. As it is not only important to have the technological knowledge, but also the background information about the child and the disease, as well as psychological aspects. The first part of the eHandbook deals with these topics. The second part introduces the reader to the world of telepresence systems. Different models of telepresence systems are presented and their use in school is described. The main focus will be on the challenges that need to be addressed to enable the use of telepresence systems.

The third part of the manual is dedicated to practical implementation. Based on interviews with teachers, parents, and pupils with chronic illnesses as well as an extensive literature research, sensitive aspects of implementing telepresence systems are described and suggestions for pedagogical practice are given. It is important to mention that these are examples and possibilities for pedagogical implementation, as the individual situation must be analysed and reflected. In this regard, Part III contains reflection questions that can help to reflect on one‘s own school situation.

Overall, the eHandbook aims to offer the possibility to get background information, examples from practice, and to learn more about the use of telepresence systems in schools.

Part I

Social-emotional aspects of teaching pupils with chronic illnesses

Content

- What teachers need to know about pupils with chronic illnesses at school
- Pupils with chronic illnesses in schools (including definitions)
- Social and emotional aspects, and basic psychological needs
- Sense of belonging, belonging to school, belonging to a peer group

School participation of pupils with chronic illnesses

School represents an important phase in life, as most children and young people spend a lot of time at school during the week (Steins, 2014). Kimmig (2014) describes that school is of particular importance for chronically ill children and adolescents, as they are those who desire integration and „normal“ treatment to a special degree. However, due to their illness and the associated therapies, children and adolescents with chronic illnesses are often unable to participate regularly in everyday school life. In addition to the physical and psychosocial challenges of the illness, the children and adolescents have to cope with losing their familiar school environment and the social contacts that take place there (Niethammer, 2014). In this respect, the importance of school and participation in the peer group and school community is significant.

What is a chronic illness?

Due to the heterogeneity of pediatric illness patterns and their courses, the definitions of chronic illness differ widely. Newer definitions focus on common characteristics as well as on the consequences of illness and not exclusively on specific diagnoses. According to Schmidt and Thyen (2008), common main criteria that can be found in several definitions are an occurrence of the illness of at least three to twelve months and a severity of the illness that is characterised by limitations of age-appropriate activities and a recurring need for care.

According to the World Health Organization: “chronic diseases [...] are of long duration and generally slow progression. The four main types are cardiovascular diseases (like heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma) and diabetes“ (Bernell & Howard 2016, 159). Reynolds et al. (2018, 11) argue that “a characteristic of chronic diseases is that they often require a long period of supervision, observation or care.” Etschenberg (2001, 9) describes that chronic illnesses mainly refer to physical illnesses that „[...] determine or affect the planning, actions and feelings of children, adolescents, or their families in a more or less threatening way for at least half a year or usually for several years or for life.“ Although these disorders are treatable, they are not yet curable. Mokkink and colleagues (2008) state four conditions that must be fulfilled for the diagnosis of a chronic illness in childhood. For example, the illness must occur between birth and the age of eighteen, the diagnosis must be based on medical and scientific evidence and justified by reproducible, valid methods, the illness must currently be not curable or resistant to treatment, and the illness must have persisted for three months or be likely to persist for more than three months, or have occurred at least three times in the past year and be likely to recur (Mokkink et al., 2008). According to Petermann (2002), the following aspects are highly important in the delimitation of chronic illness: functional limitations such as impairments in everyday life, for example in attending school, eating or communication, compensatory efforts such as taking medication or a diet to counteract impending limitations, and service use in the form of increased utilisation of care services.

It can be stated that no unitary definition of chronic illness can be identified in the literature, but essential aspects have been elaborated. As a teacher, it is essential to know about the characteristics of chronic illnesses to gain a deeper understanding of the impact they have on pupils.

The effects of chronic illnesses

The effects of chronic illness in everyday life are as diverse as the definitions of chronic illness in childhood and adolescence. In a meta-analysis, Pinquart and Teubert (2012) describe school, social and physical effects on children and adolescents with chronic illnesses. The functional limitations, that are described by Petermann (2002), can manifest themselves in many ways. For example, the child or adolescent may attend school less frequently or irregularly due to frequent hospital stays or stays at home. On the one hand, this leads to fewer opportunities to develop social skills and make friends, and on the other hand to less success at school.

Chronic illness is a risk factor for rejection by other children and adolescents and for bullying, and is associated with the development of externalising and internalising behaviour problems (Pinquart & Teubert, 2012). Etschenberg (2001) and Santos and colleagues (2015) describe further psychosocial burdens that can accompany chronic illnesses, such as a reduced quality of life, reduced well-being, difficulties in stabilising self-esteem and limited career and future prospects. Difficulties can also arise in the relationship

with teachers and classmates due to the chronic illness. Bishop and Slevin (2004), for example, describe that a lack of knowledge about the illness is accompanied by a negative attitude towards it. Furthermore, Yeo and Sawyer (2005) describe problems in relationships with peers, as children with chronic illnesses are more at risk of being socially isolated and being able to participate in leisure and sports activities to a reduced extent. Chronic illnesses also affects children‘s and adolescents‘ school performance. The absence caused by the illness and the associated treatment can lead to a drop in performance at school and to class repetitions. Difficulties in finding a job and a lack of financial independence are also described as possible consequences of chronic illness (Yeo & Sawyer, 2005).

The explanations in this part were intended to show how chronic illness is defined and should help to understand the pupils with chronic illnesses in the classroom more. Furthermore, it was important to show what effects it can have on everyday school life and on the child‘s or adolescent‘s well-being. The next part inquires a step deeper into the psychological development of pupils to better understand the background for the effects.

In a nutshell

School participation of pupils with chronic illness

A chronic illness lasts for a more extended period of time and sets limits to a child’s opportunities to engage in age-appropriate activities. The effects of chronic illness include functional limitations, like attending school less frequently or irregularly. This can add to a psychosocial burden as there are fewer opportunities for positive relationships and fewer experiences of school success.

Basic psychological needs

Social conditions play an essential role in healthy psychological development and natural processes of self-motivation. For an individual, these conditions can be either beneficial or disadvantageous. A chronic illness affects social conditions, bringing several disadvantages for the pupil, such as long-term absences from school and social isolation. This is likely to impact mental well-being in general and basic human needs in particular.
Self-Determination Theory (SDT) is an approach that relies on empirical support to explain under what conditions one can expect people to be resourceful, self-regulated, and actively engaged in what they are currently doing (Ryan & Deci, 2000). The investigation of people‘s inherent growth tendencies and innate psychological needs has revealed three basic psychological needs that are important for self-motivation and personality integration. These are the needs for **competence** (Harter, 1978; White, 1963), **relatedness** (Baumeister & Leary, 1995; Reis, 1994), and **autonomy** (deCharms, 1968; Deci, 1975). Cognitive Evaluation Theory (CET) is a subcategory of SDT that focuses on the fundamental needs for competence and autonomy (Deci & Ryan, 1985). CET posits that the kind of social-contextual events (e.g., feedback) that enable a person to feel competent while engaged in a particular activity could enhance the person’s motivation to repeat this activity. CET further indicates that feelings of competence will not enhance motivation unless accompanied by a sense of autonomy. A person must be able to attribute themselves as being a cause of positive things happening in their lives and perceive that they are in charge and able to control their situation. Autonomy is related to the feeling of volition that can accompany any act (Ryan & Deci, 2000). Thus, according to CET, to be motivated people need to experience competence and perceive their behaviour to be self-determined. To support people’s feelings of autonomy, they should be provided with choices, acknowledgment of feelings, and opportunities for self-direction (Deci & Ryan, 1985). For children and adolescents in schools, autonomy-supportive teachers have been shown to be beneficial (Ryan & Grolnick, 1986). Moreover, having autonomy-supportive parents benefits children’s and adolescents’ motivation (Grolnick et al., 1997). It is noteworthy that these principles developed several decades ago, continue to hold relevance and find application in contemporary studies. The perception of competence and autonomy may be limited in severe and prolonged illness, as individuals become highly dependent on others and the health system. However, especially in those circumstances, it is essential to provide young people with the opportunity to feel competent, related, and autonomous. Participation in school activities can strengthen these aspects, especially when pupils are offered the opportunity to participate in selected activities in which they feel safe and supported.

Self-motivation manifests as exploratory behaviour in infancy. It is especially evident when the infant is securely attached to a parent. A secure attachment makes it easier for the infant to explore new things and to move out of its comfort zone because it has the security of returning to the safe haven, to the protective arms of the parents (Bowlby, 1979). It feels well to be taken care of, even if a child cannot be with the caregivers at that particular moment. This feeling of security is deeply inscribed in the human psyche. However, the feeling of security can also be weakened by insecure relationships or traumatic experiences. The ill pupil has already had several relationship experiences before the onset of his or her illness. How the child or adolescent can adjust to the difficult phase of the illness and the absence from everyday school life can be linked to Bowlby‘s attachment theory.

Self Determination Theory hypothesises that a similar pattern is evident in interpersonal settings later in life, with self-motivated behaviour being more likely to occur in contexts characterised by a sense of security and relatedness (Ryan & Deci, 2000). Since many activities that children encounter regularly are not typically interesting for them, they still perform such actions because they are prompted, modeled, or valued by significant others to whom they feel related (Ryan & Deci, 2000). This suggests that relatedness, the need to belong and to be connected with others, is crucial for school engagement. For example, children who feel securely connected to their parents and teachers have acquired more positive school-related behaviours (Ryan et al., 1994).

Further, basic psychological needs are considered interrelated. For example, it has been shown that people are more likely to be engaged in meaningful activities that others value when they feel competent enough to carry out these activities and feel belonging to the group, such as classmates. Consequently, parents and teachers should guide children to perform those activities that they are developmentally ready to master, that can be carried out competently.
Furthermore, if the context is secure, and children feel a sense of freedom to make choices, this supports their sense of agency. For example, it has been shown that children whose parents were more supportive of autonomy and relatedness internalised more school-related values compared to those whose parents were not as supportive of autonomy and relatedness (Grolnick & Ryan, 1989). Concerning children with chronic illnesses, supporting autonomy and relatedness needs can help them to stay more in contact with school, and thus feel a stronger desire to stay connected to the school and their classmates.

Supporting basic psychological needs is essential on the one hand because psychological need deprivation is a principal source of human distress and it contributes to alienation and ill-being (Ryan & Deci, 2000). Additionally, psychological need satisfaction is correlated with improved well-being (Ryan & Deci, 2000). Furthermore, one should not underestimate the power of social contexts to enhance or hinder the psychological need satisfaction leading to either healthy psychological development and natural processes of self-motivation or problems with self-motivation and personality integration.

In a nutshell

Basic psychological needs

In times of chronic illness, a child's sense of themselves as being a cause of positive things happening in their lives, as well as perceiving themselves as being able to control their situation, may be limited. Thus, having the opportunity to participate in selected school activities might be of help. Motivation to act occurs more often in situations where a child has an experience of security and relatedness. Children are more likely to engage in activities that they can carry out with a group they feel they belong to. Thus, supporting children with chronic illnesses to stay connected to their classmates is important.

Sense of belonging to school

A very general description defines sense of belonging to school as the extent to which pupils feel cared for and part of the school (Osterman, 2000). The sense of belonging to school has been linked to positive effects, such as increased school motivation, lower school dropout rates (e.g., Allen & Kern 2017) or, a lower risk of depression or bullying (e.g., Kirkpatrick, 2020). Researchers agree that the sense of belonging to school plays an important role and it has been emphasised that the sense of belonging to school can be differentiated into several components (Karcher & Lee, 2002; Lohmeier & Lee, 2011). Lohmeier and Lee (2011), for example, describe three levels of sense of belonging. The sense of belonging can be divided into „general support" or „belongingness" (support from other pupils as well as adults and the school system in general), „specific support" or „relatedness" (support from specific persons, e.g. teachers, classmates), and „engagement" or „connectedness" (enjoyment and motivation in school tasks and activities, appreciation and involvement in/relationship with classmates or teachers). All three levels can also be important in the relationship with the school in general (e.g. premises, activities, importance of teaching), but more specifically in the relationship with adults or teachers and in the relationship with other pupils. Examples of the characterisation of the three levels in relationships with adults could be the perceived friendliness of adults at school („general support"), specific support from teachers in class („concrete support"), and conversations about important issues with adults at school („engagement") (Lohmeier & Lee, 2011).

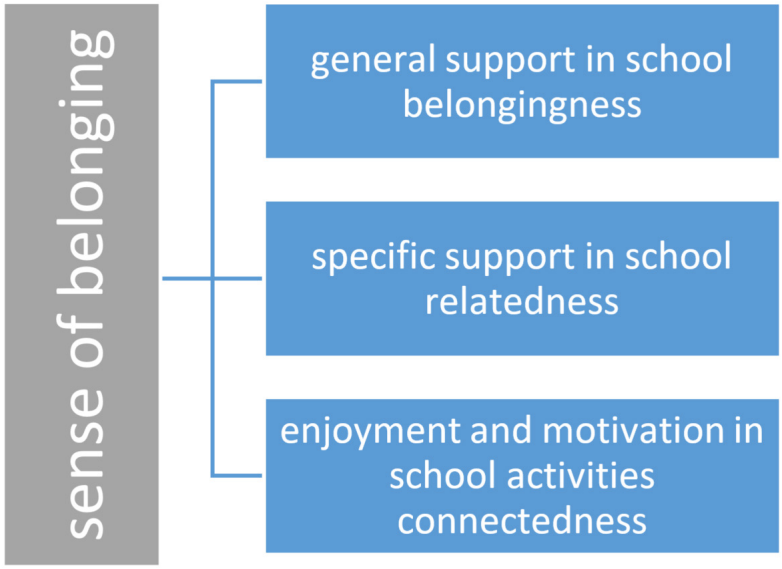


Fig. 1 Levels of sense of belonging

According to Allen & Kern (2017), the sense of belonging is not solely dependent on participating in or being physically close to others. Instead, it relies on perceptions regarding the quality of social interactions. Consequently, belonging is a reflection of one's perception of their involvement in a social system or environment. Therefore, the key factor lies in understanding the other person, showing empathy towards the individual, and recognising their mental state. A sense of belonging encompasses both affective and behavioural aspects, signifying a feeling of connectedness to others, activities, and groups. Behaviourally, it entails actively participating in and being a part of various groups, activities, and affiliations.
Overall, it becomes clear that the sense of belonging to school plays a vital role in children's and adolescents' emotional, social, and academic development. Research shows that a strong sense of belonging to school reduces the risk of depression, suicidal thoughts, bullying, and substance abuse and is associated with higher educational attainment and fewer dropouts (Kirkpatrick, 2020; Shochet et al., 2006).

In a nutshell

Sense of belonging to school

Sense of belonging to school indicates the extent to which pupils feel cared for and part of the school. Sense of belonging relies the most on perception of involvement. A sense of belonging reflects a feeling of relatedness to others and involves participating actively in groups and activities. A strong sense of belonging reduces the risk of depression and is associated with higher educational attainment.

Belonging to a peer group and risks of social isolation

Feelings of relatedness with peers can be defined as perceptions that peers respect the pupil, care about the pupil's needs, and include the pupil as a valued group member (Goodenow, 1993). Classroom peers play significant roles in creating the classroom's social context and learning environment (Ryan & Patrick, 2001). Peers influence the level of interest in school and engagement in classroom activities (Shin & Ryan, 2014). The more the pupils perceive to be related to their classroom peers the more their behavioural engagement in the classroom increases (Mikami et al., 2017). Pupils' reports of their classroom experiences of autonomy and peer relatedness partially accounted for positive changes in pupils' mastery motivation and behavioural engagement in highly emotionally-supportive classrooms (Ruzek et al., 2016). Higher behavioural engagement is again associated with relative gains in pupils' standardised achievement scores (Mikami et al., 2017). Thus, feeling related to peers is suggested to enhance adjustment (Wentzel et al., 2010) and learning outcomes in the school (Song et al., 2015).

During late elementary school, children become more concerned about gaining peer acceptance and developing a sense of belonging to the peer group (Brown & Larson, 2009; Rubin et al., 2006). Adolescents quickly learn to rely on close peers for companionship, protection, and guidance as they navigate novel contexts where peers establish and enforce norms (Laursen & Veenstra, 2021). During adolescence, some security needs are best met by peers. Middle and high school pupils increasingly consider their peers' reactions to their evolving identities (Dishion & Tipsord, 2011). On days when children experience positive peer interactions they also report higher levels of positive influence and lower levels of negative than their personal average levels (Lehman & Repetti, 2007). Thus, children seem to benefit from peer relatedness at school in terms of increased happiness and contentment. For instance, friends can fulfill unique social needs, which makes friendships uniquely influential. Intimacy, camaraderie, instrumental support, and emotional support set friendships apart from other relationships. As mentioned above, the attachment theory, a prominent need-based model, argues that attachment figures hold special status because they satisfy a need for felt security (Ainsworth, 1989). Friends serve as safe havens that facilitate exploration of the peer social world (Nickerson & Nagle, 2005). Especially in times of serious illness, the peer group can act as a safe haven and provide support during this time. In this respect, a detachment from the relationship should be avoided as far as possible; instead, ways should be found to continue strengthening relationships between the ill pupil and their peers.

Isolation from peers can bring along loneliness and diminished self-esteem (Witvliet et al., 2010), which

might progress into feelings of anxiety and depression (Bosacki et al., 2007). Children with negative peer experiences may become disengaged from academic instruction (Iyer et al., 2010), withdraw from class participation (Ladd et al., 2008), and show reduced academic self-concept (Flook et al., 2005). This, again, might lead to lower grades and achievement test scores. Young adolescents without friends are victimised more frequently by bullies and present more internalising and externalising behaviour problems than those with friends (Hodges et al., 1999). The risks are most significant during school transitions, which are peak periods for friendship loss and friendlessness (Felmlee et al., 2018). Peer rejection has been pointed out as one of the precursors of dropping out of school (French & Conrad, 2001).

In a nutshell

Belonging to a peer group and risks of social isolation

Relatedness with peers is the perception that peers include the pupil as a valued member of the group. The more the pupil perceives to be related to their classmates, the more they engage in the classroom. Pupils can rely on close peers for companionship, protection, and guidance. On days when they experience positive peer interactions, they also report more positive and less negative feelings. Especially in times of chronic illness, the peer group can act as a safe haven and provide support.

The role of teachers in the sense of belonging to the school

It has been shown that adults play a central role in shaping children‘s social cognitions, including their perceptions of peers (Corsaro & Eder, 1990; Skinner et al., 2020). During pupils’ transition from primary grades to upper elementary or middle school grades, social comparison cues are more prevalent (Urdan & Midgley, 2003), and compared to younger children, the pupils may be more cognitively capable of using social comparison cues to make inferences about others’ characteristics (Kuklinski & Weinstein, 2001). Thus, pupils‘ observations of teacher-pupil interactions may serve as an affective bias that shapes their perceptions of others’ academic abilities. Teachers are most likely to impact adolescents’ peer relatedness while interacting with them in a classroom setting (Hamm et al., 2014). As pupils perceived their teacher as promoting interaction and mutual respect among classroom peers, their self-reported motivation and engagement increased (Ryan & Patrick, 2001). Adolescents report being more engaged in classrooms where teachers were observed to be more emotionally supportive (Reyes et al., 2012; Skinner et al., 2008).

Teachers play an essential role in creating a classroom that enhances the sense of belonging. Teacher’s emotional support for pupils‘ engagement and motivation mediates autonomy and peer-related experiences (Ruzek et al., 2016). In classrooms with emotionally supportive teachers, pupils most likely experience more developmentally appropriate opportunities to exercise autonomy in their day-to-day activities and have probably more positive relationships with their peers (Ruzek et al., 2016). For instance, teachers create a more supportive peer group environment when they use cooperative learning strategies (Mikami et al., 2005) or do not allow pupils to put down others’ ideas (Ryan & Patrick, 2001). As it might be difficult for pupils with chronic illnesses who are participating from a distance to offer their ideas and participate in collaborative learning tasks, it is important that teachers pay particular attention to creating a learning environment where the sense of belonging of all the pupils is supported.

Pupils‘ interactions with teachers and classmates impact their social and emotional adjustment, academic motivation, and learning (Wentzel, 1999). Positive and supportive relationships with teachers and classmates promote a sense of school belonging and a positive pupil identity (Furrer & Skinner, 2003), which engenders the will to participate cooperatively in classroom activities and to try hard and persist in the face of challenges (Hughes et al., 2008).

In a nutshell

The role of teachers in the sense of belonging to the school

Adults play a central role in shaping children‘s perceptions of peers and peer relatedness. The pupil’s engagement increases as teachers promote interaction and mutual respect among classroom peers. Thus, teachers play an important role in creating a learning environment that strengthens the sense of belonging. As it might be difficult for a pupil with chronic illness to participate in learning tasks actively, their teachers must pay particular attention to creating a learning environment where the sense of belonging of all pupils is supported. Positive and supportive relationships promote a sense of school belonging and will to participate in classroom activities.

Conclusion

Regarding chronic illnesses, difficulties can arise in the relationships with teachers and classmates. For example, a lack of knowledge about the disease can be accompanied by a negative attitude towards it. As children with chronic illness can only participate in leisure and sports activities to a reduced extent, they might have a diminished sense of belonging to a peer group. The lack of personal contact with classmates and teachers and the lack of involvement in the classroom, can lead to children experiencing loneliness and feelings of social isolation. The feelings of social isolation are associated with further negative consequences, such as reduced well-being, low self-esteem, and less successful coping with the illness. Chronic illness also affects children‘s and young people‘s performance at school. The absences due to illness and the associated treatment can lead to a decline in performance and class repetitions.
A sense of belonging is crucial to pupils‘ success and well-being at school. When pupils feel they belong, they are more likely to engage in school, participate in school activities, and build positive relationships with teachers and classmates.
There are several ways schools can foster a sense of belonging in their pupils:

1. promote an inclusive environment: Once schools create an inclusive environment, all pupils may feel welcome, regardless of their health condition or other factors. This can be achieved by promoting diversity and encouraging respectful and positive interactions between pupils.
2. encouraging pupil engagement: A variety of in-school and extracurricular activities allow pupils to pursue their interests and passions. Participating in these activities allows pupils to connect with peers who share their interests.
3. promoting pupil voice: Real opportunities for participation give pupils a chance to voice their opinions and have a say in school policies and procedures. This can help pupils feel empowered and valued as school community members. Especially for pupils with long-term illnesses, it is central to retain their sense of competence, belonging, and autonomy.
4. build positive relationships: Teachers and school staff build positive relationships with pupils by getting to know them individually and providing support when needed. When pupils feel valued and supported by their teachers, they are more likely to feel a sense of belonging in the school.

All these aspects can be traced back to theories of basic needs and a sense of belonging, which serve as a background foil for the rest of this handbook.

Educational innovation in recent years highlights the use of telepresence systems to connect pupils with school during their absence due to chronic illnesses. The use of telepresence systems has high rates of academic, social, and emotional satisfaction (Chubb et al., 2021; Powell et al., 2021; Schmucker et al., 2020; Weibel et al., 2020). Sense of belonging is an aspect that is greatly enhanced by the use of telepresence systems as these tools can act as the representative of the child who is absent from school while undergoing treatment or convalescing from an illness. Being represented in the class generates a sense of belonging not only in the ill child but also in peers, which facilitates social connection, emotional well-being, and integration in the classroom once treatment is over (Soares et al., 2017).

In a nutshell

The lack of personal contact with classmates and lack of involvement in the classroom might lead to experiences of loneliness and social isolation. This can lead to reduced well-being, lowered self-esteem and less successful coping with the illness. Educational innovation in recent years highlights the use of telepresence systems to connect pupils with school during their absence due to chronic illness. Sense of belonging is an aspect that the use of telepresence systems can significantly enhance.

Questions to ask when teaching a pupil with a chronic illness and prolonged absence from class:

- How was the pupil involved in the class before their illness?
- How is the pupil involved in the class during their illness?
- What does the pupil particularly enjoy doing in class?
- What are the pupil‘s strengths in class?
- How well does the pupil manage to ask for help?
- Is the pupil well integrated into the class community?
- How well can the pupil pay attention to their own needs and articulate them?
- Does the pupil have a best friend in the class?
- How much does the pupil feel competent in relation to school activities despite the illness?

Part II

Telepresence systems for school participation of pupils with chronic illnesses

Content

- What teachers need to know about telepresence systems
- Relation between humans and technology
- Significance of the different designs of telepresence systems for school use
- Social inclusion through telepresence systems
- Tinkering with the systems

Telepresence systems as a bridge into the classroom

Telepresence systems represent a diverse assortment of technologies, with the standard function of representing the presence of a human, controlling the technology from a remote setting, and hereby enabling the (tele)presence of the human.
In general, such systems provide an "[…] experience of presence in an environment by means of a communication medium" (Steuer, 1992, p.75). In this handbook, technologies are referred to as "systems" to include technologies that do not inherently hold robotic connotations or functionalities. Common terms that could be encompassed under a defining umbrella of "telepresence systems" will include "telepresence avatars" and "telepresence robots".
When used specifically for pupils with chronic illnesses, telepresence technologies are used to strengthen the ill pupil's connection to education and the social environment, which refers to an extended and virtual form of learning space constituted in the interplay between material and human practices.

There is a wide variety of telepresence systems, and the differences are not always clear for pupils with chronic illnesses, their families, or teachers. The distinctions made above are to embrace concepts where the telepresence system represents or illustrates its human counterpart, which would be the case with telepresence avatars mimicking or representing human social interaction controlled by the user, but also telepresence systems that directly mirror the user through a video feed such as robots with wheels, where the remote user can control movement. In contrast, they are simply represented on a screen, such as on a tablet or mobile phone.

For telepresence robots to be seen as representative of a human being, the boundary between subject and object must be partly broken down. According to Haraway (1990), Western lines of thinking have traditionally been characterised by a distinction between the human and

non-human, where the former is associated with the 'subject' and the latter is depicted as an 'object'. From this perspective, a biological pupil in a classroom is seen as a 'subject,' while the telepresence robot represents a material/technological 'object' that can be instrumentalised for different purposes such as enabling a physically absent pupil to attend class. From such a perspective, agency, or the capacity to act on the world, is exclusively ascribed to the human actor i.e., the subject. Concerning telepresence systems, the pupil and other subjects (the teacher, classmates) are the ones who actively use the robot (object) to connect with the classroom (Zillner et.al. 2022).

The following will focus on how the teacher integrates telepresence technologies in the classroom and how they make the robot (object) represent the child (subject). Furthermore, the focus will be on how the teacher can work to include this (virutal) pupil in the classroom and the social contexts. In order to do that, first of all, some examples are presented dealing with different telepresence robots in relation to how they work and how the child is represented as it is essential for which robot is selected.

In a nutshell

The role of teachers in the sense of belonging to the school

Adults play a central role in shaping children's perceptions of peers and peer relatedness. The pupil's engagement increases as teachers promote interaction and mutual respect among classroom peers. Thus, teachers play an important role in creating a learning environment that strengthens the sense of belonging. As it might be difficult for a pupil with chronic illness to participate in learning tasks actively, their teachers must pay particular attention to creating a learning environment where the sense of belonging of all pupils is supported. Positive and supportive relationships promote a sense of school belonging and will to participate in classroom activities.

Presence and interactions between humans and technology - Consequences of what the system looks like

The morphology of different technologies and what it connotates to the human interacting with the technology is a subject especially relevant to the readers of this handbook. Since the early introduction of social robots, or robots that socially interact with humans, much attention has been paid to their physical appearance. Primarily, the focus has been on the accessibility and acceptability of systems (Damiano et al., 2015; Fujita, 2001; Ishiguro, 2006). However, how the physical characteristics of robots influence human attitudes and expectations, in general, has also been a critical point of interest. Research into Human Robot Interactions (HRI) established that users tend to perceive robots as animate beings even without a direct human control element (Fridin, 2014; Blond & Hasse, 2017, Coeckelbergh, 2018). Furthermore, technological systems that look like humans (anthropomorphic) or systems that look like animals (zoomorphic) tend to instill certain expectations in human users (Coeckelbergh, 2018; Damiano & Dumouchel, 2018; Damiano et al., 2015; Fujita, 2001; Ishiguro, 2006; Giger et al., 2019). Specifically, expectations and assumptions made due to "anthropomorphic projection" (Damiano & Dumouchel, 2018) include assumptions

of human-like emotional qualities, the ability to process thoughts, and a general overinterpretation of the capabilities of robots. These projections are highly common when dealing with technological systems such as telepresence avatars or robots (Turkle, 2011).
When exploring morphology further, we often find, that the technological artifacts have either an anthropomorphic (human-like), zoo-morph (animal-like), or robomorph (robot-like) appearance. Other iterations of the latter include techno morph examples, where the physical appearance has evident technological characteristics. The morphology of a technology is significant when technology is used in, with or for human interactions, such as in the case of telepresence systems. This is due to the aforementioned expectations that physical appearances impart. The emotional transfer is seen as an inherently human trait, so more anthropomorphic systems (or direct depictions) will often be viewed, accepted and acted upon as more emotionally salient entities. On the other hand, very techno morph technologies will often be viewed as 'colder' or emotionally detached from their setting.

How technology is initially perceived by the people involved is thus an essential factor when selecting technology. In the case of telepresence systems, there are three main types of systems with different morphologies. As these three types clearly show, there is a big difference in what the systems may look like, which in turn has an impact on what and how they are going to be perceived.

The robomorph avatar: (e.g AV1 and OriHime)

- Robomorph with anthropomorphic elements (i.e. eyes showing emotions or the ability to gesture)
- The user is able to completely mask their appearance by being represented as the robot avatar
- The user can communicate emotions through a limited range of communicative actions performed by the robot
- The system is viewed as very toy-like by older, more mature users

The screen on wheels: (e.g Beam or fable connect)

- Technomorph; looks like "an iPad on a stick"
- The user is depicted directly, and is not able to mask unwanted appearances or signs of illness
- The user can communicate emotions directly via the video feed
- The system is preferred by more mature users
- Quite mobile, the user can move around in the remote physical setting, as they would if physically present, resulting in more agency

The screen with camera control - but no mobility: (e.g Bednet)

- Technomorph; involved technology (such as camera and microphone) is clearly visible
- The user is depicted directly, and is not able to mask unwanted appearances or signs of illness
- The user can communicate emotions directly via the video feed
- Immobile, the system must be carried around within the remote physical setting

Factors for selecting and implementing a telepresence system

A few factors are highly important when selecting and implementing a telepresence system, and all relate to the appearance and functionality of the telepresence system.

1. Age and maturity of the child
2. Mobility of the telepresence system
3. Ability to communicate emotions
4. Depiction of the user

The last will be addressed in a separate section, while the other three factors will be addressed hereafter.

During interviews for the current project, it became apparent that the age and maturity of the child using the telepresence system is highly relevant, as the robomorph avatars are often viewed as more "toy-like," while screens on wheels or with camera control can be perceived as boring and low-tech. As such, older (or at least more mature) children tend to prefer telepresence systems of the latter types, while younger (or less mature) children favour the robomorph systems. This might seem a redundant factor, but it becomes highly relevant as it relates positively to the acceptability and feeling of being present remotely. A child who identifies more directly with the telepresence system representing them will often feel more included within the remote setting and be more socially involved. Moreover, classmates of the ill pupil are more likely to accept an entity, that is, to some extent, identified explicitly as a familiar subject, rather than a visually 'default' technology.
When using telepresence systems, it is crucial to consider whether the system is mobile or not (Ahumada-Newhart & Olson, 2019). This includes whether the telepresence system has wheels or not and other functionalities, such as accessing 5G internet connections so the child can participate in field trips or go outside for recess (on the telepresence system). This again relates to the identity of the chronically ill pupil. If the pupil is usually very active within the social confines of and around the classroom, they might feel limited when they are unable to control the mobility of the telepresence system. Such an agency is important both academically and especially in relation to the social belonging of the pupil. A connection can be made here with the theory of basic needs. The perception of one's autonomy can be increased through increased mobility, and ownership is in the hands of the pupil. The pupils might feel more independent as they can at least decide to a certain degree, when and where to move.
Emotional communication is a crucial factor in any human feeling present and socially connected in a setting (Oatley & Johnson-Laird, 2011; Schouten et al., 2022). Thus, how a telepresence system can

portray or mirror the emotional state of their human counterpart is again paramount to their feelings of social belonging. As with visual representation, emotional representation is also important concerning acceptance amongst classmates, as they are more likely to accept an object that can at least crudely portray the emotional reactions of the remotely present child (Schmucker et al., 2020). This could further relate to the child's social capabilities, and also their already established relationships within the classroom. If the child's capacities for emotional mediation and understanding are unknown, it might be preferable to use a telepresence system, wherein the child is directly depicted and thus viewable to all within the physical setting of the classroom. If the child, on the other hand, is adept in both emotional understanding and empathetic understanding of others, the child might use a robomorph system and thus gain the ability to mediate their emotional involvement in relation to their current energy levels (as they are in complete control of their emotional representation in the classroom).

How is the pupil depicted?

The depiction of the child is another important factor when using telepresence systems for chronically ill pupils (Schmucker et al., 2020). As the illustrations of systems show, there are two main ways in which telepresence systems can represent the ill pupil:

1. the pupil will not be seen at all and represented by the technology, as there are no screens to depict the child (i.e., the robomorph avatar) or
2. the pupil can be seen as a direct image on a screen as there is a video function

The advantages of having the child directly depicted include the possibility of retaining social exchanges based on facial expressions through the telepresence system. Thus, the classroom can more efficiently deduce what the pupil feels and how it directly reacts to interactions across the two physical settings. A clear disadvantage, however, is that a chronically ill pupil will often be physically affected by their illness. Cancer treatment, for example usually involves alterations to facial structure (i.e., swollen face, loss of hair), and hospital treatment might entail tubes or other attached physicality to the face of the child, which they might not desire to show to the world, to their teacher and friends. Even if the pupils do not want to show themselves, there is a need to belong. It is also about accessing their peer group and deciding if and when they want to show themselves.

The disadvantage of a direct depiction becomes the advantage of its counterpart, the technological avatar that takes over the physical representation of the child, in the remote setting. What the ill pupil's classmates see through the use of such a system is merely a technological avatar with the voice of the ill child. Furthermore, the ill pupil is able to install a few emotional markers in the telepresence system, thus showing happiness, curiosity, confusion, and others through lights mimicking eyes as well as other features (pictures of e.g., AV1 with different „eyes"). This means that the child is able to mask any unwanted physical appearance created by their illness and participate in the classroom. An issue with such telepresence systems derives from not being able to see the child's face and directly relate to their facial expressions, which can produce insecurities and, in turn, hinder social exchanges usually happening in a classroom.

Figure 2: Example of Apple's Memoji augmented reality avatar

A new and potentially third option is the use of augmented reality and a virtual avatar. A virtual avatar can potentially be used on a screen-based telepresence system and has the

ability to directly depict the chronically ill child while placing a virtual representation of them on top of their physical appearance (i.e., Apple's Memoji, Androids AR emoji). This technology enables a semi-direct depiction of social exchanges and facial expressions while the actual appearance of the pupil is still masked. However, the option is only currently being used based on knowledgeable practitioners who combine different technologies in order to suit the needs of the chronically ill pupil. Furthermore, this points to the necessity of practitioners 'tinkering' with the technologies they are provided for practitioners to become adept at using the technologies and, more importantly, adapting the technologies for their specific settings, and the children they interact with. This perspective will be explored more further detail later in this handbook.

In a nutshell

Factors for selecting and implementing a telepresence system

A child who identifies with the telepresence system that represents them will feel more included within the remote setting and more socially involved. For example, if the pupil is usually very active within the social confines of and around the classroom, they might feel limited when they cannot control the movement of the telepresence system. If the child's capacities for emotional mediation and understanding are unknown, it might be preferable to use a telepresence system, wherein the child is directly depicted and thus viewable to all within the physical setting of the classroom. If the pupils do not want to show themselves, they could use a technological avatar with the voice of the ill child. In such a case, the ill pupil can install a few emotional markers in the telepresence system, like showing happiness, curiosity, and confusion through lights mimicking eyes as well as other features.

Reflections on selecting a system

It is evident that selecting the accurate telepresence system for a specific pupil is not easy. In many cases, a choice between different telepresence systems is not possible because of the restricted availability of the systems. Nevertheless, it is essential to pay attention to the fit of the telepresence system with the child. In this respect, a combination with other technologies, such as AV1 and MS Teams via laptop, can also be considered.

The selection must be based on the needs of the pupil while also keeping in mind their strengths and weaknesses, combined with the social and technical prerequisites of the setting. Furthermore, this means that a 'standard' package solution is not preferable. Instead, each distinct telepresence system caters to a different user-group. What the school (municipality, family, or administration) must therefore do is appraise what is relevant in their specific case and find the best solution possible. One child may want to be able to hide signs of the illness behind the telepresence system, while another child requires the ability to move around the physical setting because he is very socially engaged in areas surrounding the classroom, such as recess and other activities. One might be an established social actor within the classroom, while the other might be more peripherally included. The selection should demonstrate that social inclusion and the sense of belonging of the chronically ill pupil takes precedence over academic potentialities and demands.

Inclusion of the pupil in the classroom

Telepresence technologies can be defined as an assistive measure that aims to include the pupil in the classroom. Inclusion is vital for pupils using telepresence technologies as they are less likely to be able to participate regularly in social communities and learning environments in schools due to illness and physical distance. Thus, the ability and willingness of teachers and classmates to include the pupil in the learning community has a significant impact on the pupil's sense of belonging and presence during school. Newhart et al. (2016) use the term "virtual inclusion" to characterise an educational practice that enables a pupil to attend school via a robotic telepresence system, referring to the pupil's compelling sense of being in a mediated space rather than where the physical body is located.

The robot as a representative of the pupil

An essential precondition for the interaction between the remotely present ill pupil (through technology) and the other pupils in the classroom is that they accept the notion of the robot as a representative of the child. Research shows that the stronger the acceptance of such a notion is, the more likely the pupil will achieve meaningful social contact with the others in the classroom (Børsting & Culén, 2016; Newhart et al., 2016). This implies that some form of humanisation of the robot must take place; in other words, the robot must be "brought to life." This refers to the previously mentioned concept of anthropomorphisation which means attributing human characteristics to non-human creatures and objects (Duffy, 2003; Serpell, 2005). Newhart et al. (2016) point out that the anthropomorphism of the robot is a key contributor to establishing a sense of normalcy for a pupil using telepresence systems because it allows the pupil to interact with classmates, maintain or establish social connections with their school community, and receive care and support from their friends. In this context, the aim is to create a situation in which those involved (the teacher and the other pupils in the classroom) accept and treat the robot as a representative of the child. The teacher might employ different strategies to actively try to anthropomorphise the robot.

One way to achieve this is to personalise the robot, by letting the pupil decorate the avatar with personal objects, colours, clothes, stickers or a favourite facial image. This process of personalising the robot, makes it easier for others to identify who the robot represents (Newhart & Olson, 2019). For pupils and young people, the school context plays a vital role in their identity development, and the personalised robot is precisely how the pupil can express him/herself and thereby achieve a form of normality. The other pupils can also take an active part in decorating the robot. Furthermore, their focus on the robot can strengthen their understanding as a representative of their classmate. Interviews with children with chronic illness and their classmates and teachers (Turner & Rockenbauer, 2023) showed that personalising the avatar is a crucial factor. Especially when personalisation has taken place as an interactive process between classmates and the affected child. This strengthened the bond between the children and the perception of the subject's feelings.

Another way to ensure that the robot will be seen as a legitimate "stand-in" for the pupil is to communicate with the robot as if it were the pupil. As mentioned earlier, the choice of technology has an enormous impact on the possibilities for communication. If the pupil's face is visible, social cues such as nods and smiles can become part of the communication, while the absence of a face can make it more challenging to read the pupil's expression. Furthermore, research has shown that the use of anthropomorphic pronouns makes human partners more likely to treat humanoid social robots as real people (Zhao, 2006). This implies a form of communication where personal pronouns such as he, she, and you should be used when talking

Figure 3: Examples of personalisation

about or to the pupil. In addition, it is essential to include the pupil's name and not refer to the robot as a robot when it is actively used. The use of pronouns such as "me" when talking about the robot clearly indicates the aforementioned acceptance of the robot as a representative. Furthermore, if classmates spontaneously use gender-based pronouns or the name of the ill pupil, it indicates their acceptance of the robot as a direct representation of the ill pupil.

In a nutshell

The robot as a representative of the pupil

The aim is to create a situation in which those involved (the ill pupil, the teacher and the other pupils in the classroom) accept and treat the robot as a representative of the child. One way to achieve this is to personalise the robot by letting the pupil decorate it with personal objects, colours, clothes, stickers, or a favourite facial image. Another way to ensure that the robot will be seen as a legitimate "stand-in" for the pupil is to communicate with the robot as if it were the pupil. If classmates spontaneously use gender-based pronouns or the name of the pupil, it indicates their acceptance of the robot as a direct representation.

Tinkering with the system

When implementing and using a telepresence system, it is vital to provide the teachers and pupils with the opportunity to "tinker" with the technology. "Tinkering" is a term most commonly used in maker-education, where pupils are engaged in creative tasks involving 3D-printing, robotic coding, and other creative tasks, and is often seen as a catalyst for invoking interest in the subject within a STEM field (Crowley et al., 2015; Swarat et al., 2012). Here, tinkering becomes a way for involved subjects to improve upon the technology they are engaged in through interaction and experimentation with the technology. Examples of such experimentation or tinkering can be seen in simple tasks such as altering the physical appearance of the technology, where classmates accessorise the AV1 telepresence system, as mentioned above. Such tinkering is an important part of supporting the sense of belonging of the ill pupil, as the process of changing the appearance of the robot can be a direct way of including the remotely present pupil in the classroom.

Another example of tinkering is the involvement of a pupil with an autoimmune disease, using the Beam telepresence system, who would like to participate in a Danish school's Saint Lucy's Day parade. In that example, the teachers and pupils created new physical materials specifically designed for the telepresence system to provide it with a robe to wear and a traditional head garland, to include the chronically ill pupil in the traditional costume of paraders on Saint Lucy's Day. These examples represent the improvement of technology to make it fit the specific context in which it is a remote representative of ill pupil. The tinkering ensures that such representation is as precise and inclusive as possible, thus increasing the sense of social belonging of the ill pupil.

Generally, the same school produced a bumper for the Beam, as the ill pupil was socially mischievous and, therefore, often bumped into others, causing them pain, or, tipping over the quite expensive telepresence system. Besides the bumper, they modified a bicycle helmet in order to protect the screen when the system tipped over due to the pupil's engagement in social exchanges. In principle, the system could have been turned off during recess, thus diminishing the risk of damage by removing the possibility of mischievous behaviour. By tinkering with the system, they include the pupil in all of his personality and within the entire school context. This will have a positive influence on his social belonging and mental well-being. Furthermore, the ill pupil's classmates were involved in the production of such materials, thus potentially raising their acceptance of the technology and the inclusion of the ill pupil, as mentioned above.

A further point of emphasis is the important process of acceptance among teachers. Including any technology in a classroom can easily be viewed as an infringement on the domain of the teacher if such inclusion is not initiated by the teachers themselves (or if they are not involved in the process). In drastic cases, where teachers are informed of the inclusion of technology late or not at all, it is sometimes even viewed as a direct violation of their professional space. This should always be avoided. However, in cases where technology is introduced, and the teachers are encouraged to tinker with the technology before and after, the teachers tend to be far more accepting of including such technologies in their classrooms. Furthermore, technology that has been tinkered with by practitioners and pupils, and through such tinkering, adapted to the specific classroom setting is more likely to be used in a successful way. This is an essential point of emphasis, as it underlines that tinkering does not necessitate electronic know-how but solely knowledge about the practice where technology is implemented.

To Tinker is to: "attempt to repair or improve something in a casual or desultory (unfocused) way." (Oxford Dictionaries)
A Tinkerer is "… one who experiments with materials and ideas to fully understand their capacities, and who further iterates on their learning to find better solutions to current problems"

In a nutshell

Tinkering with the system

The improvement of technology to fit the specific context in which it is a remote representative of an chronically ill pupil. Tinkering ensures that such representation is as precise or inclusive as possible, thus increasing the sense of social belonging of the ill pupil.

Conclusion

Telepresence systems aim to create a situation where the ill pupil gets a presence in the classroom, thus enabling the child to take part in the learning and social environment of the class. This can be challenging as the telepresence system can be perceived as a material/technological "object" and not as a representation or extension of the pupil. In this context, both the pupil and other relevant actors (teachers, classmates) play an important role in making the telepresence system act as a proxy for the ill pupil.

Telepresence systems are also described as 'telepresence avatars' and ‚telepresence robots; they differ in form and capacities, which influences what they can be used for. Overall, there are three main types of systems: 1) The robomorph avatar: (e.g., AV1 and OriHime), where the user is able to completely mask their appearance by being represented as the robot avatar. This telepresence system is immobile but can easily be carried around, which means that the user is not able to move the avatar around. The user can communicate emotions through a limited range of anthropomorphic elements (e.g., eyes showing emotions), 2) Screen on wheels (e.g., Beam or Fable connect): here the user is shown via an iPad („an iPad on a stick"), which she/he can move around in the environment, 3) Screen with camera control - but no mobility (e.g., Bednet): the user communicates via a screen with a high grade camera that makes the setting more accessible as it is possible to zoom in with very high resolution.

Some factors are critical when selecting and implementing a telepresence system, and all relate to the appearance and functionality of the telepresence system: 1) Age and maturity of the child: it is vital to use a telepresence system that the pupil can identify with because some robomorph avatars can be viewed as more "toy-like", while screens on wheels or with camera control can be perceived as boring and low-tech, and thus less attractive. 2) Mobility of the telepresence system: for the ill pupil to form social relations with peers, it is important for the child to be able to move their avatar around independently. 3) Ability to communicate emotions: emotional communication is a key factor to any human feeling present and socially connected in a setting. Therefore, it is paramount to how a telepresence system can portray or mirror the emotional state of its human counterpart. 4) Depiction of the user: the advantages of having the child directly depicted include the possibility to retain social exchanges based on facial expressions through the telepresence system. On the other hand, there can be situations where the pupil does not want to show themselves because he/she is physically affected by their illness.

Questions to ask oneself, when selecting and using a telepresence system:

How does the pupil act when physically present? (How might we enable him/her to act in a similar way through a technology?)

- What is the pupil especially good at in a social setting?
- What limitations does the illness entail (and how might that enable or disable specific interactions via the telepresence system)?
  - ◊ What does that mean for the selection of a telepresence system?
- What are the technological capabilities at our school? (i.e., WIFI, 5G connection, is everything wheel-based accessible?)
- What ground rules for inclusion existed before the introduction of the telepresence system?
  - ◊ This could be debated amongst the pupils and teachers (depending on their maturity level.
  - ◊ Who is/are the responsible classmate(s) for the telepresence system during breaks and excursions?

In a nutshell

Telepresence systems can be a valuable addition, especially when pupils cannot attend school physically due to illness, disability, or other reasons. Telepresence systems allow these pupils to attend classes remotely and participate in discussions, group projects, and other activities as if they were in the classroom.

Different areas of attention can help ensure that the pupil with a telepresence robot feels included. First of all, the aforementioned technical and practical aspects of involving technology include network connection, and charging the robot. These need to be in place so that the pupil is not excluded from the start because the technology does not work.

Additionally, the physical space is vital to reflect on, as the physical location of the robot is important for the pupil‘s sense of presence in the area. In this context, the robot should be placed so that the pupil can hear what is being said in the room and, at the same time, see the blackboard (or digital alternatives), the teacher, and the other pupils in the class.

The implementation of social rules for interaction between the pupil, the teacher and the other classmates is very important. Such ground rules may cover agreements between the pupil and the teacher on how the pupil can actively participate in the classroom and have the opportunity to express him/herself, as well as agreements with the other pupils on how to integrate the pupil/robot in games and informal conversations, and how to communicate with the child.

Furthermore, there must be a clear frame of responsibility for teachers, IT staff, parents, and the other pupils in the class to know who is in charge of what tasks. In this context, specific pupils (“robot buddies“) can be assigned responsibility for smaller tasks, such as taking the robot to other classrooms or outside during breaks.

Lastly, inclusion is about involving the child in social events that are physically outside the classroom.

Part II

Implementation of telepresence systems in lesson planning and classroom management

Content

Pedagogical approaches when using a telepresence system
Approaching the reality of the ill pupil
Preparation phase
- Preparations from the school's perspective for the use of a telepresence system
- Aligning goals and expectations

Implementation phase
- Implementing a buddy system when using the telepresence system
- Using a telepresence system for breaks and excursions
- Lesson planning when using a telepresence system
- Combination of several systems

Reintegration phase
- Designing the re-entry phase

Introduction and pedagogical approaches when using a telepresence system

In this part of the handbook, the subjects of Part I (basic needs- competence, relatedness, autonomy, and sense of belonging), as well as the focus of Part II (telepresence systems), are presented in the context of implementation into educational practice. This is based on a constructivist approach, which assumes that people actively construct their knowledge (Elliott et al., 2000). Therefore, the basis of teaching is creating opportunities and environments that enable children and young people to learn. As shown in the previous text, supporting the satisfaction of psychological needs is an important aspect of the learning environment because those who feel competent, autonomous and belonging are more self-motivated, engaged and have internalised the school-related values.
Another foundation of teaching is to create opportunities for interaction (Hamre et al., 2013). Interactions are two-way processes to which both parties contribute. Learning is more efficient when all pupils actively participate in interactions (Berry & Englert, 2005). The opportunity to interact with others safely and openly allows one to meet the needs for connectedness and autonomy. Therefore, the teacher must create an environment where pupils can express their thoughts and feelings and discuss their personal needs (Reeve et al., 2004).
This is based on a reflexive pedagogical approach. According to this, teachers perceive their professional thinking and acting in a reflexive way without mindlessly following tips and tricks.

Instead, the aim is to understand the respective situation, to perceive one's own ideas as well as the needs of the other person, and, based on this, to shape teaching and pedagogical action (Klafki, 2002). With Helspers' (2001) dual professionalisation of the reflective and routinised practical habitus, an understanding of one's own attitudes and practice routines, and regarding the child with all its needs and competences is required. The concept of mentalization (Fonagy et al., 2004; Gingelmaier et al., 2018),

which can be concisely outlined as “holding mind in mind“ (Allen, 2006), describes this professional attitude Understanding the mental states of the counterpart as well as one‘s own is essential. This includes empathy and the ability to empathise with the ill pupil through perceiving his or her needs.
The use of telepresence systems in pedagogy is relatively new. Nevertheless, it can link didactic concepts from distance teaching during the COVID-19 pandemic as well as from experiences in hybrid teaching methods. The concept of inquiry learning is particularly helpful in this context and can be seen as a pedagogical background foil for the application of digital inclusive education (Filk, 2019), as it should always invite experimentation and trial and error. Inquiry-based learning “is understood as [...] the acquisition of experiences, knowledge, and competences based on a self-reflective and theory-based confrontation with the field of action school“ (Fichten, 2013, 4).
Following the concept of research-based learning, teachers develop a “questioning-developing and critical-reflexive attitude“ (Fichten, 2013, 2) and integrate this attitude into their pedagogical practice. Fichten states that “[t]his [attitude] cannot be taught or trained theoretically, nor does it result ‚automatically‘ from dealing with certain content. It can only be actively practised and developed in situations where it is needed, i.e. generated through experiential learning.“ In this respect, research-based learning is directly linked to (one‘s own) pedagogical practice and focuses on the concrete concerns of the participants and their professional reflection and further development.
This part of the manual follows the logic of the chronological process from the disclosure of the illness and the use of a telepresence system to the reintegration of the pupil and the subsequent return of the telepresence system. Scenarios of pedagogical practice to strengthen the sense of belonging are offered. In interview studies with affected pupils, their parents, a teacher, and classmates essential moments of the school experience with a telepresence system were identified.
The handbook offers insights into the practice of teachers who have experience with telepresence systems on the one hand, and on the other hand, with reflective questions that invite reflection on teaching with chronically ill pupil.

In a nutshell

Introduction and pedagogical approaches when using a telepresence system

The basis of teaching is creating opportunities and environments that enable children and young people to learn. Supporting the satisfaction of psychological needs is an essential aspect of the learning environment. Another foundation of teaching is to create opportunities for interaction. The aim is to understand the respective situation, to perceive one‘s own ideas and the needs of the other person, and, based on this, to shape teaching and pedagogical action. This part of the handbook offers insights into the practice of teachers who have experience with telepresence systems on the one hand and, on the other hand, with reflective questions that invite reflection on teaching with chronically ill pupil.

Approaching the reality of the ill pupil

A serious diagnosis, a tragic accident, or a drastic worsening of an illness is a dramatic experience for those affected. For the first time, nothing remains the same; medical measures are taken, and therapy may be prescribed. For the pupil, this possibly means that they can only attend school irregularly or must be absent for a longer period.
If a child is diagnosed with a severe or long-term illness, it should be noted that the pupil will be withdrawn from school if the medical team deems him/her unfit for school. The impact of treatment on school attendance is discussed by a medical team, teachers, and parents so that the absence can be planned appropriately (Madrigal & Camacho, 2019).
The family environment, health staff, hospital or home care teachers, and teachers at the reference school play an important role in the flow of information to the pupil.
In hospitals with educational support, all children are cared for in hospital classrooms. Teachers in these classes are responsible for maintaining contact with the family and the reference school to give and receive information.
At this early stage of the disease, the children are not only afraid of the treatment but also of what their peers may think and the questions they might be asked. For the reasons mentioned in Part 1, it is essential that the relationship between the ill pupil and their peer group in school continues, despite the circumstances. This process can be supported by professionals, e.g., by writing letters and messages in school and sending them to the ill child during their hospital stay. It is important that the ill pupils, with the support of professionals, do not break off their relationships with their peer group. Letters, messages, drawings, and gifts are vital during the hospital stay. When the child returns home, a visit from a friend can be organised if the situation allows, or the child can be taken to an open place with classmates to play. Maintaining contact with the class can keep the sense of belonging stable. Ideally, there will be no friendship breakdowns or long periods without hearing or seeing their friends. Nowadays, digital media are a great support in this regard.

This initial fear can also be present in the usual group of peers. The teacher in the school, with the support of other professionals (psychologists, staff of parents' associations of ill children, counsellors, educators), should address the situation in the class, try to allay the fears and worries related to the illness and from there explain the processes that normally take place in this type of illness, which will also help to break down stereotypes. While the family will play a crucial role in sustaining an atmosphere of emotional security, the entire school community bears the responsibility of creating a notably open-minded, sensitive, and tolerant environment, given the challenges posed by the illness for the pupils. Therefore, effective communication among all stakeholders, including teachers, parents, and hospital staff, is essential. Implementing a telepresence system or, if not feasible, establishing a well-coordinated action plan can help prevent misunderstandings.

If the school sets up an action plan regarding pedagogical support, the following aspects should be addressed:

- Coordination strategy: people in charge, tasks, meetings, information management.
- Individualised educational plan that responds to the needs of the ill child at all times.
- Monitoring the process using a telepresence system and updating the individualised plan in response to changes resulting from the developments in health and education.
- Strategy for continuous evaluation of the education plan to improve its design and implementation. This process is important to anticipate needs and make decisions about adaptations and appropriate resources in the school to allow rapid action, as development does not allow a precise timetable of when changes will take place.

Reflection on the pupil who has fallen ill:

How did you and the class learn about the pupil falling ill?
What do you know about the illness?
How might the pupil feel now?
What might the pupil need from the class community?
How can the pupil be enabled to continue his or her relationship with his peers?
What possibilities of contacting the pupil can be undertaken?
Can a psychologist, hospital teacher or other person from the pupil's environment be invited?

Preparations from the school's perspective for a telepresence system

From the moment a child is diagnosed with a serious or chronic illness, the staff starts to prepare for the use of a telepresence system.

Pablo is diagnosed with a serious illness

Pablo, a 10-year-old boy, has been diagnosed with cancer. During his hospital stay, he was visited by teachers from the hospital and his school. At that time, a teacher at the school spotted an article in the German press explaining the benefits of the AV1 robot and thought that it could be a good tool for Pablo as it would allow him to continue learning in the classroom with his classmates. So, the teacher started to think about how a telepresence system could be used in the classroom. (Turner & Rockenbauer, 2023)

This requires three main steps, which can be taken and implemented either consecutively or in parallel:

Step 1 - Clarification of technical resources
An important aspect at the beginning of the preparation is to check which technical possibilities and resources are available in the respective region. This can vary greatly depending on the country, region, school and other factors.
The first step is to determine whether telepresence systems are available and, if so, which ones or whether arrangements have already been made for the procurement of telepresence systems. The result of the research may be that telepresence systems are not yet available or that certain devices are earmarked for use. Possibilities for allocation have been described in the ebooklet for the countries Austria, Belgium and Denmark.
In general, specific terms need to be clarified. These include terms of use, funding options, duration of the service and availability, as well as compatibility with the needs of the pupils. If no particular device is available to the pupil, it is necessary to find out about the other alternatives that meet the individual needs of the pupil.

The following questions may be helpful in clarifying this:
- Is a telepresence system available, and can it be supported?
- Is it possible to choose between different devices?
- Can different devices or systems be combined?
- Which telepresence system is most or least suitable for the pupil?
- What is the cost of the device and its ongoing use? Who can or must finance it?

In clarifying these questions and providing support and advice, a school-based or national expert can be a valuable resource.

Step 2 - Consultation with all stakeholders

Following or during the first step, various relevant stakeholders should be involved in the implication process. As education systems differ greatly between countries and regions, the selection of stakeholders to be involved and the extent of their involvement can vary greatly. Therefore, a proposal is made below:

From the academic sector, the involvement of the following partners is recommended:

- Head of school: depending on the structure, an agreement with the head of school must be obtained at the beginning of the process. The head of school is the main authority for everything that takes place in the school and should be informed accordingly. He/she is also a valuable and reliable source for potential external partners and funding opportunities. The head of school can report on previous experiences and provide information. If higher-level organisations such as ministries of education need to be involved, the head of school is also the link and should initiate communication with them.
- Teachers: all teachers working with the pupil concerned should be informed about the possible use and handling of the telepresence system. Best practices can then be shared among them. The aim is to work together to achieve the best possible outcome for the pupil and the class.
- Other support staff within the school (IT coordinator, school psychologist, school nurse): in general, depending on the internal structures of the school, all people who can make a relevant contribution can and may be involved in the preparation and implementation of the telepresence system. The contribution of these persons may vary and be of great help at different levels. As these people do not always have a direct link to the child, personal data and information about the illness must be handled sensitively.
- Senior educational authorities: in some countries or regions, especially where the use of telepresence systems is not yet routine, it is advisable to approach superior authorities for permission to use telepresence systems. In such cases, it is advisable to seek the support of telepresence system specialists. In addition to the school‘s internal stakeholders, it is important to involve external persons and institutions. Again, only a selection of relevant actors is mentioned here, which may vary in individual cases. In any case, it is crucial to check whether all the people mentioned above need to be involved or whether additional people are required.

In addition:

- Telepresence experts: experts in the field of telepresence are an important resource for information, advice, acquisition and implementation. They can support with experience, best practice examples, and relevant contacts within the education system.
- Medical professionals (doctors, therapists, psychologists): at this stage of preparation, one may not yet be in contact with the doctors treating the affected child. Regardless of whether there is already direct contact with the treating doctor or psychologist, it must be clarified from a medical/psychological point of view whether the use of a telepresence system would be beneficial. In addition, it is highly important not to trigger any contraindicated effects. Therefore, it is necessary to consult a medical/psychological expert in every case. This can be a school psychologist or an external consultant. If the school does not have the resources, a telepresence expert can help.
- Funders (NGOs, sponsors, government funders): in principle, efforts should always be made to find sustainable external funding for a telepresence system in order to avoid an additional financial burden for families. In some cases or countries, structures for the procurement and financing of telepresence systems already exist. If this is the case, it is recommended to use the existing structures. However, if this is not the case or if these structures are still in the process of being established, it is advisable to contact the following institutions:

    * Welfare organizations such as children‘s cancer support groups or other disease-specific institutions.
    * Associations such as parents‘ associations, regional/national non-profit associations or sports clubs
    * Ministries of education, health or innovation

* Corporate sponsors such as large companies and banks
* Hospitals, universities or research projects

Overall, it remains to be emphasised that the contacts mentioned are illustrative examples. The exchange of information with the family and possibly other persons determines who might be to contact. Accordingly, other people or institutions that have not been mentioned so far can also be essential contacts.

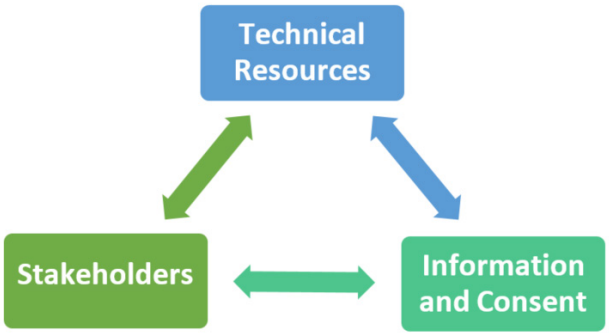
Step 3 - Information and consent

While the exchange with the family and the pupil concerned is an iterative process during the preparation phase, the final information of the family about the results and their consent is the conclusion of this phase.

It is particularly important that the consent of the pupil and the family is established from the outset. If the child concerned does not agree with the planned use of the telepresence system or its individual elements, further implementation should be abandoned and pre-implementation will not be initiated.

If the pupil disagrees with the planned use, it is essential to clarify whether the disagreement relates to the general use of telepresence systems or to individual elements of the implementation:

- If the dislike relates to the use of telepresence systems in general, this decision must be accepted and the present procedure terminated. In such cases, alternative forms of schooling may come into play, such as homeschooling facilitated by a teacher from the school. Despite these adjustments, it is important to note that the school will maintain ongoing contact with the pupil, striving to involve them as much as possible through various means, including letters, photos, and videos.



- If only individual elements of implementation are rejected, these must be identified and discussed. Then, alternative possibilities must be found, and compromises must be agreed upon if possible.
- If there is an agreement, the preparatory phase can be completed, and pre-implementation can be initiated. In the following, further mutual expectations, concrete possibilities of use and procedures are worked out together.

Pablo has the opportunity to receive an AV1 telepresence system

When Pablo was diagnosed, a teacher at the school took note of an article in the German press explaining the benefits of the AV1 robot. He felt that it would be a good tool for Pablo as it would allow him to interact and continue learning with his classmates. The teacher in charge of inclusion at the school did not have much trouble convincing the school management and bought an AV1 robot for around 3,000 euros. The school bought the telepresence system because its functions and cost-benefit ratio were considered positive for the school's continuity and the contact between Pablo and his class.
(Turner & Rockenbauer, 2023)

When arranging a telepresence system at school for an ill child, it is essential to consider the following steps:

1. Coordination strategy: identify the people in charge, assign tasks, schedule meetings, and manage information.
2. Individualised educational plan: create an itinerary that caters to the child‘s unique needs.
3. Process monitoring: devise a strategy to monitor the progress and update the individualised itinerary as required based on the changes in the child‘s health and education.
4. Continuous evaluation: evaluate the educational plan to improve its design and implementation. This process will help anticipate needs and make decisions on adaptations and appropriate resources to facilitate rapid action, as illness and evolution do not allow an exact timeline to be established.

From the findings of the interviews (Turner & Rockenbauer, 2023) and according to (Powell et al., 2021), it can be stated that after the formal aspects have been clarified, attention must be paid to the informal acceptance within the school. Patient interviews and literature show that poor communication and resistance against the telepresence system can cause harm and delay the process of getting to know the practice of the telepresence system. In this respect, not only formal consent for the telepresence system is necessary. It needs acceptance and active and constructive integration into everyday school life, which is essential for the pupil with chronic illness.

Aligning goals and expectations

Once the formal aspects and acceptance of the telepresence system have been established, the individual goals for the pupil with chronic illness must be considered. The following is about how the use of the telepresence system can be well matched with the individual needs of the pupil.

Karli receives an AV1 telepresence system

Karli (9 years old) was enthusiastic from the beginning and was very excited about the telepresence system, as, in his case, getting in touch with a friend without being seen was helpful. Karli has changed a lot through his illness and does not feel comfortable to show his face on a screen. However, the hope and desire to get into social interaction with the class was paramount. The child was relieved and happy that he could now get in touch with his friends at school without his appearance. Furthermore, he loved that his peer in the class could move the AV1 around and could carry him from desk to desk and room to room. The classmates were also excited about AV1: ”Yes, the children were very enthusiastic. Totally enthusiastic. They actually argued about who could take over the avatar for the day.” His mother describes her child as happier on days when he can chat with his friends and seems more balanced because he can exchange ideas. She sees a positive effect on her son‘s mental state.

(Turner & Rockenbauer, 2023)

Yaro receives a Bednet telepresence system:

Yaro (11 years old) has a primary immune deficiency. He doesn‘t look ill but, he is.
Yaro was never able to go to school ‘normally‘. He has been combining Bednet with going to school since the first grade.
Due to his illness, Yaro has built up a large backlog with the subject matter. But his current school is fantastic. They adapt the subject matter to his level. He is now taking all subjects, some in school, some via Bednet. He already knows that he will be exempted from a number of subjects in secondary school.

Source: https://www.bednet.be

However, the focus in interviews is not always on positive feelings. In another example, several fears were first addressed, such as rejection by the teacher and the classmates or experiencing oneself as a burden. The pupil may feel dependent on his classmates and on the teachers who have to accept the telepresence system. Here, the experience of having autonomy, feeling a sense of belonging and competence (Ryan & Deci, 2000) may be severely limited. This is where teachers can significantly contribute to making the pupil feel accepted and included. As described in Part I, a mindful and empathetic approach to the pupil with a chronic illness can greatly facilitate the entry into the classroom via the telepresence system. Therefore, the implementation of the telepresence system has proven to be a sensitive phase. In the interviews with pupils, a spectrum ranging from feeling quite anxious to feeling excitement could be seen.

A continuum from anxiety and doubts to excitement

Statements from pupils …

“[…] well, my fear was rejection by classmates or also, well, I had the teacher at that time, who was new. But that was absolutely no problem for us and there was no opposition to this avatar from the other pupils either. But those were my biggest fears.”

“[…] clearly, that a fellow pupil or a teacher or higher authorities would not allow it. That was actually the biggest fear. “[…] then it was my voice, and I thought that was really cool.

“[…] a bit of a hype: Yeah cool, we´re the class that has an avatar (= telepresence system).

(Turner & Rockenbauer, 2023)

There was also concern on the part of the teachers, as Karli‘s teacher reports:

From the beginning of the class, the teacher was very positive about the AV1, but was challenged to familiarize with the technology. “Yes, I think it was like this, that at the beginning, I had to, I wasn‘t sure how well he really hears what we say, how disturbing the background noise is, and then it turned out over time that you can actually speak quite normally, can also behave normally and he really gets it well. ... And we always ask, in the meantime the pupil already knows that he will let us know if, for example, he can’t see the blackboard or if he hasn‘t understood something. So, he is becoming a bit livelier and, the boundaries between human and machine are blurring.“

(Turner & Rockenbauer, 2023)

The teacher raises an important point here. Especially at the beginning, the discrepancy between the pupil in person in the classroom and the participation via the telepresence system may still be unfamiliar. Floridi (2015) describes in that context that in an increasingly digital society, there are transformations, such as "the blurring of the distinction between reality and virtuality [and] the blurring of the distinction between human, machine and nature." (2) Even if the telepresence system could be perceived as unnatural and possibly disruptive at the beginning, the interviews show that after a short time, it is almost taken for granted that the person is well represented in the class and can participate via the telepresence system. In interviews, this has been shown, for example, by the following statements:

Statements from pupils …

"A few classmates were then allowed to take me with them, the avatar actually."

"I had the box of biscuits in front of me, so to say, actually they put it in front of me, and then I could take part in the celebration."

"Then, at the break, everyone came over to me."

(Turner & Rockenbauer, 2023)

Examples for aligning expectations and goals:

Experience from a student counsellor in Belgium

During an extensive conversation with the parents and the student, I map out the student's problem. Will it be a long-term absence of several months or regular periods of short absences (one or more weeks)? Can he or she still come to school, half-time or not at all? What are the child's needs? Within the class council, we put together a program tailored for the pupil with an adapted lesson and exam schedule. The well-being of the pupil depends on an achievable goal.

It is a whole puzzle that needs to be put together: in our school, we ask ourselves consecutive questions:

- What can the pupil handle?
- Which subjects, subject matter components are now important to be able to start next year? What is really necessary, what can be temporarily scrapped?

Which methodology do we use?
For which subjects is it important that you see and hear the teacher via the telepresence system (Bednet)?

We have all experienced it now: taking lessons behind your screen all day is simply not feasible, not even via a good system like Bednet. That is why house teaching by teachers or self-learning (using homework or tutorial videos) is also important as variety.

https://www.bednet.be

A different pupil's perspective: just being part of the class...

"I really loved also just being in class and just listening, not necessarily doing the work, but still just involved and feeling like a part of the group, a part of the class... So just keeping me included in my friendship group, my class group, the conversation".

(Powell, 2021).

In some cases, "passive" participation is sufficient for a pupil in some phases of illness. In this respect, it is always necessary to clarify what is possible for the pupil while maintaining the possibility of contact. This means that even in these more passive phases, the possibility of attending classes and hearing voices of friends can be very positive for the well-being of an ill pupil. At the same time, however, a temporary absence of the ill pupil can be expected because therapies have to be carried out or because of weakening and tiredness due to the treatment. According to Powell (2021), the ability to network promotes a sense of agency.

Still, the ill pupil could be expected to be absent for periods of time as therapies need to be carried out or weakness and fatigue occur due to treatment. But perhaps the pupil needs more or wants to be more involved in the classroom.

What needs to be considered in practice?

The expectations from the pupil's perspective have to be determined before the goals are set, whereby an empathetic attitude and open mindedness for the particular situation due to the pupil's illness and psyche is essential. First of all, the aim is to mitigate social exclusion of the ill pupil, which, as shown in Part I, can lead to reduced motivation, mental health problems, and school drop-out.

Therefore, it is relevant for the teacher to realize that the academic expectations of the affected pupil are not comparable to the expectations of the peers. It is more a matter of responding to the emotional and social needs of the concerned pupil rather than applying the academic standard of the class to the ill pupil. In this case, apply the concept of individual differentiation (source) in the classroom, and see what opportunities, socially and academically, are possible for the pupil concerned.

However, if the pupil's state of health permits, the academic view should be addressed. In this respect, the pupil's health condition is decisive for further thoughts. Both goals, social and academic, are important in their own way, depending on the child in question. The most important point is to align with the needs and not limit oneself to one or the other. Defining the goals and aligning expectations between teachers, parents and the ill pupil, is an important success factor.

Based on the expectations of the pupil and all stakeholders involved, routine and individual goals can be defined as follows. The goals are composed of four categories: social goals, the pupil's capabilities, motivation, and performance assessment. For each of these four, the following questions could be relevant:

- **pupil's social goals:**
  What general social goals are to be achieved?
  Are there priorities in these social goals? What social activities would the pupil like to participate?
  What activities already exist in which the pupil can participate?
  What activities can be undertaken to make the pupil feel included?
  Where would the pupil like to be particularly involved?
  Are the social goals achievable during breaks, or do they need additional support?
  What routines can be established to make the pupil feel included?

- **pupil‘s capabilities:**
  What does the pupil want to achieve physically and mentally compared to the pupil‘s actual conditions?
  When is the ideal time to use the telepresence system (when are the therapy hours, rest times, the pupil‘s favourite hours)?
  Should expert advice be sought (doctor, psychologist)?

- **pupil‘s academic motivation**
  What are the pupil‘s favourite subjects?
  Are there subjects important for the pupil to have a sense of achievement at school? (For example, in years where a school-leaving certificate is to be achieved).
  What subjects or activities can be used to motivate the pupil to participate in lessons with the telepresence system?
  Are there particular classmates near whom the telepresence system should be placed to make the pupil feel more comfortable?

- **pupil‘s performance assessment**
  Does the pupil want to perform academically during their illness? (The pupil’s wishes must be accepted and understood in the first place!)
  What is possible due to their illness?
  Do the pupil‘s or parents‘ performance aspirations meet the realistic possibilities?
  Which assessments can be performed with the support of the telepresence system (possibly depending on the legal framework of the individual country)?
  Is there the possibility to provide substitute performances for examinations scheduled in the curriculum?

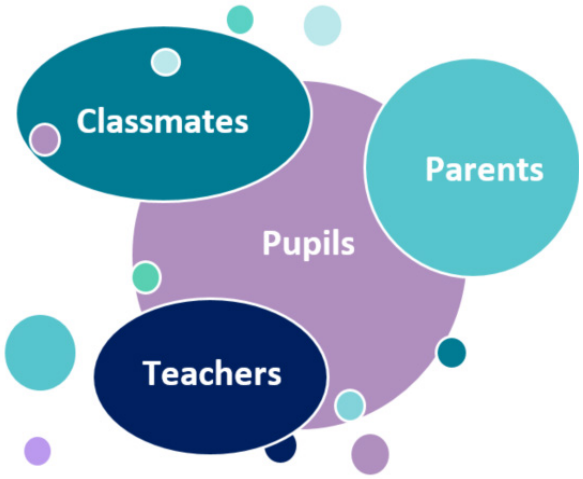
Aligning goals and expectations can be a new and challenging process. However, it is an essential element in the implementation process. It can be advisable to consult an expert (telepresence consultant, doctors, psychologists, hospital, teachers) for further support, such as a workshop on pedagogy in times of illness. Furthermore, take a look for more information in the ABILTI e-learning module and ABILITI toolbox.

Experience from a teacher

“At the beginning, you just don‘t know, then it works anyway, you get used to it, and it was also at the beginning, yes, he‘s just standing there, we looked for a place for him, talked to him, where he can see best, where can we put him. It‘s basically like when a new pupil comes into the class. Where do we put him? Where do you feel most comfortable? Where does everything fit for you? And after that, it was clear, he was in his place.“

(Turner & Rockenbauer, 2023)

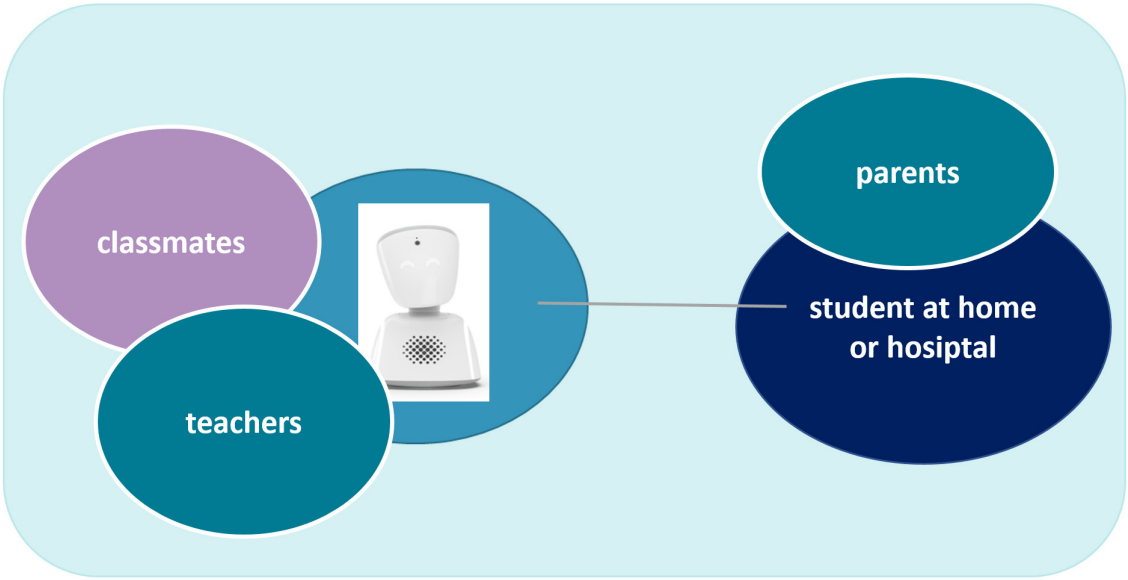
Implementing a buddy system when using the telepresence system



A well-functioning cooperation within schools and their environments (such as parents, school counsellors, psychologists) promotes the well-being of children and adolescents'. If all parties are well aware of their tasks, respect each other in these roles, and cooperate successfully with each other in their shared responsibilities, they can support the learning and development of pupils within their respective capabilities (LCH, 2017).

If there is a serious case of illness in the class, the pupil himself, the family, his close friends, the teachers, and the whole class are affected. Especially in these cases, it is essential to work as a team to enable the ill pupil to participate in class and school activities. With telepresence systems, it is important that teachers, pupils and parents work together, as interaction and collaboration are essential components for active participation in school life. Collaboration between pupils, teachers, and parents can help to create a positive learning environment that supports the ill pupil.

The following chart shows that the contact between the school and the remote pupil should not break off. However, this can happen due to technical reasons, such as a lack of internet connection, and human actions, such as forgetting to turn on the telepresence system, leaving it behind, or positioning the telepresence system incorrectly so it cannot be heard or seen. From the interviews (Turner & Rockenbauer, 2023), it can be concluded that a buddy system is beneficial when using a telepresence system. A buddy, for example, can be a fellow pupil or an employee of the school for a certain period of time who is responsible for charging and placing the device in the right position in the classroom to ensure a smooth experience for the ill pupil. In the classroom, of course, the affected pupil must be involved in activities such as group work via the telepresence system. Here, too, it is an advantage if there are particular contact persons to whom the ill pupil can turn.



The buddy system is not only a great help for the remote pupil, it will also entail an experiential and learning process for the classmates in terms of social learning and inclusion. The school community can experience a stronger cohesion in terms of autonomy, competence and belonging.

Experiences with the buddy system

A teacher reports that a friend has taken on the role of buddy in Ezra's (12 years) class. "She used to bring Ezra exercise sheets home. At the very beginning, anyway, she always brought everything, including homework and kept close contact with Ezra. She was then able to tell the class how Ezra was doing at the time and thus brought an understanding to the class. Another girl also volunteered as a buddy so the two of them could take over and share the tasks, which is, of course, a gift in itself. They are also very responsible, they have always taken care of it."

Another teacher reports on the daily routines with a telepresence system

"It's important to find two people who can take over if one person is sick or not there. We are a big school with a big staff, so it is especially important that there are pupils from the class who are responsible for the AV1. We had the telepresence system in the head office to charge, which was also great because we were lucky to have secretaries who took over this task. So the pupils knew where to put it at all times. It never stood around anywhere, and everything was so clear. When a procedure is clearly regulated: in the morning, we fetch it and put it in its place, and at the end, we put the chair up and carry the avatar to the secretariat. That was never an issue; and no matter who was sick, no matter who was there, no matter if there was schoolwork, it always worked. I think you have to think about that first. Because then everyone is relieved."

(Turner & Rockenbauer, 2023)

What needs to be considered in practice?

Consider how the pupil is involved in the class:

1. Does the pupil like to be in larger groups?
2. Does the pupil prefer to be in small groups or in pairs?
3. Does the pupil like to work alone?
4. Circle the position of your pupil.
5. Which persons can be addressed as buddies?
6. What other people in your school can help with the buddy system?

Often, the direct friends of the ill pupil take on the role of buddies. However, what should be done if a pupil is completely new to the class or has few or no direct friends because they prefer to work alone? In this case, a rotating buddy system could be implemented. It may even be possible to make new friends as the classmates interact with the ill pupil as buddies. Of course, this process should be accompanied and reflected upon by teachers. In this regard, reference can be made to the ABILITI toolbox. However, it should be noted that social participation is not natural and easy to establish for all pupils affected. Some pupils, for example, who are anxious, need special support in establishing social contact, as it is shown in the following example.

Steve does not dare to speak up in class

Steve, 11 years old, had problems hearing the teacher over the telepresence system. He was too shy to speak up in class and said that he could not follow the lesson because of the positioning of the telepresence system. He was afraid that he would be a burden to the class and he did not want to cause a stir. He was very happy to have a buddy in the class with whom he could talk and share his needs. He also told his mother about his experience, and she subsequently spoke to the teacher. The teacher was very surprised and would not have thought that Steve would not dare to speak up on his own.

(Turner & Rockenbauer, 2023)

How to deal with this?

This case shows the importance of regularly checking on the pupil‘s needs. Additionally, the contact with the buddy, parents, and the remote pupil is very important. Teachers can introduce feedback loops after class to inquire about the pupil‘s well-being. For example, at the end of the lesson, the teacher could go to the telepresence system and ask for short feedback on the lesson or the further procedure. This will only take a few moments but may contain important information for the teacher and the remote pupil. In addition, direct contact with the pupil is maintained, which can strengthen the teaching-learning relationship and motivation.

All in all, it can be said that cooperation between teaching staff is crucial for successfully using the telepresence system. It is vital to clarify organizational and technical aspects, such as battery charging, responsibility for carrying the system from room to room, and system positioning. In secondary schools, the telepresence system helps to get a better coordination between teachers due to the changing schedule. In primary schools, the class teacher takes more responsibility, considering the age of the pupils. The telepresence system strengthens the sense of belonging and fosters closer exchange among classmates. It also provides more social opportunities for friends to connect with the ill pupil. Lastly, the use of telepresence systems can be a learning process for all participants concerning inclusive digital education.

Using a telepresence system for breaks and excursions

To increase social inclusion, it is recommended to use the telepresence system as often as possible outside the classroom. Some smaller telepresence systems enable the ill pupil to accompany the classmates in non-academic activities such as excursions, and field trips. This possibility promotes a sense of belonging and, thus, the child‘s well-being. This opens up new possibilities for social participation, which positively affects the general well-being of the child or young person. While not all telepresence systems share this feature, the AV1 robot has an integrated SIM card and can be activated anytime, anywhere.

Hiking with the AV1

A class planned an excursion into nature, taking the AV1 with them in a sling. A classmate placed the AV1 in front of his upper body, facing forward, so that Carola could virtually take part in the excursion. The pupils raved about it and took turns carrying it. When they stopped for a break, Carola was represented by the small robot and sat in the middle of her friends on the lawn.

(Turner & Rockenbauer, 2023)

Break time without teacher

A teacher reports, that "whenever the avatar is present in class or at break time, I always allow them to have private conversations. Conversations without the teacher are important for them. So, they can just interact socially."

(Turner & Rockenbauer, 2023)

Sometimes is too much …

Alex's teacher reports that "the 12-year-old was quite happy to join in during the break at the beginning. However, when spring came and his friends played football outside, it was too much for him emotionally. The fact that he had to watch his friends playing one of his favourite hobbies but could not join in made him sad. At first, he couldn't express it that way, but his mother told him that he increasingly felt emotionally closed during the breaks. This was a difficult situation for me, too, because, on the one hand, the boys naturally want to play football. On the other hand, Alex felt excluded in these situations. We then decided that Alex could be present during the indoor breaks. I tried to find a responsible person through the buddies who would make sure that Alex was involved in the conversations and that the AV1 was taken along."

(Turner & Rockenbauer, 2023)

The last example, in particular, shows that the use of telepresence systems also has its limits. Therefore, it is important to pay attention to the pupil's needs. Suppose the classmates forget the device in the classroom while playing in the break room or go to the other end of the room while engrossed in a conversation. This can very quickly lead to a feeling of exclusion and temporary loss of belonging and autonomy for the remote pupil. Once again, it becomes apparent how important a well-functioning support of buddies is for the ill pupil.

What needs to be considered in practice?

As described in the section on the buddy system, it is essential to consider the social position of the pupil in the class during breaks and excursions. As the teacher in the example above mentioned positively, it is important that the pupils also have social time without the teacher. At the same time, it is crucial to ensure that the pupil is not excluded during breaks through inattention from classmates.

The following questions could help to assess the current situation of an ill pupil:

- Is the pupil enjoying having attention and being able and willing to participate in a (larger) group?
- Does the ill pupil have one or two close friends?
- What emotions can a field trip trigger in the pupil?
- In your opinion, what are the limits (physical, emotional, social level) for the pupil?
- What other opportunities are there to actively involve the pupil?
- What arrangements need to be made so that the pupil can participate well in the field trip?
- Have all the technical arrangements been made (battery, Wi-Fi)
- Who is responsible for taking the telepresence system for excursion or breaks?
- Who will ensure that the telepresence system is returned to the classroom?

It is not the activities, such as sports, that would make participation impossible; it depends on the preparation and the awareness to actively involve the pupil and on the pupil's current needs.

Lesson planning when using a telepresence system

Distance learning and hybrid/remote teaching can also be applied to teaching chronically ill children through a telepresence system (Kerres, 2021). In the context of COVID-19, lessons learned from distance learning highlight the importance of considering several factors in lesson planning.The following characteristics are also relevant to the use of a telepresence system.

Access to material: It is central that all pupils, who participate either face-to-face or remotely, have equal access to course materials, assignments, and in-class discussions. Consideration should also be given to online platforms or tools that facilitate access to course content and enable participation at a distance. Due to the COVID-19 pandemic, schools have already set up platforms, many of which are re-used for all pupils. This is an advantage for the remotely taught pupil, as it ensures all material is received. Furthermore, the worksheets can be sent via email by the teacher to the parents in advance.

Communication: One of the most important things is accurate and straightforward work instructions. They play an essential role in preparing for distance learning as pupils have to rely on themselves when completing assignments at home. It is important that the instructions are understandable and that no further explanation is needed. Particular attention should be paid to clear communication with the remote pupil. Much of what is spoken directly and often in passing in classroom conversations may not be accessible to the remote pupil. Therefore, additional channels of communication with the remote pupil and the parents are recommended, such as email or other messaging channels. Hybrid teaching can be a mixture of communication channels for the remote pupil, of synchronous (real-time) and asynchronous (non-real-time), communication methods to accommodate different schedules and learning styles.

Engagement: It can be more difficult to maintain the engagement of remote pupils, so wherever possible, look for interactive activities, discussions, and group work involving both face-to-face and remote pupils. This is also where the buddy system comes in.

Flexibility: Once again, the teaching approach should be adapted and changed according to the needs and feedback of the remote pupil. Hybrid teaching can be an iterative process, and it is essential to be open to change when necessary. Tasks for the pupil at home might need some adaption. When it comes to teaching chronically ill children, short breaks during lessons could also be considered to not overwhelm the pupil. Further, teachers need to be aware if the pupil has specific learning disabilities because of the illness. Then, it will also be necessary to adapt the lesson plan to create a motivational and pleasant learning environment.

Assessment: With regard to the evaluation of the affected pupils, there are various possibilities to achieve this. First of all, it must be clarified whether the pupil must be graded at all due to their illness and mental condition or whether participation in examinations can or should be avoided. The pupil has the right to be ill without the obligation to be subjected to grading, even when using a telepresence system. If a remote pupil is absent due to illness but still taking exams, consider how to assess the pupil's learning in

a hybrid learning environment and how to provide feedback to both face-to-face and remote pupils. A study on distance learning (Turner & Scherde, 2022) shows that increased feedback is essential for the remote pupil. Therefore, it is advisable to give detailed written feedback if possible and to hold feedback discussions with the pupil outside of class in order to be able to respond to their needs and requirements in greater depth.

Teachers‘ experiences with telepresence systems in hybrid teaching

Teacher 1 or A: “This is also due to distance learning; when I have handed out group worksheets or something, I often put them on the messenger, which I normally only hand out at school, so that the pupils can print them out at home. But of course, not everything because sometimes I quickly find a piece of paper, then I copy it and hand it out. In this case, I always have to make sure that I also provide the pupil at home with the materials. That is sometimes a challenge because not everything always goes according to plan in class.”

Teacher 2 or B: “At the beginning, we put together a kind of timetable for him, so that he knows when it‘s most important. I actually expected that he wouldn‘t be there that often, but he was actually always there. And then he once said, “No, it‘s okay anyway, he‘s staying the whole day“ and I thought, great. But you could tell that he was already tired after a whole day at school.”

Teacher 3 or C: “So, through various exercises, so when I handed out any worksheets, I always made sure that he received them digitally, or group work, when they had to discuss something, then one group had Hans. Even when I did a quiz or a game, that he just joined in, so we did the best we could, unfortunately not everything worked, but mostly it did.”

(Turner & Rockenbauer, 2023)

As can be seen from literature (Meyer, 2016) and also here in the teachers‘ statements, not every teaching situation can always be planned in advance. However, there are important aspects that need to be considered when planning lessons and teaching a pupil using the telepresence system.

What needs to be considered in practice?

The action plan for the follow-up of the ill pupil will have to establish the collaborative work and tasks of all the professionals involved.

The implementation involves actively using the telepresence device and coordinating ongoing activities. The following graphic shows the elements of the implementation process to create a grounded theoretical background, which can be implemented with the already existing competence as a teacher. In addition, an example for a more precise description of individual steps for coordinating the process is given.

Fig. 2. Aspects of an action plan

Remote/Hybrid Teaching

An important aspect is teaching as if the absent pupil and the other pupils were in the classroom. Although it can be unfamiliar at first, it is essential to remain authentic and teach as you are used to. For example, walking around the classroom, taking notes on the board, talking, projecting, and showing things. It is important that every precaution is taken to ensure that the pupil can see and hear through the telepresence system without difficulty.

Reflect on your own experience of remote and hybrid teaching during the COVID-19 pandemic:

- What lessons did you learn?
- How can the experience be applied in the current situation?
- What worked well and what did not?

Classroom Management

A daily or weekly schedule for the use of the telepresence system can avoid stress or misunderstandings. Ensure that the schedule is aligned with the needs of the child and the agreed expectations. For example, flexible schedules or time slots when the pupil participates in class need to be considered.
If several teachers are involved, for example, in secondary schools, it is essential to coordinate the timetable, expectations, arrangements, and class divisions in advance.

- Consider how to describe your class with the pupil concerned? If it is a rather lively or noisy class, make sure, for example, that no one is talking at the same time.
- How can you ensure for the class that the pupil is well engaged through the telepresence system, without being forgotten and without being overwhelmed?
- What could a good balance look like in your specific case?
- For example, an intensive observation of the class atmosphere can be undertaken over a week and a discussion can be held with the pupil.

Activities and Materials

Specific needs must be addressed for individual pupils. Just as individual needs are addressed in the traditional classroom, the needs of distance learners should also be addressed.

In some situations, the use of telepresence systems requires creative solutions. For example, during circle discussions, the telepresence system can be placed so that the ill pupil can easily hear their classmates and vice versa. Furthermore, when working independently, it is still essential for some affected pupils to stay connected online as they are motivated by working with the class. Hearing the sounds of the class, even during independent work, can make pupils feel like they are socially included but still not in the class. Others prefer not to be connected to continue working independently and free from stimuli. Another option is to turn off the microphone on the IPAD for a while if the noise is too distracting. Suppose instruction and demonstration are done in small groups. In that case, the group can be placed around the telepresence system, or the other way around, depending on the social situation in the classroom. This way, the pupil concerned can watch closely, listen, and participate in the demonstration. Lastly, it is essential to be responsive to pupil's needs or discuss with them how they feel comfortable with the implementation.
As mentioned above, special attention must be paid to ensuring that all material is available to the pupil with the telepresence system. Ideally, the materials should be sent to the pupil in advance, either digitally or through parents and buddies.

- What activities do you have planned for the upcoming lessons?
- How can the pupil with chronic illness be involved in this?
- Where does the telepresence system need to be placed?
- What materials need to be transmitted in advance?

These and similar questions need to be addressed repeatedly during the course of teaching a pupil with a chronic illness in online mode, and an action plan needs to be drawn up.

Assessments

There are several ways of assessing the pupils concerned. First of all, it must be clarified whether the pupil should be graded at all because of his or her illness and mental state or whether participation in examinations can or should be avoided. The pupil has the right to be ill without the obligation to be subjected to grading, even if they use a telepresence system.

Furthermore, depending on the country and situation, different rules may apply to the grading and assessment of ill pupils. This also needs to be clarified in advance. The three possibilities for general implementation are listed below:

Participation via the telepresence system:
The ill pupil participates in a performance review via the telepresence system, this can occur at the same time as the classmates or with a time delay at individually agreed times. With this option, the pupil must receive the examination papers in advance at home. It is advisable to use some online versions and send a link to the pupil or their parents as soon as possible before the exam begins. Furthermore, the telepresence system and the additional technologies should be checked in advance. During the performance review, a stable connection and the ability to communicate with the pupil is essential.

Physical presence at school:
The pupil may have permission from their doctor to take specific tests, exams, or practical assessments at school. Discuss with the family which options are available. There may be several options, such as taking the test in a separate classroom, at less busy times, taking a different version of the test changing the test parameters (time limit, complexity). It is essential to be prepared for cancellations at short notice and to provide flexibility in case physical or mental condition changes from time to time.

Assessment in hospital or at home:
A teacher, homeroom teacher, or hospital teacher may conduct specific assessments at home or school. In this type of assessment, the teacher at the pupil's regular school provides the necessary materials for the performance review. If the assessment is not conducted by the regular teacher, it must be discussed in advance who will assess the performance.

Teacher support
Dealing with a pupil's illness and using a telepresence system can be challenging for even the most experienced teacher. Accordingly, it is essential to take care of your own sensitivities and seek support.

Examples of sources of guidance and support include:
In the emotional realm:
- Supervision
- Exchange with professionals or others with experience in this area
- Psychologists
- In-school support staff

In the pedagogical and technical field:
- Information and support material
- Exchange with head teachers and colleagues
- Network with other users of telepresence systems
- IT staff of the school or technical support from other institutions (e.g. No Isolation, Bednet, dieBerater)

Additionally, it's recommended to be mindful of whether other colleagues might require support or ease when teaching ill pupils. Collaborating together is key to addressing these challenges with confidence.

One recommendation is to set up a collegial intervention group (see Toolbox) to share experiences, analyse critical situations together, and broaden one's own scope of action. In this way, new ideas and possibilities can be explored.

Example for individual agenda

When teaching a pupil with a severe or chronic illness, it is advisable to have an individual agenda with the most critical tasks and procedures. This will allow you to keep track of all the steps in the process and create a sense of security. For inspiration, the following list is provided as an example. The proposed activities were developed to meet the needs of long-term illnesses and can be adapted to personalised and individualised attention. (Education Commission of the Spanish Federation of Parents of Children with Cancer, 2022; Education Commission of the Spanish Federation of Parents of Children with Cancer 2022):

1. Establish global planning with a timetable and a definition of activities, tasks, and delivery times, to inform the person of their long-term goals.
2. Advise the family and the child to organise the place of study at home.
3. Make a clear daily plan that can be quickly redefined to deal with any changes in the routine resulting from the illness. Prioritise and carry out tasks one at a time. Provide instructions in a document that they can refer to and thus self-regulate their progress.
4. Establish routines to help guide work at times when the child will be at home by providing study guidelines that consider the pupil's needs for rest and well-being.
5. Provide them with the learning materials and information they need, including in printed form depending on the situation, so that they are not dependent on internet connections. Furthermore, teachers will need to select materials that are suitable for them to work with.
6. In order to carry out some tests for pupil follow-up, exercises or exams require support considering the time variable to meet the needs of the pupils, the formulation of the questions for their understanding, and a channel to be able to communicate.
7. Introduce special activities for the child, more creative activities that help to maintain interest and motivation for learning.
8. Propose activities to reflect on their learning process, self-knowledge of their strengths and difficulties, and explain the feelings that their participation in class dynamics provokes.
9. Seek their occasional participation in some activities with the reference group to maintain contact. However, without following the same rhythm this may require a great deal of effort in time of illness.
10. Propose the creation of a product that can be presented or physically taken to the classroom of their reference group as a physical reminder they are part of the group.
11. Verbal reinforcement or reinforcement through technological channels breaks the isolation and accompanies the child in their learning process.
12. Create diversified classroom activities to facilitate motivation. This can be done by solving real problems, stimulating the imagination, playful activities, artistic or musical expressions, storytelling, making cartoons, creating maps, word games, and visual acuity.
13. Provide lists of educational games that families can combine with classroom activities, and use them during times of tiredness or complicated by illness. These games reinforce memory, attention, logical reasoning, strategy, active listening and following rules.
14. Design activities that involve expressing how they are developing the activity and what difficulties they are having to favour their self-perception. Have them record this so they can send it to the teacher, who will give them feedback. This also helps to strengthen language and verbal expression, have in mind that these habitual classroom dynamics are now very limited.

The combination of several systems

Various telepresence systems are used to educate children with chronic illnesses, and the funding of these devices varies from country to country (Turner et al., 2022). In Denmark, robot-like technologies such as the AV1, or ORIHIME are used together with mobile systems such as Beam, Double Robotics or Fable Connect, while in Austria, the AV1 is the most commonly used telepresence system. In Belgium, the Synchronous Internet Education (SIE) telepresence system was used by more than 1,000 pupils in 2021. In Spain and Estonia, telepresence systems do not seem to be widely used in classrooms at present. In Spain, the AV1 telepresence system has only been used in very few cases. Consequently, in Europe, two types of support are used for the educational care of ill pupils: videoconferencing systems and telepresence systems. Videoconferencing software applications allow occasional meetings with the class. These connections establish specific moments for monitoring academic repetition or for some social activity, e.g., chatting.

Due to the COVID-19 pandemic, many online tools, such as Zoom, MS Teams, Google Meet, and others, were implemented into classrooms or classes have been taught using these tools. Therefore, it can be assumed that by now, most teachers have experience with online tools. Likewise, it is now common for pupils to communicate with their teachers via such tools, to hand in homework online, and to manage teaching materials digitally. The importance of making materials available digitally was discussed in the previous section of the handbook. Here, some examples of combining several systems are given.

Combination of social interaction and structural schoolwork

Sarah, 16 years old, reports that she uses the AV1 mainly for social communication with her friends in class. Therefore, it is very convenient for her not to be seen, and she loves to move around with the AV1. Furthermore, she likes to use the school's learning platform to organise her class material. This way, she can use both for her school routine from home.

(Turner & Rockenbauer, 2023)

Different systems were also used for exams, as the following teacher describes:

Joey, 15 years old, also took written tests. "I also had an exam with him that worked like this: He saw the board, the questions and the tasks via the avatar. In addition, we used MS Teams so that I could also see him, so that I could make sure that this was his own performance, that no one was whispering in, and there we combined."

(Turner & Rockenbauer, 2023)

What needs to be considered in practice?

The interviews showed that especially for younger children, a single system is recommended. It can be challenging to operate with the different systems. Therefore, the use of different systems should be clarified based on the pupil's situation.

Reflective question for the practice:

- Which learning platform is available to your school?
- In what way can this be useful for the ill pupil in class?
- Which learning format is suitable for combining different systems?
- When can systems be used in parallel?
- How does the pupil feel about the different media channels?
- In which situations can the pupil be overwhelmed?

Several key aspects should be considered when navigating the challenges of remote teaching. Firstly, organising teaching materials is crucial for an effective online learning environment. Additionally, active participation in online tasks and tests, along with the timely uploading of assignments, plays a significant role. Communication via telepresence systems, such as the AV1, and the parallel completion of tasks through learning platforms further contribute to a comprehensive approach.
However, it is important to acknowledge potential drawbacks. The complexity of the situation can become overwhelming, potentially leading to errors such as forgetting to upload teaching materials. This complexity may also demand increased effort, highlighting the importance of planning breaks to ensure the well-being of educators and students. Balancing these aspects is essential for a successful and sustainable remote teaching experience.

Designing the re-entry phase

Chronic or long-term illness affects relationships and social dynamics at school and impacts learning and performance. The reintegration of the pupil into school requires special measures to ensure the right to education and to adapt the system to the needs of this group. Teachers, educators, and psychologists have an essential role in reintegration. Supervisors of childhood cancer report that at the time of reintegration, the children needed special attention to catch up with school activities and the corresponding routine. In addition, they report that although the pupils received support from teachers and peers, they felt that this was not enough and that they needed more support from teachers and other professionals, such as counsellors and psychologists (Fernández-Morante & Cebreiro, 2016). Thus, the pupils need special attention when reintegrating into school, and a (multidisciplinary) team should provide this attention.

The path to be followed after the convalescence period must be adapted to the pupil‘s recovery time, age, level of education, and overall health condition.
As soon as the medical team and the pupil consider it appropriate, the pupil should resume the school routine. To this end, it is important that the school is informed about the pupil‘s situation.

The (Spanish Association of Parents of Children with Cancer Course (2022) has gathered valuable advice from their long experience to guide parents in preparing their children to return to school. It is recommended to have a short settling-in period to ease the transition back to school. The home teacher, school teacher, and parents can work together to prepare for this. Failure to prepare before returning to school can lead to academic difficulties. In case of any specific issues, support measures can be designed accordingly.

Additionally, siblings of cancer patients may also require exceptional educational support. If a child is struggling with anxiety or adjustment issues, seeking professional help is highly recommended. During the reintegration period, respecting the pupil‘s pace and openly communicating with all parties is essential.

Guideline of measures to be taken

In a nutshell

A guide to prepare for the return to school

The period of reintegration means a time of adjustment and communication between all parties involved, during which the rhythm of the pupil must be respected. If no work has been done before the return, a large percentage of returning pupils have problems achieving satisfactory academic performance.

- It is best if the return to school is accompanied by a short settling-in period. This can be prepared by the home teacher, the school teacher and the parents.
- If necessary, specific support measures are designed after clarifying the most problematic issues.
- Professional help should be sought for anxiety or adjustment problems.

First, the school and teachers must consider the resources available to adapt to the pupil's new needs, e.g., curriculum and accessibility. Furthermore, making decisions about meeting specific physical access needs, for example, spatial, material, and personal resources, is vital. Teachers must consider the removal of architectural barriers, appropriate lighting and sound, adapted furniture, technical and technological aids, and supplementary or alternative communication systems. The next step proposes gathering all information about the pupil's current situation to adapt the child's needs to their new academic pace in the learning path. Thirdly, it is crucial to inform the child's teachers and classmates about how the pupil is doing, especially in the case of significant difficulties/limitations, so that they can empathise with the pupil's new condition. Moreover, allowing the affected pupil to explain their story to their classmates and teachers is important. Another factor that cannot be left out is treating the reintegrated child as other pupils and normalising the situation by promoting group belonging and solidarity among classmates. The teacher should promote gradual inclusion according to the child's physical needs, for example, support from the centre to cover the classes he/she cannot attend. Another step that must be considered is observing and evaluating the pupil's development to adapt the pedagogical measures according to his/her development. In addition, it is essential to provide a space where teachers and pupils can eliminate doubts or carry out joint actions with and for the child; then, the family must be informed of any relevant changes involving measures to improve the child or young person's quality of life inside and outside the classroom. Lastly, one should ask for help and cooperation from parent associations of children with severe or long-term illnesses (Education Commission of the Spanish Federation of Parents of Children with Cancer, 2022; Education Commission of the Spanish Federation of Parents of Children with Cancer, 2022).

As mentioned earlier, it is important to maintain normalisation and empathy of the whole school community towards the ill pupil throughout illness and treatment. Classroom intervention with classmates and sensitisation of the rest of the pupils to the school will provide adequate preparation for reintegration into school.

What to consider in practice?

It is necessary to organise discussions and/or meetings with the educational team or the pupils, with interdisciplinary coordination of the educational staff and psycho-educational group interventions to raise awareness of the needs among the pupils.
It is essential that prior to the pupil‘s reintegration, the family provides the reference school with up-to-date information about the pupil‘s condition so that appropriate measures can be assessed and taken to meet the pupil‘s needs. These measures may relate to aspects of accessibility (e.g., if the child is dependent on a wheelchair) or to methodological aspects (e.g., materials with enlarged print, special timing for tasks).
Knowing each pupil‘s situation helps to determine the progress to be proposed, as the pupil is now continuously participating in school life, without forgetting to make a specific assessment of the match between chronological and mental age.

When a pupil returns to school after an illness, they need to be aware of the possible consequences and side effects of the treatments. The long-term consequences can vary depending on the type of treatment and the dose administered. They can be manifold: lack of concentration, visual disturbances, motor disorders, skin and hair problems, psychological problems (Fernández-Morante et al., 2017). When specific sequelae occur, they must be known to the school and teachers to set up care within an individualized plan that tries to minimize them. It is always the medical teams who, together with the families, provide personalized information about these sequelae, which allows them to develop specific interventions for each child.

It is crucial to take into account the potential impact of cancer treatment on a child‘s cognitive abilities. According to the Education Commission of the Spanish Association of Parents of Children with Cancer (2022), some common after-effects that can guide the treatment approach include cognitive difficulties, slower processing of information, language and communication issues, difficulty comprehending complex sentences and concepts, decreased problem-solving skills, difficulty applying learned information to new situations, difficulties with abstraction, and difficulty concentrating.

In terms of physical effects, the treatment can cause limitations in movement, such as a loss of speed, accuracy, or coordination. Furthermore, psychological and social difficulties may arise, such as reduced frustration tolerance, which can lead to outbursts of aggression and increased social isolation. Apathy, low involvement in tasks, and difficulties relating to peers may also occur.

Just like the implementation phase of the telepresence system, the reintegration into the classroom is sensitive. It is recommended that pupils with a telepresence system enter the class gradually. Furthermore, it is crucial to consider how much school time and intensity is good for the pupil, given the current condition. Experience has shown that it is advisable to attend school for a few hours or a day at a time. On the other days, the pupil can continue to take part in school and social activities with a telepresence system. Therefore, the device should not be returned too quickly. Only when constant school attendance can be guaranteed over a longer period of time the telepresence system is no longer needed. This can be a ceremonial act, as it also symbolises the pupil‘s state of health.

Conclusion

Part III of the handbook illustrates the implementation of telepresence systems in lesson planning and classroom management. It discusses the pedagogical approaches and preparations necessary for using telepresence systems in education. The content is presented within a constructivist framework that emphasises the active construction of knowledge by learners. It highlights the importance of meeting pupils‘ psychological needs and creating opportunities for interaction and engagement in the learning environment.

This part explains that the use of telepresence systems in education is relatively new but can draw on concepts from distance teaching and hybrid teaching methods. It suggests that inquiry-based learning and research-based learning can serve as pedagogical backgrounds for incorporating telepresence systems into inclusive education. The focus is on creating a reflexive pedagogical approach that considers the mental states of both the teacher and the pupil.

The implementation process is divided into three phases: preparation, implementation, and reintegration. The preparation phase involves clarifying technical resources and considering alternative devices or systems that meet the individual needs of the pupil. Additionally, it emphasises the importance of consulting with stakeholders such as the head of school, teachers, support staff, educational authorities, telepresence experts, medical professionals, and funders. Collaboration and coordination among these stakeholders are crucial for successful implementation.

The implementation phase covers various aspects, such as using a buddy system, lesson planning, combining multiple systems, and utilising telepresence systems for breaks and excursions. The text emphasises the need to align goals and expectations and to continuously evaluate and improve the educational plan.
The reintegration phase focuses on designing the re-entry process for the pupil after using the telepresence system and ensuring a smooth transition. The handbook offers insights from teachers with experience using telepresence systems, and provides reflective questions to encourage further thinking and development of pedagogical practices.

Furthermore, this chapter addresses the approach to supporting ill pupils and their peers, maintaining communication and contact, and creating an open and tolerant environment within the school community. It emphasises the importance of collaboration, sensitivity, and understanding in dealing with the challenges posed by the illness.

Overall, the text provides guidance and practical advice for educators on implementing telepresence systems in lesson planning and classroom management, with a focus on creating inclusive and supportive learning environments for ill pupils.

In a nutshell

Based on a reflexive approach to teaching and an understanding attitude towards the ill pupil, this part of the handbook has provided a framework for incorporating telepresence systems into lesson planning and classroom management. The information is presented in a constructivist framework that emphasises the active construction of knowledge by learners. The importance of addressing learners‘ psychological needs and encouraging interaction and engagement within the learning environment is emphasised.

The implementation process is divided into three phases: preparation, implementation and reintegration.

The preparation phase is about clarifying technical resources and considering alternative devices or systems that address the individual needs of each pupil. It also emphasises the importance of consultation with stakeholders, including school leaders, teachers, support staff, education authorities, telepresence experts, medical professionals and funders. Collaboration and coordination among these stakeholders is critical for successful implementation.

The implementation phase includes several aspects, such as the use of a buddy system, lesson planning, integration of multiple systems and the use of telepresence systems for breaks and field trips. The chapter highlights the need to align goals and expectations, and to continuously evaluate and improve the educational plan.

Additionally, the reintegration phase focuses on designing the pupil‘s re-entry process after using the telepresence system and ensuring a seamless transition. The guide offers insights from teachers who already have experience with telepresence systems and includes reflection questions to encourage further reflection and development of pedagogical practices.

This part of the handbook also addresses the approach to supporting ill pupils and their classmates, maintaining communication and contact, and fostering an open and tolerant environment within the school community. It underlines the importance of cooperation, sensitivity and understanding in overcoming the challenges posed by illness.

In summary, this chapter provides educators with guidance and practical advice for implementing telepresence systems in lesson planning and classroom management. Its main focus is on creating inclusive and supportive learning environments for pupils with illness.

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