

**New World, Old Schools:
The Importance of Adjusting Primary School Curricula and Vocational
Trainings of Hamburg towards Educating Children about the Potential
Negative Influences of Screen Technologies**

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Abstract

Children are increasingly being consumed by screen technologies, which entails a multitude of negative consequences, such as the development of materialistic values, depression, natural disconnection or societal homogenization. While the current efforts of digitalizing the primary schools of Germany focus on the provision of screen technologies and the vocational trainings of teachers about the practical usability of these devices, there is only little emphasis on educating children about the potential negative influences of screen technologies. With reference to scientific literature as well as qualitative data collected in two primary schools in Hamburg, Germany, this study focuses on why it is important to adjust the primary school curricula and vocational trainings of Hamburg towards educating children about the potential negative influences of screen technologies. Furthermore, it gives one concrete policy recommendation on how to efficiently counteract the negative entailments of screen technologies in future.

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Introduction

Within just two decades, screen technologies took up a major part of the lives of children all around the world. Instagram, Youtube or video games are progressively replacing natural exploration, interpersonal experiences or times of critical reflection. Children are not solely growing up in their individual composition of physical and social factors anymore, but spend a great part of their waking lives in shared digital environments. While children were certainly consumed by televisions or books in the past, recent technological advancements, like handheld devices or social media platforms, are making digital media omnipresent and ubiquitous in the lives of children. Setting this novel development in contrast to the whole history of humankind, it becomes clear that humanity has reached a turning point in its development. As increasing numbers of young people are getting access to the internet, the disconnected, fragmented and oftentimes isolated societies progressively merge into a world community, held together by the internet. However, in light of the negative entailments of screen technologies on children and society as a whole, such as homogenization, depression, a development of materialistic values or natural disconnection, we need to initiate countermeasures in order to ensure that these negative entailments are not being normalized and carried into the future. Since schools can be seen as social leverage points, where children acquire knowledge for the life that lies ahead of them, they play an integral role in counteracting those negative entailments in future.

Certainly, screen technologies have improved our world in a multitude of ways. Most importantly, they connected us into a global society that can collectively combat global challenges, such as climate change, gradual biodiversity loss or pollution. Nonetheless, it also entails some novel and unprecedented challenges that need to be addressed moving into the future. This study solely focuses on the negative influences of screen technologies while rarely mentioning the positive. The reasoning for this choice is the urgency of acknowledging and actively counteracting these influences. The current objective of the school agency of Hamburg is to equip schools with screen technologies and to educate teachers about the practical usability of these devices, and how they can be implemented into the class proceedings. However, this objective largely misses, and is nonreflective towards the negative effects of screen technologies, which already impact society and will continue to do so if no countermeasures are being taken. Hence, children are currently being confronted with screen technologies, inside and outside of school, without being equipped with the critical

lense to protect themselves from these largely unnoticed negative influences. Therefore, my research question is: “Why is it important to adjust the primary school curricula and vocational trainings of Hamburg towards educating children about the potential negative influences of screen technologies?”. Based on academic literature and qualitative data collected from two primary schools in Hamburg, Germany, this study analyses a multitude of societal fields that are being negatively influenced by screen technologies and the roles of primary schools in counteracting those influences. The results of the study are divided into three main sections; the literature review, the qualitative results and the discussion. Each section first discusses the negative implications of screen technologies on children, before diving into the role of primary schools in establishing a more healthy relationship to screen technologies in future.

Methodology

This exploratory research project aims at analysing the importance of adjusting primary school curricular and vocational trainings towards educating children about the potential negative influences of screen technologies. Furthermore, the building blocks of this study are an extensive literature review as well as qualitative data derived from six in-depth interviews with personnel from two primary schools in Hamburg. For the literature review, the method of a structured literature review was used, in order to answer a predetermined research question from multiple angles in a structured way, while not having to stick to a static predetermined structure of topics to include (Karolinska Institutet, 2020).

First, preliminary literature research was conducted about the multitude of negative consequences of digital devices. For that, Google Scholar and Smart Cat were used (UG online library), along with paper books on the subject matter. For the preliminary online research about the negative entailments of screen technologies, keywords were combined such as ‘smartphone usage’, ‘children’, ‘screen technology’, ‘digital devices’, ‘digitalization’, ‘social media’ or ‘psychology’. However, other keywords were added after diving deeper into the literature, such as ‘depression’, ‘addiction’, ‘loneliness’, ‘envy’, ‘friendship’, ‘materialism’, ‘influencers’ or ‘democracy’. However, due to the multitude of individual themes resulting from the literature research, the literature review of this study solely focuses on a subjective selection of exemplary themes. For the research about the current objective of digitalizing primary schools in Hamburg, I consulted the official websites and documents of the federal ministry of education and research of Germany, the websites of the German ministers of culture as well as the agency for school and vocational training of Hamburg.

After the literature research, the qualitative part of the study began, which included the formulation of interview questions as well as finding potential interview participants. The interview questions (Appendix 1.) needed to be as open and unbiased as possible, in order to gain true and accurate insights from the interviewees, without me influencing the results. The questions aimed at revealing the individual opinions about the negative consequences of screen technologies on children, whether it is important to educate children about them, if the positive aspects of screen technologies outweigh the negative or if they feel adequately prepared to lead children into the age of digitalization, to mention a few.

When it came to the selection of the interviewees, speaking to people who are in contact with numerous children from different social, religious and ethnic backgrounds was important, in order to get the most realistic and unbiased picture about the young generation and their relationship to screen technologies. It turned out that primary schools were the best gateway to look for participants that meet this criteria, as they are spending several hours a day interacting with children from diverse backgrounds. Since I have already been in contact with a primary school in the past, which is known for its diversity and plurality of backgrounds, I was able to consult two teachers, a teaching assistant, a social pedagogue and the secondary principal of the school, who were willing to participate in an interview. Furthermore, I consulted a primary school teacher from another school, which made a total number of six participants. Four of the interviews were held physically at the primary school, one was held physically at a café and one was held online via a phone call. The interviews were semi-structured (Galletta, 2013), since this created a fluid and relaxed atmosphere without being too static. The set of 14 questions that were prepared in advance were open-ended, giving the participants the opportunity to explain their answers in as much detail as they wished. Occasionally, in order to avoid repetition, questions were skipped when participants already gave an answer in the context of another question. The length of the interviews ranged from 17 minutes up to one hour. For the recording of the interviews, a recording device by Sony was used. After the conduction of the interviews, they were manually transcribed into text. This was followed by me reading the transcripts three times to get an understanding of the key themes discussed, before starting with the analysis. Therefore, thematic analysis was the method of choice to code the data (Clarke & Braun, 2014). While the audio files of the interviews have been deleted right after transcription, the transcripts are saved securely on my laptop, locked by a password.

The primary reason to choose qualitative over quantitative research was to gain in-depth insights from the participants along with all the arguments, explanations and standpoints surrounding my research topic. Based on the preliminary research about research methods, it was concluded that qualitative research was the most suitable method (Fossey, et al., 2002; Hennink, Hutter & Bailey, 2020; Patton, 2005). Furthermore, the research question of this study is a ‘why-question’, which can better be answered by sentences than by numbers. The primary reason not to include parents into this research is that they would not have comprehensive and generalizable viewpoints from which broader assumptions about society

can be made. School-personnel seemed to be the most suitable social group to consult, since they are in close contact with numerous children from a variety of social, religious or ethnic backgrounds five days a week. Hence, their viewpoints are more accurate and generalizable when attempting to analyse the characteristics of an entire generation. Moreover they experience how children interact with each other on a daily basis, which is also an important part of this study. In addition to that, school-personnel that have worked in the educational sector for several decades are able to reflect on the long-term changes between generations, especially in relation to the sudden influence of digitalization.

Literature Review

Negative Implications of Screen Technologies

Screen Time

According to Rideout and Robb (2019), the average American between the ages of 13 and 18 has spent an average of 7:22 hours a day looking at a screen and between the ages 8 and 12 it is 4:44 hours, excluding the time spent for homework. Furthermore, 53% of 11 year olds own their own smartphone and by the age of 12, 69% do. While there are no studies on the screen time of German children before the Covid-19 pandemic, it can be inferred that the usage and ownership of technological devices has skyrocketed in recent years. According to a study conducted by NortonLifeLock, German children have spent an average of 6:47 hours a day looking at a screen during the Covid-19 pandemic (It-daily, 2020). Furthermore, the usage of smartphones, in particular social media apps, leads to the disbursal of dopamine, the neurotransmitter responsible for the feeling of happiness, which makes the usage addictive and increases usage (Macit, Macit & Güngör, 2018).

Psychological Implications and Positive Feedback Loops of Screen Technologies

Screen technologies have a variety of psychological implications that act as positive feedback loops. Elhai and his colleagues (2016) analysed the correlation of smartphone usage of individuals and the resultant negative mental health outcomes such as depression, anxiety or the fear of missing out. As individuals spend increasing amounts of time in the digital environment, many of their physiological and psychological human needs are not met, which often entails the consequence of developing depressive symptoms. One of the main findings of the study was that the impulsive pathway to problematic smartphone usage is marked by a decreasing level of emotional self-control. This emotional disposition has shown to result in an even greater overuse of smartphones, in part because of a cognitive escape mechanism to cope with the negative emotions as well as the inability of regulating emotions. Therefore, the unpleasant emotional disposition due to smartphone overuse acts as a positive feedback loop, since it enforces an even greater overuse of smartphones, which then again enforces a

negative emotional disposition. Furthermore, the habitual shift from the physical towards the digital environment is being accompanied by a new form of fear that excessive smartphone users experience in times of digital disconnection; the fear of missing out (Elhai, et al., 2016). As the social life of many individuals nowadays is increasingly taking place online, being disconnected means to take the risk of missing out on something worth experiencing. This force, which keeps our eyes glued to the screen, does not only threaten psychological wellbeing in the short-term, but also in the long-term, since it acts as a positive feedback loop, similar to the one described above. While excessive smartphone usage entails the consequence of developing the fear of missing out, this fear does then enforce excessive smartphone usage which in return leads to a higher level of fear of missing out when not being digitally connected (Elhai et al., 2016).

Another study by Elhai and his colleagues, conducted in 2019, analysed the relationship between problematic smartphone usage and repetitive negative thinking as well as the proneness to boredom of individuals. Repetitive negative thinking, which happens passively and is often the result of depression and anxiety, involves negative thoughts in the form of worry or rumination. The latter two are perceived as cognitive strategies that individuals use to avoid dealing with negative emotions. Whereas rumination involves repetitive thinking about past events, worry involves repetitive thinking about future events (Elhai, Yang & Montag, 2019). The study revealed a mutual correlation between problematic smartphone usage and repetitive negative thinking of individuals. Thus, smartphone usage can not only result in repetitive negative thinking, but is also a coping mechanism to temporarily relieve individuals from negative thinking processes. One possible explanation of this phenomenon is that repetitive negative thinking may be a driver for individuals to seek reassurance of their own self-worth from their family, friends or acquaintances, manifesting itself in form of increased back-and-forth messaging or soliciting 'likes' on social media (Elhai, Yang & Montag, 2019). Another finding of the same study was that depression and anxiety involve attentional deficits, such as a difficulty to concentrate (Elhai, Yang & Montag, 2019). Such attentional deficits may set the stage for depressed and anxious individuals to experience boredom and boredom proneness, which can in turn drive them to overuse their smartphones as means of relieving their boredom. Again, a positive feedback loop becomes visible, since boredom and smartphone usage are mutually correlated.

Furthermore, other studies pinpoint smartphone addiction to be a major cause of loneliness and depression (Hunt, et al., 2018; Mahapatra, 2019; Yavich, Davidovitch & Frenkel, 2019). Since social networks provide individuals with a superficial feeling of belonging and social inclusion, smartphones have become means to experience a sense of relief and escape from the feeling of loneliness (Hunt, et al., 2018; Mahapatra, 2019). This, however, only provides immediate and superficial gratification which ends once the individual puts away their smartphone. Gradually, users fall into a pattern of repetitive behaviour, using the smartphone as a mean of mood enhancement, which increases the level of psychological dependency once the repetitive behaviour is reinforced (Mahapatra, 2019). Again, a positive feedback loop arises from the usage of smartphones, which can in the long run harm the real physical and social life of individuals. The sense of excitement, relief and fulfillment that users derive from the digital sphere is so appealing that they often neglect real social interactions, substituting family members and friends with digital media.

Natural Disconnection

The time that people have spent in the natural environment is progressively being replaced by time spent in front of screen technologies (Rideout & Robb, 2019). This habitual shift, which is highly anomalous in contrast to how people have spent their time before digitalization, is resulting in a variety of negative consequences. In the book 'Last Child in the Woods', by Richard Louv (2008), the term 'Nature-Deficit-Disorder' has been coined. The Nature-Deficit-Disorder describes the costs to children as they are increasingly being deprived from the natural environment. Several studies have found a positive correlation between time spent outdoors and the psychological wellbeing of children (Bratman, Hamilton & Daily, 2012; Nisbet, 2014; Nisbet & Zelenski, 2011; Pensini, Horn & Caltabiano, 2016). On the other hand, childhood spent indoors rather than outdoors is linked to a variety of negative health outcomes such as impaired social skills (including increasing violence), attention-deficit-disorder, obesity or alterations in mental health (including depression) (Louv, 2008). Besides the negative psychological implications for children being increasingly disconnected from nature, there are major consequences for the environment (Ives, et al., 2018). Several scholars perceive society's disconnection from nature as the root cause of unsustainable development (Dorninger, et al., 2017; Ives, et al., 2018; Zylstra, et al., 2014). As modern urban society is constantly being stimulated by screen technologies and fictional

media contents, people live in the illusion of being separate from, and even outside and above, ecology and nature (Zylstra, et al., 2014). Furthermore, ecological phenomena no longer form experiences that shape consciousness, which restrains people from intrinsically wanting to care and stand up for the environment. Hence, in light of the global environmental challenges we are facing, like climate change, gradual biodiversity loss or pollution, reconnecting to our life support system is playing an integral role in the establishment of a sustainable future.

Disappearing Media

Unlike media that is being uploaded to be available online for a long period of time, disappearing media is both disposable and short term (Kotfila, 2014). Popular networking sites such as Instagram or Snapchat are enabling users to post content that is only available for 24 hours, before it is being deleted. This new form of media breaks the barrier of individuals to upload quality content only and takes the act of posting on a new level. Charteris, Gregory and Masters (2016) state that it is common in the life of a teenager to upload a daily visual overview of their banal everyday lives. These contents might include the food they eat, how they are dressed, which people they meet or what they are experiencing throughout their day. Hence, abstracts of life stories are being uploaded on a regular basis, which can trigger envy and in-group competition among peers (Charoensukmongkol, 2018). As a result, individuals are being pressured to partake in this online portrayal of one's everyday life, in order to not give the impression of having a life not worth posting about. Furthermore, exciting experiences throughout the day trigger the urge of filming and posting, since not doing so would be a missed opportunity to give a favourable impression to the online community. In fact, the research by Liu, Wu and Li (2019) revealed that even the choice of activities of individuals is being influenced by the postings of other people. Furthermore, according to the 'Looking-glass Self Theory' by Cooley (1902), individuals base their sense of self-worth on how they believe others view them, using social interaction as a type of mirror. Projecting his theory into the digital sphere, individuals are trying to enhance their own sense of self-worthiness with the means of publicly displaying themselves in a favourable way.

Adoption of Materialistic Values

Nowadays, the way people are being perceived by others is not only rooted in their physical appearances but also in their digital representations of themselves. As our lives are increasingly taking place online (Rideout & Robb, 2019), the digital representations of people are gaining in importance. This shift, according to Paek and Pan (2004), leads individuals to neglect the means of defining themselves through personal traits, towards defining themselves with the means of materialistic possessions, believing that this will lead to success and happiness. However, besides the habitual shift into the digital sphere, other mediating factors are also playing a role, such as a low level of interpersonal relationships or a low level of self-esteem, since individuals try “to turn to material goods to compensate for or cope with doubts about their self-worth and competence (Wang, et al., 2018).

Furthermore, the study by Chan and Zhang (2007) shed light on how adolescents develop materialistic values through the endorsement of media celebrities. Media celebrities are often being idealized and worshipped for having glamorous and extraordinary lifestyles. However, they often demonstrate their lifestyles through materialistic possessions such as houses, cars or jewellery, which children then believe is worth pursuing (Chan & Zhang, 2007). Especially in the age of puberty, when the focal point of reference moves away from parents towards peers and idols, young admirers are prone to see media celebrities as their guiding role-models, believing that imitating them will eventually lead to happiness, success and fulfillment, just as portrayed in the social media posts of the celebrities (Chan & Zhang, 2007). Furthermore, the study by Chamberlain, Wang and Robinson (2006), including 827 third-grade school children, revealed that “screen media was significantly associated with concurrent requests for advertised toys [...] and foods/drinks”. As children are being confronted with an increasing rate of materialistic contents, such as advertisements, they are more likely to internalize them (Wang, et al., 2018).

Democratic Implications

The habitual shift from the physical to the digital environment also entails considerable consequences to our democracy. While children have been growing up in their individual composition of physical and social factors before screen technologies invaded society, they are now growing up in more homogeneous and assimilated digital environments which do not

differ as much from person to person. This habitual homogenization results in people making similar experiences, share similar values or share similar goals in life (Hsu, 2017; Merkovity, Imre & Owen, 2015). Furthermore, the contents within the digital sphere are created by human beings. Since digital media contents are always means towards other's goals rather than ends in themselves, the lack of life experience and vulnerability of children can be exploited by incentive driven organizations in the pursuit of shaping profitable future customers and followers (Zuboff & Schwandt, 2019). This 'Instrumentarian Power', which is being fueled by behavioural surplus data or addictive software design practices, threatens individual autonomy and democracy by not only instrumentalizing individuals for economic objectives but by contributing to the development of an assimilated society that grows increasingly accustomed to homogeneous stimuli (Zuboff & Schwandt, 2019).

Current Objective towards Digitalizing the Schools of Hamburg

In May 2019, the federal government provided 5 billion euros for the 16 states of Germany to be used for the 'digitalization of schools' between the years 2019 and 2024, called the 'Digitalpakt Schule' (Bundesministerium für Bildung und Forschung, n.d.). This money is being used to purchase digital end-devices, install digital infrastructures such as WLAN and acquire teachers with digital competence skills. Of the 5 billion euros, 128 million euros have been provided to the schools of the city-state of Hamburg (Behörde für Schule und Berufsbildung, 2019). According to Ties Rabe, who is the State Minister for School and Vocational Training of Hamburg, "it is our goal that digital media is being used as a matter of course, just as textbooks or workbooks. This is the only way we can ensure that students are optimally being prepared for life and learning in a digital work- and studyworld" (Bildungsbehörde Hamburg, 2019). While there is a lot of emphasis on the practical implementation of screen technologies along with equipping teachers with the practical skills of utilizing technologies in the classroom, there is little emphasis on the associated risks of screen media.

While the nationwide strategy 'education in the digital world' of the ministers of education is briefly touching upon acquiring children with the skills of critically questioning their own media consumption, there are no concrete arguments to why this is important other than functioning well within the digital future (Kultusminister Konferenz, 2017). There is no concrete list of topics that need to be addressed, such as natural disconnection, democratic

implications or depression, which leads different states to decide for themselves how they educate children to critically question their media consumption. This is a key issue, since there is no centralized and holistic guideline that all the states follow along, which deemphasizes the importance of critically questioning media consumption.

Resulting from the nonexistent guidelines, the educational components of Hamburg about why and how to equip children with a critical and differentiated view on the potential negative influences of screen technologies are very poorly developed. As a reaction to the strategy ‘education in the digital world’ of ministers of education, the school agency of Hamburg developed the ‘Digital Learning Lab’, a platform that teachers can consult in the search of general topics about digitalization in schools, how to practically implement new technologies, or topics to discuss with children in class (Kultusminister Konferenz, 2017; Behörde für Schule und Berufsbildung, 2018). However, this portal is on the basis of ‘from teachers, for teachers’, meaning that there is no central authority developing the contents of the website, but it relies on teachers developing the content. According to the website of the Digital Learning Lab, it wants to “assist teachers to acquire and enhance digital competences themselves. This should enable them to also assist students in their acquisition of competences” (Behörde für Schule und Berufsbildung, 2018). One of the six categories of the Digital Learning Lab is ‘Analyse & Reflect’, which has the purpose of providing contents about how to analyse and reflect on ‘digital tools, media, architectures and rooms’. However, there is almost no content specifically related to the subject issue. In fact, the category is filled with topics that individual publishers marked to be somehow related to the category of ‘Analyse & Reflect’, but are most of the time not aiming at triggering a critical thought process about the negative consequences of screen technologies, but rather practical utilization practices of digital tools. When using the search option of the website, there were no results for the following keywords in German: ‘Depression’, ‘Porn’, ‘Materialism’ or ‘Democracy’.

Results

The six interviews were conducted and transcribed on German. Since I am a native German myself, I was able to accurately convey the results on English. The results are divided into the main themes that were discussed in the interviews. The transcripts of the interviews can be found in the Appendix (Appendix 1.).

Children live in Digital Realities

One of the main findings of the interviews was that children nowadays live in digital realities, without the critical ability to distinguish between what is real and what is fiction. The media “seems to portray reality” (P2), while too little effort is made to acquire children with the critical abilities to question this artificial portrayal of reality. Due to the lack of life experience and the amount of time spent in the digital environment, children have “weak reference points in the real world and therefore cannot critically question the digital world” (P4). Participant 4 described a situation where a boy from the second grade told him that he finds all Chinese people to be absolutely disgusting. When the participant asked the boy why he held that opinion, he said that he saw a video on youtube of a Chinese eating a spider. Furthermore, one participant pointed out that children are talking about things they saw and experienced in the digital world at an increasing rate. Especially the “role models [...], the beautified and modified world, that is not the true world” (P2), is problematic for children to experience, since “they want to imitate and act in ways that are being exemplified” (P6) in the online environment, especially by the mainstream role models. Resultantly, “children become unhappy about themselves, as they cannot live up to these standards” (P2). “Probably, they think they are following their own ideals without realizing that they have merely adopted them over time” (P4). Furthermore, the digital world that children are living in “is being created on the basis of algorithms, [...] which mainly show you things you already like” (P4). Hence, “a worldview is being conveyed that already matches the one you already hold anyhow” (P4). This “polarization of society” (P4) is fatal, since it results in a situation where the different parties are not able to understand each other anymore, as each party is only being confronted with information that validates and confirms their opinion, without getting in contact with the opponent’s opinion. Furthermore, several participants pointed out that digital experiences are replacing experiences that children would make in the

outdoors, which are very important for the healthy development of a child. There is often no central authority that is controlling what children get to see on the internet. They are being exposed to unfiltered content that might not be appropriate for children to see. For example when the videos of people being beheaded by the terror organization ISIS circulated on social media or the pornography websites that are accessible via any device connected to the internet. If children see these contents, their worldview is being influenced and shaped by them. “Children might believe that it is normal that people are being beheaded” (P4). Hence, children are increasingly living in a digital reality.

Children Develop Materialistic Values

Another aspect that resulted from the interviews was that children develop materialistic values when using screen media. “The visual appearance of a person becomes increasingly important in social media while the character of a person loses in importance. Children are the future and if it goes on like that, society will flatten out in a way that profound things will be replaced by superficial things like the way people look or their status symbols” (P4). Furthermore, the focus of individuals shifts from personal development to success, since that is what can be utilized and uploaded on social media. This notion is popularizing among the young generation, while also being normalized. Participant 2 said that “everyone wants to look like and own the same things as the popular influencers, especially girls, who want to have the same haircuts, the same body shape or the same body movement. If they do not, they are out”. Furthermore, it was mentioned that there is a loss of individuality in society, since children see the same things and looks everywhere they go, let it be the offline or online environment. Children want to match this norm in order not to be bullied or excluded from their peers. However, this “homogenization of the outer appearance of people comes to the cost of those who are not able to comply with this norm or do not want to comply with it” (P4). Others might then “perceive them as ugly or simply not good enough for this world” (P4). This negative judgement can be emotionally very challenging for children, urging especially girls to use make-up or undergo plastic surgery at higher ages.

Psychological Implications on Children

There are a wide range of psychological implications on children that the interviewees associated with the usage of screen technologies. One participant pointed out that the usage leads to loneliness, since online relationships will never be able to substitute physical relationships. Furthermore, screen technologies are highly addictive, since their usage leads to a disbursement of dopamine. One participant found this to be very unhealthy, since children do not see the added value in gaining their dopamine in the physical world anymore. Children find it more convenient to feel happy in front of a screen than in the physical world, since they do not need to move anymore but only sit and interact with a screen. This shift also affects their ability to concentrate themselves, since apps like TikTok are providing children with content at such a high pace that they cannot endure to concentrate on one thing for a longer period of time anymore. In addition to that, participants pointed out that school has become boring for children when comparing it to what the internet has to offer. “Children always want to watch videos before class starts” (P6). The internet seems to be so much more attractive than school, that children lose their motivation to work for school. Furthermore, this discrepancy between what schools try to teach children and the actual world that they live in leads to disrespect of authorities, since the internet seems to know much more than them. Also, “the cool kids from the internet do not care about things taught at school either” (P4).

Physiological Implications on Children

One participant emphasized the physiological effects of screen technologies on children. Since less time is being spent on moving through and interacting with the physical world, the motoric skills of children are underdeveloped. The participant has been a teacher for several decades and observed a noticeable change in the way children are able to run, climb or jump. Being inside the whole time and not actively using the body is very unhealthy, as the participant pointed out. Furthermore, “the eyesight of children has weakened over time” (P2). More children are becoming nearsighted due to them only looking into two-dimensional worlds in front of their face, not using their eyes to see things far away. Furthermore, their ability to recognise things in the three-dimensional physical world is worsening since their

eyes are growing increasingly accustomed to the two-dimensional digital world. Participant 2 even reported children trying to ‘zoom in’ on something they saw in the textbook.

Social Relationships

Social relationships have also been reported to be affected by the influence of screen technologies. According to one participant, the alienation from reality and real social relationships is leading to a form of social incompetence among children. “Children are losing their social abilities while developing themselves into internet-nerds” (P1). Less children are meeting up after school and if they meet, they often “look at screens together” or connect themselves via the internet (P2). Furthermore, “when children are in front of screens, they are dealing with themselves and not with other children” (P6). Participant 3 reported that screens have some kind of “magic force to grab the attention of children”. Independent from the content, even the smallest children are being consumed by screens. “Even a screen saver is more interesting than anything else. If a device turns on, children are in front of it” (P3). As mentioned above, interviewees reported that the outer appearance of children is increasingly overshadowing their personal traits. This also has an effect on their social relationships, since children tend to “choose their friends based on their coolness and beauty rather than on how well they can discover new things or play with them” (P4). Furthermore, “those who cannot live up to the beauty ideal of society, such as owning Nikes, or simply do not own a smartphone, are being excluded, laughed at, or bullied” (P4). Those who do not own a smartphone often lose connection to their peers owning a smartphone, since they cannot partake in their conversations about things they sourced from the online environment. As a result, owning a smartphone becomes decisive in the social realm of children.

Sexuality

Participants also pointed out how sexuality and gender roles are changing from the influence of screen technologies. Especially pornography is playing an increasing role in the lives of children. While, pornographic websites often contain contents that can be highly disturbing to children, there is no regulation, such as a mandatory proof of age. Hence, children of all ages are able to watch all kinds of pornographic videos, as long as they have access to the internet. The impacts of this open access can already be felt at school. Participant 4, who is active in

the grades one to six, has mentioned three situations from the sixth grade that are exemplifying the effects of porn on children. First, 11 year old boys were openly talking about their porn consumption in class. Second, 11 year old girls were openly talking about with how many boys they have had oral sex before. Third, an 11 year old girl was offending another girl by asking: “Did you pay attention to how your ass looks?”. Participant 4 holds the opinion that it is way too early for children to have any form of sex life, since children then start identifying themselves with it way too early. “Children of the age of 11 should not worry about how their asses look or who might have the biggest one” (P4). However, “through the media they are being told that having a big ass is important” (P4). This also reflects on their own self portrayal on social media, where we can witness “an extreme sexualization and objectification of girls, who are presenting their bodies in ways that are way too extreme and just inappropriate for children” (P4). Hence, the internet can erode certain achievements by humanity, such as gender equality. “Sexism takes on new forms in the digital age, since women are not the ones cooking or caring for the kids anymore, but the ones having to look sexy and meeting the expectations and fantasies of men” (P4). Participant 5 also pointed out that video games and movies are influencing gender roles in society. Oftentimes, “the heroes in computer games are boys while the girls are just side characters. That might also be the reason why girls play less computer games. The boys are always experiencing exciting things while the girls have to look pretty, wear something tight, be styled and so on” (P5).

Glorification of Violence

Another theme that has been repeatedly mentioned during the interviews was the normalization of violence among the young. While “children have been playing board games in the past, where violence did not play much of a role, they are now playing video games in which they need to execute and kill others” (P2). Children in second grade are playing violent games that are not approved for their age. This is a big problem, since children do not only start normalizing violence but reenact it at school. Several participants pointed out how they observe children acting in ways that have been exemplified in video games, by pretending to be a certain character for instance. The violence of video games also found its way into the arts of children. Participant 5 described how a boy drew fight-scenes on a containership they handcrafted. Generally, violent behaviour among children has become a lot more common in

recent times. Participant 4 also believes this to be correlated with the music children hear, as rap groups glorifying violence, such as '187 Strassenbande', are popularizing among the young generation. This leads to "children speaking to each other in ways that are deprecative and offending" (P4). Furthermore, as pornographic contents are becoming easily accessible to children, so are videos containing sexual violence.

Are the Positive Aspects Outweighing the Negative?

When the question was asked whether the positive aspects of screen technologies are outweighing the negatives, answers varied widely. Participant 1 holds the opinion that there is "barely any positive aspect. While it enables us to find information easier and communicate with people quicker, it somehow makes it all so worthless". For participant 2, it depends on the age. For people who do not excessively use screen technologies, like herself, it can be good. However, there are some threats if the technologies are not being used responsibly. Irresponsible usage by children can take away all the bodily experiences away from them for example. Participant 3 believes that it depends on how digital media is being used. It has the potential to make certain things easier and give access to things that were inaccessible in the past. However, "the problem is that it is oftentimes not used wisely" (P3). Participant 4 holds the opinion that "theoretically the positive aspects could outweigh the negative aspects. In reality however, this is not at all the case". When it comes to children, he says, the negative aspects are outweighing the positive, since there is no regulation that limits the negative consequences. Furthermore, if screen media is not being regulated, just as the real world is being regulated to be able to function as a society, certain achievements of humanity are decaying again, as in the example of gender equality described above. While participant 5 has not been asked explicitly, it can be inferred from other answers that she had a rather negative attitude towards children using screen technologies irresponsibly. Participant 6 said that for herself, the positive aspects outweigh the negative, since she is able to google anything and easily connect with friends and family for example. However, she also criticises the consumption of screen media by children in other answers.

The Role of Schools

All participants said that schools are responsible to educate children about how to use screen technologies responsibly. Three participants mentioned that parents are not responsible to acquire children with knowledge about the potential negative influences of screen technologies. Participant 6 said that parents have the primary role to educate children about using screen technologies responsibly, since they are the ones being with the children at a very young age. Secondly, kindergartens and schools are responsible. According to participant 4, “parents play a big role in teaching children how to behave within society but schools are responsible for the knowledge, where children could learn about why excessive consumption of media can be bad for example”. Children should also learn about how an algorithm works or how screen technology can lead to addiction, since these topics are playing an integral role in the modern world. However, learning about the beneficial aspects of screen technologies, such as having access to information at all times, is also important. Children need to be taught in a way that they view screen technologies “as working tools and not just as portals of fun” (P3). Participant 2 said that “parents would be overcharged to adapt such a program at home. It is their role to look after the time children spend in front of screens however”. Furthermore, participant 5 mentioned that many children can only be reached at school. Hence, schools need to be modernized in order to be in the position of adequately preparing children for a digitalized world. One example, stated by participant 3, is how schools are just prohibiting children to use smartphones at school, without engaging them in a discourse about when, for what and to what extent smartphones are truly beneficial. “The current educational plan dates back to a time in which there were no computers. Therefore, everything needs to be adjusted to be able to prepare children from a young age onwards” (P1). Participant 4 emphasized that schools need to start being appealing to children. Currently, there is a great discrepancy between what children learn at school and what children do after school. However, the purpose of schools is to prepare children for the life that lies ahead of them. Hence, schools need to be fluent and adaptive to the ever changing world in order not to be outdistanced by modern developments. “Schools must be up to date, teachers must be up to date and the school agency must be up to date, so children are being taught that what they see is not normal and that there is so much more to explore outside of the digital environment” (P4). Currently, teachers and students do not really understand each other anymore, since they are living in very different worlds. Hence,

teachers are also not able to support and guide children into the digital realm, as they do not understand the world that children are living in. In fact, all of the six participants reported that they do not feel prepared in guiding children into the age of digitalization. Furthermore, the schoolings about digital competence for teachers do currently only address the practicalities of how technologies can be integrated into the learning process, not the potential negative implications of technologies. However several participants wished that teachers were being taught about the potential risks of digital devices, not just the practicalities. Participant 2 also reported that the current schoolings are very unstructured and did not really help with the acquisition of digital competence skills.

All of the six participants believed that children should start learning about the risks of screen technologies and how to use them responsibly from a young age onwards. Participant 1, 3 and 4 said that the education should start as soon as children start interacting with screen technologies. Participant 2 suggests it to start in the day-care center, participant 5 would like it to start in primary school and participant 6 suggests it starting in the first grade. Several participants highlighted that supervised and regulated usage is important from a young age on, to avoid children from “getting on the wrong track” (P3). We need to reach the point where “children are intrinsically willing to reduce their screen technology usage because they know it is bad for them” (P1). However, as children are spending more time in the digital environment, without being told about the negative implications for themselves, this point of critical self-reflection is becoming more unlikely due to normalization.

Discussion

When comparing the qualitative results to the literature results, it can be concluded that they are in line and there are no things contradicting each other. However, while the interviews did not cover all the topics mentioned in the literature review, the interviews discussed a range of additional topics, which provided new perspectives on the subject matter.

Democracy in the Digital Habitat

As the results show, the digital world is becoming a place for individuals to fulfill their needs, socially engage or create an identity, which is why it could also be called a digital habitat. Since children cannot look beyond the boundaries of their own reality, while spending a great share of their waking lives in the digital habitat, digital reference points are becoming their means of orientation in life. Just as the physical habitat has shaped the reality of past generations, the digital habitat is now shaping the reality of current generations. While the physical habitat is highly heterogeneous, objective, diversified and complex, the digital habitat is comparatively homogeneous, subjective, monotone and structured. Digital inhabitants live in the illusion of a diversified world, due to the instant access to a variety of contents, while actually living in a world that is a lot less diverse than that from their ancestors. As the digital habitat is the result of subjective fantasies, ideologies and designs of individual people, and the diversity of contents is comparatively low when setting it in contrast to the physical habitat with its billions of individual inhabitants, children are nowadays growing up in intersubjective realities. Intersubjective realities, just like religions, are subjective realities shared among many individuals. Hence, popular trends in the digital habitat can be called intersubjective realities, since many people believe in the same subjective idea. While intersubjective and subjective realities are not bad per se, digital inhabitants are solely being confronted with these realities while being completely deprived from any form of objectivity. Everything they see, hear and feel is the result of a subjective creation. Hence, they are not being confronted with things that are ends in themselves anymore, but only with things that are means towards someone else's interests. As children cannot look beyond the boundaries of their reality, unless being confronted with something that expands their worldview, they are growing accustomed to what they know and see. Therefore, there is an ongoing homogenization and de-individualization of society, which

thus, also becomes increasingly predictable and controllable by external interest groups. This loss of individuality also entails that our socio-economic system is becoming more resistant to change, since children are currently not being sufficiently told to critically question the digital habitat and to develop their own sense of understanding the world and its downsides. As participant 4 pointed out, we live in bubbles managed by algorithms. In combination with the popularization of certain trends and the overall decrease of diversity in the digital habitat, it leads to a polarization and homogenization of society.

Screen Technologies and the Ecological Crisis

In light of the current ecological crisis that we as biological organisms on planet earth are facing, the ongoing habitual shift into the digital habitat is at the same time an alienation from the physical habitat. We are encapsulating ourselves from our life-support system, which is collapsing as a result of irresponsible human activity. As several scholars have pointed out, society's disconnection from nature is the root cause of unsustainable development (Dorninger, et al., 2017; Ives, et al., 2018; Zylstra, et al., 2014). The ongoing process of people being increasingly deprived from the natural environment, while being constantly stimulated by artificial and fictional media contents, lets children live in the illusion of being separate from, and even outside and above, ecology and nature. Ecological phenomena no longer form experiences that shape consciousness. Hence, from where should children source the intrinsic motivation to actively change their behaviour and stand up for a world they are not familiar with? Furthermore, when children are growing up in a world of which they are the center of, empathy for other people, living beings as well as the environment is likely to decline. Unlike past generations, the current generation does not have time to slowly make sense of the world surrounding them and randomly synthesize a worldview. As the ecological challenges of the 21st century require immediate behavioural change of humanity within the next decades, the worldview and resulting actions and non-actions of the young generation will be decisive for life on planet earth as a whole. If these individuals fail to develop a holistic view about their role and responsibility as human beings on planet earth, it could mean an end to life as we know it. Currently, there is the popular belief that sustainable development is primarily linked to finding external solutions in the external world, such as solar power, agricultural innovation or electric vehicles, which should largely enable us to continue our current way of living. However, the general debate about sustainable

development often misses a deeper reflection about the sources of the very problems we are trying to solve. Since the ecological collapse is being caused by human activity, why find secondary solutions to primary causes? If we are the primary cause of the ecological collapse, we should also be the primary solution. Since our current decisions are largely being driven by the question of ‘what do we want?’, we often miss a deeper reflection of why we pursue these desires. Nowadays, as the literature and the results of this study showed, our desires are largely being driven by the influences of the digital habitat and oftentimes associated with materialism. Since all humans just have one limited lifetime, they are often not willing to make deep sacrifices in the pursuit of their desires. Therefore, when aiming towards a more sustainable future, altering the very root of our desires is a much more sustainable, long-term and efficient solution than engaging in the continuous process of finding secondary solutions to primary problems. Hence, we should start asking the question ‘what do we want to want?’ instead, which brings us to the adjustment of current school curricula. The negative entailments of the habitual shift is just one of many subjects missing in current school curricula. Next to climate change, gradual biodiversity loss or pollution due to human activity, children need to learn about the importance of their generation in combating those global issues. However, from my point of view, the negative entailments of the habitual shift should be on the very top of the list, since it alters personalities, worldviews and desires on an ongoing basis.

Materialism and Inauthenticity

The results strongly emphasize that children develop materialistic values and adopt the behavioural patterns exemplified in the online environment. Due to the very limited ability of identifying oneself beyond the boundaries of materialistic possessions in the digital habitat, children start believing that what they own or what lifestyle they can afford is who they are. Children also compare themselves to idealized and inflated media images that often exemplify happiness and success. Hence, these images, which are largely composed of things that can be visually portrayed through a screen, become their reference points of how to become happy and successful. However, as these portrayals are often not realistic or can only be achieved by very wealthy people, children start becoming unhappy about themselves and their lifestyles. Furthermore, these idealistic images are oftentimes worshipped by a large number of individuals, resulting in many people developing similar ideals and imaginations

about their future. Hence, we need to start recognizing and acknowledging the influences of screen technologies on our pursuits and values, so that we hold on to the things that truly make us happy and fulfilled. However, as the results show, the experiences that children have made in the past are progressively being replaced by digital experiences. Children are therefore not getting in contact with alternative ways of achieving happiness that would expand their worldview, but adapt the exemplified means towards happiness in the digital habitat. In addition to that, the results highlighted how interpersonal relationships are changing in times of digitalization, which was not covered in the literature review. The emphasis on materialistic possessions is colouring our choice of friends, while personal traits like empathy, individualism or courage are losing in importance. One reason for this development might also be that friends become some kind of materialistic possessions to the individual, which look good to be with in public. Another aspect that was mentioned in the results and not in the literature review was how pornography affects children at a mere age of 11. This sexualization, in combination with materialism, leads children to wanting to improve their outer appearance by looking sexy. This applies especially to girls, since pornographic contents are most of the time tailored to the fantasies of men. The results show that this influence of pornography does not only let children behave inauthentic, but shifts the gender roles in society towards girls having to comply to the sexual fantasies of men, and men seeing women as their sex-toys. This also finds its way into the online portrayal of young girls, who are representing their bodies in sexualized ways.

The Role of Schools

Schools are centralized leverage points for societal change. In light of the threats and negative implications of screen technologies yet capable of educating children in a manner that is adequately preparing them for a life in a digitalized world. All of the six participants said that the education about a responsible usage and the negative implications of screen technologies should either start in primary school or as soon as children start using screen technologies. Furthermore, all six participants said that they do not feel to be in a position to adequately guide children into a digitalized life. However, if teachers are not able to do so, who is? The results show that parents only play a subordinate role, as it is difficult, if not impossible, to force such a program onto them. Due to the diversity of living conditions, values, worldviews and that parents would be overcharged and can oftentimes not be reached,

parents are rather a decentralized and ineffective leverage point for such an immediate intervention. Several participants indicated that schools are responsible for the knowledge children acquire, not parents. Since children lack life experience and are thus the most vulnerable in society, they are the most heavily affected social group by screen technologies. Hence, children should also be the ones being directly addressed without the intermediary step of parents. Most importantly however, when formulating an answer to the question of ‘what do we want to want?’, we are shaping the parents of tomorrow, which is a much more long-term and sustainable solution. Of course, parents are responsible to limit the time children spend in the digital habitat, but if we want to reach the point where children intrinsically decide not to spend as much time as possible in the digital habitat, due to their knowledge and awareness about the negative effects it can have on themselves, we need to start with schools. Hence, in light of the ongoing negative influences of screen technologies on society, there is a great urgency to adjust primary school curricula and start educating teachers in a suitable manner.

The results showed that it is not enough to acquire teachers with the practical knowledge of implementing technologies into the classroom. If Ties Rabe, who is in charge of the school system of Hamburg, says that the only way to ensure that students are optimally being prepared for life in a digitalized world is by using digital media as a matter of course, it gives the impression that he did not critically reflect on the very technologies he is praising. Since digital media is already ubiquitous in the private lives of children, along with all the negative consequences, digitalizing schools would currently mean an even further increase and normalization of the usage of screen technologies. If this development is not accompanied by clear guidelines and teaching contents about why and how ubiquitous screen technology exposure can be harmful, it will have severe effects on generations to come. Especially because screen technologies are unprecedented in nature, we first have to deliberately outweigh and be aware about the positive and negative aspects, before we can trustfully expose the young generations to these novel technologies in- and outside of school several hours a day.

While the Digital Learning Lab of the school agency of Hamburg is a step into the right direction, it does not live up to the challenges we are facing. The ‘from teachers, for teachers’ concept is not incentivising teachers to develop content. Furthermore, there are only very little contents that are specifically directed towards the responsible usage and negative

implications of screen technologies. Additionally, teachers are not required to gain knowledge themselves or to teach children about it, and are not being provided with any overarching guidelines on how to approach the topic in class. The vocational trainings are solely aiming at developing a practical competence. Hence, the problem of the six participants not feeling prepared to guide children into a digitalized life is not actively being solved. Furthermore, as technological innovation progresses, the discrepancy between teachers and students will be carried into the future, meaning that teachers will always be behind children in the knowledge about new technologies. This discrepancy naturally shrinks when the age difference between teachers and students is lower. However, as teachers grow older, there need to be new approaches on activating these teachers to acquire the practical and theoretical knowledge about new technologies. Hence, schools need to move away from being a solid structure to being something fluid that flows with the time.

Limitations

This study has three primary limitations. Firstly, the qualitative data originates from solely the primary schools within Hamburg, which comes at the cost of generalizability. Hence, there might be variations if this study would be replicated within another state of Germany. Secondly, the qualitative data has only been collected from two primary schools in Hamburg, which also comes at the cost of generalizability upon all suburbs of Hamburg. Thirdly, the qualitative data has been collected during the COVID-19 epidemic, which might have coloured the lense through which participants saw the world during that time, which also comes at the cost of generalizability.

Conclusion & Policy Recommendation

After all, it can be concluded that the primary school curricula and vocational trainings of Hamburg do currently not live up to the challenges posed by screen technologies. Screen technologies pose unprecedented threats to human psychology and society, which are currently not being addressed in the school system of Hamburg. While current efforts of digitalizing German schools largely focus on the provision of digital devices and the vocational trainings about the practical usability of these devices, there is only very little emphasis on equipping children with the knowledge and skills of critically questioning how these devices affect their personalities, worldviews or values. This study revealed that the unregulated usage of screen technologies by children can result in a multitude of negative outcomes such as the development of materialistic values, depression, natural disconnection, sexism, glorification of violence or societal homogenization. Furthermore, the results suggest that the responsibility of counteracting these developments primarily lies upon the schools, since they can be seen as centralized social leverage points that are responsible for the acquisition of knowledge, whereas parents are rather decentralized and responsible for the timely limitation of screen technologies. In light of the current ecological crisis we are facing, it has been discussed how the ongoing alienation from our physical surroundings is inhibiting people from actively changing their behaviour and standing up for the environment. With hindsight to the results of this study, there is one concrete policy recommendation that is directed towards the federal ministry of education and research of Germany. There need to be clear, holistic and mandatory guidelines and overarching content structures for all states of Germany to follow along. This includes both the development of content to be implemented in primary school curricula, as well as the development of content for the vocational trainings of teachers. Since the negative consequences of screen technologies are affecting children all over Germany, and will continue to do so if no countermeasures are being taken, it cannot be left to the individual states whether to, or how to develop their own concepts. In the case of Hamburg, this resulted in the unstructured and insufficient approach of the Digital Learning Lab, as well as teachers not feeling prepared to guide children into a digitalized future. Therefore, shares of the monetary funds of the ‘Digitalpakt Schule’ should be utilized to develop overarching content structures and contents about critically questioning the influences of screen technologies for children and teachers. Furthermore, due to the

complexity and heterogeneity of the negative entailments of screen technologies, these overarching measures need to be based on scientific research.

Since we have just recently begun living in a digitalized world, there needs to be more emphasis on equipping children with the critical ability of questioning the historically novel and unprecedented world they have been born into. Current efforts of digitalizing the schools of Germany heavily focus on the provision of screen technologies and the vocational trainings about the practical usage of them. By adding the third component of critically questioning screen technologies, it can not only lead to a more healthy relationship children have to them in future, but can empower children to consciously use screen technologies to their benefit.

Further Research

Since this study focuses on WHY it is important to adjust primary school curricular and vocational trainings towards educating primary school children about the potential negative influences of screen technologies, further research needs to be done on HOW to achieve this objective. This includes research about what topics within current curricula could be replaced by topics about critical media literacy, as well as developing scientifically based contents for children and teachers to work with and learn about.

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