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Research report

Forum:	UNICEF
Issue:	Discussing the influence of technology on the development of child cognition
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Introduction

With the invention of the internet and cell phones, technology started developing at an accelerating rate, and we are barely able to keep up with all the changes. We are now at a point where we are close to a virtual world accessible to everyone. However, we still do not know how something as simple as a telephone or tablet influences the cognitive development of humans, especially those of children and teenagers.

Compared to ten years ago, children are now surrounded by distractions. From games on their computers to videos on their phones. Many studies show that this development, unlike common belief, is not just a bad one.

There is no doubt that technology is starting to shape our societies in ways we could not deem possible twenty years ago. With it becoming such an important part of our daily lives, we must ask ourselves to what extent we are willing to let this development go?

This research report will discuss the good and bad sides of the impact technology has on the cognitive development of children and teenagers, what will happen if no changes are made and the measures that countries and organisations can take to solve this issue.

Definitions of key terms

Cognitive development
Cognitive development is the process by which children acquire, organise and learn to use knowledge and understand the world around them. (*Cognitive Development*, n.d.)

Technology
Technology is machinery and equipment developed from the application of scientific knowledge.

Attention
Attention is the ability to actively process specific information in the environment while tuning out other details. (*How Psychologists Define Attention*, n.d.)

Spatial abilities
Spatial ability is the capacity to understand and explain spatial relations among objects or space. It is the ability to mentally create, rotate, and transform visual images. (*An Introduction to Spatial Abilities*, n.d.)

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The Goldilocks Effect
The Goldilocks Effect is the premise that people are inclined to seek 'just the right amount' of something.

The private sector
The private sector includes privately owned companies, either listed or non-listed. They can operate on a national or international level, but are never part of a government or regime. Examples include Apple, Amazon and YouTube.

Digital divides
The digital divide is defined as the gap that exists between those who have reliable internet access and devices and those with very limited access or none at all.

General overview

History of technology
One of the biggest moments in the history of technology was the Industrial Revolution. The Industrial Revolution can be divided into two parts. The First Industrial Revolution lasted from the mid 18th century to 1830 and largely took place in Britain. The Second Industrial Revolution lasted from the mid 19th century to the early 20th century and had spread to Europe, America and other parts of the world. The biggest inventions during this period were the steam engine, light bulbs, the automobile, telegraphs and telephones. The Second Industrial revolution especially was the time when the development of computers started growing, due to the discovery and exploitation of natural and synthesised resources, such as plastic, light metals and new energy sources.
From this point onwards, computers started developing at rapid speed, from big machines to the flat laptops that we know now. Apple launched its first iPhones and iPads and soon technology became an indispensable part of our daily lives. (*Industrial Revolution*, n.d.)

Cognitive development in children
Many people, specifically parents, have a very negative view on the way technology influences their children's cognitive abilities. They are not entirely wrong, however, there are many factors that must be taken into account before one can decide if the technology is indeed bad for a child's cognitive development. Those factors include which type of technology is used, the frequency with which it is used and for what purpose it is used.

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The most fundamental part of a child's cognitive development is attention, the so-called 'gateway to thinking'. Without our attention other features of thinking, such as perception, memory, learning, language, reasoning, creativity, problem-solving and decision making will significantly decrease or not occur at all. Thus, a child's attention is vital when it comes to their development into happy and successful people. The cognitive development of children is a process with various stages: by the age of 2.5, children are able to understand and learn from child-appropriate television. The understanding of more complex television continues to grow up until 12 years old. Once a child fully understands what they see on screen, can those programmes, videos or games actually influence a child's knowledge and thus, their cognitive development. (*Digital Screen Media and Cognitive Development*, n.d.)

Effects of different types of technology

Many forms of technology are all about speed, being able to quickly search, scan and process information. This not only includes search engines. Numerous social media platforms, like Instagram and TikTok, are all about showing pictures or short clips following each other up at rapid speed. This leads to children not being able to focus for longer periods of time. Especially in the early stages of cognitive development, a child's brain is very vulnerable to these types of content. Their brains adapt themselves to an environment where the norm is not attention, but distraction. This, however, does not have to be seen as a negative change. Children's brains are being wired in a different way, not necessarily a bad one. With technology on the rise, it is much more useful for children to know where and how to find information instead of actually remembering that information. This creates space for them to participate in more advanced forms of thinking, such as problem-solving, contemplation and critical thinking.

When focussing on technology used for gaming, researchers from the Seattle Children's Research Institute have found that a correlation exists between video games containing simulated violence and forms of aggression in children. They state that children who are being exposed to violent video games are more likely to argue with their friends, family and teachers and are more impacted by real violence. On the other hand, video games can also be beneficial to children and their cognitive abilities. Research from the Radboud University in Nijmegen showed that shooter- and strategic video games enhanced players' spatial abilities, problem-solving skills and creativity. It is important to note that racing and fighting video games showed no such improvement. (*The Benefits of Playing Video Games*, n.d.)

Lastly, research has found that children and teens are likely to engage in mindless eating while watching TV or playing video games. They also generally spend less time outside participating in physical activities, due to technology use. As a result, researchers have recorded increased obesity rates in children. (*The Negative Effects of Technology on Children*, n.d.)

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The Goldilocks Effect

There is reason for concern when technology starts to replace important parts of our lives, such as sleeping adequate amounts of time, interactions with friends and family or physical activities. This is a statement that almost all articles and researches agree on. To further elaborate, a study done by the University of Oxford and Cardiff University tested the Goldilocks Effect in regard to the use of technology with teenagers. Researchers found that teenager's well-being increased when their screen time increased, up to a certain point. After that point, increased screen time was aligned with decreased well-being. This means that a certain amount of screen time can actually be favourable to children's and teenager's well-being and cognitive abilities, since moderate use can enhance creativity, critical thinking and other skills, as mentioned in the preceding paragraphs. Furthermore, the study also found that the point at which screen time flips from favourable to harmful is notably lower on weekdays, seeing as weekdays provide more opportunities for teens and children to participate in educating and social activities. (*A "Goldilocks Amount of Screen Time" Might Be Good for Teenagers' Wellbeing*, n.d.)

This means that when technology becomes more dominant, and no measures will be taken to ensure moderate use of technology with children, they will miss out on important physical and social activities. Activities that will help them develop into happy and successful people, in a way technology never can.

Digital divides

Besides the discussion on how technology influences a child's cognitive abilities, there is also the issue of millions of children not having access to technology at all. As mentioned in the preceding paragraph, moderate use of technology can be very favourable in fields such as education and relationships. It can create better learning experiences and serve as a valuable tool for many children to help them as they grow older.

Digital divides do not only separate the connected and the unconnected. They go deeper, concerning how people – including children – use Information and Communication Technologies (ICTs), as well as the quality of the online experience. Both of these can vary greatly, due to factors that include the level of users' skills and education, the types of devices they use, family income and the availability of content in their own language. Some children going online for the first time find themselves in a digital space where their language, culture and concerns are not represented.

Regardless of whether they are fully online, partly online or completely unconnected, every child today is growing up in a digital world powered by technology and information. In the immediate term, children who are unconnected are missing out on rich educational resources, access to

YOUTH IN LOW-INCOME COUNTRIES ARE LEAST LIKELY TO CONNECT
PROPORTION OF YOUTH (15–24) WHO ARE NOT USING THE INTERNET (%)
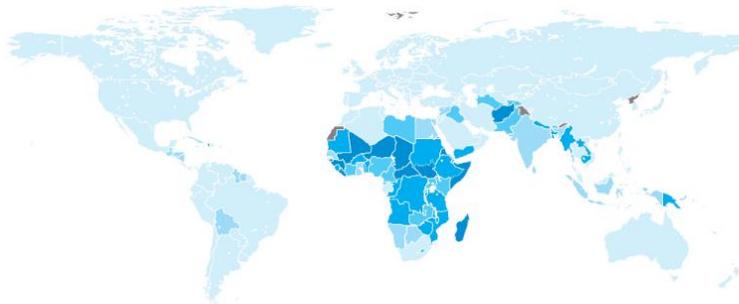
Note: This map does not reflect a position by UNICEF on the legal status of any country or territory or the delimitation of any frontiers. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined. The final status of the Abyei area has not yet been determined.
Source: International Telecommunication Union estimates, 2017.

Percentage
0   20   40   60   80   100
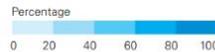
global information and online opportunities for learning; they are also foregoing ways to explore new friendships and self-expression. (*Digital Divide*, n.d.)

International attention
Almost all countries have policies regarding Artificial Intelligence (AI) and Information Technology (IT). All countries are aware of the technological developments in these decades. Thus they know what the influences can be on society, child cognition, the economy, et cetera. This not only accounts for governments, the private sector is also aware of this. Especially data companies, such as Facebook and Apple, have many responsibilities in regard to this issue. However, the influence of technology on the cognitive development of children is not receiving the international attention that it needs. Governments often fail to consider children's rights into their policies. This is mainly due to the fact that there is simply not enough information on the exact influence of technology on a child's cognitive abilities. Therefore, governments cannot properly take this issue into account when creating new policies. (*Policy Guide on Children and Digital Connectivity*, n.d.)

Major parties involved

The Republic of Korea (South Korea)
South Korea is, according to Global Finance, the most technologically advanced country in the world this year. Over 95% of the country is connected to the internet and 85% of South Koreans uses social media. South Korea is also implementing technology in schools through a program called SMART Education. (*Technology in South Korean Schools*, n.d.)

United States of America
The USA is the second most technologically advanced country in 2022 and has always played a big role in technological development. All the big tech companies, like Apple, Microsoft and Facebook were founded in the US and it is from there that phones, tablets and computers reached the rest of the world. The USA wants to enhance their various technologies through international policies and global partnerships.

China

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China has very strict policies when it comes to technology and social media use. All common platforms like Facebook, Instagram, Twitter and WhatsApp are banned in China and they have clear limitations for the amount of screen time for children. Citizens are only allowed to use Chinese Social media platforms and are strictly monitored by the government.

Democratic People's Republic of Korea (North Korea)

Only 4.7% of people in North Korea have landline connections and 9.7% have cell phone connections, which means only 1 out of 10 North Koreans have mobile phones. Locals can't have access to the World Wide Web and aren't allowed to interact with people out of the country (through social media). Instead, they have an intra-country intranet portal run by the government. However, foreigners can access 3G cellular networks launched by Egyptian Telecommunication Company Orascom.

Cambodia

Cambodia is an LEDC that struggles with poverty, hunger and corruption and is also very far behind when it comes to technology. Despite having neighbouring countries that are much more technologically advanced, Cambodia is relatively cut-off from the rest of the world with its primitive technology. However, they are certainly trying to catch up on the rest with promising plans for future years.

Timeline of Key Events

1733-1913	The Industrial Revolution
1981	International Business Machines Corporation (IBM) releases its first personal computer (PC)
1991	The Internet is publicly available.
1993	Tim Berners-Lee released the World Wide Web.
2001	The internet and computers are now in more than 50% of US households.
2007	First iPhone is released.
2010	First iPad is released.
2020	The Global Partnership on Artificial Intelligence was launched. It currently has 25 members and is monitored by the OECD.

Previous attempts to solve the issue

Many organisations and research centres, such as the Royal College of Paediatrics and Child Health (RCPCH) and the American Academy of Paediatrics (AAP), have combined information from various studies, performed by them or other research centres, and come up with an estimate screen time for children and other age groups. These estimates have been established after looking into many different factors and situations. Countries have used those estimates to create national guidelines for the maximum amount of screen time a day. These usually differ from 1 to 2.5 hours, depending on the age group. (*The Health Impacts of Screen Time - a Guide for Clinicians and Parents*, n.d.)

Possible solutions

Much research has already been done on this issue. However, the information we currently have is far from complete and needs many more statistics and studies to further clarify and encompass all aspects of this issue. As mentioned in the General Overview, countries do not have enough information and statistics to properly create policies that encompass all the problems arising with this issue. Furthermore, it is necessary that children in all parts of the world have access to technology. This prevents the growth of digital divides and gives every child an equal chance to a bright future.

Lastly, UNICEF needs to work together with other UN bodies to secure policies on a national and an international scale when more research has been done.

Questions for further research

1. What happens when technology becomes even more dominant in our lives?
   a. How is that going to influence our society?
   b. How is that going to influence children and teens?

2. How does the lack of proper access to technology hinder children in their development?

3. To what extent should countries restrict social media and internet use for children, if at all?

Further reading

1. This policy guide made by UNICEF discusses children and digital connectivity. Not everything is this guide is related to the issue, however, it provides a valuable information source.

2. This paper from the Organisation for Economic Co-operation and Development (OECD) talks about the impact of technology on children. Specifically their brain, cognitive development and well-being. It is informative and provides more insight into the issue.

3. An article written by Jim Taylor addresses how technology changes the way children think. It is another source that gives you a better understanding of the issue.

4. This report from UNICEF specifically focuses on the digital divides among children and how that affects them in different ways.

5. This policy statement from the American Academy of Paediatrics (AAP) is perfect for any further understanding of the issue. It gives a clear overview, as well as some recommendations for families and governments.

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