The Power & Potential of 5 Billion Minds

KIDS ON EARTH

by Howard Blumenthal & Robert Pianta

Pre-Publication Edition - July 17, 2024

Special Pre-Publication Edition

From the start, this book has been a collaborative international effort. We have worked with children, teenagers, parents, teachers, administrators, government officials and university researchers to construct a reasonable future for learning in and out of school. Many people have contributed ideas. You will meet some of them in this book, and we will add many more, both in evolving versions of this manuscript, and on our website.

We offer this Pre-Publication Edition for several reasons. Most important, we seek input, feedback, and your ideas about what ought to be added, deleted, or changed. We are especially interested in perspectives from cultures that are not represented, or not well-represented, in the current version. Please use the comment form on www.kidsonearth.org.

In an effort to make this pre-publication version available without delay, we have focused on the digital side, so there is no print version available. If you are interested in purchasing a print version of the book, please use the comment form (above), and we'll let you know when if and when it becomes available.

Enjoy. Be well. We look forward to your comments.

Howard Blumenthal
Robert Pianta
July, 2024

About the Book's Title:

Kids - A "kid" is person living under adult supervision or control, as young as an infant, as old as a teenager, often well into their early 20s.
on Earth - For every 10 kids on earth, 6 live in Asia, 2 live in Africa, 1 lives in Europe, and 1 lives in the Americas. About 1 in 100 live in Australia and Oceania.
Power & Potential -
5 Billion - Nearly 5 billion "kids" will grow up during the first half of this century.
Minds - Learning begins before birth. School is only one factor that affects what human beings learn, believe, know, and understand. Humans learn for a lifetime.

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Pre-Publication Edition
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The Cataloging-in-Publication Data is not yet available at the Library of Congress.
ISBN: (not yet available)

Manufactured in the United States of America.

Pre-publication edition

For children and teenagers growing up in
the first half of the 21st century.
And for the adults who help them.

Contents

[The above numbers refer to this PDF Pre-Publication Edition, and may be slightly incorrect in this version. Note that pages in each individual chapters are also numbered.]

This is a book about growing up and learning in the 21st century. It is written to address the wants and needs of nearly 5 billion children and teenagers attending primary and secondary public school, worldwide, between now and 2050.[1] By then, earth's population will approach 10 billion people.[2] In short, this book is about educating half the people on earth.

Unlike many books about growing up and learning, this book does not attempt to reinvent school from the top-down. It does not focus on incremental adjustments, or local workarounds that satisfy government requirements. Instead, this book deals with economic, social, political, public health, behavioral, technological, local and global realities. Instead, this book considers what young people want and need to survive and thrive, and suggests a reasonable framework to serve them. It encourages collaboration among people of all ages and across many other boundaries.

The lives of people growing up in the 21st century are very different from the lives of people who grew up in the 20th century. Many live healthy lives, and live longer. There is a much larger middle class, a global consumer economy, a very productive workforce, many more career options, and diminishing extreme poverty. With notable exceptions, individual rights and freedoms are more rule than exception. Many young people grow up in relative safety and without the economic necessity of working to support their family. They have time and resources to focus on their interests, education, and future. They enjoy more points of connection with other cultures and other countries. Children and teenagers are increasingly aware of potential opportunities, many far from home. Most are aware of existential threats related to peace and prosperity, clean air, food and water, mental and physical health, and economic stability.

More than half the people in the world can access abundant information on almost any subject via the internet. (Some cannot – yet – but not for much longer.) In theory, technology could help more than 5 billion people learn to think clearly and make reasonable decisions. In practice, technology is a useful tool, but children and teenagers require caring adults – preferably trained teachers – to learn effectively. Roughly 1.4 billion students currently attend primary and secondary school, but several years of pre-school are being added the mix, and secondary enrollment is increasing, so global student population in the 2030s will reach nearly 2 billion students.[3] If one teacher is responsible for 15 students, the world needs 100 million teachers. There is a global shortage of nearly 50 million teachers. (For reference: 52 million people live in South Korea.)

Children and teenagers growing up in the 21st century require education aligned with their lives. Responsibilities of citizenship, and care for the planet and one another, require modern thinking. School as a local gathering place for learning remains sound, but the current structure of public education has run its course. It requires rethinking and reworking. To facilitate that process, this book offers a conceptual basis for a significant transformation, and a practical framework based upon fresh thinking by students, teachers, parents, and other learning experts.

Growing Up in the 21st Century

In 2021, UNICEF and Gallup surveyed young people 15–24 and adults 40-plus — more than 21,000 people in 21 countries. The survey confirms significant generational differences.

> "Young people are almost twice as likely as older people to say they identify most with being part of the world, as opposed to feeling primarily part of their local community or country."[4]

> "Overall…young people embody the spirit of the 21st century more readily than their older counterparts. Young people are more active and savvy users of digital technology than members of their parents' generation. They are quicker to see its benefits and more at ease with its risks, even as they too voice serious concerns."[5]

> "When children have agency — the personal capacity to act and make free and informed choices to pursue a specific goal — it empowers them to actively participate in and engage with the world around them.[6]

> "…young people are optimistic about the future and recognize the progress that has been made, including in key areas of children's lives. Yet they are not complacent. Young people recognize both the benefits from, and the risks associated with, their increasingly digital lives."[7]

> "…they are not just accepting of changed norms; they also demand greater tolerance and pluralism, including in the realm of LGBTQ+ rights. The survey results reflect the reality that members of this group have only ever known a highly digitized, interconnected, and more pluralistic world."[8]

> "The challenge now is to listen to these views on childhood and the world — and meet young people's clear-eyed optimism with action."[9]

The Bigger Picture

For more and more people in more and more places, powerful forces are reshaping daily life and resetting priorities. Ideas rarely discussed in the 20th century are now top-of-mind. Driven by identity, agency, social justice, global awareness, unstable political systems, technology, and more, today's children and teenagers define childhood and adolescence in ways that were inconceivable when their parents and teachers grew up.

Children and teenagers watched as 7 million people died in the COVID-19 pandemic, and nearly 700 million people were infected. Many hospitals were unable to care for the sick; many loved ones died. Since the beginning of the HIV epidemic, 40 million people have died,

and 85 million have been infected, including 1 in 25 African adults.[10] Students in the U.S. are afraid to go to school because they might be shot by a former student with an assault rifle; the palpable sense of danger is amplified by "shooter response preparedness drills" in K-12 classrooms.[11] Children and teenagers study details of war in Ukraine and Israel through a multi-platform flow of news coverage never before experienced on earth. There are floods and extreme heat, and enormous wildfires, but no meaningful action by adults to put aside fossil fuels to mitigate climate change and save the planet. Young people are skeptical, fearful, dealing with serious mental health concerns — with good reason. As they observe 21st century adults in action, many do not see the path to stability, safety, peace, wisdom, or economic success. Many hope school will provide the answers they need.

There is much more to know now than there was in the 1990s. There are many more sources of information. About half the people in the world share what they believe and know via the internet and social media, but the pool is polluted by mis-information, dis-information, old information, misleading and incomplete information. With uncertain editorial oversight and few trusted gatekeepers, and artificial intelligence (AI) generating stories, confirmation of accurate and relevant information is difficult for everyone — and especially challenging for children and teenagers because they possess fewer years of experience. Diversity of ideas is valuable, and intermingled beliefs, opinions, knowledge, and contexts require clear thinking. Accurate answers are hard to find. There is little to reason to believe technology's progress will be regulated or made safe for use by children and teenagers.

School

School now competes to be the primary source of learning; media and the internet are well-funded, ubiquitous, agile competitors. School is open 6-8 hours daily (weekdays only), and closed half the days of the year. When school is closed, everyone continues to learn on their own, but without school's standards for quality, integrity and rigor.

Unfortunately, and perhaps by design, school resists change. School employs a legacy model based upon dissemination, memorization and testing. Mostly, school ignores recent cognitive science, contemporary understanding of human behavior and future studies. Frustrated, many students and teachers and parents recognize the need for change. The purpose of school must shift to clear thinking, away from dissemination. If school fails to address this challenge, media (and AI) will control what human beings believe, what we know, and our decisions.

When public school took shape more than a century ago, there were fewer people on earth (~2 billion in 1925,[12] compared with 8+ billion today). In most countries, poverty was rampant, child mortality was high, longevity was low, food and other resources were limited, and expectations were lean. One in two children died before their fifth birthday. Many children did not finish primary school. Most teenagers did not attend secondary school.

Most of today's children and teenagers will live 70, 80, 90 years – twice as long as children growing up a hundred years ago. Long-held prejudices are fading, so both boys *and* girls attend school, regardless of their economic and social situation. There is now an emphasis on pre-school. Nearly all of the world's children – more than 90 percent – attend primary school.[13] About 80 percent attend lower secondary, and about 60 percent attend upper secondary school (as pandemic absence patterns dissolve, accelerated growth is likely).

By and large, regional and national efforts to increase school enrollment have succeeded. In 1970, nearly half the world (43 percent) was illiterate. Today, 86 percent of people on earth can read and write.[14] In many communities, public education has been a striking success – but this is not true everywhere.

Contemporary realities place more pressure on public school than it was designed to bear. People growing up in the 21st century possess confidence and potential far beyond the dreams and capacity of their parents and grandparents. We are raising the healthiest, wealthiest, most connected humans in the history of the world. Their curiosity runs wide and deep. They make use of every available resource for learning because their future requires vast, diverse, modern skills and knowledge. School has not kept up with their intellectual and social development, the transformed world in which they live, or their imagination.

> "Quick anecdote. My oldest daughter was in kindergarten. She drew a picture of a purple leprechaun and got an unsatisfactory grade. When I saw this, I went into the teacher and said, 'I don't understand. She made the leprechaun purple. What was wrong with that?' Teacher said, 'leprechauns are green.' I said 'leprechauns aren't real, you know.'"
>
> – Dr. Mary Jo Podgurski,
> President and Founder, the Academy for Adolescent Health

Too often, students experience school as a rigid setting in which imagination and divergent perspectives are stifled. The material they are told to learn or understand is often experienced as irrelevant to their lives, without clear purpose or utility.

> "Sometimes, I think about just leaving the public school system and starting a small school. But that's not the solution. It doesn't solve the problem, and it doesn't help very many students, either."
>
> – Dr. Herbert Monroe,
> Assistant Superintendent
> Caroline County School District, Virginia, U.S.

Alternatives have emerged. Usually, the organizing principle is based on diversity of individual student interests and experiences. Students develop ideas,

implement them as individuals and in small groups, interact with the community and the world, and develop experience and wisdom that may prove useful in the future. Alternative models are used in private schools, or charter schools, but not in most public schools.

The purpose, design, structure, and operation of public schools has not changed with the times. As a result, there are serious, widespread problems with attendance, discipline, motivation, academic performance, and mental health. These problems are related to what is taught, why, and how. The best efforts, hard work, and dedication of so many students, teachers, principals, specialists, volunteers, parents, and community members could be so much more productive with an up-to-date model for learning in school. And outside of school – in "Not School" – too.

Despite many extraordinary examples of what school could be, all over the world, there is no clear direction, no plan, no common framework for productive, locally-relevant, globally-useful learning. In this book, we provide a scaleable framework for local reinvention that captures contemporary realities.

One more top-down design to modernize school is not helpful. After 30-plus years of investment and practice, reform based upon standards and extensive testing has produced little improvement because it is misaligned with current and future needs and realities. The current model, in which teachers prepare lessons to disseminate lists of facts and skills children and teenagers must remember in order to pass tests, has outlived its usefulness. Although certain basic skills and knowledge may be acquired this way, the top-down model is poorly suited to the diversity essential in 21st century learning.

"Evidence is abundant that deep, authentic, and accelerated learning starts with students -- their experiences, goals, and ambitions -- and focuses on topics relevant to their lives… Effective teaching starts with recognizing and understanding students' perspectives on their learning and guides students toward new and deeper knowledge and more sophisticated skills. Standards define what adults believe is important to learn and follows a model of teacher-driven instruction in large groups. Is it surprising then that nearly every single study of student motivation shows them starting to disengage around 4th grade, a decline that shows up even earlier and more seriously for students from historically marginalized backgrounds or who have struggled to learn basic skills in prior years? Yet, every student craves learning when it is relevant -- given a challenge they care about, children and youth display high levels of motivation, engagement, and sophistication."[15]

– Robert C. Pianta,
University of Virginia, School of Education & Human Development

As long as public school has existed, there have been critics, and urgent calls for reform. The 2024 version focuses on inequity, economic and social justice, AI, and the need to address climate change (etc.). Sometimes there's discussion about book banning, values-based lessons, or replacing teachers with technology; these issues are tangents.

A 21st Century Framework

Primary and secondary public school students require a new framework for public education. The key idea is focus on the individual – the operating concept is Personal Education, not a mass education. A new framework must address each individual learner's unique interests, life situation, and future pursuits in the midst of rapid global transformation.

1. **Learning Is Personal.** Learning is a lifelong process involving curiosity, play, gathering and evaluating knowledge, connecting ideas, adding new ones, discarding others, gaining skills, refining understanding, and building relationships based upon individual's unique interests, life situation, and goals.

2. **Learning Builds Identity.** Learning is the process of selecting very specific ideas from the universe of beliefs and knowledge, connecting those ideas in patterns personally meaningful to the individual, experimenting and adjusting fit to cultivate personal growth.

3. **Learning Is Relational.** Learning arises from relationships with others. It takes shape as two or more identities interact and respond to one another. Often, these relationships are human, but they may involve animals, places, a vibe, a sense of being. These interactions support and shape interests, motivations and behaviors, and sometimes, result in sustained engagement, new learning (resulting from shared curiosity and actions), additional relationships, and groups of like-minded individuals.

4. **Learning Is Active.** Learning requires personal engagement in ideas that matter, discovery exploration, errors, intrinsic motivation, an environment generally free from stress and other distractions, and connection with other people with similar interests.

This framework is not intended to generate or support incremental changes to a stubborn *status quo*. Instead, it is intended as the conceptual basis for public school based upon the interests and needs of people living in a rapidly-changing world.

Kids on Earth

Confidence in this approach grows from several sources. There is abundant local activity across countries, cultures and communities to support these philosophies. Conversations with children, teenagers, parents, educators and other adults in more than 70 countries have been remarkably consistent in their criticism of the current approach and interest in a new

philosophy and a practical new framework. The philosophy is based upon the way children, teenagers, teachers and adults learn – except when they are in school.

One precipitating action for this change comes from hundreds of one-on-one interviews with children and teenagers from diverse backgrounds, of various ages, in Bulgaria, England, Brazil, Paraguay, India, Ghana, Uganda, Egypt, Puerto Rico, Mauritius, Kentucky, Pennsylvania and dozens of other places. These videos can be seen on *Kids on Earth*.

For example, Jonathan, 16 years old, who lives in England, is nonverbal and immobile. He asked to tell his story on Kids on Earth to focus adult attention on his literacy campaign for overlooked students. Jonathan explained that adults do not often listen to ideas from children and teenagers about learning, school or education.

During *Kids on Earth* interviews conducted in schools, teachers and principals were often surprised by ideas offered by their own students. Many principals and head teachers admitted they had never asked their own students questions about the experience of learning in and outside of school, or their individual plans for the future. Often, students explained that adults usually/always "told them what to do" but "never really listen."

A parallel project, *Reinventing School*, was an hour-long video interview series, featured school principals, award-winning teachers, authors, university researchers, superintendents, and government leaders, often with students in the same video conversations as peers.[16] Most of the guests – adult educators, as well as children and teenagers – explained that school is structured top-down, that wants and needs of individual students could not be easily addressed within the current structure. While acknowledging every student is unique, interviewees' capacity to discuss a modern framework for school and learning was limited. Instead, some described virtues of progressive private schools, home schools and examples of specific teachers, schools or small clusters of schools who seemed to have a handle on the future. Many children, teenagers and adults were intrigued by the idea of comprehensive plan for public schools; their interest led to the framework described in this book.

The interviews were produced and conducted by Howard Blumenthal. *Kids on Earth* continues a valuable tool for direct conversations with children and teenagers all over the world. Its focus has evolved toward conversations about school and learning.

The 21st Century Learning Project

Working with #Learning Planet, The Jena Declaration (for Sustainability), panel discussions for UNESCO and NGOs, and colleagues, Howard was surprised to find similar frustrations in Africa, South America, Europe, the Middle East, and many parts of North America. Well-aware of developments in technology, media, the internet, artificial intelligence, globalization, gender and identity, diversity, mindfulness, climate

change, public health, personal growth, and human progress, he found nearly all of these topics to be front of mind for educators and students but lacking in curriculum and practice in public schools. Education systems seemed too rigid, too inflexible, too fixed in their ways to accommodate transformations that define life and progress in the 21st century.

Howard is neither a traditional educator nor academic researcher. Gathering information from conversations with people of all ages throughout the world, he was curious about the intellectual capital, insights, research and relationships a major university could provide.

The 21st Century Learning Project was established in 2021 with Bob Pianta, then completing 15 years of service as Dean of the School of Education and Human Development at the University of Virginia, now returned to his role as a professor. Bob's long experience in psychology and education, his involvement in a wide array of traditional and future-facing research projects, and his willingness to engage in the envisioning of possible futures proved a constructive counterbalance to Howard's enthusiasm and world view.

From the start, the objective of The 21st Century Learning Project was a reasonable path forward for the world's public school students learning in and out of public school between now and 2050. Working with faculty, graduate students, and local middle school and high school students, particularly in Virginia's Charlottesville Lab School, a framework and operational path began to emerge, providing the basis for this book and related work.

Structure of the Book

A viable framework must be reasonable, practical, and must provide straightforward parameters to guide design and action. It must make sense for people in top-down governance, teachers and individual students. It must address the wants and needs of parents, college admissions officers and future employers. It must ensure alignment with broad local, regional, provincial/state, and national priorities. After this Introduction, the book is organized in seven chapters:

Chapter 1: Growing Up - We begin with a report on 5 billion people born, to be born, in the first half of this century. Each one is unique, but they share important characteristics. They observe, play, learn from others, tell and enjoy stories, develop an identity and gain agency, and build networks of personal connections. Each possesses a unique combination of capabilities, interests and relationships — and learns most of what they know outside of school. Growing up from a child and teenager's perspective anchors the book — children's and teenagers' learning is shaped by many different factors. School plays a role, but in this chapter, the view of Growing Up focuses on the whole child and teenager, not school.

Chapter 2: Learning - Learning is a lifelong activity in which school plays a relatively small part (humans attend school for less than one percent of a lifetime's total waking hours). Beginning with the intellectual lives of infants and young children, this chapter explores curiosity,

perception, attention, motivation, memory, and their relationships to learning. Learning is explained in midst of access to more information than the world has ever known, and massive transformative global change. Ultimately, the chapter focuses on the importance of diverse knowledge and each student learning different things – a departure from the standardized learning that has characterized public schooling from the start.

Chapter 3: Old School - We refer to the current version of public primary and secondary education as *Old School* – developed a century ago, resistant to change, fading in relevance and utility as the 21st century proceeds. Acknowledging regional and local variations, the Old School schedule is, mostly, filled with Mathematics, Science, Language Arts, Social Studies and perhaps study of a second language. Mostly, these major subjects are studied 5 days each week for about 12 years. Minor subjects, such as Physical Education (Health), Art, Music, Library (Research), and Technology (Computers) occupy fewer instructional hours. Is this a reasonable allocation of resources? Does this approach produce desirable results? What constitutes essential learning in each of these subject areas? Is this how all, or most, students should spend their time in school?

Chapter 4: New School - A refreshed structure of 10 new Learning Categories – including My Mind, My Body, Our Countries & Cultures, and Our Planet & Beyond – replace Old School subjects. The strategy shifts from tradition to relevance. After learning Fundamentals in each Learning Category – the list of Fundamentals is revised annually by students, teachers and community leaders, and government officials – each student spends most of school's instructional hours learning about what interests them. Each teacher focuses on individual student engagement – and far less time disseminating information that everybody must know. Assessment is part of every student's learning process, but it takes place as the student learns, when it is helpful, not after, when it is not. Students share what they learn, and build upon one another's work to expand human knowledge.

Chapter 5: Not School - New or Old, school provides only a small portion of lifelong learning, and, surprisingly, a small portion of learning during childhood and adolescence, too. As with Growing Up, this chapter provides a big picture view. Of the many ways young people learn outside of the school environment. The gamut that includes community interaction and abundant interplay with technology, social media, linear media, internet video, and artificial intelligence. By acknowledging the many sources of learning, and ways 21st century school could learn through collaboration with the Not School sector.

Chapter 6: Adults - Children and teenagers rely upon adults to help them understand the world, but adults are no longer the primary disseminators of the world's information. There are other sources, especially for young people with internet access. Besides, a more important role is taking shape for adults. They must figure out how to work together on a local, regional, international and global scale to provide the resources that children and teenagers want and need in order to learn in the 21st century. They must retain the best of Old School, invent and implement New School, integrate Not School, and build an operating

plan for learning 2025-2050. Adults occupy so many different roles, and hold so many beliefs and opinions. They/we must learn to work together for the good of our children, and our children's children. This is a formidable undertaking.

Chapter 7: Progress - Learning fuels progress. Today, everyone is learning in the midst of multidimensional transformation — many aspects of life are experiencing significant, interconnected evolutionary changes. We must consider global progress, but must we do so with operational systems that are in need of updating or replacement, without trustworthy information, and with an abiding need for self-preservation. Sometimes, humans rely upon magical thinking to make progress — or to maintain the *status quo*. Instead, we recommend an updated version of school responsive to contemporary needs, equitable, and sufficiently powerful to propel sustainable progress for the world and for a happy, productive life for more than 5 billion new graduates.

Every Human Learns Differently

Many of the people who make decisions for today's 21st century students were born around 1980 or so. Since that time, the world has added 33 new countries,[17] and our planet's human population has doubled from about 4 billion to about 8 billion.[18]

Maybe you knew that. Most people don't. Maybe you forgot. Maybe these ideas aren't important to you. Maybe you were busy learning about something else — there is nothing wrong with that. We're not going to ask you to name the 15 countries that became independent when the U.S.S.R. broke up, or what year East and West Germany became, simply, Germany. We're not going to ask because, it doesn't matter whether you know the answers. If you're curious, you can look it up. You know lots of other things. We're glad you do. Otherwise, everyone would know the same things, and that wouldn't be interesting at all.

You are unique, an individual with distinct knowledge, beliefs, and interests. Just like every other person on the planet. For you, and for everybody else, learning is personal.

And, lest we forget… Learning is natural. School is not.

END OF INTRODUCTION

[1] Data based upon https://ourworldindata.org/grapher/number-of-births-per-year and average 80 percent enrollment (95% primary, 80% early secondary, 60% late secondary, with 134 million births per year and no assumption for increased enrollment beyond the current estimates).

[2] https://population.un.org/wpp/Graphs/Probabilistic/POP/TOT/900

[3] Source for 2,000,000,000 = https://population.un.org/wpp/DataQuery

[4] *The Changing Childhood Project - A multigenerational, international survey on 21st century childhood* - https://www.unicef.org/globalinsight/media/2266/file/UNICEF-Global-Insight-Gallup-Changing-Childhood-Survey-Report-English-2021.pdf - page 52

[5] *The Changing Childhood Project - A multigenerational, international survey on 21st century childhood* - https://www.unicef.org/globalinsight/media/2266/file/UNICEF-Global-Insight-Gallup-Changing-Childhood-Survey-Report-English-2021.pdf - page 52

[6] *The Changing Childhood Project - A multigenerational, international survey on 21st century childhood* - https://www.unicef.org/globalinsight/media/2266/file/UNICEF-Global-Insight-Gallup-Changing-Childhood-Survey-Report-English-2021.pdf - page 38

[7] *The Changing Childhood Project - A multigenerational, international survey on 21st century childhood* - https://www.unicef.org/globalinsight/media/2266/file/UNICEF-Global-Insight-Gallup-Changing-Childhood-Survey-Report-English-2021.pdf - page 73

[8] *The Changing Childhood Project - A multigenerational, international survey on 21st century childhood* - https://www.unicef.org/globalinsight/media/2266/file/UNICEF-Global-Insight-Gallup-Changing-Childhood-Survey-Report-English-2021.pdf - page 19

[9] *The Changing Childhood Project - A multigenerational, international survey on 21st century childhood* - https://www.unicef.org/globalinsight/media/2266/file/UNICEF-Global-Insight-Gallup-Changing-Childhood-Survey-Report-English-2021.pdf - page 73

[10] https://www.who.int/data/gho/data/themes/hiv-aids

[11] https://www.alicetraining.com/our-program/alice-training/k12-education/

[12] https://www.census.gov/data/tables/time-series/demo/international-programs/historical-est-worldpop.html

[13] https://ourworldindata.org/grapher/primary-school-attendance-selected-countries?tab=chart - based upon 2023 data from World Bank Education Statistics (EdStats), World Bank, 2023. Licence: CC BY 4.0.

[14] https://ourworldindata.org/literacy

[15] April 23, 2023 draft of "The Case for Radical Redesign" by Robert C. Pianta

[16] https://www.youtube.com/@ReinventingSchool/videos

[17] https://www.thoughtco.com/new-countries-of-the-world-1433444 - Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, Croatia, Slovenia, Macedonia, Bosnia and Herzegovina, Serbia, Montenegro, Namibia, Yemen, Germany, Micronesia, Czech Republic, Slovakia, Eritrea, Palau, East Timor, Kosovo, South Sudan

[18] https://www.populationpyramid.net/world/1980/

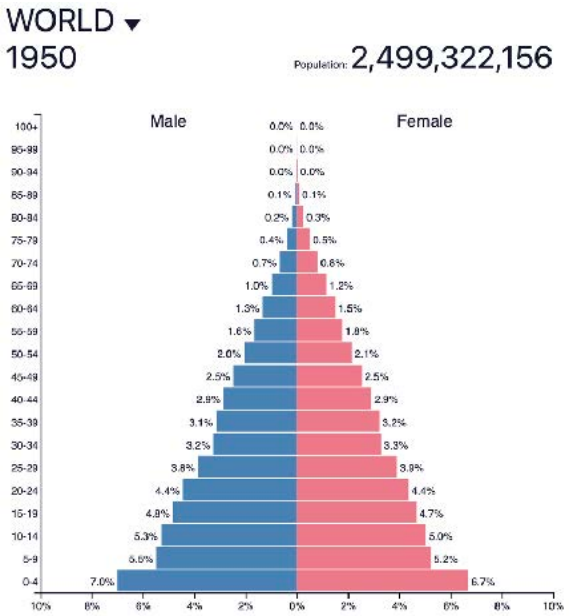
Chapter 1:
Growing Up

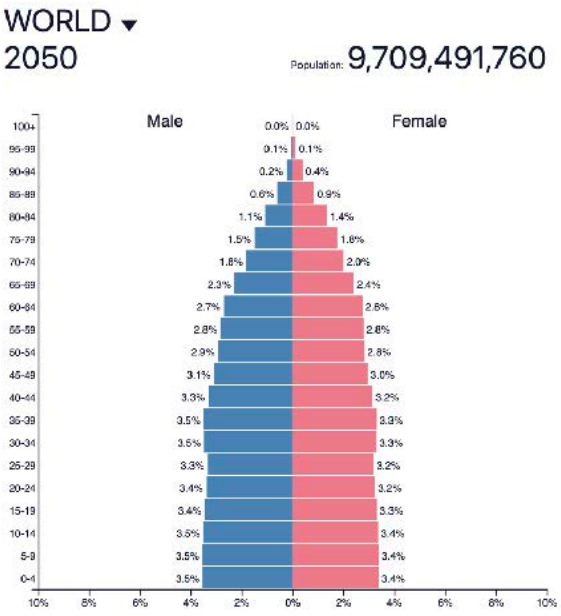
12,563 Words

The number of people in the world is increasing (approaching 10 billion by 2050 or so, and 11 billion by about 2085), but the number of children and teenagers on earth will remain unchanged. People are living longer – so the global population increase is not due to new babies. Instead, it is due to people not dying. Specifically, it's due to the increased longevity of today's grandparents and parents.

In 1950, just after World War II, people 0-18 represented 40 percent of the world's population. Since then, all over the world, education and well-being of young people have been primary concerns for governments and nonprofit organizations. Moving toward 2050, kids will represent just over 20 percent of the world's population – and half of that growth will be invisible to decision-makers in rich nations because it will take place in Africa. While Africa becomes the youngest continent on earth, Europe and North America, and part of Asia (such as Japan) will shift their social and economic focus to people over 60 years old.

Compare the Population Pyramids for 1950 and 2050. People 60+ increase from 8 percent of global population to about 23 percent, but people 0-19 years decrease from about 45 percent to about 27 percent.[1]





The meaning of these pyramids is profound. The global population of people 60+ will require far more care and social services than national budgets currently allow. Thanks to better health care, people live longer, extending their years of productive employment, but many will require post-retirement income and care from social services. With the trend toward more senior and fewer young people, governments will be reluctant to invest in new schools and services. Instead, they will prioritize facilities and services for seniors (who tend to vote) to keep them healthy and out of poverty, and pull back on schools and services for younger people (who do not vote).

None of this will make life easier for people growing up in the 21st century.

Growing Up Different

Within an extremely wide range of physical, mental, and emotional characteristics, every human being develops differently. Even within a group of same-age, same-background children, there are big differences between one child and another. Variation in human development is the rule, not the exception. For example, it's not unusual to find 5-year old boys and girls as short as 39 inches and as tall as 47 inches.[2] A 100-pound teenage girl and a normal 200-pound teenage boy might be same-age best friends.[3]

Every child and teenager's body, mind, relationships, interests, capabilities, life situation, and plan for the future is unique. It's easy to understand why. Genetics, culture, family experience, economics and epoch intermingle with social, physical, cognitive, moral, ethical factors, and available resources – and more. The result: every person grows up differently. It is unreasonable to assume every person of a certain age or from a certain background will behave, think, or learn, in a particular way. To do so is prejudicial.

People of all ages make assumptions about popularity, physical attractiveness, friendship, capacity and intelligence based upon unreasonable categorizations and standards. Variability – differences between one person and another – is the rule, not the exception.

Just yesterday, more than 350,000 human beings were born. Some will die in childhood, but almost all will grow up, attend school and build a life.[4],[5]

Family & Friends

In nearly all cultures and societies, family is the foundational building block of human development. Family provides food, clothing, shelter, companionship, guidance, instruction, and usually, close personal relationships, and so much more.

Family nurtures behavior, values, expectations, sense of self, sense of community, context, responsibility, and more. Perhaps half of the world's children grow up in households with 2 married parents – one male, one female – with one or more siblings who share both parents. Perhaps a third grow up with one birth parent, same-gender parents, siblings who do not share their parents, or with relatives, such as grandparents.[6] A small number live with parents who are not relatives, or with an adopted or foster family, a constructed family, or no family at all. Parents may have grown up elsewhere; according to its 2021 census, almost half of Australians had a parent born overseas, most often from India.[7] Children grow up under all sorts of circumstances. It is unreasonable to make assumptions about family structure.

Chapter 1:
Growing Up

12,563 Words

Diversity increases variability among children, and teenagers. As they grow, they transform community demographics.

Family is the locus and source of many formative developmental processes – attachment, language, cognitive functions, physical growth. By extension, families are part of communities, in which parents learn from one another and share some responsibilities. When children talk about growing up, they talk about their interactions with people who live nearby.

"I am a Buddhist. My Buddhist belief is made up of different communities. We have meetings. We do prayers. We also have storytelling. People tell their stories…These programs are really nice. One of the things I like most is to be happy. I like when people see me being happy. I try to be nice with people so people are happy when I am happy."

– Larisa, 11, São Paolo, Brazil
[Kids on Earth interview]

"I like to go to my friends' houses. I like to talk to them. What makes me most happy is to be with them, to laugh with them. Very important. My friends are strange but they are cool. I have a friend who likes to read, but not the same books I like to read. I have another friend who likes music and wants to become a musician someday. My other best friend – there are three – is really interested in culture. We talk a lot about our futures and what we'd like to do. When I tell them that I like to read and write about crime, and I want someday to work with that, some of them think it's cool, some of them think I'm crazy, yea. They think, okay, *why*?"

– Catherina, 13, São Paulo, Brazil [Kids on Earth interview]

Attachment

Humans are social animals. Human development is deeply rooted in our relationships. We rely upon the care, kindness, and friendship of others. Without their love and attention, we fail to thrive. Beginning in (or before) infancy, humans pay close attention to their families, and their caregivers' responses. We constantly assess, querying the situation to ascertain safety and security. When interacting with a caregiver, are the responses predictable, well-timed, comfortable and loving? Or are they unpredictable, harsh, disconnected from cues – misreading an infant's state or needs? These interactions lay down the tracks of identity. They raise deeper questions that resonate through childhood, adolescence and throughout adulthood. How do others perceive me? Am I worthy of care? Do I trust the other person? Can I and should I count on that person? Is our relationship safe, healthy, happy and productive? Am I too independent – or not independent enough? Should I reach out to

others for attachment my provider does not offer? Each of us is seeking a safe haven, a sense of attachment that feels secure yet flexible, grounded yet free. From the earliest age, as humans grow, secure attachment remains paramount. Growing up, relationships and learning are intertwined and inseparable.

Attachment is connected to friendship, love, personal worth, and more. It is an essential aspect of life and happiness for babies and young children, and everybody else. It plays a major role in the health of seniors, and their longevity. Young children begin to understand attachment through play. They pretend, mimic behaviors, role play, tell stories. They develop hypotheses, conduct experiments, refine their understanding. They build knowledge of themselves, their relationships, and how things work.

Children at Play

"Babies don't launch themselves into the world of strange people and objects from the abyss – they do what every smart explorer does – they establish a base camp. The flip side to a baby's intrepid exploration is her sense of a safe haven."[8] If the baby feels insecure, there will be fussing, fitful behavior that disrupts curiosity and play.[9]

– Susan Engel,
The Hungry Mind: The Originals of Curiosity in Childhood

Babies are drawn to novelty, constantly gathering new information, and connecting ideas.

> Susan Engels: "By the time they are nine weeks old, they [babies] will look only briefly at an image they have been shown before, and then turn to look at something new."[10] "By the time they are twenty-four months, they… try to figure out the link between two different actions (for instance, the link between piling the blocks up high and seeing the blocks tumble…")[11]

As they play, babies use of all their senses – tasting, touching, listening. They put their hands on things. They make noises. They watch, wander, climb, collect objects and make connections. Sometimes, there's a purpose, or a temporary smudge of a purpose, but rolling down a hill or banging on a frying pan is purpose enough. They're playing and learning at the same time – the difference is inconsequential. There are no rules. If it doesn't work, try again later. Forget about it. Maybe stick with it. Do it a different way. Share. Make a new friend.

> "I love to play hula-hoop and I love to play basketball. I play basketball every day, and twice a week, I do hula-hoop also. When I was little, around 5 or 6, my aunt, she gave me a hula-hoop to play with. So I learned to play with it… After a few months, I was

> really good at it. You can do it on your waist and you can also do it on your hands. Your elbow. Your neck. Legs. So like there are different variations. You can get it from your legs to your hands. It's really not an India thing. Very less people in India do hula-hoop. Mostly it happens, like, in America and Europe. Other girls asked me how to do it. So I asked them to come to my house and I showed them how to do it."
>
> — Ashmita, 10, New Delhi, India [Kids on Earth interview]

Play doesn't require structure, specific objects or custom-built environments. Sticks, sand (especially wet sand) or mud are just fine. So is a cardboard box. Puppets are over 6,000 years old. They remain useful when pretending to be somebody else. Puppets easy to create; even a hand movement will do. Marbles date back to Ancient Egypt, Greece and Rome. More than 5,000 years ago, kids played with spinning tops in (what is now) Iraq. More than 3,000 years ago, Chinese kids (and adults) were flying kites.[12] Before anyone figured out how to make a ball, kids kicked around animal heads (and still do).

A researcher could make this case: *all toys are tools for learning*. For example, a spinning top introduces sophisticated concepts in physics including force, friction, potential energy, kinetic energy, precession (related to wobbling), gravity, and angular momentum.[13] Playing with a top involves learning to spin it longer, straighter and with greater control.[14] Most children don't care about scientific phenomena or underlying mathematical calculations. In fact, adding the burden of directed learning to play often destroys the fun. And yet, they learn all of these things, and more.

When a child is having fun, the child is *sometimes* more likely to spend more time and energy on an activity. Sometimes, play increases the child's understanding, control, ease, and desire to do more. Sometimes, more play increases curiosity and collaboration — "what if we try *this*?" Dominoes are lined up, precisely, on their edges, so one touch flips a long column and makes a wonderful sound; their intersecting patterns are even more fun. When the child controls the experience, novelty and variation make play more engaging, more fun. When the child loses control, interest wanes.

It is not as if play has no structure. Sometimes, the structure (or rules) is made up ("*NO!* The *purple* one always goes on *TOP* of the red one!"). Sometimes, as with team sports, there are formal rules and structures. The critical factor is the child's buy-in.

Stories & Storytelling

Stories allow the child — anyone, really — to explain their version of the world in terms they understand and control. Storytelling is always subjective. (Despite claims of objectivity, even journalism is subjective because the storyteller determines which stories to tell, which characters and themes to include, what to exclude, what to explain and how to tell the story.)

As with play, there are no rules unless the storyteller decides rules are necessary. Characters may be versions of real people in the child's life, or abstractions of those people, or imagined. A story may reflect a vivid imagination, a cry for help, an inventive combination of ideas (a talking red-haired elephant who wears sparkly sneakers, and has potty issues). A story need not be fixed in permanent form or fashion. Retold stories may include new details, new characters, new roles for old characters. The storyteller makes the rules.

Telling the truth is less important than making mom laugh. Half-truths, backstories, utter nonsense, exaggeration, leaving out details -- these tools are used by every storyteller, including best selling authors, teenagers, and young children (parents do this, too – and watch out for grandparents!) Stories may evaporate quickly, or may hang around for years.

In every culture, making up and sharing stories is part of growing up. It's the way humans cultivate beliefs, knowledge and culture. Stories are a very powerful way to connect ideas – and connected ideas make learning possible. Music, characters and comedy can make stories more powerful. Humans are far more likely to remember stories than they are to remember facts and figures – an aspect of learning schools often forget. And, incidentally, stories are the basis of an enormous global industry built on trust and (brand) loyalty – the Disney empire and the remarkable success of *Sesame Street* are based upon characters, storytelling, and (very important) making people laugh.

Rarely do two children tell the same story in the same way. Each storyteller brings their own world view, their role in the world, and their unique imagination into storytelling. Every person who watches or listens to a story interprets meaning in their own way. Even with global sharing of stories, the dominant natural force is variability, not uniformity.

Personal Connections

How many people do you know? How many people would recognize you when they see your face? How many know your name, and something about you? Ask any child to make a list of everyone they know, and compare it to any other child's list. The lists will be different.

As a child grows, the diversity of their connections grows, too. Beyond family and friends, there's interaction with people who walk their dogs, work in local stores, perhaps a bus driver, a doctor, a dentist, a law enforcement officer. The child observes, interacts, asks questions. As the list of connections becomes longer, it also becomes more varied. It's not unusual for a child to list more than a hundred people before they complete primary school.

Most teenagers travel beyond their immediate neighborhoods. They become involved in group activities. Each new person they meet leads to more connections, more circles of connections. These circles become networks, and these networks intersect. Belonging to a variety of networks further distinguishes one teenager from another.

Quantity, quality and frequency of interactions affect relationships: some grow, some fade. Individual and group identity, and shared interests grow on these pathways. A friend becomes vegan, another takes up skateboarding, and another starts drawing manga and watches anime. Each leads to new relationships, new connections, more shared interests, more explorations and more differences between people.

School Adds Complexity

Most people in each child or teenager's network are self-selected, the result of intentional participation in family, neighborhood, and local networks. School introduces a new factor: people who live nearby who are not (yet) members of those networks. Some new peers may live in different neighborhoods, or come from other countries. Their past experiences may be unfamiliar. They may eat different foods, speak different languages, dress differently.

Teachers must treat each student in the same way. The operating assumption: students attend school for the same, or similar, reasons: to make friends, learn the curriculum, and develop discipline necessary for success. The teacher must help each student develop skills and diligence, self-confidence, self-awareness, self-reliance, resilience, kindness, fairness and more. In traditional public schooling, teachers must apply similar practices to all students, minimizing individual differences. This may run contrary to a student's sense of self.

Younger kids are naturally curious about kids who are older, and often protective of (or sometimes, mean to) kids who are younger. In many places, young people are aware of diversity, curious, and often ask one another questions about heritage, family customs, strange smells, and other unfamiliar ideas. With new friendship comes exposure and, sometimes, experimentation, which adds to diversity and variability.

Social media brings sharing, and also, nastiness. Some friendships can be trusted, others fall apart; some are resurrected, or remain shaky. There is kindness. There are bullies. School becomes a laboratory for social experiments; during early secondary (middle) school, these behaviors intensify, and many young teenagers require emotional support. The variety of issues and each individual's response — further distinguishes each teenager's life.

Broadly, school serves three purposes: supervision of children (so parents can pursue other activities), social interaction (kids interact with one another) and academic training (kids learn). The core idea — a safe place where many children and teenagers are supervised by adults who help them learn — has become nearly universal. Teachers must facilitate this process by navigating student's individual interests, school culture and their personal values and beliefs. Social interaction causes students to find others with similar interests (sometimes causing struggles). Kids tend to diversify their interests and their social groups, so they may hang out with one group for music, another for sports, another for new people and new

ideas, and so on. As a result, each child or teenager's list of relationships is unique, even when comparing two very close friends.

Participation in activities outside of school further distinguishes one child or teenager from another. Religious organizations with youth groups, and local sports leagues are among many examples. In some cases, such as scouting, adults are involved, but not as teachers. Instead, they serve as guides and mentors – helping children and teenagers through specific requirements to earn badges, and also design and build projects within reasonable guidelines.[15] Unlike school, scouts are encouraged, but not required, to advance (more like a videogame than like school). Each scout earns a different assortment of badges, so each individual figures out how to grow up in their own particular way.

Digital Connections

Unlike young people who grew up in the 20th century, today's children and teenagers interact in the digital world. For more than 50 years, kids have played computer games, but the paradigm changed in the early 2000s when mobile telephones became personal communication devices. Unique to the 21st century, it is now possible to share ideas, images, texts, stories, videos, and other material, instantly, all over the world. This increases the number of people in any network, multiplying diversification. And introducing potential danger. Today, growing up requires digital awareness.

> "I use my phone to keep in touch with my family. I don't carry my phone everywhere because we're not allowed it at school. [Otherwise,] everyone would be on their phones all the time and not learning anything interesting. It seems a little strange that we're not allowed to use it at school, but it is safe. There are lots of things like cyberbullying, things that could happen that are dangerous to children. I am very careful online. If someone posted a video [that was bad], I would show my parents first, I would report it and I would block that person, too. You should also be very careful about posting things online because it spreads very far and it spreads very fast. [And] don't give out personal information [such as] passwords…"
>
> – Erin, 12, Southport, England [Kids on Earth interview]

Growing up in a digital world requires diligence as well as openness to exploration and new experiences, and to new people (who may or may not be the people they claim to be, may not be people at all). Social media encourages people to read, watch, create, share and respond to posts from people they know and may not know. Artificial Intelligence allows anyone to create digital twins – interactive playmates, study buddies, new friends, and other beings for enhanced play, storytelling, companionship, reflection, love, reflection, abuse, and an unimaginable range of other purposes.

One child may create, communicate with, and amplify the capabilities of any number of digital companions. Together, they can play, learn, and tell stories. They can build and grow networks of other beings, both digital and human. This is not far-fetched future stuff. It happens today, though not yet at meaningful scale. It is becoming as much a part of growing up as human relationships, teddy bears and comfy blankies.

This combination of human imagination and digital intelligence competes with school. Ask a well-informed teacher about a deep sea blob sculpin and there may not be much of a response. Ask an AI learning buddy the same question – a buddy attuned to your personality, sense of humor, desire for imagery, and curiosity – and you're likely to see a *Psychrolutes phrictus*, and other deep sea creatures including zombie worms, Sloane's Viperfish, and Giant Isopods (pictured). As cool or cooler than dinosaurs, they are worthy of further imagining, play, storytelling, and more. Not only is this fun, it's learning, too. (Collect all 3,465 species!)

If you can learn about this stuff on your own, why wouldn't you? When you interact with a real or imaginary life form, does that count as a digital relationship? Knowing your AI buddy is constantly on the lookout for weirder, scarier life forms, and that it can make up stories about them, it's possible you'll spend more time with digital buddies than human friends. There is even more variability – not only among children and teenagers, but among their digital buddies, too. And why wouldn't the digital buddies develop relationships of their own?

A cuddly plush AI toy can become a child's closest friend. Designed in accordance with attachment theory, the toy becomes as smart, long-term, deeply committed companion. As the child shares secrets and asks questions, the toy remembers everything, and connects with other toys to share data and insights. Kids (not just little kids) carry it in (or on) their backpack. It becomes the ultimate study companion and homework helper. Entering adolescence, in perhaps a different physical manifestation, it could become something more.

Classroom Interaction

After sleep, meals, and starting and ending the day, most children and teenagers are left with about 12 waking hours per day. School occupies about half of those hours – half the days each year. The other half are available for family, friends, pets, play, sports, chores and working, personal interests, social media, watching music videos on YouTube, mastering videogames, reading, and learning things not associated with school. Kids don't make a distinction: play, stories, relationships and learning overlap.

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Through much of primary school, learning is fun, or at least, clear in its purpose to disseminate knowledge, and to cultivate fundamental skills. Learning to read is part of growing up, and so is making sense of numbers, basic science, and history and geography. Everything is new, and mostly, interesting. There's a lightness about primary school – teachers tend to be flexible and supportive; the social and relational sides of learning are accepted and valued. There is work to be done, but students and teachers are usually united in their pursuit of successful learning. In later primary grades, some students may become more interested in things other than school, but this is perceived as normal and acceptable. Nobody wants to grow up stupid or ignorant – and paying attention in primary school provides adequate insurance. Primary schools are usually local, so many kids have a friend in class. In secondary school, the situation changes.

Secondary school students are more constrained. At just the time in development that students' interests diverge, become more personal, and identity forms, the 'space' of school narrows. Most students make an honest effort to pay attention and care, but much of the material is perceived as boring, irrelevant and useless, and they gradually lose traction. Given school's disregard of their individual interests, students begin to withdraw. Some doodle, distract their neighbors, attempt to make others laugh, pretend to pay attention, engage in covert nonsense. It's a defense mechanism – better than acknowledging their curiosity and creativity are melting away by the minute. As the teacher drones on about "the meaning of a *function* – a rule that gives a variable a value based on its relationship to another variable (2x = y)"[16] or "the fullest extant text of the Gilgamesh epic is on 12 incomplete Akkadian-language tablets found at Nineveh in the library of the Assyrian King Ashurbanipal ([who] reigned [from] 668 to 627 BCE)."[17] Students find the program irrelevant and many (thanks to the pandemic and closures) express dissatisfaction with disinterest and chronic absenteeism.

Students share their disbelief. They cannot escape. Why is everyone devoting their time to these ideas? Does my teacher actually care about any of this? Who decided we needed to learn this? Can anybody un-make that decision?

Life & Learning

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This pyramid took shape as early secondary students in Virginia's Charlottesville Lab School discussed learning in school within the context of their lives.

My Whole Life

Differences between one life and another is not the stuff of headlines. Instead, a life is defined by sharing a noisy room with a pair of siblings and not enough space, an upset stomach, saving money to buy a bike, a beloved aunt whose health is failing, a souring romance, a computer that doesn't work, plans to become a YouTuber, several rainy days in a row. Kids spend lots of time thinking about the future, but that future might be next Saturday. When developing a bottoms-up framework, paying attention to kids is critically important.

"Hi, my name's Tilly. I like the name because it pretty much suits me, and what I look like. It takes about a half hour to get to Liverpool. There's always something to do in Liverpool. There's Liverpool One, that has lots of shops there. I like all the toy shops. There's always something I want to buy there. My favorite shop is Smiggle, which is a stationery shop. It has bags, it has pencil cases, it has sharpeners. I got my ears pierced in Clare's. I was pretty scared, but once it happened, I felt fine. My mum had her ears pierced so it made me want it. Sometimes, people get it done in weird places, like on the nose, or here [eyebrow], in the tongue and stuff like that. But I'm not really comfortable with tattoos. It's kind of painful when you get that done. I know that because my Nanna has lots of tattoos. I'm not really that into them. If you've got a tattoo in a place and you don't like that tattoo, or you want a different tattoo in that same place, you can get to a shop and they'll get it done for you. Some people are really into them, but I don't think other people want to get them done. People are just different. It isn't really a family thing. You just do it if you feel like it."

—Tilly, age 8, Southport, England [Kids on Earth interview]

"I'm thinking about all the animals in the sea. There are interesting kinds of fish, jellyfish, things like that. I will study in Slovenia and maybe in some other countries. I will get a job in Slovenia, and I will travel around the world. As a marine biologist, I can work in a lab, or in a marine biological station [on the sea]."

— Martin, age 10, Piran, Slovenia [Kids on Earth interview]

"For my career, I'm planning to be maybe someone like Damon Albarn, the brainchild behind Gorillaz who partners with other artists and makes music that cannot be pointed at any genre, really. Gorillaz is a virtual band. They reject false icons. I'm planning to become a music producer, so I won't be L.A. Reid, but I'll probably be more like produce the

music, then go on tours. I play piano, trumpet, drums, and guitar. I practice quite a lot, really. I'm hoping to build it from there. I've got big plans to become a musician. I'm the adrenaline junkie of music. I do it for the kicks!"

– Dylan, age 11, Southport, England
[Kids on Earth interview]

"I live in the Appalachian Mountains. We use the mountains for our coal, lumber… We mine the coal for… electricity. Miners work underground and they drill out the coal. My dad, you never know whether he's going to come home at night because he works in the coal mines. Everyday, I wait and I pray that dad's coming home. Sometimes, we talk about it. He says, 'when it's his time to go, it's his time to go.' I say, 'I know.' And I know."

– Jaylee, age 13, Neon, Kentucky, U.S. [Kids on Earth interview]

"I live in a trailer, there's 3 bedrooms, 2 bathrooms. We have a patio, a deck and a pool. A trailer is a step up from an apartment. When I was a baby, I lived in the same room, never moved rooms, same house, same colors, everything the same. My mother is a nurse. My dad is a coal miner. He comes with coal dust all over himself. He works from 3 a.m. until like 8 at night. He works 6 days a week. We only see each other on Sunday. He works all the time to make us a better life… He's fun. He's a very good artist. I love him so much. He's a great dad, so supportive. Sometimes people pay him to do art. I don't think my dad would make as much money doing art as he does working as a coal miner…

…It does worry me that he's in the coal mine. He could have a heart attack, a seizure, a stroke. Something could fall on him. I cope with it because he's wearing all these protective clothes. He used to smoke, that damaged his lungs. And he does coal mining, which makes it worse. Sometimes, the inside of his lungs is black. There's like [dark] popcorn all around [inside the lungs]. It's already making him not breathe. It makes it hard for the heart to pump enough blood. There's not enough oxygen. That will cause heart problems, lung problems, he won't be able to run as fast, be able to keep up. There's a lot of stuff to worry about because you don't know what's going to happen. So you have to stop and think about what will make life better. Say I become a pharmacist. I would make 6 dollars an hour, and I can pay for all his doctor bills. I'm repaying him…

…I want to help people. I want to make medicine. So when I help people, I could give them medicine that will help cure their body. Like with my dad. You know, he's got lung

> problems. I might become one of those pharmacists that research stuff to make new medicines which will cure that disease or any other disease. Help people. Cure all the diseases in the world."
>
> —Tori, age 12, Neon, Kentucky, U.S. [Kids on Earth interview]

Kids spend a lot of time thinking about the future, plotting it out, asking questions, researching, observing, learning from videos as they can, trying things out for a possible fit.

Where I Am

Place matters. It's one reason school often promotes a local emphasis. With a 2021 population of 6.2 million people, Toronto is Canada's largest urban area. Montreal is in second place with 4.3 million. Vancouver is third with 2.6 million. Quebec City, Winnipeg and Hamilton each come in at about 800,000. Charlottetown, Prince Edward Island is home to 79,000 people; Moose Jaw, Saskatchewan has about 35,000 people; Saint-Marie, Quebec has 13,000 people.[18] These places are very different from one another, but they are all places where kids grow up.

About 6,000 children and teenagers live in Moose Jaw, the fourth largest city in the Canadian province of Saskatchewan.[19] That's enough to fill 5 high schools and 15 elementary schools. Most are of European descent, but about 7 percent are indigenous (Cree, Assiniboine, and mixed-race Métis, the first settlers). Another 7 percent come from Asia (in 2001, it was ~1.5 percent, so the Asian population is slowly increasing).

Moose Jaw supports an active 2SLGBTQ+ community – (2S abbreviates "two spirits" – "an English term used to broadly capture concepts traditional to many Indigenous cultures… to indicate a person whose gender identity, spiritual identity and/or sexual orientation comprises both male and female spirits.")[20]

With just 35,000 people, Moose Jaw is a small Canadian city. It is not defined by population density or public transportation issues. It is not without crime – it typically ranks as roughly the 40th most crime-ridden city in Canada[21] – but personal safety is not a primary concern.

It's easy for many Moose Jaw residents to reach much larger places. Regina is 2 hours east with about 8 times as many people. It offers more and better shopping, a university, annual music and arts festivals, and a Canadian Football League team. Saskatoon is 2 hours north with more than 250,000 people. Edmonton is 6-7 hours west, with 1.3 million people, a big science museum, an enormous shopping mall, the Oilers pro hockey team, and a large performing arts center. Drive 6-7 east hours, and there's the big city of Winnipeg, with 750,000 people, 3 performing arts centers, several pro hockey teams.

A hundred years ago, these communities were isolated. Today, cars and trucks connect rural locations and cities. Still, Moose Jaw is surrounded by open land and small rural communities, big lakes, park land, and mines. Rural broadband lags, but advocate groups are making progress. In 2022, for example, SaskTel agreed to invest "an additional $100 million in its Rural Fibre Initiative to expand SaskTel infiNETTM Service to over 80 more towns and villages throughout the province… connecting tens of thousands of rural households to SaskTel's fibre optic broadband network… Speeds reaching close to a gigabit per second [allow[subscribers to surf, stream and share… at incredible speeds."[22]

Details like these determine how young people in Moose Jaw spend their time, what they observe, the people they meet. Children and teenagers who grow up in Guangzhou, China, or Manaus, Brazil, or Nord-Trøndelag, Finland do not experience the same things, and as a result, they don't know the same things. Where I Am is a defining characteristic; it is also a key differentiator that further diversifies kids on earth.

Where I Am exists at the intersection of physical, mental, emotional and spiritual space. Sense of place may be experienced differently, even by 2 children with similar backgrounds living and studying in close proximity. That's because Where I Am exists in the mind. I feel comfortable in this place, but *that* place feels creepy! Many young people live a life of urban (or rural) poverty. Some live in the midst of war or other violence. Naturally, every human wants to be in a place where they feel comfortable, where they belong.

> "When I complete my studies, I will not be able to find a job. I am not going to stay in Greece. To be honest, I don't like it here. Greece is a great place for holidays, but I can't find anyone like me. I have a different culture from them. My mother raised me differently. My opinion doesn't match anyone's. They are so closed-minded. They can't accept anything different. I'm non-binary. Nobody accepts me. No one! My mother says, 'okay, that's some personal information for you, but don't tell the others.' Sorry, but if they cannot accept me, why do I live here? How can I be myself? I want to be myself. I don't like to pretend. I don't know where I want to go, but I want to travel to find someplace that treats me better…"
>
> 
>
> "Here in Greece, the way the school works, how we treat each other… I feel that I'm in a different universe or something. The internet! – it's the answer for everything!! (*Laughing)* So I looked up different countries and how their laws are, how everything works. I'm trying to do what I love now so I will be okay with myself… there will be a way for me to get out of here."
>
> – Rosa, 16, Athens, Greece [Kids on Earth Interview]

Several years ago, a well-intended field trip for low income (mostly Black) secondary students in Philadelphia clarified the importance of place. They visited an upscale (mostly White) high

school in the suburbs. Teachers hoped the groups of students would develop common interests, friendships and an ongoing exchange. On the bus ride back to the city, the kids expressed a common opinion: "We are so *f***ed*." For the first time, they saw where they were clearly. And they were deeply disturbed by their realization.

Data supporting their discovery and its implications is not hard to find. *The Opportunity Atlas*, published by Harvard University's Opportunity Insights Institute and the U.S. Census Bureau, builds on work done since 2014. Briefly, "Children's lives are shaped by the neighborhood they grow up in."

Further detail: "social mobility is about more than just earnings. Recognizing this, *The Opportunity Atlas* provides information on key indicators such as marriage patterns, college attendance rates, fertility rates, and incarceration rates. As with income, we find very sharp differences in children's outcomes on these other measures as well."[23] The work involves consider nuance to capture conditions often obvious to the people who live there: "Neighborhoods are not unidimensional: experiences within those neighborhoods vary by racial and ethnic group, and by gender."[24]

Who I Am

Who I Am is always a work-in progress. That's true for everyone, and especially true for children and teenagers because they are still learning about so many things. With bodies changing and growing, minds developing, new capabilities, and relationships taking shape and evolving, young people are constantly in the midst of change — so are their peers.

Figuring out Who I Am is a natural process, but each of us learns a lot by experimenting and exploring. Sometimes, Sometimes, this goes very well — it's wonderful to discover new friends, new possibilities. Sometimes, it goes badly as young people do stupid things to get attention, push against acceptable boundaries, get themselves into trouble, and make choices contrary to their best interests. Some teenagers try to remain invisible. Some struggle with mental health, and hurt themselves or others. Each of us learns in our own unique way — choice of clothes or hair style or makeup, public persona, choice of friends, passion for sports, games or other activities, and, if a child or teenager is lucky, the design of a personal space, such as a bedroom, or a tabletop work/play space. Along the way, there's an absurd amount of problem-solving (and some pretty crazy problems).

Growing up, everyone deals with behaviors and inclinations that may be difficult to manage or understand. Friends and family can help, but every situation is different. Some issues are vibrant and perhaps, concerning. Sometimes, it is difficult to recognize a potentially serious issue. Most people are not prepared to do so because they don't know much about the mind or the body. Some rely upon the internet, but struggle without sufficient training or context.

Chapter 1: Growing Up

12,563 Words

Everything is more complicated because Who I Am is often affected by Who *You* Are. Each of us is affected by friends, family, people we observe and follow, and by people don't like us. Who I Am requires looking in a mirror to try to figure out what others see. Everybody exists in their internal world, and also, in the external one.

And, things change. Friends move away. Brothers and sisters are born. Family members get sick. Some die. Parents separate and sometimes remarry. Everything seems unpredictable, sure, but when difficulties become multi-dimensional, everything becomes more difficult to manage. Peer interaction helps a lot, especially when parents don't say or do the right things, or don't seem to understand at all.

Growing up takes place at the same time as primary and secondary school. Often, school and life compete for attention. Sometimes, school must be put aside because a friend or family member is in need, or because the student cannot handle the combined stress of school and daily existence. And sometimes, school provides the answer through a combination of peer interaction, academic learning, and/or adult intervention.

Hey! Growing up is hard!! When school interferes with larger problems, students become upset about school. This dissonance grows from a strong sense that subjects matter more than students, that school is uncaring and unresponsive to the most important aspects of growing up. That's not okay.

How I Learn

Learning is as natural as breathing. Something observed, heard, smelled, sensed captures the imagination, and there's a desire to learn more. Everyone is motivated to learn, but we are all motivated to learn different things. Some things, we learn simply because they are interesting. Some things, we learn in order to make personal progress, and eventually earn money. Some things, we learn to help others. We learn these things in different ways. We observe. We learn from friends, by trying things together and asking one another questions. We watch videos. We experiment. We make use of every available resource, knowing full well that access to resources is inequitable – so each of us is as resourceful as can be. We rely upon other people – especially adults, who tend to be more experienced and tend to enjoy more and better resources than kids do. They can be especially help when a situation is dark, scary, or otherwise seemingly out of control.

At first, in school, it seems as though the teacher is in charge. Slowly, it becomes clear that teacher is following instructions set forth by other adults who are in charge. With reading and arithmetic, the mass education process usually works so well, there is no reason to question who is in charge. By third, fourth, perhaps fifth grade, How I Learn in school begins to unravel as the teacher begins to disseminate large amounts of information via lectures, textbooks and testing. By now, it's clear that the teacher is not in charge, that other adults, who are never

seen, are in control of learning. As students move from primary to secondary grades, they become more confident in their sense of self and relationships, gain more control over executive functions, stronger preferences based upon reflection and experience, and develop a deeper connection with their personal interests. As school follows an old model and simply requires everyone to learn the same things in the same ways, many gradually lose interest. By de-emphasizing individual student interests and motivation, and over-emphasizing what seems to be an endless list of must-learn items produced by mostly unseen and unknown adults, much of school follows a playbook that is contrary to How I Learn.

It is difficult to believe most adults believe in this strategy. Still, there is something about being in a classroom with a teacher who cares, and a good feeling about trusting an adult who wants kids to learn (who wants *me* to learn). That's worth a lot.

Why I Learn

When posed as a question – why do you learn? – young children often include the phrase, "So I can…" in the answer. For example, "so I can read," or "so I can use the computer," or , "so I am allowed to feed the dog myself." Their answers are clear and practical. Success is within reach. Some answers include an aspirational "someday:" as in, "someday, I want to run in a marathon like my mom" or "someday, I want to design cars." In all cases, learning, whether in or outside of school, is intended to produce a personally meaningful, relevant, useful result .

Deep down, Why I Learn is driven by curiosity, and the desire to learn more. Often, learning is motivated by a practical need. Practical – or situational – learning is usually associated with solving, or helping to solve, a problem. An animal is in distress, so a human assesses the situation, considers possible remedies, scans available resources, takes action, and evaluates the outcome. Wearing an N95 face mask may slow the spread of a contagious virus. In order to get a job delivering groceries, it is necessary to learn to drive.

Walking in the woods, trying to understand why tree limbs grow in many directions (but mostly, up), may not involve practical learning, or why two people are attracted to (or truly dislike) one another, or why chocolate tastes so good. Instead, Why I Learn is driven by curiosity, which may or may not lead to any meaningful conclusion. Pursuing curiosity just feels good – sometimes, just thinking about why may be enough. That is, Why I Learn does not require a specific answer. "Because" is just fine. Learning for the sheer joy of it is fine, too.

Once again, school operates in a way that is contrary to why most people learn. Much of what school offers is not particularly practical, and does not energize joy. Instead, Why I Learn is reduced to "because you insisted."

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When somebody – anybody – insists, "you need to learn this!" – unless it's a matter of personal safety or survival – learning usually falls outside the natural circle of Why I Learn. Retention becomes unlikely. A steady diet of "you must learn this!" becomes unpleasant, and after a while, promotes inattention. When "you must learn this" is associated with far too many ideas to learn in school, required homework and mandatory testing, there is little room for joy, and good reason for stress. When teachers and students lack control over their time and attention, the situation becomes worse because it runs contrary to Why I Learn. And yet, the school day is packed with the likes of:

- "I am too sore enpiercèd with his shaft to soar with his light feathers and so bound, I cannot bound a pitch above dull woe. Under love's heavy burden do I sink…"[25]
- $BC^2 = AB \times BH$ and $AC^2 = AB \times AH$, summing these 2 equalities as $BC^2 + AC^2 = AB \times BH + AB \times AH = AB\ (AH+BH) = AB^2$ which, after simplification, demonstrates the Pythagorean Theorem, $BC^2 + AC^2 = AC^2$
- Tales of Ashoka, the Mauryan Emperor of Magadha in the India subcontinent from around 268 to 232 BCE [26],[27]

This mumbo-jumbo is not easily connected to Why I Learn. Forcing students to learn in school causes many of them to watch the clock and pray class will end soon.

There is, however, a greater good: human flourishing: the wellbeing of people and the planet. In many ways, this has become a core organizing principle for 21st century learning.

What I Learn

Learning begins early. Dangers of fire, water, vehicles, rats, crocodiles and poisonous snakes must be learned. Some plants can kill you, and some can cause hurt you. Be careful around people who may be dangerous, such as people with guns, knives, and other weapons. Stay away from people who are sick and contagious. Don't go near rushing water or a flood because you might drown. Don't go near vehicles in motion, even if they are moving slowly; the driver may not see you… If your skin is a certain color, you must learn how to behave, especially when law enforcement officers are nearby; otherwise, they may hurt you or the people you love.

There is so much to learn at home and in the community: observing and mimicking adults as they prepare food, clean clothes, sweep away dirt, deal with insect pests, shop, protect the household from rough weather, deal with people, what to do if a toilet won't flush or a pot is boiling over, or somebody has an accident.

Children want to share their ideas, ask coherent questions, understand others. They want to read and write, build a vocabulary, understand and manipulate numbers, and comprehend

how the world works. They want to master fundamentals, the essential skills that allow them to learn just about anything. They look forward to going to school to learn all of this and more.

As with Why I Learn, those fundamentals are mastered in the early years, at home, in school, in the community, and by watching television / videos. If they can read, a child can borrow a library book about dinosaurs and try to understand it without much help from siblings, teachers or other adults. Turns out, there are lots of books about dinosaurs, lots of websites, too. It's easy to learn more, fun to discover what else there is to learn. Why aren't there are any dinosaurs in the zoo? What happened to them? Did they live at the same time as cavemen? Were there any women or girls in prehistoric times (if yes, why isn't everyone called a cave person?) Isn't everything in the past just history — what, then is prehistory?

What I Learn is determined by curiosity and our need to make connections between one idea and another. Why learn about malaria and dengue fever but not HIV/AIDS? Why do people in Brazil mostly speak Portuguese when most other people in South America speak Spanish? Why is the language still called Portuguese when only 10 million people live in Portugal but 200 million people live in Brazil?

At any given moment, any given child or teenager is wondering about their own unique, custom-tailored list of questions. In school, at any given moment, in any given classroom, students are learning because a group of adults, far away and invisible, decided which questions they should be able to answer.

Growing Up Aware — and Deeply Concerned

There may have been a time when adults controlled the information available to young people, but that was long ago. Now, many young people are well-informed. The gap between what children and teenagers know and what adults know is collapsing.

In sub-Saharan Africa, and especially in South Africa, children and teenagers are well aware of the impact of HIV/AIDS because they know people who died, or take medicine to control the disease.[28] Similarly, young people in Asia, Europe and North America understood what peak COVID-19 was, and the messy adult pandemic response.[29] Many were deeply concerned about availability of vaccines, masks, hospital beds, people with compromised immune systems, social isolation, 6-foot distancing and much more. With widespread news coverage, many children and teenagers were as well-informed as adults. They worry because adults do not seem to be in control. They understand what climate change is because they see wildfires and hear about the extreme heat and melting glaciers.

> On July 11, 2023, *The New York Times* reported frightening local stories about climate change. "Torrential rainfall and widespread flooding wreaked havoc in the river valleys and mountain towns… ravaging communities… in New York and Vermont" and "lethal

> landslides… and roads knee-deep in water… in India" and "more than 61,000 people died because of last year's brutal summer heat waves across Europe…" and "hilltop collapses into canyon after epic storms lash Los Angeles county," and "soaring temperatures baking the desert Southwest [U.S.] are not only strikingly high but also unusually persistent," and "extreme weather fueled by climate change is the new normal…" On the next day, headlines included "Floods Expose Failure to Meet Climate Threat," and "Unusually Heavy Rain Brings Floods and Landslides in Japan."

When kids cannot go outside because air quality is dangerous, or because it's too hot, too cold, too wet, too risky or cannot go to school or play with their friends, they experience transformation directly. When their families begin to discuss climate migration because it may not be safe to remain at home, these stories become very real. That's happening more and more often – and the sense that things are not going to be okay.

Growing up in the 21st century means thinking about the unthinkable. Young people are concerned about enough food to eat and water to drink. They know climate disasters can kill crops, and destroy the roads vehicles need to deliver food and supplies. What if the planet becomes so hot that plants and animals needed for food die off, or morph into things humans cannot eat? In 2019, Chennai, India – that country's sixth largest city – started running out of water. Every day, they trucked-in 10 million liters of water. "People stood in lines for hours to fill containers, water tankers were hijacked, and violence erupted in some neighborhoods."[30]

> "Most people are leaving because West Virginia is dying. We have nothing here. I like it here, but it's not a good place to live because of all the homeless people. Your house could be broken into. We have a lot of drugs around here. Kids are involved when parents don't make good choices. Kids get pregnant early. People start on drugs in high school or middle school because they feel stressed out because their parents make them feel they're not welcome at home. This is a problem that grows. To break the cycle, I would start with homeless people and help them get jobs, more opportunities. They need to stop the cycle and stop doing drugs. They can say 'I don't need help.' Actually, 'you do!' I think it's a family responsibility. People do drugs, people cut themselves, because they feel there's nothing to life. We need to stand up and say, YOU NEED HELP!!"
>
> –Lyric Lee, 13, South Charleston, West Virginia, U.S. [Kids on Earth interview]

One thing young people are learning is adults are not taking necessary action to make things better. Instead, mostly, they see well-intentioned adults arguing and not really knowing what to do. This is frightening, but it's also a call to action. If the adults are not going to take action – which seems clear – then today's children and teenagers must learn a lot about all of these problems so they can solve them (or, at least, mitigate the potential damage). And they must

act quickly – which is why many are frustrated by school's insistence on teaching so much useless material, and wasting time and valuable resources on 20th century education.

As journalists and researchers document serious widespread mental health issues among young people, particularly depression, anxiety and a sense of hopelessness, there is a strong sense adults have failed, and will not turn things around. When children and teenagers observe government in action and political gridlock, they sense adult leaders are "only in it for themselves" (a frequent refrain from teenagers everywhere), and that "nobody cares about people like me" (also common, in those words). When they say, "school is a prison," they are not just referring to rules restricting their freedom and movement, they are expressing frustration with their inability to control their own lives.

Accepting Responsibility

If adults do not take the necessary action, then it's up to the next generation – people growing up today. If school is inadequate, then young people must learn as much as they can on their own. Many students do not expect teachers to know what to do, or to lead the way. They know education is inequitable, that their postal code, color of their skin, poverty of their parents and community dictate the shape of their lives. They sense that their ability to learn – and their teachers' effectiveness – means more to their future success than those often-cited postal codes or advanced technology.[31]

> "My goal is to be a doctor because I'm seeing problems. People go to hospitals, but doctors are lacking in Uganda. I like the U.S. because I hear that the best school in the whole world is there, but I have forgotten its name. Until I become a doctor, I have to go to school so I have enough material I can use so I am perfect to be a doctor, with everything needed. The universities in Uganda… for me, I can't afford that. But if I could meet some person, any person [to pay for my future education]… I wish to go to outside countries for university studies. If I am employed there, I can stay. If they decide for me to come back, I have to come back. I want to stay there and do very many things because there are fine hospitals [where I could work]."
>
> – Stephen, 14 years old, Wakiso, Uganda [Kids on Earth interview]

Fair treatment, equal opportunity, equity and justice are still somewhat new ideas. Well into the 20th century, and into the 21st, women, people with darker skin, people with disabilities, indigenous people, immigrants, and many children and teenagers were (and are) denied rights. In many places, for hundreds of years, they were exploited, required to work under nasty conditions for very low wages that were sometimes not paid at all. They were excluded from opportunity. None of this was fair, but it was the way much of the world worked. During the past 25-50 years, progress has been unevenly distributed. Today, in 29 countries, women

cannot legally head their households. In 98 countries, companies are not required to provide equal pay for equal work for men and women.[32] In some countries, the 21st century has been slow to begin, or progress has been blunted by repressive regimes.

The United Nations Sustainable Development Goals ("UN SDGs") identify 17 areas in which equity requires significant improvement. These include poverty, hunger, good health and well-being, quality education, gender equality, clean water and sanitation, affordable and clean energy, decent work and economic growth, climate action, and more.[33] For many children and teenagers, in many parts of the world, these concerns define growing up.

Celebrating Difference

Many of today's countries and cultures were built by disrespecting, abusing, killing, and destroying people and their cultures. Day after day, in full view of the world's children, the pattern continues in Ukraine/Russia, Israel/Gaza, and in Afghanistan, Burkina Faso, Myanmar, Haiti, Iran, Iraq, Lebanon, Libya, Mali, Niger, North Korea, Somalia, South Sudan, Sudan, Syria, and several Mexican states.[34] And, to varying degrees, elsewhere.

About 3 percent of people on earth live outside their home country — the number of migrants has remained stable since 1960. As the world's population increased from about 2 billion to about 8 billion people, a four-fold increase, the migrant population also increased four-fold — but not more. People want to live near their families, in their home communities. .[35] What has changed is the mix of countries sending emigrants, some receiving countries, and some reasons why people migrate. Economic opportunity and personal safety are established reasons. Climate migration is becoming a factor — but only in specific locations. What has also changed is the current (but predictable) wave of demographic shifts, notably in Canada, Australia, Saudi Arabia, New Zealand, Kazakhstan, Gabon, Cote d'Ivoire, Oman, the U.S., Libya, Sweden, Germany, and French Guyana.[36]

In many places, fear, hatred, and rumors about the damage that immigrants could do enflame frightening prejudice, woefully inadequate human services, flagrant abuse, exclusion from economic opportunity, and other unconscionable actions. Many immigrant families share these stories. Today, there are more people from more places. Progress depends upon their ability to cooperate and collaborate, not waste time and resources fighting.

When a family moves to a new place, they are most likely to find housing near others with a similar background (because word-of-mouth and social services tend to cluster people in neighborhoods). The difference today: there is more interaction between cultures. It's easier to get around, and schools are less segregated. There are more opportunities to cross paths with people from other cultures. And so, growing up in the 21st century, particularly in a busy urban or suburban environment, means friends from United Arab Emirates and the Dominican Republic, South Korea and South Africa, the Philippines and Ghana, Panama and

Serbia (and, fair number of mixed families with parents from more than one country). It means learning words and customs, visiting one another's home and tasting new foods, asking one another about unfamiliar religions. Respect comes naturally – kids tend to get along unless they are instructed not to. Prejudice and hatred must be taught, but more and more 21st century children and teenagers don't want to learn anything like that. They do not want to live like their parents or grandparents. They want to be treated fairly, and they want to treat other people fairly. There are enough resources for everyone. They want to live in peace.

Nobody Knows My Story

The Philippines has become one of the largest source countries for new U.S. immigrants. More than 2 million people from The Philippines now live in the U.S.[37] A Filipino child new to the U.S. might reasonably assume everyone in the U.S. knows all about The Philippine-American War because everybody in Philippines knows about it. That 1899 war is almost never mentioned in U.S. schools.

It was a guerrilla war. Hundreds of thousands of Filipinos died from disease, famine, and atrocities. It happened just after the Spanish-American War, which is studied in U.S. schools. Filipino patriots fought for independence, first from Spain, then from the U.S., but lost the war. The U.S. annexed The Philippines – a forceable acquisition of another country.

A child's family tree may reveal a great grandparent killed fighting for independence from the U.S. Some Filipino children wonder why so many Filipinos now live in the land of their oppressor. Should Filipino-American history be learned only by children with Filipino heritage, or by everybody? Maybe just in and near Daly City, California, where 1 in 3 people are Filipino? Should every kid in California learn what happened in the Philippines more than a century ago because they interact with Filipino-American kids today? Should every U.S. student learn about this?

Curiosity is not limited to a child or teenager's own culture. Most nations have invaded other nations, then buried those stories. Growing up means interacting with relatives and cultural groups who will never forget the atrocities, the insults, the inability to secure a job. In or out of school, growing up means learning how your family managed to get this far – sometimes, choosing to forget.

Some Filipino children may prefer to learn about Italy or Argentina, or the mess that became the Spanish-American War in the first place.[38] There's nothing stopping those students from learning whatever they want to learn. They may or may not it learn it in school, and learning in or out of school is easy to do – if the internet is available.

Everybody Knows My Story

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A woman, now grown, recalls her middle school nickname: Swampy. It was not intended as a compliment. She's Korean, and she would bring *kimchi* (fermented cabbage, other vegetables) to lunch every day. Other kids hated the smell. They made fun of her, made up the nickname, made her cry. Kids from other cultures tell similar stories.

Kids learn from their parents, their siblings, their neighbors. They build profiles of people from different cultures based upon assumptions and very limited information, then convince themselves they know the whole story. In the U.S., many darker-skinned Black teenagers know the routine – and they are very careful around law enforcement, school administrators, even teachers who make assumptions about their lives.

Growing up in the 21st century does not shield children from prejudice. In fact, prejudice continues to determine which schools and school districts receive the resources they need, and the neighborhoods protected from crime. It continues to guide hiring and opportunity.

As 21st century kids become more worldly, as they interact with more people from more places, there's an emerging belief system that growing up involves less prejudice and racial discrimination than in the past, but not for everyone.

"Yes, there is still racism here, in some places. People don't accept differences. They start to judge based on those differences. In my environment, I have never seen racism, and my friends have never told me about these kinds of things. But I am sure it exists. Judge people through their actions, by the way they deal with others, and by their honesty."

– Sthepany, 14, São Paolo, Brazil [Kids on Earth interview]

"Skin color, yes, that does affect my life. A lot. I am different. People don't like different. Especially when Trump [was] in office. He said, 'Make America great again!' A lot of white people that live in my neighborhood, when they drive by, they scream (at me), 'Make America great again' because I'm Black. When my parents grew up, there wasn't as much danger, there wasn't as much racism. Barack Obama was the first Black President for the United States of America. He had… healthcare for families who were struggling. That really helped a lot of people. Civil rights means everybody should have the same rights as somebody else. It doesn't matter (about) your skin color, your religion, your sexuality, you should have the same rights as every other person. Whatever you were taught as a child, you are going to grow up having that mindset… but you can change your mindset! If you just keep going off the same perspective, you are not going to learn anything!"

– Neveah, 12, Philadelphia, Pennsylvania, USA [Kids on Earth interview]

"I think less people are racist now. Maybe a hundred years ago, no one liked people with darker skin, but now, a lot of people have come to Sweden knowing that being a racist is not okay."

–Molly, 12, Stockholm, Sweden
[Kids on Earth interview]

Fair Treatment for Everyone

"I come from England, but my family comes from India. Many people come from other countries and they live here. And they speak different languages. I have friends who come from Poland, and they can speak Polish and English. And some of my friends come from Latvia as well. Everybody is allowed in this school. I am Hindi. I feel welcome here, even though I'm not Christian. Everyone treats me nicely. I treat them the same way back."

– Janvi, 10, Southport, England [Kids on Earth interview]

Many children and teenagers are concerned about being "fair." It's a useful umbrella term they often use when discussing equality, equity, equal opportunity, being kind to one another, healthcare for everyone, and the end of poverty, hunger, racism and prejudice. There seems to be a shared sense of right and wrong, and a powerful desire to eradicate unreasonable thinking and unfair practices. It's easy for adults to dismiss notions of fairness as childish and unrealistic, but 21st century children and teenagers consistently demonstrate very strong feelings about fair treatment for all. When combined with agency, fairness causes children and teenagers to speak out and fight for their rights, and to cultivate common cause.

"I tell my story, sometimes people dismiss it, but we can't ignore an army of stories. Maybe you can teach me: how do you assemble an army? When you are non-verbal [and non-mobile], you can't easily speak for yourself. How you do you see the 21st Century Learning Project helping people with disabilities? Some educators go as far to say it's cruel to try to teach us literacy! They argue that you will never be literate, so why try? I argue if you don't try, you don't know. Denying literacy is a denial of the right to education. But, I come across children who are surprising teachers all the time. I am a voice for the voiceless."

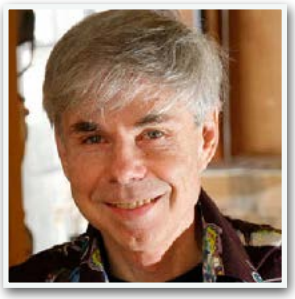
– Jonathan, 17, Wiltshire, England [Kids on Earth interview]

People, by Category

Chapter 1: Growing Up

12,563 Words

Taller, darker, smarter, more talented, a better friend – before school begins, humans compare ourselves to one another. We draw inferences, learn from mimicry, try on different roles, and we learn. We make analogies – and that's good.



> "…the human ability to make analogies lies at the root of all of all of our concepts… the spotting of analogies pervades every moment of our thought's core… many are created to try to make sense of situations we face on a [large] scale… the triggering of memories by analogy lies so close to what seems to be the essence of being human that it is hard to imagine what mental life would be without it."
>
> – Douglas Hofstadter & Emmanuel Sander, authors, *Surfaces & Essences*

People born in 2024, a Year of the Dragon in the Chinese zodiac are believed to be "… indifferent to things the average person worries about. They may seem lazy, but once they decide to do something, they'll be more ambitious and vigorous than anyone else."[39] According to the western Zodiac, anyone born between July 23 and August 24 is a Leo (the Lion). "It's quite common to see a Leo on stage or in Hollywood since these folks never shy away from the limelight. They are also supremely talented and have a flair for the dramatic. Warmth and enthusiasm seem to seep from every Leo pore, making these folks a pleasure to be around. They do love pleasure and being the center of attention!"[40]

On the Myers-Briggs Type Indicator, you might check the box on a written test to indicate your preference for lively or calm; peacemaker or judge; speak or write or that you make decisions with your heart vs. your head.[41] By cross-tabulating answers, the MBTI may report that you tend to be an extrovert who prefers planning to spontaneity, and thinking to feeling in your working relationships. Comparing your profile with others who have provided their profession, you may be well-suited to work as a marketing executive, lawyer, English teacher, librarian, commercial artist, sociologist, minister or rabbi, geographer or investment manager.

The popular Big Five Personality Model, is a test to measure your neuroticism, extraversion, openness, agreeableness and conscientiousness. [42] Howard Gardner's Theory of Multiple Intelligences may be useful to understand your tendencies toward spatial intelligence, visualizing the world in 3D – or perhaps linguistic intelligence, finding the right words to express what you mean. Other intelligences may offer stronger connection: musical, logical-mathematical, bodily-kinesthetic, naturalist, interpersonal, intrapersonal intelligence.[43]

It is difficult to conceive of any meaningful scale that results in broadly-useful assessment based upon personality or behavior. There are simply too many differences between individuals– too much variability – to lend credence to this approach. Every child and every teenager is a work-in-progress, dynamic, changing based upon so many inputs and experiences every day. Schools famously rely upon categorization; they deal with human

variability and difference with labels and tests and groupings and those decisions have a profound impact on a child or teenager's development and relationships. Kids also have a way of figuring things out on their own.

[Jaylin:] "We're twins. She's like the total opposite of me. She cheers for me when I play basketball. When I grow up, I want to be a professional motorsport racer.
[Kaylin:] I would like to be a pediatric nurse and work in the nursery with the babies… Here's what drives me crazy is that she looks like me! She's a smart-aleck. I think I'm smarter than her.
[Jaylin:] Yeah, she's definitely smarter than me. She's really good at reading and cheer. I'm really good at math and basketball.
[Kaylin:] Once in fourth or fifth grade, we dressed up as each other, and one of our teachers didn't notice — until I talked."

— Jaylin (left) & Kaylin (right), 12, Fleming-Neon, Kentucky, U.S. [Kids on Earth interview]

Whether in Kids on Earth interviews or less formal conversations, we encounter a universal truth about children and teenagers. Any time we make an assumption or a comparison, we are *always* wrong. Analogies and labels are so often off the mark, we don't even think about them. Even when two friends or siblings look or talk in similar ways, they are full of surprises. Every child, every teenager, and every adult is a unique human being, unlike any other.

Different People, Different Priorities

Growing up, every human people follows their own path. Children evolve, teenagers evolve, everyone changes day to day and year to year. Interests change. Some take root.

"Fashion is really important to me. I try to look decent at least half the time. People my age, they like to be on top of the latest fashion trends. They take (up to) an hour fixing their hair to make it look a certain way, or their makeup, their outfits. Some people don't even wear makeup because they don't want to, or feel they don't need it, or don't have the money to. Right now, I'm only wearing mascara (no other makeup). I have lighter hair… so my eyelashes are light. Mascara makes my eyes look bigger. Girls start wearing makeup around sixth grade. Boys in my school don't really wear makeup, but if I see a boy wearing makeup, that wouldn't be unusual; I've seen that on YouTube."

— Cecilia, 12, Richboro, Pennsylvania, U.S. (near Philadelphia) [Kids on Earth interview]

Chapter 1:
Growing Up

12,563 Words

"I would like to be a police officer because my father used to be one. You can save people, but it's dangerous, too. There are bad people, but you can arrest them. I think I could be very fast to run after a thief. I can be very strong. I can catch them! I would be worried about people with weapons. I don't want to shoot someone… but I would shoot someone (if they were threatening the life of another). But I would feel bad, but I would still be a police officer after the shooting."

– Maite, 11, Valparaiso, Chile [Kids on Earth interview]

"I want to be a surgeon. I see a lot of surgeons having a lot of difficulty in operating. Very complicated diseases. A person may get a complicated disease. She's admitted to the [operating] theater, but that surgeon may lack knowledge about how to operate on that particular complicated disease. That patient will not have the ability of living. The person will just die in the theater. I want to learn in Britain because Britain has a high standard."

– Joan, 14 years old, Nkowe, Wakiso, Uganda [Kids on Earth interview]

Growing up, every young person is different. They possess different experiences. Each in their own time, they develop a particular sense of self, and their own plans for the future. They want to learn different things for different reasons.

"I want to be a pediatrician. I need to study a lot to find out what to do with a kid when they're sick, to know what that means. You need to learn a lot about people. I know there's the urinary tract here, the liver is here, there's a heart here and the heart beats but when it stops beating, the person dies. It's connected to the veins, and if they're cut, and a lot of blood comes out, they could die. One time, my liver was enlarged so they had to do a sonogram. I could see everything inside. [I had an infection and they saved my life.] I want to live in Bulgaria and be a doctor."

– Bozhidara, 7, Oriahovitsa, Bulgaria [Kids on Earth interview]

END OF CHAPTER 1

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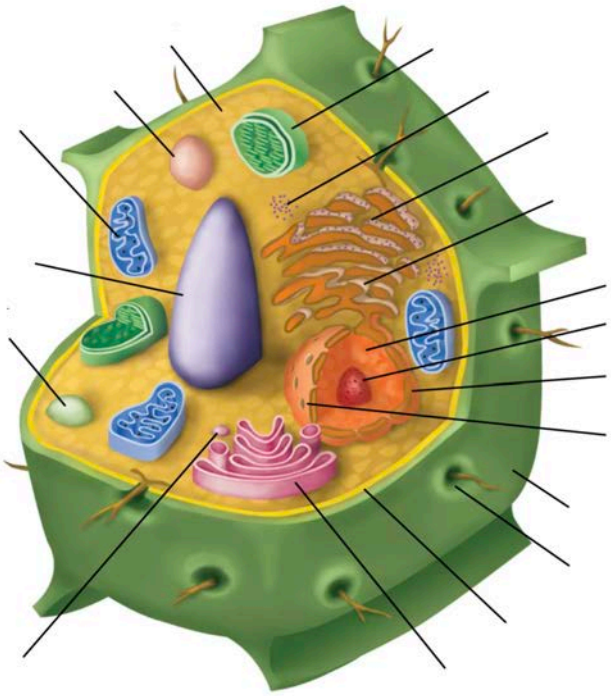
Chapter 2:
Learning

10,059 words

The object below may look familiar.

Many – perhaps most – students spend days or weeks learning what this is, what it does, and the names and functions of its component parts.
If this object is unfamiliar, or you cannot recall details, perhaps the object is no longer relevant. When it was introduced, taught and presumably learned in school, you probably memorized its parts and functions. Many former students forgot why we learned about it in the first place.

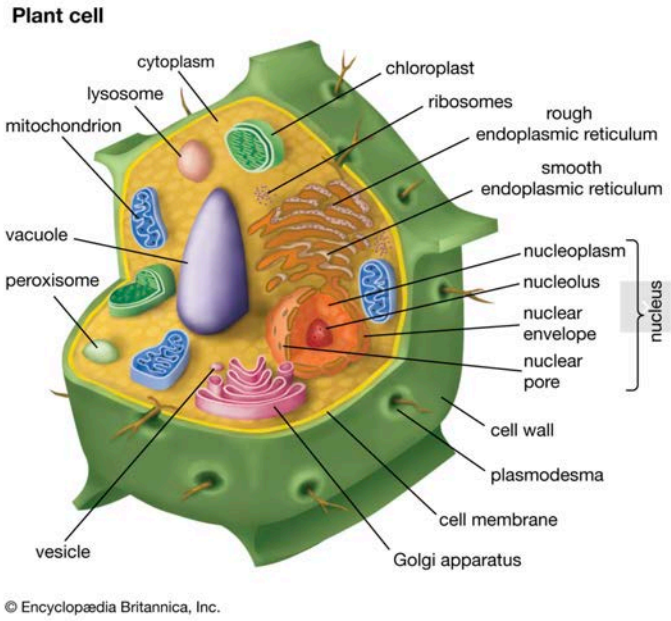


For more information about the object, please turn the page.

Chapter 2: Learning

10,059 words

It's a plant cell, the microscopic building block for food, clothing and shelter.[1] As coal, plant cells provide half of the world's electricity and much of its pollution. When there is a wildfire, plant cells are burning out of control. Plant cells become sneakers, furniture, perfumes, coffee, tea, automobile tires, paper, books, boats, pianos, guitars, and cigarettes. In the form of spices, plants were one reason Europeans colonized Asia. Just being around plants can calm the human mind and body, and lower blood pressure. Plant cells reduce carbon dioxide in the air and convert it into oxygen.[2]



A lot can be learned about plant cells, but it is neither possible nor desirable to learn everything. What should every human know about plant cells? Is it more useful for every human to learn the same things about plant cells, or different things?

What should everybody understand about climate change? It is a global phenomenon, but climate change is experienced locally. It is a long-term phenomenon, but its impact can be felt in a matter of seconds (a tornado) or hours or days (storms and floods). Is the history important? About 20,000 years ago, New York City and London didn't exist; their current locations were beneath deep sheets of ice.[3] Today's wildfires in Canada and Australia, rising summer temperatures in Europe, melting glaciers, increases in hurricane and tornado activity are all important, but are they equally important to everyone, everywhere?

Alternative energy sources matter. So do rising sea levels, and recycling at home. Everything is important, but not to everyone, and usually, not at the same time. One friend wants to design electric vehicles, another wants to campaign against beef, and a third wants to become an eco-grief counselor. What should each of them learn about climate change? Should they learn the same things, or different things? If the answer is different things, this is in conflict with the way children and teenagers are taught.

Intellectual Lives of Children

Human infants are naturally curious. Before they are born, they begin to develop cognitive systems. Emerging from the womb, they gather enormous amounts of information about themselves, people nearby, and the world around them. They constantly identify gaps

between what they know and what they would like to know, then ceaselessly test new hypotheses.[4]

> "Six- or seven-month olds will systematically examine a new object with every sense they have at their command (including taste, of course). By a year or so, they will systemically vary the actions they perform on an object: they might tap a new toy car gently against the floor, listening to the sounds it makes, then try banging it loudly, and then try banging it against a soft sofa. By eighteen months, if you should them an object with an unexpected property, like a can that makes a mooing noise, they will systematically test to see if will do other unexpected things."[5]
>
> — Alison Gopnik [pictured], Andrew Meltzoff, Patricia Kuhl
> *The Scientist in the Crib: What Early Learning Tells Us About the Mind*

Babies make decisions about what is interesting and uninteresting, safe and unsafe, desirable and undesirable, worth exploring, worth remembering. They communicate by gesturing and other nonverbal signals, and by making sounds. As young children acquire language, they begin to ask questions to gather information.

> "Adults are largely oblivious to the intellectual lives of young children. While children are busily gathering information, mulling things over, and speculating about the world, the adults around them are, for the most part, unaware of all of that mental activity. Watch and listen for twenty minutes in almost any school in the United States and it becomes clear that the educational system does not concern itself with children's intellectual lives."[6]
>
> — Susan Engel, *The Intellectual Lives of Children*

As each child makes decisions, they develop a unique set of ideas, unlike the ideas in any other human mind. Each interaction contributes to identity, the result of vast amounts of input and a selection process based upon relationships, culture, resources, language, and many other factors. They also develop executive functions. "The major components of executive functions include inhibitory control (the ability to control impulses); working memory (a type of short-term memory that involves temporarily storing and manipulating information); and cognitive flexibility, or shifting (the ability to switch between thinking about different topics). Each of these skills develops at different rates, with windows of growth and opportunity for intervention… [Executive functions] can be substantially fostered or hindered by environmental factors including early childhood stress, family structure, and educational opportunities."[7]

As executive functions develop, choices become more conscious, more unique to each individual's personality. Children gain control over their own behavior, their relationships,

their desired path. A trusted guide — a teacher, parent, or friend — can ignite interest, amplify importance, and encourage curiosity.

Children pursue their own projects, and happily obsess about collecting, finding patterns and building relationships, they build, discard, pretend, have fun, stumble and cry, try to sense of things they don't understand. They may go deeper, go wider, move on, return later, incorporate their learning into their identity. Or not. Seemingly without reason. Later, reason may become clear. Or not. Teaching is structured, but in most domains, there is not much that's linear, or predicable, about curiosity or learning.

Expertise

And yet, young people acquire skills and knowledge during predictable phases of their life (when they are toddlers, for example). Learning, however, rarely follows a fixed timeline. Each child makes connections unique to their own needs and their own ways of thinking. Some cohere as expertise.

> "Experts notice features and meaningful patterns of information not noticed by novices. Experts' knowledge cannot be reduced to sets of isolated facts or propositions, but instead, reflects contexts of applicability — that is, the knowledge is conditionalized on a set of circumstances. Experts are able to retrieve important parts of their knowledge with little attentional effort."[8],[9]

Experts add to their knowledge in many ways. For example, some children and teenagers memorize lots of details (e.g., sports statistics), or obsessively watch a video over and over again until they know every word. They collect objects and arrange them in one way, then another, decorate their spaces with ideas and images that enhance experiences, dress and accessorize to become a physical manifestation of an idea. Learning interweaves with identity.

> "Experts' knowledge is connected and organized around important concepts; it is 'conditionalized' to specify the contexts in which it is applicable; it supports understanding and transfer (to other contexts) rather than only the ability to remember."[10]

Academics use the term *deeper learning* to describe sophisticated understanding and complex cognitive processing. Experts engaged in deeper learning are sensitive to new and interesting ideas and patterns, but they are also extremely selective about their intake of information. In this way, experts greatly increase the quality and quantity of their knowledge, cultivate useful ideas, and ignore or discard what they believe to be irrelevant information.

As students mature, expertise and identity develop, school's rigidity becomes increasingly counterintuitive and frustrating.

Chapter 2: Learning

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> "Each learner develops a unique array of knowledge and cognitive resources in the course of life that are molded by the interplay of that [individual] learner's cultural, social, cognitive and biological contexts. Understanding the developmental, cultural and historical diversity of learners is central to understanding how people learn."[11]

Over time, each individual's network of ideas and experiences generates more internal synaptic connections, so each person's neural network becomes more complex, more capable of engaging in increasingly sophisticated information and problems, and more distinct from other people's networks. The learner becomes more clear about what it and is not important (what they want to learn, what they will remember, and why; that is the learning becomes more intentional. These behaviors carry on for a lifetime.

In the presence of a supporting and challenging guide or teacher, learning expands and deepens. This is psychologist Lev Vygotsky's "zone of proximal development:" When joined in a productive manner, learning becomes a series of building blocks that advance each individual's interplay with relationships, knowledge, capability, sense of self (identity), and the world.

Curiosity

Curiosity is a difficult term to define and measure. The science of curiosity is surprisingly undeveloped. "Curiosity is such a basic component of our nature that we are nearly oblivious to its pervasiveness in our lives…"[12] There is no clearly-defined field of curiosity studies; instead, there is a lot of research about curiosity in creativity, learning, attention, motivation, basic human needs, perception, play, and animal behavior (curiosity is not exclusive to humans; in their way, worms are curious, too.)

Still, it seems likely that "curiosity is the direct manifestation of children's motivation to understand the world and build a model of it."[13] In fact, curiosity seems to drive learning.

One theory: children (and the rest of us) become curious when there is a gap or inconsistency in our knowledge.[14] We develop a hypothesis that requires experimentation to satisfy our curiosity. Another: satisfying curiosity simply feels good.

"Curiosity begins as a feeling – a stirring, or a sense of mental unrest,"[15] but the term is difficult to define and the phenomenon is difficult to study. Susan Engel observes, "…when our curiosity is aroused… we lean in to carefully observe. We touch, we smell or listen. As we get older that moment of cognitive arousal may lead to a search through our thoughts or even through books [and the internet] for… information."

Note the word choices: desire, satisfy, stirring, aroused. A connection between curiosity and dopamine seems likely. The brain's treatment of curiosity is pleasurable. Anticipation of sated

curiosity is pleasurable, too. Research and experimentation powered by curiosity is pleasurable, too. It feels good to think about something and figure it out. Perhaps this is why "the more curious you are about something, the more likely you are to remember it."[16]

> "As humans, our brains are hard-wired to seek out behaviors that release dopamine in our reward system. When you're doing something pleasurable, your brain releases a large amount of dopamine. You feel good and you seek more of that feeling… Through the dopamine circuit, the satisfaction of our appetite to learn — or even the anticipation of that satisfaction — is deeply rewarding. Learning possesses intrinsic value for the nervous system. What we call curiosity is nothing more than the exploitation of that value."[17]
>
> — Stanislas Dehaene, *How We Learn*
> Director, NeuroSpin, France's advanced brain-imaging research center.

> Engel: "Studies have shown again and again that when people want to know, they learn. Inciting children's curiosity is the best way to ensure that they will absorb and retain information. That sounds incredibly obvious [but] we know very little about what makes children more curious or less curious, under what circumstances curiosity can be encouraged, and how to build upon children's curiosity so they learn well."[18]

Curiosity and learning are closely related, but the addition of school, with its curriculum, structure, rigid schedules, lack of freedom, forced interactions, and abundance of information, is often problematic. "Children may lose their curiosity because they lack cognitive stimulation tailored to their needs. As learning progresses, the expected learning gain shrinks: the more we master a field, the more we reach the limit of what it can offer, we are less interested in it."[19] This is often true for "good students" — those who experience school as a generally productive learning experience.

"Students who struggle in school may wither away for the opposite reason. Metacognition remains the main culprit: after a while, they no longer have any reason to be curious because they have learned… that they do not succeed in learning."[20] "Too many children lose all curiosity because they learn, at their own expense, to expect no reward from school."[21]

Role of Teachers and Other Adults

The fantasy image of unfettered, independent children roaming freely, stopping to explore anything that captures their fancy is romantic but it's not the way curiosity or learning takes shape. Engel: "Inquiry does not bubble up simply because a child is intrinsically curious. Not does it simply erupt when something in the environment is particularly intriguing. Whether

the child has the impulse, day in and day out, to find out more, ebbs and flows as the result of adults who surround her."[22]
In other words, the curiosity of a child (or anybody else) is directly connected to teachers, other students, parents, and community members. Relationships drive curiosity and engagement, which drive learning. Positive relationships generate sunshine, energy, encouragement, stress relief, and (no surprise) more positive relationships.

> Engel: "Smiling and encouraging children to explore are two of the ways that teachers influence children's curiosity. But as we know from a vast array of research… adults influence children in other ways as well. Children watch adults react to objects and events, listen to what adults say to other people and they watch what adults do."[23]

In selecting teachers, schools are often focused on natural intelligence, diligence, disposition, but a teacher's curiosity may not be a central concern. It should be. Candidates who constantly learn and study new things, who participate in community projects and pursue their own research, make connections with others so everybody learns more, these are the people who are most likely to prioritize curiosity in classrooms and in lives of their students.[24]

Sensitivity, Selectivity and Learning

Sensitivity is related to sensory input, connecting perception with cognition ("all forms of knowing and awareness"[25]). Within limited ranges, humans are capable of seeing, hearing, smelling, tasting, feeling and perceiving the world. For example, humans hear sounds from 20 to 20,000 Hz – roughly the lowest and highest notes produced by musical instruments – but we cannot, generally, hear sounds above or below that range. Dogs can't hear lower frequencies, but they can hear higher ones (hence, dog whistles).[26] Humans see from 380nm to about 750nm – from violet to red on the visual spectrum.[27] Dogs see only blue and yellow, but they see in dim light better than humans do. Dogs also perceive motion 10-20 times more clearly than humans.[28] Generally, the sensitivity of each human's senses is similar, but there are many individual differences.

Humans devise systems to expand perception and improve sensitivity. Corrective lenses in eyeglasses, hearing aids, and public address systems are among many examples. Advanced imaging has expanded our understanding of learning and the brain. For example, MRI is "a medical imaging technique that uses a magnetic field and computer-generated radio waves to create detailed images of the organs and tissues in[side] your body".[29]

Selectivity involves a series of decisions made before and after sensory input arrives in the brain. An infant can choose to, or not to, eat or drink certain foods. By closing the eyes, a human can choose not to see. Still, much of selectivity is beyond our control.

Chapter 2: Learning

10,059 words

"We consciously see only a small subset of our visual world, and when our attention is focused on one thing, we fail to notice other, unexpected things around us – including those we might want to see…[30] For more than a decade, my colleagues and I have been studying a form of invisibility known as inattentional blindness. In our best-known demonstration, we showed people a video and asked them to count how many times three basketball players wearing white shirts passed a ball. After about 30 seconds, a woman in a gorilla suit sauntered into the scene, faced the camera, thumped her chest and walked away. Half the viewers missed her. In fact, some people looked right at the gorilla and did not see it."[31]

– Daniel J. Simons,
Beckman Institute for Advanced Science & Technology,
University of Illinois at Champaign-Urbana

Most incoming information is ignored, discarded, never processed because it's neither useful nor relevant. This survival mechanism is hard-wired: humans attend to what matters, and disregard what does not. These decisions are made very quickly, usually without any conscious thought at all. However, we are attracted to – more likely to pay attention to – known or interesting people (and animals), safety and security (avoiding potential danger), and novelty (something new and intriguing).

When an interesting person offers interesting information, we tend to pay attention for as long as it takes to determine its value. If we're intrigued, we may connect their new information to existing information, and attempt to learn more. If not, our attention fades. We see this in very young infants, so it's probably innate. It's easy to observe this behavior: visit a classroom, or almost any meeting in a conference room.

Sensitivity and selectivity are affected by "noise" – anything in a signal's path that impedes its progress from sender to receiver. For example, a room may be too dark, too bright, cold, hot, smelly; a chair may be uncomfortable; the learner may be hungry or thirsty or in need of a bathroom; volume may be too low, extraneous sound may distract; so on. It's unusual to find ideal circumstances for learning, but a reasonably quiet, safe place is a good start. Humans make accommodations for themselves when learning (or entertainment) offers value. When children and teenagers are fully engaged with a teacher who offers useful, relevant information in interesting ways, they do their best to overcome the obstacles and pay attention despite a troublesome signal-to-noise ratio. When school does not accommodate learners' needs, students are not likely to learn, or they will find other ways to learn.

Attention

"She's really interested! Look at how she's paying attention!!"

Just outside on the patio, a family of deer nibbled on nearby bushes. The family dog, a beagle, was riveted by their every move, and would not be distracted.

Some aspects of attention are hard-wired. They are associated with safety and danger, food and water, and relationships. Other aspects of attention are intentional – the learner makes a conscious decision to learn (improve, study, etc.) and determines the intensity of concentration, the depth and breadth of the experience, and its duration.

> "I would carry my big instrument, my euphonium, to a practice room in the music building on campus. I spent a lot of time there. I would find the best chair – posture matters when you're playing any instrument. I would set the tuner to B-flat – 466.164 Hz, a half step up from A440 (the note that orchestras tune to). Then, I would close my eyes, and play and hold that note over and over and over again. As I paid attention to my breath support, my posture, and intonation, I would envision the two sound waves: my B-flat and the tuner's B-flat. Same note every time. I listened very carefully – so carefully, I could easily imagine two waveforms, and I tried, time after time after time, to consistently play a clean wave to get them to align perfectly, without wavering in and out. I tried to play and sustain a perfect B-flat – 466.164 Hz over and over again, for hours. Nothing distracted me. It was almost a trance-like state. I paid complete attention to B-flat – and nothing else in the world mattered. I paid complete attention to the connection between my body, my instrument, and my perception of that B-flat at 466.164 Hz. And I didn't just do this once, or on that one note, I did this on every playable note on my instrument, to ensure that what I'm playing and what I'm hearing are aligned. I did this day after day, night after night, because that's the way you learn to play a musical instrument at a high level.
>
> – Steve, 19, music student, Duquesne University, Pittsburgh, Pennsylvania, U.S.

Researcher Mihaly Csikszentmihalyi interviewed many athletes, musicians, and artists. He asked how they experienced optimal performance levels. "Optimal experience is something we make happen… The best moments usually occur when a person's body or mind is stretched to its limits in a voluntary effort do accomplish something difficult and worthwhile."[32] Every time Steve worked hard for clean alignment with every note, he paid complete attention to the immediate task, undivided attention rooted in a powerful desire to learn.

Undivided Attention

Developing the educational TV series *Sesame Street*, researchers measured individual pre-schoolers' second-by-second attention (to the TV screen showing a sample segment) and distraction (to anything else). They figured out how to attract and retain young children's

attention — and explained their findings to the show's creative staff, which responded by designing the viewer experience to minimize distraction.

Attracting and retaining attention on a massive scale is the super power cultivated by social media, consumer advertising, political advertising, and network television. Every second counts — every image, every edit, everything is crafted to maximize impact. By commoditizing attention, consumer goods companies build successful brands, and political consultants persuade citizens to vote for their candidates. Social media creates algorithms that addict young people, often encouraging social comparisons, anxiety, fear, and depression. Working with abundant data, much of it gathered from the internet and processed through machine learning, marketers and social media companies have become sophisticated in their manipulation of human attention. Artificial intelligence increases their power and influence.

Learning in school is much less sophisticated. School places responsibility for attracting and retaining student attention on each individual teacher, but control over what is taught and why is beyond the teachers' control. Operating with limited flexibility, and limited resources, each teacher must engage each student's attention for thousands of hours annually.

It's an unfair fight for attention. Capturing and retaining attention of 15, 20 or more students, each with a different level of interest and a different learning pace, requires seemingly endless hours of preparatory work, performance skills, clever delivery, a captivating sense of humor, personal interest in the material (real or feigned), and extraordinary classroom management skills. Despite all of this effort, some students may not care.

Motivation

> "Intrinsic motivation is the drive that comes purely from within, without any ostensible external rewards. You do it because it's inherently enjoyable, and not because of any anticipated reward, deadline, or outside pressure."[33]

Children play because they want to play, not because they are rewarded to do so. Extrinsic motivation is useful to coax a child or teenager (or an adult) to try something new, or to try again. Typically, the gambit involves distraction from task — do this, you'll get that. "When you're extrinsically motivated, you're doing the behavior to gain an external reward."[34]

> "Extrinsic motivation is any reason someone does work other than the joy of doing the work itself. Anything promised for completing the task or received as a result of completing the task are extrinsic motivators. An extrinsic motivator needs three elements to be successful, according to research by psychologist Victor Vroom: expectancy (believing that increased effort will lead to increased performance), instrumentality (believing that a better performance will be noticed and rewarded), and valence (wanting the reward that is promised)."[35]

Extrinsic Motivation requires an effective reward structure, but the reward must be continually upgraded to maintain motivation. Extrinsic Motivation is useful for specific classroom activities, notably test-taking ("get an A, you can paint your room purple"), but it's usually the wrong approach for comprehension and long-term memory.[36] Extrinsic Motivation is aligned with mass education: everyone learns the same things, whether they're interested on not, so they must be cajoled with grades, the possibility of good feelings associated with successful test results. Managing learning on a massive scale via Extrinsic Motivation is exhausting (ask any teacher), expensive, and usually unsuccessful. When students fall asleep in school, or check-out due to extreme boredom, or complain, Extrinsic Motivation has failed. When applied repeatedly, it dulls the senses. "Children and teenagers who focus mainly on their own performance (such as gaining recognition or avoiding negative judgements) are less likely to seek challenges and persist than those who focus on learning itself."[37]

Intrinsic Motivation is aligned with Personal Education. A student is internally motivated to pursue an interest, so the community and school support that activity. It is less complicated than Extrinsic Motivation, and far less taxing.

Memory

It's helpful to think about memory as bits stored in various parts of the brain that come together, in various combinations – not as snapshots or computer files. Much of schooling relies upon the effective use of human memory, but, by and large, school's approach is out of sync with scientific understanding.

Memory begins with perception and selectivity, but most incoming information is discarded, and never finds its way into short-term memory. Information that survives is distributed to various parts of the brain for processing. For example, some brain cells ("neurons") process incoming information about faces; this takes place in the brain's inferior temporal region. Processing of voices, words, music, movement, relationships, emotions, letters, numbers, shapes, colors, and other ideas are processed by neurons in other parts of the brain.

> Dehaene: "As these neurons are activated, they begin a process of physical change that is learning: "they modify the strength of their interconnections… making it more likely that this set of neurons will fire in the future. Some synapses [the connections between the neurons] become physically larger… These changes are the physical basis for learning; collectively, they are the substrate [underlying layer] for memory."[38]

In these initial stages, everything happens very, very quickly. For example, "the human brain can process entire images that the eye sees for as little as 13 milliseconds."[39] Once complete – "the memory remains dormant, unconscious but inscribed in the very anatomy of my neuronal circuits. In the future, thanks to those connections, an external clue… may suffice to

produce a cascade of neuronal activity in the original circuit. This will restore a pattern of discharges similar to the moment the memory was made… According to this theory, each restored memory is a reconstruction."[40]

Once again, the mind is not organized as a filing system. Instead, "memory involves reconstruction rather than retrieval of exact copies of encoded mental reproductions."[41]

> "Because they are reconstructed, memories are not frozen in time; they are reconstructed anew each time a person recalls something, and the reconstruction takes into account current knowledge, expectations and context. For this reason, memories are not fixed, but instead morph over time, and they may omit details or include fabricated details that did not occur."[42]

Generally, memorization of information is not an effective learning strategy, and should not be used in schools.

Nine Stages of Memory

Think of memory as a multi-stage process:

1. Prior Knowledge
2. Attentiveness to Inputs
3. Engagement
4. Correction
5. Consolidation
6. Forgetting
7. Rehearsal, Revision & Retention
8. Automatization
9. Recall & Retrieval

The initial stage is not intake, it's *Prior Knowledge*. Every being is born with memory of millions of years of evolution, and deep understanding of nature. They possess their species' natural curiosity and attentiveness, specific sensitivity and selectivity, operating processes, emotions, and multi-generational trauma. Species actively begin to gather information before birth, and learn before they are born.

> Dehaene: "Clearly, the blank slate conception of learning is wrong. Human babies are born with considerable core knowledge, a rich set of universal assumptions about the environment that they will later encounter… Their brain circuits are well-organized at birth and give them strong intuitions in all sorts of domains: objects, people, time, space, numbers…"[43]

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Humans continue to learn through observation, experimentation, play, interaction with parents and other humans, pets, and experience. They are not new to learning when they enter pre-school or kindergarten.

Attentiveness to Inputs includes observation, inquiry, hypotheses, experimentation, exploration, and the many other ways humans gather information. We remember a small portion of incoming information, and we train to remember more. We are more likely to remember what interests us, more likely to pay more attention to people who care about us.

Engagement enhances information with action. Outside of school, learning and memory are interwoven – driven by curiosity, personal interest and intrinsically motivated learning, and often involving pursuits or adventures beyond the facts themselves (such as collecting, drawing, exchanging information with friends, etc.) In school, project-based learning adds individual and small group experiences. The desired result is deeper learning, intensification and diversification, and meaningful memories.

> "Not having heard something is not as good as having heard it; having heard it is not as good as having seen it; having seen it is not as good as knowing it; knowing it is not as good as putting it into practice."[44]
>
> – Xun Kuang, Chinese Confucian philosopher (312-230 BCE)[45]
>
> His works were collected into the *Xunzi*, a set of 32 books (~ 818 CE)

Learning involves a steady flow of errors and missteps. Nonjudgmental, supportive *Correction* produces and supports reasonable memories. Unfortunately, in school, when the focus is dissemination, there is less patience for this step, and pressure not to make mistakes. This breaks the cycle of learning, so students become frustrated, think of themselves as stupid, disengage, and make poor decisions, and do not learn effectively. Associating error correction with fear and negative consequences results in incomplete ideas, irrational memories, foolish decisions, and vulnerability to bad actors (political strategists use this deficiency to their advantage.)

Consolidation requires sleep. It captures the day's events, moving memories for sense-making (hence, dreams), contextualization, and ready access for reconstruction and revision. "Every night, our brain consolidates what it has learned during the day. This is one of the most important neuroscience discoveries of the last thirty years. While we sleep, the brain remains active; it runs a specific algorithm that replays important events it recorded during the previous day and gradually transfers them into a more efficient compartment of our memory."

Children require about 10 hours of sleep every night, and teenagers require about 9 hours.[46] In part, this allows muscles and other organs to rest in preparation for the next active day. It also enables humans to make sense of what they are learning, and to remember what the

past day has taught. Without sufficient sleep, the network of memories fails to take shape, connections are not constructed, or constructed improperly, so memory becomes less reliable. When students trade sleep loss for test preparation, when adults stay up all night to prepare a report or presentation, they sacrifice clear thinking based upon imperfect memory. When this is done repeatedly, confusion, disorientation, and poor cognitive performance creep in. Many students operate this way throughout their high school experience.

"Sleep is not just a period of rest. It is an integral part of our learning algorithm, a privileged period during which our brain plays its models in a loop and enhances the experience of the day by a factor of ten to one hundred. Sleep and learning are strongly linked." According to the 2015 CDC survey in the U.S., "6 out of 10 middle schoolers [and] 7 out of 10 high schoolers don't get enough sleep."[47] In many cultures, school's requirements and sufficient sleep at home are out of balance. Substantive change is necessary because impact on learning is significant (insufficient sleep exerts negative impact on mental and physical health, growth and development, reason, relationships, decision making, too).

Forgetting is not a human failure. Instead, it is a cleansing process that frees the brain so it can process and store new information and generate productive connections between ideas. In fact, we forget most of what we learn, but we do so quickly and efficiently. The Forgetting Curve was developed by In the 1880s, Hermann Ebbinghaus mapped his own memory on what he called The Forgetting Curve.[48] It remains popular, notably among test prep companies as they promise to improve retention (see below).

"Ebbinghaus experimented with his own ability to remember using a list of nonsense syllables, which he attempted to recall after different lengths of time." He found that memories weaken over time, that the biggest drop in retention happens shortly after learning, that it's easier to remember things that have meaning, that the way something is presented affects learning, and that how you feel affects how well you remember.[49]

Numerous replications of and variations on Ebbinghaus' original work seem to confirm several important ideas, but the addition of learner interest and other factors seem to affect results. If the learner possesses little interest in what is being learned, about third of the information is lost within the first 15-20 minutes, about 1/2 is lost within the first hour, about 2/3 is lost within a day of exposure to the material, and about 3/4 is gone by the end of the second day. Then, forgetting slows down, but about 4/5 of the information is gone a month later.[50] These numbers are not absolutes, but they provide useful guidance. (It's easy enough for anyone, or any classroom, to construct a similar experiment.)

Rehearsal, Revision & Retention can improve results, but only for specific items, not for all memories. For example, a refresh 10-15 minutes after initial exposure seems to extend initial

memory so that 1/2 is retained a day later, but a week later, only about 1/4 is retained, most of it lost by month's end. However, a second rehearsal 24 hours later improves results: after a week, 1/2 of the information is retained, and a month later, the loss is only about 2/3. A subsequent rehearsal within the week offers even more improvement: a month after the initial exposure, about 1/2 of the material is recalled.[51] This is the way human memory works. It's not the way school deals with memory and learning, but it should be.

Automatization is kin to *Consolidation* – the daily process of moving memories to permanent locations in the brain. "Why is automatization so important? It frees up the cortex's resources. Remember that the parietal and prefrontal executive cortices act as a generic executive control network that imposes a cognitive bottleneck: it cannot multitask. While our brain is focused on one task, all other conscious decisions are delayed or canceled. Thus, as a mental operation remains effortful, because it has not yet been automated by overlearning, it absorbs valuable executive attention resources and prevents us from focusing on anything else. Consolidation is essential because makes our precious brain resources available for other purposes."[52] When the brain faces a steady flow of largely irrelevant details – standard practice for most students in most schools for more than a decade – curriculum and teaching impedes effective learning.

Recall & Retrieval are related. "The initial perception… is generated by a subset of neurons firing together. Synchronous firing makes the neurons involved more likely to fire together in the future, a tendency known as *potentiation*… recreates the original experience. If the same neurons fire together often, they eventually become permanently sensitized to one another, so that if one fires, the others do [too]. This is… *long-term potentiation*.[53]"

Hyphenating re-collection brings the word to life: a collection of potentiated neurons is re-activated. The "act of recollecting makes the [group of] neurons even more likely to fire again in the future, so repeatedly reconstructing an event makes it increasingly easy to recall."[54]

The opposite is true, too: if the original thought's neurons are not activated, the connection becomes dormant, and the memory fades. Testing specific to material learned within the past hour, or just days ago, reactivates those connections; testing weeks later does not.[55]

"So you just go, read the book, try to memorize as much as you can, answer your quiz, and that's it, that's your education. You're just memorizing words. The next day, you don't even remember what you did. So I think you need to be knowing, not just memorizing. Understanding what you are reading so you can use it in your future [is much better] so you actually can depend upon what you are doing in school when you are an adult."

– Hazem, 14, Cairo, Egypt [Kids on Earth interview]

Scholars express similar concerns. "Textbooks are filled with facts that students are supposed to memorize, and most tests assess students' ability to remember the facts… Research… clearly shows that useable knowledge is not the same as a mere list of disconnected facts."[56]

An Abundance of Information

Today, there is more information available than at any time in human history.

> "We have gone from a world where nobody could effectively deliver a book without a publishing organization in 1990 to one where anybody can today…[57] The choice of book titles has become so vast – going from about 500,000 titles in English three decades ago to about 20 million titles available through [leading book wholesaler] Ingram today…"[58]
>
> – Mike Shatzkin, thought leader in digital publishing

In 1980, there were 28 U.S. cable television networks.[59] By 2021, there were at least 124,[60] but the statistic is less meaningful than before. Many viewers now watch streaming video services. Popular viewer behavior has shifted away from scheduled programming, toward viewer choice (exception: sports and some major news coverage) – in the 21st century, people prefer to choose not only what they watch but when they watch it.

In 2004, YouTube was a new company with no videos online. Twenty years later, YouTube is probably world's largest website with a library that soon to exceed one billion videos.[61] YouTube is watched by about 1 in 3 people in the world, so it is now arguably the world's most popular tool for both entertainment and learning.

In December, 1995, approximately 15 million people used the internet (0.4% of global population). By December, 2005 – 10 years later – approximately 1 billion people (15.7%) used the internet. In December, 2015, the count was 3.4 billion (46.4%), and as of December, 2022, it was up to 5.5 billion (69%).[62] As these numbers rise, the amount of information shared per second increases, too – because people using the internet don't just watch and read, they generate information.

From 1996 to 2020, the number of science and engineering research papers published in high-income economies doubled, and increased nearly ten-fold in high-middle income economies. Among lower-middle income economies, research papers tripled.[63]

There is now more information, more ideas, more perspectives, more stories, more of everything available on the internet than on any other communications platform in the history of the world. As the internet continues to grow, and as AI generates inconceivable quantities of new or reconstituted information, much more information is on the way.

When 2 people (A and B) collaborate, there are only 2 connections, AB and BC. When 5 people (A, B, C, D and E) collaborate, there are 10 connections, AB, AC, AD, AE, BC, BD, BE, CD, CE, and DE. This is the *network effect*. A century ago, it was discovered and used to build a then-new telephone industry. More recently, the network effect has made social media, eBay and other internet services successful. Add micro-targeting based upon individual usage patterns, and machine learning's ability to slice-and-dice to data to generate even more sophisticated patterns. The result: more and more of what people learn, know, and believe will be based upon each user's distinctive, differentiated, diversified, specialized, unique pattern of activity. This information already provides the basis for political and consumer marketing, choosing a mate, and much more. So far, data mining and machine learning has not has not been used to reconfigure learning in school. Outside of school, it is a very active component in human thought – for internet users, and also people who associate their personal data with consumer purchases, driver's licenses, health benefits, employment, and other aspects of 21st century life.

Building a Better Mind

> Dehaene: "All research findings are remarkably convergent: *enriching the environment* of a young child helps her build a better brain. For instance, in children who are read bedtime stories every evening, the brain circuits for spoken language are stronger than in other toddlers– and the strengthened cortical pathways are precisely those that will later allow them to understand texts and formulate complex thoughts… Exposing the developing brain to a stimulating environment allows it to keep more synapses, larger dendrites, and more flexible and redundant circuits… the blossoming of [young] brains depends in part on the richness of the stimulation they receive from the environment."

Validation of personal interest and curiosity, especially from a trusted adult, goes a long way toward encouraging a student to learn or continue to learn. Often, discouragement generates the opposite result.

Validation builds self-confidence, which increases *agency* – the sense that one's judgement and decisions are sound and reasonable. Self-confidence propels students to explore, experiment, excel, pursue mastery, and do things they've never done before.

Agency is enhanced through *explicit or implicit permission*. When a learner enjoys reasonable boundaries with unrestricted rights and privileges to think freely, pursue their own interests, and share, they thrive. When school restricts rights and privileges (which is standard practice) students conform, but agency is diminished.

Future-mindedness is a result of agency. Encouraged by exposure to a free flow of ideas, content, context, and new ways of thinking, learners imagine their possible futures. Observing

people who share their ideas (TEDTalks is a good example), traveling to unfamiliar places, interacting with people from other communities and cultures are powerful contributors to a sense of "maybe I could try that." Again, these choices are indications of each child's individual interests and plans for the future, and each child's uniqueness.

Although Personal Education is the direction school must go in order to be effective in the 21st century, learning alongside others is often enriching. We are all deeply influenced by the people around us; for children and teenagers, caring and knowledgeable adults are often positive influences. It is possible to learn from media – the internet, television, books, and so on – but meaningful social interaction continues to rank among the most powerful components in learning, especially for infants, toddlers, children and teenagers.

> "A primate can learn a great deal through training by using its mechanical and mental skills, but it cannot be made more intelligent, that is, it cannot be taught to solve a variety of more advanced problems independently… human learning presupposes a specific social nature and process by which children grow into the intellectual life of those around them."[64]
>
> – L.S. Vygotsky, *Mind and Society*

Learning in the Midst of Change

Learning in the 21st century is different from learning in the 20th century. [From 1970 to 1999], six themes changed conceptions of learning – and these changes have been barreling forward: (1) memory & structure of learning; (2) analysis of problem solving and reasoning; (3) early foundations for infants and young children; (4) metacognitive processes and (5) self-regulating capabilities; and (6) cultural experience and community participation."[65] These changes are profound, but they are more meaningful when mapped onto physiological transformation common to every human child and teenager.

"The brain increases four-fold in size during the pre-school years and reaches approximately 90 percent of adult brain volume by age 6."[66] Throughout childhood and adolescence, connections greatly increase, forming an increasingly complex neural network.[67] Physiologically, the growing-up years are an ideal time to learn how the world works, but not to receive, organize and remember many thousands of random facts. specific information. Young minds are taking shape. Many ideas are still to come. Many stories are still taking shape in meaningful ways. Context matures later.

Diversity, Identity and Learning

Located in-between New York City and Boston, the U.S. State of Connecticut is small. The number of foreign-born Connecticut residents in 2021 is twice what it was in 1990, and it

continues to grow. People come to Connecticut from all over the world: South America, the Caribbean, Mexico and Central America, Africa, China and Eastern Asia, India and Central Asia, Poland and Eastern Europe, and more.[68] Each family comes with its own stories, heritage, and expectations about their native and adopted culture. This is true everywhere.

"Many, many years ago, Bulgaria was on Turkish slavery. The Turkish people killed many Bulgarian people. They kidnapped the Bulgarian children and made them Turkish soldiers. Then, those soldiers forgot about their families in Bulgaria, and killed them. There were 500 years under Turkish slavery, and it was very sad. There were many brave people. Russia helped Bulgaria to win in the war, and in 1878, Bulgaria was freed. Slavery started in 1396. About five hundred years. I think now Bulgaria is peaceful. Our nature is very beautiful. We can see many sides."

– Mitko, 12, Stara Zagora, Bulgaria [Kids on Earth interview]

"When the Portuguese came [to Brazil], they made arrangements so that the people fought among the themselves. That was a strategy they used to win. I will give you an example of the symbol that I know that is like a Black Panther of that time. He was like The Guardian of *capoeira*. He had several moves, offense and defense, and was very good at martial arts. He defended very well. The landowner's gang pursued him, but he got away. He managed to escape into the jungle."

–Gabriel, 11, São Paulo, Brazil [Kids on Earth interview]

"I think Ashoka was a great king. He traveled many places. He went down south, to Southeast Asia. He went to places like Malaysia and Thailand. You know how Bali has a very similar culture to India? Ashoka was the reason why! I've been to Bali. They told me that Ashoka conquered Bali. At one point in time, Ashoka would conquer and spread his religion. He decided to stop and let all of that go and follow Buddha, a man who seeks peace. For me, that's a huge mystery… why he just suddenly changed. It's very difficult to just let all of that go. He was a man with great power."

Abraham, 12, Gurugram, Harayana, India [Kids on Earth interview]

Pace

Everybody learns at their own pace. This is an inherent reality of human development – be frustrating for school management, but true everywhere.

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Some children and teenagers bring prior knowledge and well-practiced skills to learning. Some dawdle. Some care deeply, and diligently complete their work within the allotted time. Some deal with other issues, or they just not very interested. In most any third grade classroom, there will be a small number of children who have finished reading a few Harry Potter volumes among other children who have not yet mastered kindergarten-level basic word recognition and phonetic skills. The same is true on a football pitch or in any other venue associated with growing up. There are myriad reasons why this is true: parental involvement, individual interests and capabilities, interactions with friends, fear, desire to succeed, curiosity, and lots more. Again, every human is unique – assumptions are pointless.

"My little sister, Kloe was premature. She was born about 5 months early. She had brain blaze [brain bleeding] when she was born, which caused her to have Cerebral Palsy. She couldn't see well, so she's had three eye surgeries. She had braces for her feet. She still wears them now and she's 6. And she's learning how to walk. And she learned how to sign. It's hard for Kloe to communicate with other kids when she can't speak. My family has learned sign language. I know the alphabet and some numbers, and words she knows like 'eating' and 'drinking.' Then there's words like 'firefighter' that we don't even know, and Kloe would be signing them. We'd look it up and she'd be doing the correct [sign]. [We would ask her] how do you know that? She learned how to do it by herself. Kloe watches this show, it's called *Signing Time* and she watches it all the time! She wants to watch it at school! As soon as we get home, she goes straight to her iPad and she goes to YouTube. She can find stuff very easily. Kloe just found *Signing Time* herself—one day, she was just watching YouTube and it popped up so she clicked on it. Now, she watches it all the time! She's a very smart kid!"

– Karla, 12, Neon, Kentucky [Kids on Earth interview][69]

Kloe learns at her own pace. She learns some things much faster than the people around her. Her interest is intense because each new word increases her knowledge and potential to communicate more clearly. Kloe is outpacing her sister, her classmates, her parents and her teachers. Kloe knows the word for *firefighter*, but this is not useful because other people can't interpret the sign. This neither stops Kloe from learning nor slows her down.

If everybody learned the same things, everybody would know the visual sign for firefighter.[70] Must everyone must know the sign? How about people who rarely interact with a person who is hearing impaired? What if there's a fire?

Impediments to Learning

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How many of today's children and teenagers deal with serious impediments to learning? The answer depends upon the definition of the term.

One useful source is the 2021 UN Report, *Seen, Counted, Included*.[71] It attempts to quantify the well-being and challenges of children with disabilities. It lists 13 functional disabilities, many related to learning and life at school: signs of depression, signs of anxiety, seeing, walking, controlling behavior, accepting change, making friends, remembering, learning, concentrating, hearing, communicating and self-care. Although results vary by region, income, gender, age, and other factors, the report estimates about 250,000 children and teenagers with disabilities in the world – that's 1 in 10 children.

Acknowledging the risk of some double-counting, and a high likelihood of under-counting (not examined, not diagnosed), add another 1 in 8 children with a form of ADHD.[72]

According to a 2023 UN report, 1 in 6 of the world's children and teenagers live in extreme poverty,[73] and it is very difficult to overcome the many obstacles in order to learn, acquire significant knowledge and attend to memory in the midst of multi-dimensional poverty. Many more children and teenagers live without extreme poverty, but lack essential resources. In the U.S., about 16 percent of children live in poverty. The global total is probably above 20 percent[74] – that's 1 in 5 children! Adults, how can we allow this to be our global reality?

Add difficult social conditions at home and in the community, and in the country, and the percentage of children and teenagers who struggle with learning due to external conditions, the total number of disadvantaged young people is probably more than half of the total number of young people on earth.

Learning Different Things

Some things, everybody ought to know: floods are dangerous. Fire is, too. Some things many people ought to know: once girls reach a certain age, they should know interaction with a boy could result in pregnancy and a new baby. Some things, some people need to know: there are 23 provinces in China, with interesting questions to explore about Tibet's status (it's a province), and Hong Kong (it's not).[75] Other things, a small number of people need or want to know in detail: periods and epochs of the Mesozoic Era, and what happened during the Cretaceous, Jurassic, and Triassic periods.

It's easy to find out about China's provinces[76] and the Geological time scale[77] with an internet search – if you have access. For many ideas, it's sufficient to know how to find the answer, or know someone who can – and little compelling need to learn or commit anything to memory.

With more information becoming available, learning must become a more selective process (memory, even moreso); the question is, who chooses? Social media algorithms, state boards

of education, parents, culture warriors? This is the battle over standards and curriculum, Perhaps incoming information could be evaluated and categorized, more or less as follows:

- Ideas Everybody Must Know
- Ideas Most People Should Know
- Ideas Many People Should Know
- Ideas Some People Should Know
- Ideas a Small Number of People Should Know

In contemporary schooling the entire system is focused around ideas everyone must know. Thousands of standards are stuffed into curriculum, delivered through instruction regulated by pacing guides, and evaluated in the most reductive form through mass testing, with success encoded in terms of the percentage of these ideas that can be reproduced correctly.

Taiwan is one of 23 provinces in China, but "it is not administered or controlled by the PRC, and is thus a *de facto* independent country."[78] A second fact – that "Taiwan dominates the global production of computer chips" – connects a new idea, "A Chinese takeover in Taiwan could give Beijing some control over one of the world's most important industries."[79] The facts aren't fascinating, but a subsequent discussion growing out of these facts might be. The result: a shift in position from Some People Should Know to Many People Should Know. Of course, many children and teenagers won't know much about the situation from the start – but storytelling is one way to elevate ideas so they capture the imagination of more students.

Learning in School

More than a century ago, in many parts of the world, it became clear that most people ought to learn to read, master numbers, and develop certain scholastic skills and capabilities. Large numbers of public schools were organized to disseminate a very thin slice of human knowledge to very large numbers of people. School turned out to be a brilliant idea! Education has been, and remains, a major factor in human progress and economic development, and a human right, as articulated as the UN Sustainable Development Goal #4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all…"[80]

> The World Bank adds, "Education is… a powerful driver of development, and one of the strongest instruments for reducing poverty and improving health, gender equality, peace, and stability. It delivers large, consistent returns in terms of income, and is the most important factor to ensure equity and inclusion. For individuals, education promotes employment, earnings, health, and poverty reduction. Globally, there is a 9 percent increase in hourly earnings for every extra year of schooling. For societies, it drives long-term economic growth, spurs innovation, strengthens institutions, and fosters social cohesion."[81]

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Learning, school and education are not synonyms. Learning continues to be robust, but school has lost traction, and education, as a system, struggles to provide the relevant knowledge, skills, capabilities and support required for life in the 21st century.

"I want to be a cosmologist. My father watches a lot of science [documentaries], so I know Stephen Hawking. Cosmologists basically study the creation of the world, the creation of the universe, and space. [As] we look by satellites, telescopes, we get to know more things. The Big Bang is something that I was really interested in. It was an explosion that created the universe. There was no space, no time, no gravity, nothing. When it burst, everything was created. There was nothing outside of the big bang [including the molecules in my body]. There is no size of the universe. It is unlimited. There is no time [either]. I would like to be discovering new things."

—Dhruvika, 11,Gurugram, Harayana, India [Kids on Earth interview]

Although Dhruvika spends lots of hours thinking about space, time and cosmology, she doesn't do much of it in school. As with other students her age, Dhruvika learns core subjects and minor ones, too. She is being trained to be a generalist, but she wants to become a specialist. Mostly, learning in primary and secondary school is not designed for specialists.

Adults decide what Dhruvika should learn at school. As it happens, Dhruvika attends a top-tier private school, but her ability to learn what she deems important is not the guiding factor in her education.

"I love space. I want to know more about space. I want to go to space. If possible that I want to be an astronaut. I want to find more life. I want to explore more planets. I want to find more life. Other than earth, which planets have life? People say that with all of the pollution, earth has to end someday because of the damage that we are creating. If we have to evacuate, where else can we go and live? Where can we start a new life? I don't know about other people, but I care!! I want to know answers to these questions. We have to find another planet so we can start a new life there!"

— Trisha, 12, Gurugram, Haryana, India [Kids on Earth interview]

How much time and attention should Trisha devote to her own exploration of space? Should she do this on her own, or spend more hours in school learning about space? Might her interest cause other students to spend more of their school hours learning about space, perhaps instead of something else on the curriculum? If students are allowed to learn based upon their interests, the current role of school in learning must change.

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Deciding What Most People Ought to Know

In 2015, Connecticut revised its Social Studies framework for primary and secondary students. This is common practice in U.S. states and in many countries. Frameworks are blueprints for curriculum standards that become the basis for teachers' lesson plans and the testing that follows. Connecticut's K-12 Social Studies framework document is 145 pages long. The framework includes a thousand-plus big ideas, such as:

- "What causes regions of the country to interpret laws differently?"
- "How did indigenous peoples view the ownership of land?
- "How did that view differ from the colonists?"
- "Why was there a lack of democracy in the Middle East prior to the Arab Spring?[82]

Each question could generate a lively discussion with plenty of diverse opinions. Apparently, this was the intention of the 40 members of Connecticut's clearly competent and dedicated Social Studies Frameworks Writing and Reviewing Team, including Stephen Armstrong of the Connecticut State Department of Education, John Tully of Central Connecticut State University, and Vanessa Diaz-Valencia of Hartford Public Schools and "the many social studies educators who helped to review and approve this document"[83] These decision makers are mentioned by name for a reason: they are not shadowy figures. Instead, they are real people who live and work in Connecticut, interact with real children, teenagers, teachers and parents and care about what is taught in their schools.

Connecticut's Social Studies framework is quite modern. It doesn't advocate memorization of long lists of names, dates and places. Instead, it encourages deep thinking about big issues. Similar frameworks guide Mathematics, Science, Language Arts, and other subjects. Together, these frameworks outline nearly 10,000 ideas every student in Connecticut should know. Frameworks, curriculum and school emphasize breadth of information.

Efficiency & Effectiveness

> "When I'm in school, bells which tell us the end of the class…I don't think that's a very good way to organize learning. If someone stops you when you are in the middle of writing something or researching, you don't really fully understand what you were doing. You don't get the full information. That's not good. When I am coding something, I would be in the middle of… making something work. The bell interrupting me, would basically stop my mind there and tell me to stop, so next time I would not be as clear on what I was working on."
>
> —Shraynash, 12, Gurugram, Harayana, India [Kids on Earth interview]

Chapter 2: Learning

10,059 words

Education is managed as an assembly line because more than a billion people must get through the system by their 18th birthday (more or less). With so much material to cover, operational efficiency is critically important.

> "The reason I didn't study hard was simple. It was boring. I just wasn't interested. There were so many other things in life more fun than studying for school. Reading books ['there are tons of books that are more interesting than any textbook'], listening to music, going to the movies, playing baseball, playing around with cats… compared to those, school was a total bore… Not that I felt like I was sloughing off… because deep down, I knew that reading lots of books, listening intently to music… was a personal form of study that had real significance, a significance far greater than studying for any tests for school… I was aware of being defiantly anti-schoolwork. Of course, if the schoolwork involved a topic that interested me, I would study it on my own initiative."[84]
>
> — Haruki Murakami, Author
> Attended primary and secondary school in Tokyo, Japan, roughly 1954-1966
> His 30+ books have been translated into 50+ languages.

END OF CHAPTER 2

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Chapter 3:
Old School

10,530 words

> "I feel the school system is based on ideas that are 100 years old… My parents are educated, so they can pass the knowledge they have to me… Just talking to people, just being observant, questioning, being curious, I think that's [how I gained] all of this knowledge about my own country. School teaches us the history and the dates, who's who in Apartheid… but I think we need… a more hands-on approach in education. Just coming on a hike in Tsitsikamma National Park, I learn so much about the vegetation around the me, I can see effects of [2018's] drought…"
>
> — Almaaz, 15, Johannesburg, South Africa [Kids on Earth interview]

Like all children and teenagers, Almaaz learns in many different ways. Old School is just one way to learn. Old School is a rigid system rooted in three core ideas: (1) everyone learns the same things; (2) adults determine what those things should be; (3) the best way to determine whether students are learning those things is through testing and analysis of test results.

> "It has become clear everywhere that the schools we have today will not be able to provide opportunities to learn what is necessary in the future… Indeed, education systems are facing twin challenges: how to change school so students may learn new types of knowledge and skills in an unpredictably changing world, and how to make that new learning possible for all young people regardless of their socioeconomic conditions."
>
> — Pasi Sahlberg, *Finnish Lessons*[1]

Social Justice

If every student is unique, but Old School is based upon standardized curriculum and practices, there is a disconnect. The bottom-up needs of the individual are in conflict with the top-down dictates about what everybody ought to know. "Everybody" is a dangerous term because it endorses commonality and dismisses diversity.

Matching standardized curriculum to serve each growing child and teenagers' needs, wants, and plans is nearly impossible. And yet, far behind the front lines, a dizzying combination of adults interpret, promote and politicize largely irrelevant test results to advance agendas that do little to correct misalignment. They include legislators, bureaucrats, curriculum and assessment companies, advocates, even real estate agents (because high test scores increase local home prices!). In theory, a government framework could be the foundation of social justice in school and learning. In practice, the well-intentioned common denominator approach and standards-based reforms create stunning inequities.[2]

Accommodations and the best of intentions provide small scale fixes, but the difference between equality, equity and justice are striking — and impossible to eradicate in Old School. See illustration below.[3]

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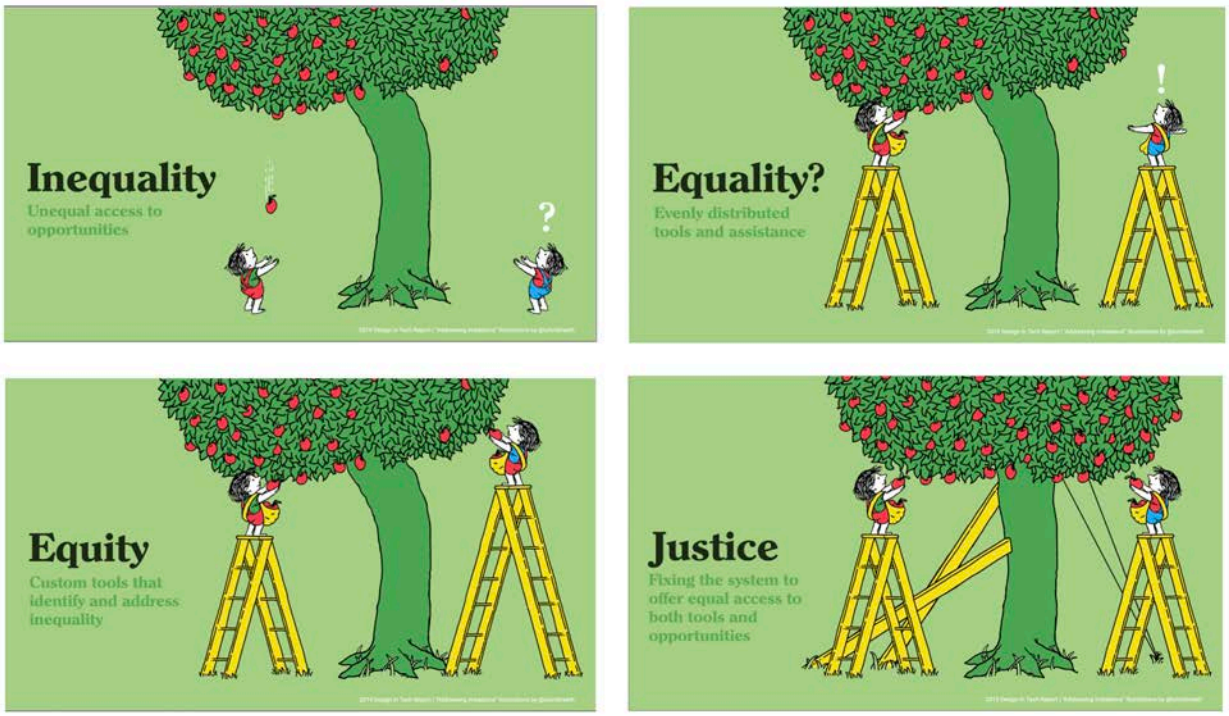

"The mission of the North Carolina State Board of Education is to use its constitutional authority to guard and maintain the right of a sound, basic education for every child in North Carolina Public Schools,"[4] The 2021 edition of the *Quick Reference Guide for the North Carolina Standard Course of Study for Grade K* runs 50+ pages and sets priorities for every 5-year old. Should every North Carolina kindergartener learn the same things? Is a 5-year old girl in low-income rural Duplin County[5] curious about the same things as a 5-year old girl in high-income urban/suburban Durham County?[6] At what age does a child become an individual with a distinct sense of their own curiosity, likes and dislikes, personal interests and ideas for their own future? Does standardized curriculum support what each child needs or what society wants?

5-Day Subjects

Time is money, so the amount of time devoted to each Old School subject is a reasonable proxy for the financial investment in each one. Each subject occupies a relatively constant number of hours, a portion of the overall schedule. Each subject also offers useful knowledge and skills, and potential future use of those assets in an evolving marketplace. For example, Mathematics offers a great deal of detailed information about processes, presumably because familiarity and facility with those processes is valuable. Each Old School subject delivers a unique value proposition that routinely affected by societal and cultural change, marketplace needs, and new ideas. The need for students who know a lot about any particular subject, or area of study, changes over time. Often, it is difficult for Old School to assess the value of what is being taught and learned in each individual subject.

There is no widely-accepted tool for this assessment. Adults argue, but not much changes – other than adding more curriculum, more information to navigate and memorize, and more to test. Dominant subjects – Mathematics, Science, Social Studies, and Language Arts – continue to fill school days, immune to questions about relevance, utility, time allocation, and effectiveness. Discussion and assessment are overdue.

Mathematics

Mathematics is taught about 40 minutes a day, 5 days each week, 180 days a year, for a dozen years. It seems to be one of the most-taught subjects in Old School.

Before young children begin kindergarten, most learn numbers, arithmetic, and some geometry from parents, siblings, friends, and through exploration and play. Learning is informal, practical, and often, fun. Then, in school, learning Mathematics becomes formal, far more theoretical, and fun only for some students. In Australia,[7] Year 3 students "recognise, model, represent and order numbers to at least 10 000… represent money values… count the change…" Year 6 students "identify and describe properties of prime, composite, square and triangular numbers… solve problems involving the addition and subtraction of fractions with the same or related denominators… and investigate combinations of translations, reflections and rotations with and without the use of digital technologies." Year 9 students apply index laws to numerical expressions with integer indices and and graph simple non-linear relations with and without the use of digital technologies, and calculate the surface area and volume of cylinders… and deal with categorical variables…"[8]

By Year 6, students face esoterica beyond "everybody should know," but Mathematics curriculum continues unchallenged for 6 more years. The popular defense: Mathematics is a holistic system of increasing complexity resulting in advanced knowledge that can elevate student skills, capacity, versatility and self-confidence. Undoubtedly, this is true for some people, but not for most students who can easily find more productive uses for time in Old School that Mathematics currently owns and controls. Similarly, some adults argue advanced Mathematics education increases likelihood of academic success (in certain disciplines), but the same argument can be made for most learning pursuits.

No reasonable person would argue against Mathematics in schools. The question is how much and what type of Mathematics education is necessary and useful. There is no single answer because every student's path is unique. Most students will never require Mathematics knowledge or skills beyond those taught in primary school. For students who pursue STEM careers, additional coursework and training are available in school and from many other sources. To a far greater extent than other subjects, Mathematics benefits from digital tools: calculators, spreadsheets, search engines (with instant calculation results), and AI.

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In some schools, Mathematics includes coding, robotics, data science, economics, probability, game design, statistics, and trend analysis. Perhaps these additions justify the large number of hours devoted to Mathematics, but these hours could be better deployed, by some and perhaps many students, in pursuit of other types of learning.

In the U.S., with its full-time workforce of about 165 million people (half the population), about 3 million people work in fields related to Mathematics — more than a million are engineers. There are 1.5 million accountants and auditors, but AI will eliminate many of those jobs. Other roles employ far fewer people: data scientists, operational research analysts, statisticians and insurance actuaries, for example, with about 275,000 jobs.[9] On its own, Mathematics is not a growing field. Computer Science is growing, but the role of secondary school Mathematics in that field is limited.

Science

Old School's conception of Science evolved when life was simpler, when there was no internet. Now, there are so many branches of science — some well-known because of movies, popular culture, pandemics, and media. Children and teenagers are now aware of a very wide range of scientific pursuits, and possible career paths. Why not oceanography, systems theory, electrical engineering, anthropology, climatology, mycology (fungi), biodiversity, therapeutic robotics, or 3D organ engineering?

Most schools cannot support oceanography, or mycology because there are no teachers trained to teach that material, and too few students in any given school to establish a speciality. Still, the limitations of Old School should not become the limitations of students' learning. School is only one of many ways to learn; Old School's structure is limiting, but Old School is not the only way to do school.

Old School packages a very small slice of science, often laden with facts to memorize, not horizons to explore. It usually fails to address unknowns — the basis of scientific exploration and discovery. Even fascinating information is boring and difficult to remember: "At standard temperature and pressure, two atoms of [Nitrogen] bond to form N_2, a colorless and odorless diatomic gas. N_2 forms about 78% of Earth's atmosphere, making it the most abundant uncombined element in air."[10]

Standardized Old School curriculum cannot present the enormous range of current scientific knowledge, so it provides a survey of general information. That's not the way scientists think or explore. Instead, the fun begins with deep exploration of specific ideas. One student may be fascinated by the symbiotic relationship between coral and algae. Another may wonder about the varied colors of coral. Another, the role of climate change, toxicity and bleaching. Another: biodiversity. Another: the crown-of-thorns starfish that eats, and destroys, coral.[11] There are so many ideas to explore, but not every student is intrigued by every idea. Of

course, an engaged and enthusiastic student is likely to get other students involved – a far more organic way to learn, and care about what happens in school.

Student interests converge and diverge, and reconnect in fascinating ways. Old School is not set up to handle this diversity, and the ebb and flow of evolving student interests. Managing a biology lab with 20 different students dissecting 20 different animals and asking a dozen questions about each of them is nearly impossible. Unless – the teacher pivots from the person-who-knows-all to the person-who-guides students to learn, set up, do the research, handle the dissection, create the video (or write the report, or draw the diagram), clean up, and dispose of carcasses on their own. Or, everybody can learn the same things in the same ways, whether they care about what's inside a dead frog or not.

Most people who become interested in science don't become professional scientists. Instead, they cultivate their own scientific literacy based upon practical interests. Most amateur bakers (including serious and casual viewers of *The Great British Bake-Off*) are familiar with food science. Not only can they explain the role of gluten development in the making of specific breads, they can explain why gluten is not usually a factor when baking a cake. As a result of YouTube cooking videos, many amateurs know to smash or mince garlic to release *alicin,* a poison to most living things and a tasty delight for humans.[12]

Students are very interested in science, less so in learning everything that a science curriculum insists they must be taught, they must memorize, they must remember for the upcoming test. The current approach is a buzz-kill because there is just too much information, and not enough relevant to the student's individual interests or experience. It's exciting to visit dinosaurs in a museum, look through a telescope, or talk in a silly voice after breathing-in helium. Parents and kids bond through shared discovery. People enjoy watching nature documentaries and observing microscopic worlds. BBC Earth is popular because science is so well-suited to visual storytelling. Students, and the world, benefit from a lifelong interest in science – school's job is to amplify that interest.

"Me, loving science, I think I'm going to be a veterinarian because you have to know animal biology, anatomy of a dog, basically, a cat, or any animal. Social Studies? I don't really lean into that. How I become a veterinarian is, I go to high school for 4 years, go to a college somewhere, do 4 years of that, go to Virginia, they have a veterinarian place down there, watch what she does, observe, and it should let me become a veterinarian. The pets I have around are a dachshund – his name is Julio – we had a firefighter [a Dalmatian], he was skinny, it almost made me want to cry. Then we got another dog. His name is Smokey. He's a mixed breed between a long-haired dachshund and a rat terrier. He's fuzzy and playful. Then, we've got a chihuahua named Oreo. He's old and grumpy. He's got cataracts in his eyes and a big bubble on his chin. Just makes me want to get through veterinary school faster

> and help him. You know he's gotta be hurting. I thought about treating wild animals at one point, maybe going to Africa because I've always wanted to travel around the world, and see different cultures, how they speak and stuff. So, I'd like to do that, too."
>
> — Cruiser, 13, Neon, Kentucky [Kids on Earth interview]

By far, the largest number of U.S. jobs related to science are nurses (3.5 million), followed by doctors (about a million). Neither requires a broad-based survey of scientific knowledge; instead, they require extensive training in medical science, biology, and human behavior. About a half-million people work as scientists in many different specialities and sub-specialties (zoologists, microbiologists, epidemiologists) and as technicians and other support personnel. There are agricultural scientists, environmental scientists, materials scientists, food scientists — it's a very long list of distinct fields, many quite small.

Social Studies

Originally focused on history, geography, and civics/government, Social Studies now covers more territory: human rights, social justice, economics, media literacy, popular culture, sociology, culture, immigration, and their intersections. Increased scope is one of Old School Social Studies' many issues. Social Studies is hobbled by "accountability systems [that place] social studies conspicuously lower in the hierarchy of academic achievement, [than] math, literacy, and science…"[13] And, "research consistently demonstrates that social studies receives the least amount of instructional time in the elementary grades when compared to the amount of time afforded to other core content areas."[14]

Students are interested in varied perspectives. They are the first generation of globally-connected citizens. Often, they know more about specific topics than their teachers do — and teachers cannot be expected to keep up with each individual student's interests in specific parts of the world.

Social Studies is affected by misinformation, cultural differences, politics, and parents who may object to a teacher's handling of a particular issue. For example, teaching students about Ukraine is the story of nearly 35,000 years of human history. In the past, portions of Ukraine have been ruled by Mongols, Lithuania, Poland and Russia, and its western region has been divided and made part of Poland, Romania and Czechoslovakia.[15] In modern times, Russia has been trying to regain its control over Ukraine. Since February, 2022, more than 8 million Ukrainians have been displaced within the country, and more than 8 million more have left Ukraine, producing Europe's largest humanitarian crisis since World War II. More than 3 million Ukrainian refugees live in Poland; Russia has launched missiles from Belarus aimed at Ukraine; arms and ammunition have been supplied to Russia by Bulgaria. Moldova has a half-million Ukrainian refugees, and it's concerned about its relationship with Russia. Responses from large nations are not unified; U.S. responses differ from China, Brazil and India. Other issues include German reliance on Russian oil; Finland's NATO membership; etc.[16]

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10,530 words

Children and teenagers are quick to point out that Ukraine is more than the history of its wars. It's family and social gatherings like *Vechornytsi* – parties that originally celebrated the end of summer farming season.[17] It's *kutia* – a Christmas goodie with cooked wheat groats, poppy seeds and honey. It's *pysanky* eggs decorated at Easter time. It's *kolabasa*, and *borscht* with *smetana*, *pierogi*, and *salo*. Weaving, lace-making, wedding traditions, the football rivalry between FC Dynamo Kyiv and FC Shakhtar Donetsk, and the iconic embroidery on the *vyshyvanka,* and Sunday services in a Ukrainian Orthodox Church.[18] It's the long history of Ukrainian resilience, regardless of foreign domination. Mostly, it's love of family, friends, pride, stories – difficult to express (beyond a single assignment) in a prescribed Social Studies framework. Every nation, every culture, every family has enough stories (and more than enough beliefs) to build their own Social Studies curriculum. Each student comes to school with their own priorities. With 21st century prioritization of diversity and mutual respect, Social Studies in its present form is difficult to teach and learn.

> "I will tell you about the Triple Alliance. It was a big war against Paraguay. It was Argentina [and Brazil and Uruguay] against us. We lost a lot of territory. We lost, in the fight, a lot of men, they died. It was a difficult time for Paraguay. Some women died. After the war, there were more women [alive in Paraguay] than men. This happened in 1870. After that, the women had to rebuild the whole country. It was very tragic for us. We were wealthy before. And the country was [much] bigger. We lost, mostly, everything."[19]
>
> – Kiara, 14, Areguá, Paraguay [Kids on Earth interview]

Usually, soup is soup, but soup can be a useful introduction to the people and customs of far away places. Greenland's national dish is *suaasat*, soup made from seal meat. Soups are pretty interesting. Why not a curriculum about soup (and soupy stews)? Ukraine's *borscht*, Greenland's *Suaasat,* Spain's G*azpacho*, Brazil's *Feijoada*, Japan's *Nabeyaki Udon*, Malaysia's *Penang Laksa,* Morocco's *Harira*, Thailand's *Tom Yum*?[20] One entry point to Greek studies is *Avgolemono,* which students can make themselves, and taste if a local family cooks enough for everyone, or if there's a Greek restaurant nearby.

Oops – the list omitted *Mansoor Dal* and West African *Egusi,*[21] and thousands of other soups. A formal Social Studies curriculum cannot cover everything, so it offers a weak representative sample – Britain's Parliament and Japan's National Diet become placeholders for legislatures all over the world. It's impossible to cover every Chinese dynasty, or African empire, so the Han and the Songhai must suffice – regardless of individual students' curiosity. The present system does not allow a student to study, for example, the major empires of Africa because they must study the British, Ottoman, Mongol, and Russian empires, as well as the dates of most major wars and the history of the Middle Ages.

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Everything begins to feel arbitrary – people outside the classroom making decisions about which history matters. Nearly every story must be modulated because the historical truth can be harsh, deeply divisive, soul-crushing in its negativity. Is it wise for children and teenagers to learn the truth about their own country's past? The history of the U.S., Germany, Japan, Italy, Belgium, France, England, Turkey and many other nations include horrors. Educating children is part of healing. Some or all children? Those whose families include terrorists or murderers, passive people who allowed devastation? Overall, the human story is relentless domination of men, and exclusion of others. What should everybody learn about this?

> "[In the U.S.], in order to get elected to the House [of Representatives], it requires an absolutely ridiculous sum and money and access to capital that most people do not have…the representation of working-class people in Congress is extremely low. Women still only constitute 27 percent of our Congress. People of color, Latinas – there have only been, I don't know, two or three dozen Latinas who have been elected in [U.S.] history."[22]
>
> – U.S. Congresswoman Alexandria Ocasio-Cortez

The current system, based upon curriculum-by-committee, often fails to tell students what they might want to know. Another example:

> "As of 1 January 2023, there are 31 countries where 34 women serve as Heads of State and/or Government. At the current rate, gender equality in the highest positions of power will not be reached for another 130 years."[23]
>
> – UN Women, the United Nations entity dedicated to gender equality and the empowerment of women.

In theory, students learn curriculum-based Social Studies to become responsible citizens. In practice, this strategy has failed. Evidence: many self-destructive decisions on the basis of beliefs, not knowledge, good reason or common sense. Many, many examples include Brexit; widespread prejudice, income inequality, the U.S. taxation of Social Security benefits; many and perhaps most wars; laws restricting voting rights; choosing leaders who harm their people (often claiming to do otherwise); unfathomable immigration policies; lousy access to health care and other services, poverty and homelessness, not voting in elections, more.

If the argument for extensive mass Social Studies education is employment, students will find a few careers directly related to Social Studies. In the U.S., less than 1/10 of one percent workers are employed as as journalists (47,000; declining), economists (about 17,000), anthropologists and archeologists (7,500), historians (3,300), sociologists (3,000), or geographers (1,600). At about 150,000, the largest number of people working in careers related to Social Studies may be… Social Studies teachers![24]

Language Arts

Language Arts presents a different set of issues. Given appropriate resources, young children learn to read and write usually in just one language. However, it is now difficult to provide a common curriculum in literature and media to serve more than a billion individual students whose identity is based upon confidence in their own ideas. Current curriculum concentrates on reading and writing, which remains useful, but children and teenagers also communicate, process and share ideas in many other ways.

Listening

Language skills begin with listening, which provides a path to knowledge acquisition in each child's home language. Sounds are imitated and become speech. Listening combines aural perception with interpretation, attention, sensitivity to sounds, selectivity (attending to sounds that matter, blocking sounds that don't), decoding and processing signals, and connecting input to ideas stored in several areas of the brain. Each child develops their own vocabulary by connecting sounds to meaning, creating fascinating of errors and misunderstandings on the way to building an idiosyncratic intellectual and emotional map. Always listening, each child and teenager's pace, observations, interpretation and desire to respond is unique.

Listening is also a social skill. Attentive listening and demonstration of interest suggest compassion and personal connection. Being a good listener may come naturally, but most people benefit from listening instruction and practice. When children do not learn how to listen effectively, they miss verbal and nonverbal cues. Effective listening collects information from context, facial expression, eye movement, and body language. Poor listeners may not paraphrase, recap to confirm understanding, or provide appropriate, timely feedback. They may fail to convey the need for additional information. They may signal disinterest or disagreement. Listening is closely aligned with hearing, perception and processing, and with behavior — as in "you are not hearing me."

Listening occupies far less time in the K-12 Language Arts curriculum than reading or writing.

Speaking

> "Young children typically gain several new words a day, acquiring vocabulary at an 'astonishing rate'.[25] Yet by the time they start school, some children will have heard millions more words than others. The number of words a child has heard and can speak by the age of three is a predictor of later language development, so these early vocabulary gains are critically important."[26]
>
> — *The Reading Framework*, U.K. Department of Education

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After a year of making sounds not easily recognized as words, most humans begin to express themselves and speak clearly. "Children vary in their development of speech and language skills. However, they follow a natural progression or timetable for mastering the skills of language."[27] By age 1-2, most children can put together short statements and questions ("Where cookie?"). By 2-3, they can point to objects and identify them for others by name, often in short sentences ("I want juice!"). By 3-4, sentences contain more words, descriptions are more complete ("I fell down and hurt my knee"). By 4-5, the child may be a competent storyteller.[28] Every child develops at a different pace, with varying skill, interest, vocabulary, vivacity, etc. Caring adults and stimulation enhance the process, offering subsequent benefits in language skills and other competencies. Most of this takes place before primary school.

Old School does not concentrate resources or instructional time on oral language or listening. Instead, it focuses on reading and writing. This is unfortunate because speaking and listening are more common, more useful, and essential for effective human interaction.

Writing

It is not possible to read something that has not been written. Writing is an extension of speaking – but it involves symbols and rules unique to each individual culture. There are thousands of languages on earth. Every written language must be taught and learned. Writing must be practiced, corrected and internalized. It's helpful to learn to write and read in a single step, but Language Arts tends to devote far more time to reading than writing, and this is probably the wrong decision because the process of writing develops individual skills in clear thinking and effective presentation of ideas that reading often does not.

Unfortunately, writing can be tedious. It requires deep concentration, few distractions, some inspiration, and sufficient time to draft not only a first draft, but second, third and preferably fourth drafts, too. Professional writers often struggle to get started, toss early attempts, and follow an uneven path from first draft to completion. The written piece, and the writer, often benefit from feedback, but feedback is not easy to accept or process – especially in school because available time is fixed, and because of social and emotional issues.

> "First drafts are slow and develop clumsily because every sentence affects not only those before it but also those that follow."[29]
> "Regardless of the writing project or its length, drafts 2, 3, and 4 take about as much time as [the] first draft."
>
> – John McPhee, Pulitzer Prize winner;
> Author (34 books) and prolific *New Yorker* essayist;
> McPhee has taught writing at Princeton University since 1975.

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It is difficult for most people to find the solitude to write. A quiet place, appropriate tools (pen, pencil, paper, writing surface) may not be at hand. Devices must be charged, connected, and deployed without distraction from social media and other applications. The space must feel free from judgement. A school classroom is not always the best place to write, but home may not be ideal, either. If writing is a valuable skill, facilities must be available for students to fully participate.

Reading

Technology and human behavior continue to evolve, but reading remains important for a variety of reasons, discussed below. Currently, reading operates at a disadvantage because it employs long passages of words and letters in a single language on paper, and cannot be quickly or easily translated. Other forms of communication and media are more pliable, including e-books, a bridging technology.

Humans do not simply learn to read; we learn to decipher symbols, words, sentence structure, syntax, grammar, word order, and meaning. Without structured instruction and reinforcement, these symbols are impossible to decode:

私は公園で犬を散歩させた。
Я вигулював свою собаку в парку.
مشيت كلبي في الحديقة.
I walked my dog in the park.[30]

Learning to read begins before kindergarten. New readers benefit from consistently successful techniques for reading and writing instruction. Students who learn from a phonics-based curriculum, acquire and practice useful skills in through *morphology* (internal structure of words), *phonology* (sound of words), *accidence* (inflection of words), and *semantics* (meaning and interpretation of words). They develop a larger vocabulary, and improve their spelling, too. Learning to read cannot be absorbed through observation or through the likes of balanced learning / whole life reading. Instead, learning to read requires the child to "understand the relationships between sounds and letters, with daily lessons that build on each other in a systematic order. Plenty of evidence shows that children who receive systematic phonics instruction learn to read better and more rapidly than kids who don't."[31]

The impact of parents reading with their children is considerable. More exposure to reading, at any age, improves proficiency, which encourages more reading. In primary school, there are two clear objectives: (1) make sure all students acquire and practice reading skills, and (2) cultivate their interest in reading. Many children's books are funny, or fun, to increase comfort with reading, through stories and intriguing ideas.

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Given 21st century students' exposure to media from many countries and cultures, most children know reading books is a way to learn about the world. Every student develops personal favorites, and a vague list of interesting ideas and places to visit.

"I didn't like to read until, like, 7th grade, but then my younger sister, told me about the Harry Potter series of books. I already watched the movie. I loved the movie so I wanted to read the book. I think, then, I love to read, and I read a lot. My favorite author is Cassandra Clare. She wrote *Shadow Hunters*. My favorite book is *Vampire Academy*. It's about a vampire girl who has to save her boyfriend. The books I read came from other countries. I read their translatements [translations]."

– Marija Lara, 15, Ljubljana, Slovenia [Kids on Earth interview]

"I'm reading *Diary of a Wimpy Kid*, and some *Beast Quest* books."

– Giyan, 8, Manchester, England [Kids on Earth interview]

In primary school, students are encouraged to read books that interest them. "Teachers should provide books likely to give the most pleasure, so that all pupils feel encouraged to put in the reading miles before they read more challenging books independently: sets of short, popular easy-read page-turners, hi-lo books,[32] joke books, irreverent books – anything that helps to establish the reading habit."[33]

> "Extensive international research shows that being a frequent reader is associated with a range of academic, social and emotional benefits. Far more than pleasure is at stake. Multiple studies suggest that enjoyment is associated with higher reading performance. The recent 2021 PIRLS data for England showed that the pupils who said they liked reading the most scored, on average, 34 points more than those who said they did not like reading.[34] In effect, pupils who are reading regularly for enjoyment give themselves unofficial reading lessons, supporting their reading comprehension."[35],[36]
>
> "Further, pupils who read regularly report heightened levels of social and emotional wellbeing.[37] For many, reading is a form of relaxation, a place to escape everyday challenges, a source of entertainment. Reading allows readers to adopt new perspectives, develop empathy and become more socially conscious."[38]
>
> – *The Reading Framework*, July 2023, U.K. Government Department of Education

Reading requires more effort than speaking. If a book is interesting, a student may read the whole thing, but most written material is scanned, browsed, or read in part. . We scan, browse, skim, read parts of stories. Few adults read 150,000 words in *The New York Times* daily print

edition – the equivalent of 2 or 3 books. Everyone who reads is selective, but our school systems fail to teach a large proportion of students how to read; at least a third of the world's 4th grade students are not literate.[39]

"We're thinking about teaching reading wrong… we're not following the science… we're not recognizing how much kids need conversations around books – talking about ideas, not just words on the page."[40]

– Rebecca Rolland Ed.D., author, *The Art of Talking with Children*
Writing in *Psychology Today*

Contemporary research links reading proficiency to many other benefits. "Reading benefits society, too, both economically and socially. Although estimates of the cost of low levels of literacy vary and the methods are often opaque, the costs to the UK are estimated to be very high…[41] In social terms, better reading might enhance opportunities for individuals to become more engaged politically, increase their tolerance and involve them in their communities more effectively.[42]

"*Invisible Man* by Ralph Ellison! I read in the sixth grade and it gave me the appetite to write. I loved what he was speaking up for and saying. It really impacted me as a young Black boy to want to be seen, heard and recognized. His book made me feel seen and heard… It made me learn that through the music and art I do I can return the favor, and make people feel seen and heard…"[43]

– Common, rapper, actor, author, activist

Reading carries more than its share of magic. Students want to know how to read and write to communicate via social media. Many students love reading as a richly personal experience. Reading is the most successful version of large-scale Personal Education devised so far. It's a quiet activity that engages curiosity and imagination – but listening to someone reading aloud is also special. Each student chooses books based upon their own interests, but most stay close to the pack. *Dragons Love Tacos* has been on *The New York Times* best seller list for 420+ weeks because kids tend to buy and read the same books.[44] Through adolescence, students expand their range, but remain loyal to books and topics their same-age friends are reading. Recent examples include *I Am Not Your Perfect Mexican Daughter*, *Laughing at My Nightmare* (about disability), and *What Made Maddy Run: The Secret Struggles and Tragic Death of an All-American Teen*.[45])

Media

If reading is so wonderful, why bother with other media? It's not an either-or argument – except in Old School. If the time devoted for Language Arts is about 40 minutes per school

day x 180 school days per year x 12 years, or 1,440 classroom instructional hours in all, how many hours should be allocated to listening, speaking, writing, reading, and other forms of media? How much additional work should children and teenagers do at home? How much time should be devoted to consuming and studying sounds, images and interactive media?

And how much time should be devoted to making media – which is often more time-consuming than, say, writing? Some stories can be told simply, but more complicated stories – fiction or nonfiction – require preparation and technical skills. A script, with multiple revisions, is essential, along with site visits, props, costumes – and all of this must be planned, produced and assembled. Budgets, access to materials and people, weather, transportation, group dynamics, clear goals, defanging conflict, and endless problem-solving affect every significant creative decision. Making media requires a lot of time and effort.

When students make media, they learn about subject matter and they learn about making media. They consider the interests of their intended audience. Quickly, they realize that school is not the best place to produce video. Production requires greater control and more flexibility than most schools can provide. The outside world, including home and community, is usually better. Logistics, opening and closing times, control over shooting locations are tricky, and require lots of time, local cooperation, and relationship management. Many communities support a formal or informal media making group, which is useful for students who want to learn from others, borrow equipment, and perhaps develop their own team for future work. This is possible in Old School, but other priorities conflict.

Even a podcast – which seems relatively easy to make – requires research, formatting, choice of voices, scripting, choice and editing of music, recording technology, audio editing, packaging and a means of distribution. Students require sufficient time to go through all of the steps – and make corrections when things do not work out. Graphic novels are simpler, but they require much more work from the artist(s), who must spend many hours to draw everything (either on computer or by hand). Each medium is its own speciality – and some do lead to employment. How much of the available work will be done by AI is an open question. Should students learn to make media in school just as they learn to write? The answer is yes – but only for some students. Others will choose to learn, study, pursue something else. There is no common denominator.

"Specials" - 1-2 Day Subjects

The word *school* traces back to Greek *scholē*, and a surprising meaning – *leisure*. In Greek culture, leisure allowed a time thinking and finding out. "Hence, leisure's connection to pursuit of knowledge… eventually to a place of learning."[46]

Today, people of all ages choose to spend their time learning about Foreign Languages, Computers / Technology, Art, Music, and Health / Physical Education, and in a Library To a

limited extent, Old School incorporates these pursuits as secondary to the 5-Day subjects. They are undervalued.

Foreign Languages

About 1 in 12 of people in the U.S. speak Spanish today. By 2050, 1 in 4 will speak Spanish.[47]

In the U.S. state of New Mexico, 1 in 2 people speak Spanish today. Should everyone in New Mexico learn to speak Spanish? How about everyone in the U.S.? About 1 in 30 people in New Mexico speak a Navajo language; some speak Zuni, Tiwa, or Tewa.[48]

Should demographics determine which languages are learned in school? If the answer is yes, what about children and teenagers who speak other languages?

"…the goal is not just being bilingual. It's about being able to read, write, dream and weave in more than one language. The U.S. eliminated hundreds of heritage languages through Colonialism. As a school focused on environmental sustainability, we learn biodiversity is health, it is wellness. We're teaching students that learning two languages is about that same health, that biodiversity. ."[49]

– Dahlia Aguilar
Founding Principal and Chief School Officer,
Mundo Verde, Washington, D.C.

Exposure to a broad range of cultures and their languages sparks curiosity, but the opposite is also true. No coursework in Javanese or Turkish means little learning and discussion about Indonesia or Turkey. Regardless of their contribution to culture or history, most countries are never almost never mentioned in Old School!

In the U.S., only about 1 in 5 students opts for foreign language classes.[50] About 70 percent of schools offer Spanish-language instruction, followed by French (about 12 percent) and German (3 percent). Other languages – such as Arabic, ASL, Chinese, Japanese, and Russian – are offered by a very small number of schools.[51]

Is it wise for schools to offer, and students to become familiar with many different languages – or concentrate on just one or two? Is it valuable for a student to be able to write, speak and translate to and from German, Korean and Vietnamese – and to simply become familiar with the sounds and letter forms?

Als ich mit meinem Hund in den Park ging, fand sie den Eisstand und die freundliche Verkäuferin machte eine Eistüte – nur für sie

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강아지와 함께 공원에 갔을 때 그녀는 아이스크림 가판대를 찾았고 친절한 상인은 그녀를 위해 아이스크림 콘을 만들었습니다
Khi tôi đi đến công viên với của mình, cô ấy tìm thấy quầy kem và người bán hàng tốt bụng đã làm một cây kem ốc quế - chỉ dành cho cô ấy
When I went to the park with my dog, she found the ice cream stand and the friendly vendor made an ice cream cone -- just for her.

A curious student wants to know whether it's okay to take a dog to a park in Busan, South Korea, Ha Noi, Vietnam? To explore whether the dog is likely to encounter a friendly ice cream vendor in parks in those places? Do people enjoy like ice cream in those places? Same flavors as here, or different flavors? Does it taste like it does here, or does it taste different? Which flavors are popular? Now, it's off to the internet to learn about Trang Tien Ice Cream in Ha Noi, and matcha ice cream in Busan, look at shop (and ice cream) pictures of, and learn what else they eat (and their dogs eat). A learning adventure begins (but nobody is memorizing vocabulary lists or conjugating verbs).

"We do not have to be perfect. It's not studying about language. It's about playing with it so you can make sense of it in your head. If someone was to ask me what is my first language, I would have no answer. I was brought up speaking 4 languages. One grandmother spoke in one language, the other in another, my mother in another language, [actually] my mother and my father in two mixed languages. I grew up in India, in Bombay [Mumbai]. The four languages are English, Hindi, Marathi and Guajarti. Learning one language at a time, that's kind of outdated theory. It's theory that is coming from the Western world. And we are living in a very multilingual world! I can bet that most people, at some level, are multilingual."

— Gautami Shah
Hindi programs at Rice, Yale, Duke Universities;
currently at University of Texas, Austin [Reinventing School interview]

Although a minor subject in Old School, instruction in World Languages (formerly, Foreign Languages) has taken big steps toward 21st century ideas.

"It's not difficult to learn a language because we now know from neuroscience how to do it better at a classroom level… to speak in the language, that we have to contextualize. For example, when we teach vocabulary, rather than giving English and then the target language, an image and the target language — called dual language — again a neuroscience concept — allows us to go right into short-term memory. If it's contextualized, language practice, where we use a story or context, we only need repetition 17 times.

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> If it's decontextualized like we used to teach it, [learning requires] over 70 times!"
> — Dr. Ali Moeller, Distinguished Professor of World Language Education, University of Nebraska-Lincoln [*Reinventing School* interview]

When learning a second language, Dr. Moeller continues, "plasticity is increased. Executive function is amazingly improved, [so] they can plan better. They become self-regulated learners. Neuroscience has now shown that… if you know another language, your chances of delaying Alzheimer's are 100 percent! Your neurons are actually restored and rejuvenated as a result of learning a language. The learning of another language encourages the rebuilding of parts of the brain… basically, there are synapses between the neurons, and there's a plasticity there. As we age, it becomes more solid. What world language is able to do, because it uses different parts of the brain, it allows it to regain some of its plasticity…".[52]

English is rapidly gaining popularity, especially among young people who associate English with popular culture and being cool. English connects cultures, so many people, of all ages, can share ideas and communicate with one another. Only about 1 in 4 people on earth communicate in English, so it's not a universal language – at best, English is spoken or understood by 2 billion people.[53] But English is growing. Over time, people who speak English instead of their local language may be contributing to their native language's death sentence. In modern times (among many examples), this behavior caused the demise of Yiddish, once spoken, read and written by millions of people, now understood by several tens of thousands (and undergoing a small revival thanks, in part, to The Yiddish Book Center, which celebrates and promotes Yiddish literature and culture).[54]

With nearly-instant translation on digital devices, a person speaking Turkish can communicate with another speaking Swahili, so the perceived value of foreign language instruction in Old School may fade. Students take several years of French, but after the course is over, they forget most of what they learned because they have little occasion to communicate in French. For many students, learning a Foreign Language in school is an interesting idea, but does not produce useful long-term results. However: the newer World Languages approach makes a lot of sense in their increasingly diverse world.

Art

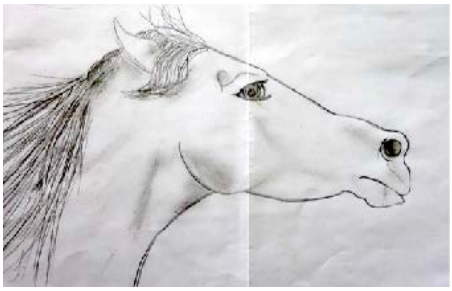
The perceived insignificance of Art instruction allows its teachers to operate under the radar. Freedom opens the door to 21st century ideas. Making a collage is not treated with the same reverence as remembering details about types of rocks or the names of rivers, so teachers and students operate with greater freedom in Art than in most other classes.

Most public schools do not invest heavily in art programs. At best, there may be an art teacher or two, and a classroom with tools, supplies and large tables and adequate lighting. Primary school students become familiar with materials, process, technique, safe practices, respect for

one another's work, feedback and criticism, and own clean-up – but most of time, they make art. Most of the time, secondary school students make art. Often (but not always), students are encouraged to make their own creative decisions.

Art teachers lecture, and show images, so students become familiar with many types of art – but these presentations are brief because students are anxious to make things. On classroom walls and in school hallways, students may see some ancient and modern art from China, colorful textiles from Ecuador, pottery from Maine, puppets from Indonesia, modern work by Keith Haring, surrealism from Salvador Dalí, and Amy Sherald.[55] And they participate in group discussions about graffiti, abstract art, still life, portraiture, and whether it's okay to paint the sky pink or yellow instead of blue.

Total careers in art-related fields: more than 5 million – about twice the number of careers in Mathematics, Science and Social Studies combined. Many people also pursue art part-time and for fun. Art museums, awareness of advertising and other forms of visual expression, are now part of being human. But Old School does not devote much time or energy to of Art.



"Oh, no, no, we haven't got an art class! I want, but we haven't! I learn at home. I have a book. It tells me what I have to do when I draw. I like to draw flowers and animals. Sometimes, I draw people. I draw from the internet or from the book. I want to do art when I grow up. I started when I was 5. I drew everything. I draw almost every day, in my free time. I want to go to an art school. When I graduate, I want to go to another country [to] study [more]. I will come back to Bulgaria and open a school for art."

– Kamelia, 13, Stara Zagora, Bulgaria [Kids on Earth interview]

Music

Music is one of school's most challenging subjects. It requires years of diligence, practice, and collaboration. The experience of learning music is very different from the experience of learning any of the 5-day subjects. It begins as each student chooses their own instrument – with guidance from teachers, peers, family and friends. This is a big decision. It involves a commitment to take care of the instrument, learn how it works, practice, and perform for other people. There is a commitment to teamwork, too. No other subject involves this degree of specialization and Personal Education.

Students overcome frustration. It is difficult to get the right sounds to come out of a wooden box or a metal or plastic tube. Each student is encouraged to "stick with it," no matter no

matter how they sound, no matter how much practice is required. Music requires learning a new language (aural and visual notation), memorization, synchronous collaboration, error correction, resilience, and dealing with the uneven progress of other students. Each young musician constantly self-assesses, and receives feedback from the teacher and other students. Some are haunted by possibility of having selected the wrong instrument — and starting over, this time on flute, not violin.

Music education is very specialized — hence, Personal Education -- but very young musician must play the same music in the same way at the same time. If they don't, the music may sound awful. Music must be played at a certain pace, or tempo, often in unison with other people playing similar and different instruments, always with other inexperienced students. Unlike most other subjects learned in school, failure and error correction are routine — everybody makes mistakes, strives to improve. Students rely upon adults for lessons and technique, but each student works on their own (and in small groups) to get it right.

As with Mathematics, progress is cumulative. It is not sufficient to learn to play a few notes, or a few songs. As each student gains competence, individual and group engagement increases. Students begin to play together, sometimes forming their own band. As they do, they realize what they capable of accomplishing on their own. There isn't enough time to practice or rehearse in school, so they accommodate one another's after-school and weekend schedules (that is, they self-manage their schedules). When the music comes together, that's something special. Some students continue to play music for years after school ends. No other subject produces these results.

Building and sustaining a full-time, long-term career in music is often challenging, but many people support themselves in other jobs and careers, playing music on the side. In the U.S., fewer than 250,000 people work full-time in music.[56] Some lucky people who pursue music careers can become rich and famous; for some students, this is a motivator. Making and listening to music is a popular leisure and social activity, part of human flourishing.

Library / Research

Some schools contain a library filled with books and other media materials. Many schools do not — but there may be a lending library in a hallway, or a cabinet, or a book cart that travels between classrooms. Some communities support a community or public library; many do not. Some schools employ a full-time librarian to manage the library, and to teach students how to find information and explore interests. In this environment, each student is treated as a patron — a curious, responsible individual with particular interests and capabilities. Each patron is expected to find their own way, but staff is available for guidance.

At its best, a library is designed for Personal Education. It offers a satisfying combination of individual freedom and assistance from knowledgeable, caring adults — with no prejudgment

and no testing. Instead, the library presents opportunity to learn from small, colorful packages, well-organized, numbered so every item can be easily found, with a professional whose sole purpose is to help. If the desired book or other media is not available from one library, it can usually be found in another. In many regions, a librarian can access a list of other libraries' holdings, so almost everything a student may want or need is available. Libraries routinely exchange books to serve local patrons. (Access to many resources is a hallmark of Personal Education.) Remarkably, school libraries, and most community and public libraries, are operated free of charge, funded by local residents through taxation and donations — a wonderful model of community support for learning.

In the midst of concern about dis- and misinformation, the library provides a calming source of reason, and accurate, up-to-date information. Librarians are constantly exposed to new material — as budget allows, they are always buying new books, and/or receiving donations. Library staff takes pride in matching student needs with relevant material. Unfortunately, many libraries, particularly school libraries, are under-resourced and poorly promoted.

> "In some countries, like Thailand, libraries are often overlooked and barely has any roles in our lives. Libraries do exist in our schools but they play no role except physically exist."
>
> — Ploi Sripoom, student,
> University of Virginia School of Education & Human Development.
> She grew up in Thailand.

Students treat library books with respect. They borrow and return books and other materials, usually on time. Borrowing books feels like a privilege, so students learn to take responsibility Students take responsibility. They keep materials in good shape for other students — an early grade manifestation of an economic public good. Students read the books in class and at home, on their own schedule.

In public and community libraries, children and teenagers learn alongside adults. Unfortunately, libraries are not available in every community, and opening hours are often limited. Given the powerful, long-term benefits of libraries for students and the general public, funding should be prioritized, moreso if the library provides reliable internet connection in places where this can be hard to find.

Public and community libraries are situated in neighborhoods — they're more than just a building, they are gathering places. With constant foot traffic and windows facing the outside, libraries are well-suited for community displays — local history timelines, murals and public art. In regions where a standalone library is beyond reach, a mobile library can fill a gap. Mobile libraries — bookmobiles, for example — are more than a century old. In many neighborhoods, public libraries introduced immigrant children to books. They were reintroduced in New York City in 2019.

Chapter 3: Old School

10,530 words

About 4 out of 5 U.S. public schools include a school library. About 105,000 U.S. public or community libraries serve more than 336 million people – that is, one library for every 3,200 people in the U.S., but some people must travel for the nearest library. Many countries have fewer libraries per capita. Many require travel that may be difficult for kids and parents.

Most students do not learn in libraries with the intention of someday working in the industry, but they do learn valuable research skills. In the U.S., the field offers nearly a million careers in libraries and related fields, including librarians and library media specialists (140,000 jobs in the U.S.), archivists, curators and museum workers (related, if not spot-on, 38,000), library technicians and assistants (162,000), non-internet publishing (over 100,000), and internet publishing (about 300,000[57]). In total, that's more than Mathematics or Social Studies jobs.

Computers / Technology

Old School is conflicted about technology's role in learning. In many schools and classrooms, cell phones are considered a distraction, so students are not permitted to use them while learning. This is understandable because teachers must cover a certain amount of required curriculum, at a certain pace, but it's also crazy. A mobile device is a powerful computer that provides easy access to tools and information useful for classroom learning.

Many schools offer computer and/or technology classes, but curriculum varies from place to place. Some concentrate on basic skills, such as word processing or spreadsheets (which many children figure out on their own). Others encourage students to code and to experiment with AI and robotics. Learning in this domain requires planning, experimentation, hypotheses, failure, correction, revision, attention to feedback, creativity, critical thinking, and many other useful skills. Much of it can be learned via peers, YouTube and experimentation.

"When I was in 7th class [grade], I thought there should be an app that told me what homework I had to do today. For that, I thought, I want to make an app. I didn't know, really, how to do it. That's how I started. Now, I've have projects in education and health. In 8th class, I developed an app called Diabetes Doctor. My grandfather had diabetes. It's a very common disease in India. It led to solving other problems, like blood pressure and heart-related diseases. Looking at websites, I found the American Diabetes Association and there was information about reversing diabetes. That's how I got interested, and developed an app so I know what steps I can take as someone with diabetes in my family background."

– Hitarth, 18, Sirat, Gujarat, India
(when Hitarth developed the app, he was about 14) [Kids on Earth interview]

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Learning about, and gaining experience in, computers and technology provides students with meaningful exposure to a very large and fast-growing industry with more than 3 million jobs including software developers, testers, systems analysts, video game designers, web developers, digital designers, information security analysts, data scientists database administrators.[58] For many students, this is a first step to a very productive career.

Physical Education / Health

Although health and wellness of the whole person are typically included in government mandates, local implementation is often less than comprehensive. Old School's "Physical Education" and "Gym Class" remain common.

> "We have a lot of work to do. What we must do as a profession is stop playing games. There are teachers out there, that's all they do, they play games with the kids. Fun! That's really important because if the kids are not having fun, they're less likely to [be active] as they get older… The skills you learn in elementary school through high school, if you develop those skills, you are more likely to participate later in life. If you never learn to swim as a child, you're likely never going to learn to swim as an adult. If you never learn to ride a bike… that's why we are trying to expand biking programs in elementary schools. We are trying to teach the skills, knowledge, and hopefully develop the attitude to be physically well for a lifetime. [Some of our] associates are not getting this message!"
>
> – Brett Fuller, curriculum specialist for health and physical education Milwaukee Public Schools, Wisconsin, U.S.[59] [*Reinventing School* interview]

In Old School, Science covers anatomy, physiology, some nutrition. Physical Education encourages exercise and some aspects of fitness. Extra-curricular sports goes further, and the school nurse or family practitioner addresses immediate health concerns. . Lacking integrated instruction, knowledge, beliefs and interest in the human body vary widely. The result is ghastly: 1 in 5 U.S. teenagers is obese; 1 in 4 for the Black or Hispanic kids.[60]

Mostly, Old School concentrates on movement – cardiovascular exercise – because time and resources for nutrition and strength training are lacking. Educators in this field usually lack the power, respect and support to advance a more robust agenda. Mental and emotional health is beyond Old School's gamut, except when dealing with specific issues.

Yet, there is a powerful connection between exercise, fitness, nutrition, wellness, and learning.

> "Exercise improves learning on three levels: first, it optimizes your mind-set to improve alertness, attention and motivation; second, it prepares and encourages nerve cells to

> bind to one another, which is the cellular basis for logging in new information; and third, it spurs the development of new nerve cells in the hippocampus."[61]
>
> – John J. Ratey, MD, Clinical Associate Professor Psychiatry, Harvard Medical School
> Author, *SPARK,: The Revolutionary New Science of Exercise and the Brain*

Based upon extensive research and field tests, Dr. Ratey recommends 15 minutes of exercise for every 45 minutes of traditional classroom instruction. In schools that follow this regimen, Dr. Ratey sees significant, sustained improvement in student health, and significant, immediate and long-term improvement in grades, test scores and overall wellness. With regular daily exercise, throughout the school day, exercise reinforces cognitive processing, regardless of the subject matter, and aids in short-term memory and long-term retention. Even a 10-minute walk between classes is helpful to clear the mind, reset, and organize material in the brain before the next barrage of information is unleashed. Not only for students – for teachers, too.

Contemporary students need quiet, reasonably private places for individual contemplation, relaxing, healing, meditation, exercise, restful reinvigoration, or the likes of yoga. Old School emphasis on everybody-plays competitive games does not address these needs.

Modest time allocation for Health, Fitness, Wellness and Nutrition is misaligned with widespread student interest, public health benefits, and potential employment. In the U.S. (and throughout the world), this field is large and growing fast – supporting 7 million careers including nurses, doctors, pharmacists, radiologists, physical and occupational therapists, dentists, veterinarians, exercise trainers, and more.

Old School Outcomes

Is Old School effective? The answer depends upon the meaning of the word "effective." If the measure is completion of all primary and secondary grades, the 2020 UK graduation rate was about 63 percent, and the OECD average was 83 percent. The U.S. rate completion rate was 87 percent, less for Black and Hispanic students (83 and 81 percent).[62] If the measure is moving ahead to a college degree, South Korea and Singapore lead the world with about 33 percent completing college.[63]

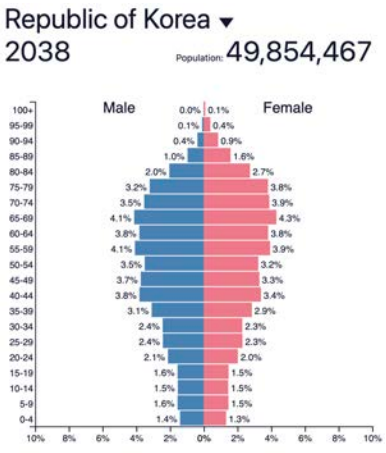
Perhaps the measure ought to be test results. A hallmark of public school education, the overall pattern of secondary school student performance on OECD's PISA international scale shows a decline in knowledge and skills "that are essential for full participation in modern societies, particularly in the core domains of reading, mathematics, and science."[64] Some countries improve, most do not, and many are making almost no progress (the trend began long before COVID's disruption).

Other Old School metrics are equally discouraging. Measured by absences, drop-out rates and through surveys, student dis-engagement has increased during the past decade, again after accounting for pandemic disruption. Mental health concerns among students, and teachers, is gaining considerable attention — again, worldwide. Over 50% of U.S. teachers say they will leave the profession in the next 3 years. Enrollment in teacher preparation programs has declined dramatically.

Encouraged by teachers Ryoko Okamoto and Erin Noxon, students in Japan's Sagano High School in Kyoto were reluctant to schedule time for a discussion because "they must spend every available minute studying for the big tests" and "they are reluctant to sacrifice an entire hour on anything that would not be tested."

Third grade teacher and radio journalist Yerica Park,[65] describes an urgent situation in South Korea. Dangerously high stress levels are associated with testing for admission to the most desirable colleges in South Korea, This is a significant national problem in many eastern Asian nations). BBC: "The exam is considered crucial as it determines not only which university students can go to, but also their career paths. Both students and parents feel that it will directly impact their futures… Parents begin preparing children for it from very young ages - usually around four - although there is also a significant percentage of children who start at two."[66] *The New York Times:* "The test, notorious not just for its rigor, has also long kept the private education industry booming. So-called cram schools are typically filled with students until well past midnight, and the stakes that come with acing the CSAT have fueled an intense rat race among students to enter the nation's best universities. Hundreds of thousands of students sit for the nine-hour exam, typically held every November."[67]

Extreme rigidity affects each student's sense of self and emotional well-being. The cycle is difficult to break, in part because soft characteristics are more difficult to measure than, for example, GDP. The spectacular economic success of Japan and South Korea is built on this way of thinking. (Japan is the world's third largest economy, South Korea is tenth.[68]) Still, the world is changing, students in Japan and South Korea are gaining agency and independence along with the rest of the world, the internet (widely available in these countries) provides exposure to other ways of thinking and acting. There are grave concerns about population patterns in these countries (see Population Pyramid, right) along with serious questions about the interplay of national unity, mental health, sustainable productivity, lifelong learning, immigration patterns and education systems.



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Old School is seriously out of touch with contemporary needs. It does not do a good job in preparing students to become the next generation of capable, knowledgable, forward-thinking adults ready to solve the world's significant problems. Old School neglects so much about what we now know about learning.

Things are not going well. The Old School model was designed for top-down education and employment in an era when life expectancy was much shorter, children and teenagers did as they were told, far fewer people attended school, and opportunity beyond the local region was largely unknown.

The planning assumptions for the Old School model are no longer relevant.

It is time to rethink the model.

END OF CHAPTER 3

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[6] https://www.ncforum.org/wp-content/uploads/2023/03/Durham-County-Profile.pdf

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[14] https://ccsso.org/sites/default/files/2018-11/Elementary SS Brief 45 Minute Version_0.pdf

[15] https://www.britannica.com/summary/Ukraine

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[17] https://en.wikipedia.org/wiki/Vechornytsi

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[21] https://theroamingfork.com/international-soups/#2-egusi-soup-west-africa-

[22] "Ocasio-Cortez Reflects on Her Evolution, Politically and Personally" *The New York Times*, September 5, 2023, page A16

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[28] https://www.nidcd.nih.gov/health/speech-and-language

[29] McPhee, John, *Draft No. 4*. New York: Farrar Straus Giroux, 2017. Pages 138-9.

[30] The languages are Japanese, Ukrainian, Arabic, and English.

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[33] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1178136/The_Reading_Framework_2023.pdf - page 88.

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[36] Mol, S. E. and Bus, A. G. (2011). 'To Read or Not to Read: A meta-analysis of print exposure from infancy to early adulthood', Psychological Bulletin, Vol. 137, No. 2, pp. 267-296.

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[48] Above excerpt about New Mexico from Blumenthal, Howard, *Our Whole World in Their Hands: 21st Century School & Our Global Future*, May 18, 2021, page 25

[49] https://www.learningrevolution.com/reinventingschool/episode-43-language-learning-part-1

[50] https://www.americancouncils.org/sites/default/files/FLE-report-June17.pdf

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[62] https://nces.ed.gov/programs/coe/pdf/2024/coi_508c.pdf

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[64] PISA 2022 RESULTS (VOLUME I) © OECD 2023, page 45

[65] Presentation to about school in South Korea at Hakuba Forum, Hakuba, Japan, by Yerica Park on March 10, 2023, followed by personal interview with Yerica Park on May 23, 2023

[66] https://www.bbc.com/news/world-asia-55155217

[67] https://www.nytimes.com/2023/06/21/world/asia/south-korea-csat-questions.html

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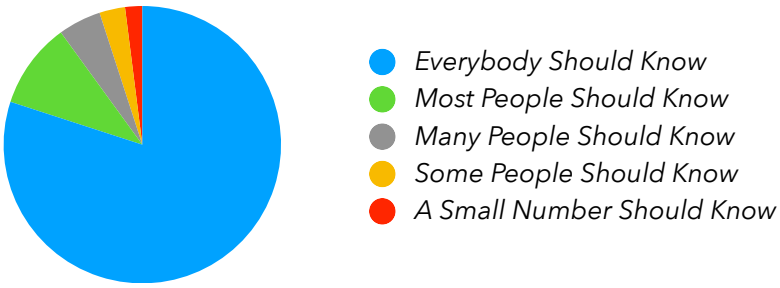
Chapter 4:
New School

13,483 Words

Old School is based upon ideas far removed from the ways human beings learn, how they remember, and what they need to know to survive and thrive in the 21st century.

Below, a representation of Old School curriculum priorities:



As early secondary students in Charlottesville, Virginia's Community Lab School explain, "Nobody likes to be told what to do!"

This model relies upon oversimplification, limited perspectives, and compliance. For those in the dominant group, emphasis on *status quo* and a glorious past may be comforting, but the model fails for other people because it does not represent their needs, interests, world view, or future. However, the model is useful for the assimilation of large numbers of immigrants ("to take in and utilize as nourishment : to absorb into the system"[1]), and successfully used in the U.S. for that purpose in the first half of the 20th century.

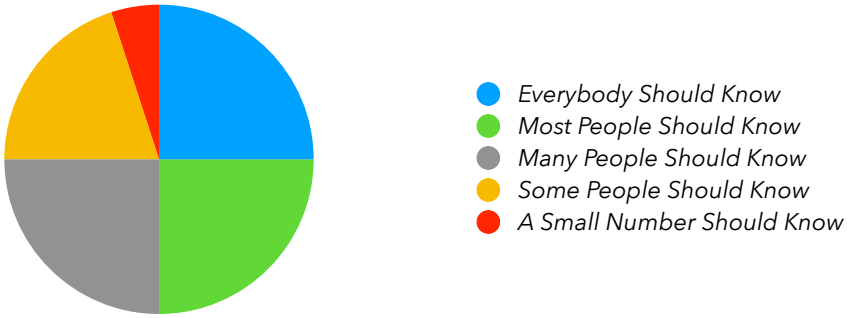
Monoculture

"We have to go from what is essentially an industrial model of education, a manufacturing model, which is based on linearity and conformity and batching people. We have to move to a model that is based more on principles of agriculture. We have to recognize that human flourishing is not a mechanical process; it's an organic process. And you cannot predict the outcome of human development. All you can do, like a farmer, is create conditions under which they will begin to flourish."[2]

— Sir Ken Robinson,
Global authority on creativity, education, human potential[3]

In agriculture, monoculture refers to cultivation of a single crop, or single group of crops. This is a very efficient, very profitable way to operate very large farms, but success relies upon chemicals and destructive practices that deplete soil, damage soil fertility, and wreak havoc with other forms of life.[4] Invasive (that is, non-natural) species sometimes thrive because there are no predators… , but many invasive species destroy habitat, the places where other plants and animals naturally live."[5]

Commoditization of learning works against happiness, productivity and economic interest of every child, teenager and adult. Learning the same things as everybody else is counterproductive and dangerous because it stifles original thought and innovation. It creates a monoculture. Concentrating most student instruction across a small number of subjects that seemed to matter in the 20th century impedes progress. Contemporary students require a balanced portfolio, as represented below:



All over the world, there are many successful examples of this philosophy in action, but Old School continues to dominate public education.

Old School - Monday Morning

"…Before we start today, remember your League of Nations reports are due tomorrow (Tuesday), and the big WWI exam is Friday. So: after the League of Nations didn't work out, after WWII, countries tried again, this time with the U.N. Last night, you should have read textbook pages 121-157, so you know the U.N.'s history and organization, and all about WHO, UNICEF and UNESCO. Today, we start on UNESCO's 17 Sustainable Development Goals; we'll do 8 SDGs today and the other 9 tomorrow (Tuesday). Tonight, your homework is to summarize the 8 goals we discuss today; you'll do the rest tomorrow night. Be sure to focus on SDG #1 tonight – poverty. On Wednesday, we'll do NATO and other international treaty organizations; that test is Thursday. What is poverty?…

New School - Monday Morning

"…This morning's Fundamental is the first UN SDG: eliminate extreme poverty everywhere.

WWII was a horror. Nobody wanted anything like that to happen again. One in 33 people on earth died. The U.S. dropped two atomic bombs on cities in Japan and killed more than 200,000 civilians.[6] The Germans wanted to kill all the Jewish people on earth, plus gay men, Black people, people of mixed race, and the disabled.[7] But it wasn't just about Germany. In Russia, 11 million people died. More than a million died in China. WWII was the bloodiest conflict in the history of the world.[8] For a peaceful future, nations needed an organization

where they could work out problems. After a few failed attempts, the United Nations – or U.N. – was born. Nobody knew exactly what the U.N. would do, but it turned out to be a good idea. If you're interested, I can help you learn more about the role of the UN in world peace, protecting human rights, and providing humanitarian aid, especially during emergencies…

…In the 21st century, the U.N. started something new. They made a list of really important things the world should do before 2030, and encouraged people all over the world to get involved. Officially, the list is called the UNESCO Sustainable Development Goals, but everybody calls them the SDGs. There are 17 SDGs. The first SDG – the one that we're going to talk about now – is "No Poverty." That is, "End poverty in all of its forms everywhere." You may decide to learn about some of the other SDGs on your own, and of course, I am here to help.

Let's start with a question: "What is poverty?…"

Instruction in this Fundamental is nearly complete. The teacher does not answer the question about poverty. Instead, students begin to construct their own knowledge by asking questions. "Not enough food" and "not enough money" seem too simple. The teacher explains "multidimensional poverty," which guides a discussion about context. Students add homelessness, race prejudice, economic inequality, food deserts, unfair laws, water supply, access to health care, the role of government and NGOs. A bigger picture begins to take shape. When the teacher asks where poverty exists, students begin far from home, but further discussion brings the problem uncomfortably close to home. Students offer personal observations. For the teacher, this signals readiness to move from the Fundamental to Personal Education explorations of their own.

During these first 20 minutes, the teacher told a story, then listened, and watched each student settle into greater depth. But not every student. Some seem distracted, uninterested, at a loss not engaged. They require immediate one-on-one attention from the teacher, and some support from other students.

At one or time another, every student disengages. Some students simply tell the teacher they need help – no shame in that, no embarrassment associated with not knowing what to do, being confused, uninterested, or just not getting it. Meanwhile, students talk to one another

to refine and clarify their individual and small group projects. Some get started on their own. Some ideas deflate, so students help one another develop new ones because the teacher is busy. They learn from one another.

By the end of the hour (yes, in New School, a full hour, not 42 minutes), students have lots of ideas about poverty and homelessness in their home town, poverty in Ethiopia (related to drought and food shortages), multidimensional challenges faced by refugees, how poverty is measured and why that's often inequitable, what a poor family can afford, social programs, and more. The diversity of their inquiries is impressive, sometimes naive, often marginally coherent, but they have begun.New School is set up so they can learn a lot about poverty, and/or they can move on to other SDGs, such as #7 - Affordable and Clean Energy, or #10 - Gender Inequalities. Or they can learn something else. Not everybody needs to know the details about Extreme Poverty or any other UN SDG.

Initial student-teacher's initial conversations are check-ins: quick rundowns on the concept, next steps and end product. Some conversations require more time — so students schedule longer conversations later the same day (using modern, student-centric scheduling software).

Nobody expects the teacher to know a lot about the U.N., the SDGs, or global poverty. That's not the teachers' job. Instead, the teacher's job is engagement — making sure every student is interested in what they are learning. Students manage their own projects; teachers serves as guide, mentor and resource expert.

Fundamentals

New School fully embraces two big ideas:

1. Children and teenagers should learn many, but not too many, Fundamentals.
2. Children and teenagers should learn to think for themselves.

As evidenced by its many requirements, and use of instructional time, Old School favors lots of information. Regardless of relevance or utility, all of it is considered important. Dissemination fills most of each school day. There is little time for anything else.

New School presents far fewer Fundamentals. If government standards have several thousand standard items for the K-12 Social Studies, New School might offer several hundred. This is not a radical departure for learning; but it is a departure for school.

What, exactly, is a Fundamental? It is a set of facts, a story, a survey or overview, a context, skills, techniques, a process focused on a specific learning needed by all, or almost all, students. It is well-organized, well-presented and admirably concise. It is well-chosen, interesting, and relevant.

Chapter 4:
New School

13,483 Words

Fundamental Launch Pads

Fundamentals provide an entry point. A Fundamental introduce students to India as the world's most populous nation, the world's largest democracy and the world's fastest growing national economy. India is composed of many ancient and modern cultures.

As a launchpad in primary school, a 15-minute Fundamental session about India might open pathways to Hindi (the language), Hindu (the religion), the British Empire, Gandhi, and Ganesh ("an elephant-headed deity… worshiped as the remover of obstacles and patron of learning… usually depicted colored red, with a potbelly and one broken tusk, riding a rat"[9]). In secondary school, a 20-minute Fundamental session about India would be more sophisticated: Pakistan, Bangladesh, growing the tech economy, conflicts between Hindu and Muslim, Narendra Modi, in Gujarat and other states, water issues, emigration, wildfires, and more. There is no shortage of things to learn about India, but there is far too much information about India to fit into an Old School Social Studies curriculum.

Another example… In the New School Learning Category called Our Planet & Beyond, the James Webb Space Telescope might be a Fundamental – likely to generate student interest in the Big Bang, the early universe, optics, astrophotography, galaxies, black holes, NASA, astronomy as a profession, the remarkable images gathered by the Webb Telescope, light years, infrared light, and more. Students are curious, easily engaged if they are interested. (Easily disengaged if they are not, so flexibility is built into the system.)

In a Learning Category called My Body, one Fundamental might study the human hand. The hand is a complicated piece of engineering – lots of bones, lots of muscles and specific functions. Feeling confident about how hands work, students naturally leapfrog into Personal Education about feet, arms, muscles, knees, circulatory system, blood flow, muscles, bones, similar-but-different hand-like appendages on other animals, invention and development of tools (the history begins with hand tools), typing on a keyboard or playing a musical instrument by pressing keys, opening and closing valves or manipulating strings.

Every Fundamental is a starting point. Extensions into Personal Education are infinite.

Who Decides?

Over time, sometimes from one year to the next, topics gain or lose currency. Different communities, states, and nations prioritize different ideas. Who decides what every student, or most students, learn in school? Governments outsource these decisions to framework and curriculum committees. No reason to reinvent the whole structure – but it needs updating.

In Old School, students are required to learn far too much information, teachers are required to prepare far too many lessons, and students forget much of what was taught. New School

provides students with a smaller amount of truly relevant, useful information. Every student learns a reasonable number of very important concepts – Fundamentals – and can explain what they are learning and why it matters. If every student learned – truly learned, internalized and remembered – 10 Fundamentals per week – that is, one Fundamental per Learning Category per week of school, that would be a wonderful starting point for Personal Education. Of course, every student will learn a lot more, but they will do so on their own terms, based upon their own interests, not because unseen adults require them to do so. The youngest students require more Fundamental instruction, especially in Words & Stories, Numbers & Money, and Sounds & Images.

Who decides what to include in each school year's list of Fundamentals? Teachers, students, experts, community members, and government leaders. Working together for the common good, each bringing insights and priorities to the discussion at a local, regional and national level. Developing the initial list of Fundamentals and should be challenging. After the first year, corrections and improvements grow from collaboration amongst varied communities, best practices, and students' changing needs.

The process won't be perfect – it does not need to be. Even with a fairly fixed idea about what a given Fundamental might be – say, the solar system – there is variability from one teacher and school to the next. One teacher may focus on planetary orbits, another on moons and other objects, another on visiting the planets, another on measurement. And that's okay. There are many rooms in New School's mansion.

In Old School, everybody learns the same things for the same reasons. In New School, everybody branches out from Fundamentals to learn different things for different reasons in Personal Education.

The Path from Fundamentals to Personal Education

From the start, students in any given classroom know they are not the only classroom studying the U.N. SDGs, not the only ones working on SDG #1 - No Poverty. As students settle into their Personal Education topics, they should be able to access work done by other students, share materials, and collaborate. One student learning about poverty in Botswana will find other students with similar interests, as well as experts, both in Botswana and elsewhere. Teachers coordinate efforts. Students gain self-confidence.

School becomes more meaningful. Students do not spend long days in a well-intended intellectual prison. Their ideas are respected. Their work has value. They have freedom. They are seen and heard. They contribute to global knowledge and understanding. They make mistakes, but they know error correction is part of learning. They make good use of adults as guides and for access to resources, but adults no longer tell them what to do.

Chapter 4: New School

13,483 Words

Old School is not banished. Old School is pruned; only the essentials remain. The rest fade away because they are no longer useful. In fact, this is the way the human brain operates — shedding connections to become more efficient, more effective.

Personal Education

All learning is personal. There is no other way to learn. Therefore, *personalized learning* is not a meaningful term. *Personal Education*, along with Fundamentals, are the defining components of New School.

Responsibility for learning shifts from teacher to student. This reset recognizes and values the contributions of each individual student in an authentic, meaningful way. Students are supported by teachers, parents, other students, and the community. As described in Chapter 5, students share their learning to build global knowledge and understanding.

Once or twice each week, in every Learning Category (more, for early literacy and numeracy), all students are introduced to a Fundamental within a Learning Category in an age-appropriate way. A Fundamental serves as starting place for further exploration.

Often inspired by group work in a specific Learning Category, each Personal Education project is designed to be completed within several hours over one or several days. Students often work on their own, but may also work with several other students. The limitations are meaningful; it is easier for a student to stay on track if projects are clearly defined and do-able. If a pursuit is especially interesting, or opens doors to other pursuits, the student can add a related project. For example, the Fundamental might introduce Clouds — types of clouds, how they are formed, why they look the way they do, how they can be used to forecast weather. One student may decide to learn more about Cumulonimbus clouds — they are associated with lightning and big storms. After that's done, the student may jump to thunder, other big noises. Another may be curious how artists depict clouds — El Greco's *View of Toledo*, Van Gogh's *Wheat Field with Cypresses* and J.M.W. Turner's *Sunrise with Sea Monsters*[10] being good places to start. Where to go next? Sea monsters! Not just any old monster: Jörmungandr, a terrifyingly cool monster from Norse mythology.

As each student develops and completes each Personal Education project, they publish their (digital and analog) "working papers", sources and output. They are careful to tag everything so other students can learn from their work on El Greco, Cumulonimbus, Clouds, clouds in art, and so on.

Sometimes, a student will generate an extraordinary insight. Sometimes, a student will follow their idea into a dead end, or unexpected complexity — that's worth noting so others learn from missteps. Sometimes, the idea isn't very interesting, or expected resources are not available, or the student struggles with completion. That's when the student asks for help — or

the teacher takes notice and guides the student toward alternatives. Student-to-student mentoring is always encouraged, freeing the teacher to work with students who need more time. Mentors may package their help as projects of their own.

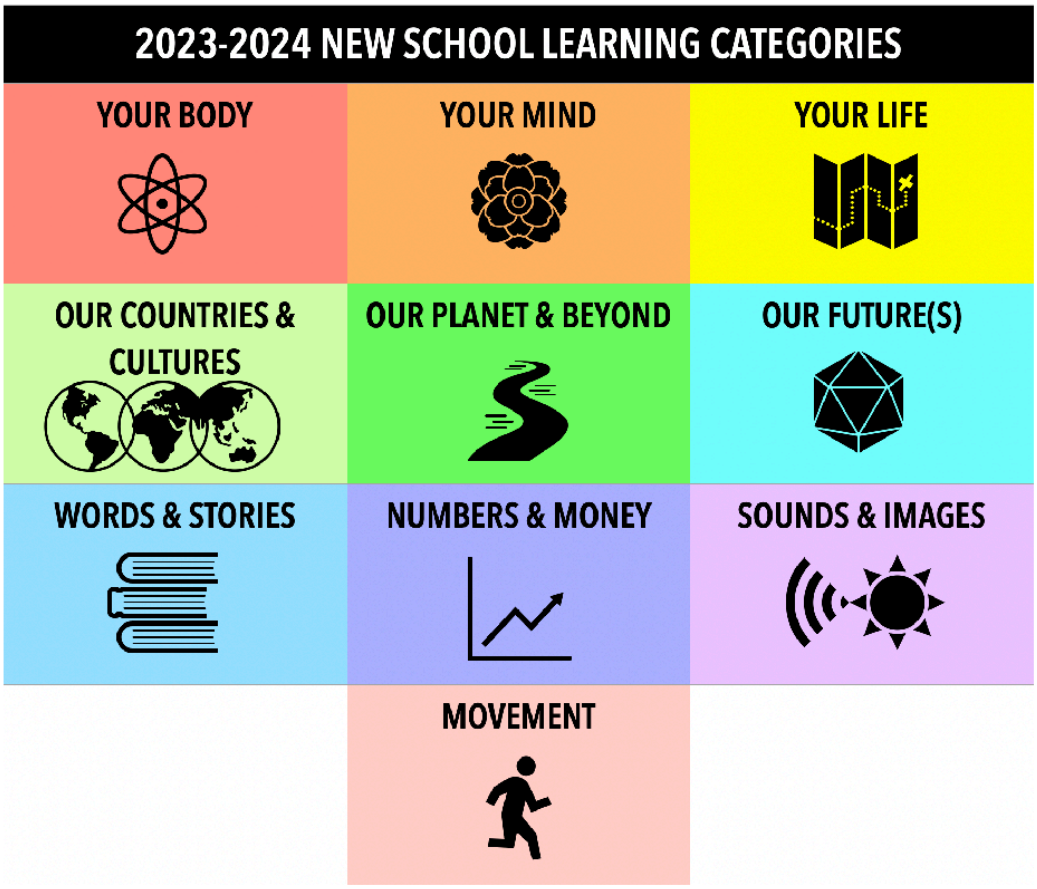
The teacher's job is to keep every student interested, well-resourced and productive. Teachers require training and practice to do that – new kinds of professional development.

New School's Learning Categories

New School is not based on *subjects* – not in the Old School sense. The etymology of *subject* is dreadful: "one under authority" and "to subject, literally, to throw under." And, "subjecting" is associated with "one who is placed under authority or control;"[11] "Vassal" is related.[12]

It's time to eliminate *subject* from education. The term *Learning Category* is clear and non-toxic. Category's etymology is related to *affirm* and *gather, agora* and *aggregate*.[13]

Below, a version of New School Learning Categories. It's not a prescription. It's a tool to initiate discussions among students, teachers, parents, government leaders and researchers.



Learning Category #1: My Body[14]

A human being is responsible for the care of their body – most body parts cannot be replaced, but each must last a lifetime. And a lifetime could be a hundred years (or more).

Beginning in kindergarten, learning about My Body should occupy at least one hour per week of a student's school career. Every student should receive this minimum dose – 450+ hours of study about My Body for every public school student in the world. If more than a billion students studied My Body for 450 hours, they would know more about human health than nearly all of their ancestors.

Within My Body, Fundamentals may include: how the body grows, how a body's internal systems work together (circulatory, respiratory, digestive…), what can go wrong, keeping a body in optimum shape, caring for other people's bodies. Personal Education continues the journey with students deciding what to learn, know and share about brown eyes, toenails, chubby bellies, sunburn, oily skin, ribs, and, (of course) farting. They'll develop hypotheses about what happens when they do or don't exercise, eat a whole pizza, run as fast they can on a very hot day, eat too much candy, drink gallons of soda, touch their genitals, sneeze, get a tattoo, break an arm, sleep too much or stay up all night. Prompted by Fundamentals about physical growth from infancy to adulthood, and their own lives, they'll pursue questions about emotional growth, reproduction, growing hair, smelling stinky, and death. Not everybody wants to know what other people want to know. Students learn to respect one another's curiosity, each individual's right to know.

Children, teenagers and adults are exposed to the same health news – when to get a flu shot, whether screen time leads to developmental delays, new tick-borne diseases.[15] Children need to understand what is normal and not-so-normal. In New School, learning and talking about the human body becomes commonplace, not a cause for embarrassment. A conversation among pre-diabetic, overweight adolescent girls should not be shameful.

"I know that a lot of my family has diabetes, and, I think, lung cancer? It was something like that. I went to the doctor at one point, and they told me that I had premature diabetes (pre-diabetes). I realized that my mom was right about exercising and how it can help you. And I realized I needed to do better. Here's what I know about diabetes. I know that you have to get, like, medicine and shoot into you. Oh! And you can also go into a diabetic coma, right? Also, it could get you at any time. Some of my dad's friends have diabetes, and they black-out sometimes when they're working. I really don't want that! I'm trying really hard! I think it's caused when you're overweighted. When you're over, like, 200 (pounds) or something, it can cause your body to have diabetes. I

> think it has to do with sugar. Some people have to actually eat sugar in order to deal with diabetes. It's really dangerous! You could die from having too much weight. You have to realize it's important to take care of yourself."
>
> —Janeen, age 13, Philadelphia, Pennsylvania, U.S. [Kids on Earth interview]

What Janeen learns about My Body could save her life — and the lives of family members and friends, and, via the internet, people she'll never meet. A competent teacher would guide Janeen to her own version of Fundamentals about Type 2 Diabetes (which more than 1 in 10 people need to know). If there is family history that tends toward obesity, high blood sugar and other factors, this may be the most important infromation Janeen ever learns in school — and many others could learn along with her.

Working collaboratively on a school-related research project, Janeen should be able to access doctors, nutritionists, authors, behavioral experts and others to help her understand her situation and explain it to others. Working in a group, government or philanthropic support might be available. Along the way, Janeen does not just control her pre-diabetes, she gains confidence in her ability to solve problems and help others. Packing diabetes into an already overstuffed Old School Science curriculum rarely produces these results.

New School provides Janeen Personal Learning she requires, control she doesn't yet know she needs, and a path to learn with people who share her interests. In return, Janeen focuses on an important problem, gathers and shares insights, helps others to learn, learns from people in similar situations all over the world, and perhaps works as part of a group to model data, support a hypothesis, and cultivate a growth. She will need help — everyone does, from time to time. Every day, her teacher will be there to answer questions, mentor, strategize, overcome challenges, and help manage inevitable missteps.

Janeen stays healthy and contributes to the world's knowledge. That's a big improvement over the Old School reality, in which her charter school's multi-year grant to teach Type 2 diabetes ran out. The nurse-practitioners at Janeen's local clinic don't have the time or expertise to help her. So right now, she's more or less on her own, stranded by Old School's inability to serve her needs.

Janeen's teacher is not, and does not need to be, a Type 2 diabetes expert. The teacher does not prepare a lesson plan about diabetes, doesn't spend the night before class brushing up on glucose and insulin.

Students who have studied My Body for a dozen years — learning for themselves, learning from others, asking and answering meaningful questions — will be well-positioned for employment in health, medicine, and social services. In low and low-middle income nations, 18 million more health care workers are needed today, and that number is growing fast.[16] (Think Africa and Asia.) Nine million more nurses and midwifes are needed, too.[17].

As global population increases from 8 to more than 10 billion, there will be many more jobs for trainers, opticians, therapists, geneticists, pharmacists, doctors, researchers, clinicians, etc. With New School, students can easily envision the connection between studying My Body and working in related fields, and taking care of their own bodies, too. There are direct, immediate benefits of learning about My Body by living every day. There is a a clear connection between New School and real life.

Learning Category #2: My Mind

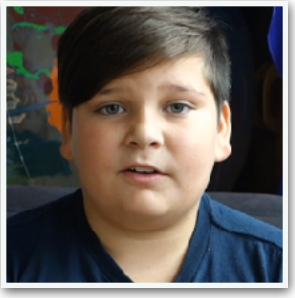
> **"**The human brain weighs approximately 3 pounds. It is made up of billions of cells called neurons. Junctions between neurons, known as synapses, enable electrical and chemical messages to be transmitted from one neuron to the next in the brain, a process that underlies basic sensory functions, and that is critical to learning, memory, thought formation, and other cognitive activities."[18]

No photograph is available to depict the human mind because, as far as we know, the mind isn't a physical object. It's uncertain whether the human spirit is something that can be photographed, whether visual manifestations are trustworthy.[19] Still, the conception of human mind and spirit are interesting to every student, prompting questions about identity and purpose. Learning about learning, thinking, memory, consciousness, bias, and the brain are productive use of one hour per week, or more, in primary and secondary school.

In My Mind, Fundamentals might parallel this book's Chapter 2: Learning. Most students, some teachers, and many parents would benefit from Fundamental lessons in memory, recall, happiness, attention, interest and disinterest, and the roles of sleep and exercise in learning, . What do we know about the minds and behaviors of our youngest humans? . What is known, or theorized, about the brains and minds of people who are 6, 16, 60 years old? The brain changes over time; so do behavior, and memory. Fundamentals provide a first step toward deeper learning about the Mind.

My feelings, my emotions, my way of seeing the world. Studying the mind comes to life with personally relevance: my family, my grandparents, our shared characteristics, my depression, my friend's happiness, my great-grandmother's resilience. My Mind may overlap with a college Psychology 101 course, but New School's My Mind target starts in kindergarten. Growing up, kids think a lot about their behaviors and try to figure things out on their own.

> "I'm concerned because my dad and my grandpa were both a little bit, [well] pappa [grandfather] was mentally insane, and my dad was a little bit insane, too. I am not



mentally insane, but I am very, very hyper, and I feel that kind-of impacts on my happiness. I sometimes will get really, really mad. I'll go psychopathic and beat everything up. Everything around me. I don't want it to impact on me. I have a lot of video games, and I kind-of spread them out. Some video games help me to just calm down. I have a racing game that I just love. It calms me down so much. I have a little brother and he's like a bull in a China shop. He is like a mad scientist and I'm like a bunch of buttons. He loves pressing them and getting me mad. He is a very tough kid, but when he makes me mad, I force out on him, I flash out on him. My mom knows how to deal with this very, very well. It's amazing how she does this – because she had this when she was little with her stepbrothers."

– Aiydan, 12, Neon, Kentucky (Kids on Earth interview)

Children and teenagers spend a lot of time thinking about who they are, what they think, why they think that way, what they believe, who to believe, how to behave, and so much more. With regular weekly study and ample opportunity to explore in New School hours dedicated to Personal Education, they gain access to resources, experts, collaborations, and relationships. Each student acquires a customized understanding of theories of mind, family relationships, happiness, emotional wellness, mental illness, self-control, relaxation, anxiety, consequences, and more. They learn to think more clearly, and segregate germane and non-germane variables to make better decisions. They explore the many forms of curiosity and creativity ,learning more about themselves in the process. They may try to communicate with a family dog by developing a barking language (they would not be the first). These are kids – we want them to have fun learning!

Summarizing a 2024 LinkedIn post from University of Virginia Education Professor Tish Jennings, very young children fascinated by the natural world, or engrossed in an activity, seem to engage in "protomindfulness" – attention is clearly focused on the present moment with openness and curiosity, but there is no meta-awareness of this state. We often disrupt this process, thinking the child is "daydreaming" or "off-task." By nurturing their protomindfulness, we can help them develop into mindful individuals."[20]

For each of us, My Mind holds secrets. Inspired by My Mind, we develop a better understanding of one another. Students will tell stories about their lives, dreams, plans, relationships and imagination. Trained to recognize potential danger signs, teachers respond in an appropriate manner. As students become more interested in My Mind, they explore websites and videos never intended for people their age, self-diagnose, and sometimes, take appropriate action – but if and when they don't understand, or go astray, the teacher can help find the necessary resources. (There's no stopping people from exploring whatever interests them on the internet; the difference here is one-on-one support from trained educators.)

Chapter 4: New School

13,483 Words

The way we live today, with so much emphasis on identity, agency, mental health, emotion, behavior, and ideas related to the mind, adults must address the scale and scope of learning students now require. New School should end the dark ages, bringing My Mind into the light.

Learning Category #3: My Life

In Old School, there is a clear distinction between one subject and another. In New School, boundaries are porous, overlaps are intentional.

One way to think about My Life is to organize it into past, present and future. As with so many aspects of My Life, nothing is simple. Nobody's life runs in a straight line. For every human life, there are many pasts, multiple presents, and uncountable futures. A child or teenager may decide to explore any of them at any time on their own terms. The past may be a half hour ago, or in the 19th century, when the first ancestors show up on a family tree. And that's okay. The point here is to provide space to learn and explore, with structure and support.

Another way to think about My Life is through relationships: parents, siblings, cousins, friends, a librarian or a shopkeeper, a babysitter or mom's friends from work. What, exactly, is a "best" friend? Are friends from social media real friends — or acquaintances? What does it mean to fall in love? To truly hate somebody — enough to do them harm? To deal with consequences of our own actions? Or blame somebody else?

Relationships change. People move away. New people move in. Stability varies. Parents lose jobs, transfer to other places. Sometimes, parents choose other partners. There are celebrations and disappointments, highs and lows, long periods with neither.

My Life — everyone's life — contains so many questions. How do you know whether a goal is worth achieving? Air quality is suddenly so bad, it's dangerous to play outside — should I convince my family to move? My family doesn't have enough money, what can I do to get more? What happens when a friend begins to make bad decisions? What are the rules for South Korean teenagers and law enforcement in this part of Vladivostok? What if I'm pretty sure my sister is not really my sister? Why do people believe, and not believe, in God; why do some people rely on religion, and why do others not? Should I lie to keep my friend out of trouble? How do I find enough time for my friends, my boyfriend, and my family responsibilities? If I go through a bad period, how do I get things back to normal? What can I learn from Buddha?

Some of what is now packaged as Social-Emotional Learning should be candidates for My Life Fundamentals (with My Mind overlaps): taking care of yourself, nurturing identity and relationships, and making positive decisions for yourself and the people around you, identity, resilience, overcoming obstacles, dealing with adversity, happiness, sadness, managing energy, contemplation and more. Happiness could be a Fundamental. It's likely to be

popular: one of Yale University's most popular classes is about happiness. Learned optimism, resilience, and self-awareness are also potential fundamentals. GRIT, by Angela Duckworth, examines self-control and perseverance a potential Fundamental to inspire Personal Education. Gaining useful work experience, making contacts, earning a living, getting along, spending more time outdoors – all are Fundamental candidates. Breaking bad habits fits in this frame, too: lying, stealing, eating unhealthy foods, bullying, arguing, fighting..

Each of us carries responsibility for others' well-being. The British Red Cross has outlined several first aid priorities: bleeding, broken bone, choking, head injury, burn, and inability to breath, or an asthma attack.[21] Every child and teenager might learn how to help others with Fundamentals or Personal Education. In the U.S., nearly all causes of nonfatal emergency department visits for people under 25 result from unintentional falls, getting hit or struck by a foreign body, animal and insect bites, inhalation / suffocation, piercing and cutting, overexertion and motor vehicle accidents.[22]

In New School, My Life stands beside Numbers & Money, My Body, and Our Planet & Beyond as one of 10 high-value primary and secondary school Learning Categories. With My Life, New School makes a firm commitment to respect, honor and help each student grow up.

Learning Category #4: Our Counties & Cultures

My Body, My Mind, and My Life center on the self. The next three Learning Categories – Our Countries & Cultures, Our Planet & Beyond, and Our Futures – encourage students to think beyond their own lives.

Our Countries & Cultures means different things to different people. Everyone learns about the world from books (Harry Potter), sports (Olympics), music video (Rema's "Calm Down"), movies (*My Neighbor Totoro*), food (empanadas), news (Gaza), politics (Putin) and more (climate change). We learn from family and friends who travel, do business in other countries, pursue higher education and work in other places.

Students want to know where they came from, what happened before they arrived. At home, they get pieces of their own stories, limited views through photographs and home videos. Most parents and families cannot pull together a comprehensive story.

"I'm from Stara Zagora. From the history, I know it's 7,000 years before Christians. This is one of the oldest cities in the world. You can find some things from the Stone Age era, the Roman Empire, the Byzantine Empire, the Ottoman Empire. Stara Zagora changed its name 8 times because it was occupied by so many others."

– Siyana, 12, Stara Zagora, Bulgaria [Kids on Earth interview]

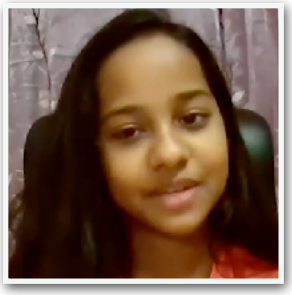
"I know some, because I am not very good about history. I know that Bulgaria was… uh, I don't know the word… *occupied*! 1878 was the year [we became a nation]. The men who helped were many. I can talk about some. Vasily Levski. Stefan Karadzha. Georgi Sava Rakovski. Hristo Botev. They are heroes to Bulgarian people. They emancipated us from Turkey. We needed to start a war with Turkey. Russian helped us. Macedonia, she helped, too. I know this. There is a TV channel called NOVA, and there are TV shows, a few about the life of heroes and peoples. I believe Bulgaria is safe now, but there aren't heroes to help us.

—- Alexandra, 12, Stara Zagora [Kids on Earth interview]

Fortunately, in Our Countries & Cultures, there are existing historical timelines, maps, and often, written or oral histories. There are streets to stroll, buildings, cafes, recipes that in the family and culture for decades, centuries. Bulgarians and Greeks argue about feta cheese (Bulgarian uses sheep's milk, Greek uses cow's milk, perhaps some goat milk, too) – there are local variations, foreign versions (Israeli, French, etc.) There are old family recipes, and flexibility if there's a good recipe on YouTube. Pride of place, and global interaction, too.

"Mauritius is one of the Mascarene Islands, which is found in the Indian Ocean. I am near Africa. There are three islands in the Mascarene Islands. The names are Rodrigues, Mauritius and Réunion. I don't know if it's enough big, but I find it really great. It is really far to walk. The British fought a battle with the French, and the French won. [So they controlled the island.] When the British conquered the island in 1810, they attacked the French in their sleep. Then, it was British territory from 1810 until 1968. Then, there was a vote to make the island independent."

–Adi, 11, Port Louis, Mauritius [Kids on Earth interview]



"I speak French, English and sometimes Creole. My Creole is really bad. Creole is my mother language, my mother tongue. Before, I could only speak French, but now, it's mostly English for me. I have three friends from London. With them, I speak English, but I have other friends who speak French and English. But I hang out with a group of friends, and they're always all there, so we speak English so everybody can understand."

–Shailee, 10, Port Louis, Mauritius [Kids on Earth interview]

Must every student in Mauritius know the island's history? What about every student in nearby Rodrigues and Réunion? Should they know the history of Mauritius, their own islands, the Mascarene Islands (of which they are a part, too)? Nearby Indian Ocean islands? Madagascar

is 734 miles away. It's a very different culture. How much should Malagasy[23] students learn about Mauritius? To what extent proximity determine what students know? All students, or some students, or just those who are interested? Adi, Shailee and their parents tell us that Mauritius is a very interesting place, but it's a small place most people in the world know nothing about. In New School, some students may choose to learn about Mauritius, and perhaps build new online relationships with friends like Shailee and Adi. Already, Shailee has friends in London, and she would like to study abroad. Who determines what Shailee must or should or might want to know?

With more than 200 countries and about 6,000 languages in the world,[24] and recognition that a single country often includes many cultures, potential learning is spectacular.

"My mother is Swedish. My dad is from Syria. We lived in Syria. Growing up, I don't have mom. I didn't know much about my mother until I was 9 years old. We came to Sweden. I met my mother. My mother is very kind. When I was in Syria, she took care of my sisters in Sweden. [When I arrived here], I didn't know Swedish. She helped me to learn. My father is Muslim and my mother is Christian. Muslim, we have one God, and a Prophet. In Christian, you have Father, the Son, and God. I go the church, sometimes, with my grandmother. I go the mosque with my father. My father told me I can choose my own religion, whether I want to be Christian or Muslim, or… it's my choice (I'm still deciding.) In Christian, you have good things and not good things. In Muslim, you have the same. In Christian, if you curse at your mom, God will forgive you. In Muslim, you are not forgiven. Yes, I know people who get into trouble. In the morning when you go out, there are people causing trouble. Sometimes, when people start a fight, they call in their friends. The fight becomes bigger. Somebody was talking badly about my mother. I told him not to say bad things about my mother, but then, he waited outside school for me, to fight. I've been boxing for 6 years. He went down on the first punch. My father, he was a professional boxer. He taught me."

—Khaled, 15, Stockholm, Sweden [Kids on Earth interviews]

Visiting Stockholm to learn about boxing from a Syrian teenager used to be unusual. Now, this is the way the world works. Old School students learned about places by reading encyclopedia articles and textbooks. New School students connect with somebody who lives there. (Doing a Bolivia project without communicating with someone who lives there seems, well, a little silly.) Curiosity is drives learning. Kids who live in Sucre, Bolivia are curious about the rest of the world, and apart from internet inconsistencies, there's no reason why they cannot learn from kids in Windhoek, Namibia. Arrows point in both directions. Translation may be cumbersome, but nowadays, there are ways to make it work with steadily-improving technology (consistent with 2024 global averages: 50-60 percent internet penetration in both countries, higher in the cities). It's getting better quickly.

As students forge connections, learning becomes more interesting, nuanced, connected in ways parents never thought possible. Students in should be talking to each other. At one time, people who lived in Buenos Aries and Montevideo were trying to wipe Asunción – all of Paraguay – off the map. Now, they argue about football teams: Argentina's FIFA / Coca-Cola World Ranking is 1st, and Paraguay is 49th.[25] They watch the same TV shows, play the same videogames, read many of the same books. For them, Brazil is a an outlier because Brazilians communicate in Portuguese, not Spanish, but that's becoming less of a problem, too.

Imagine going to school every day to tell the story of your people, and to learn about the lives of new friends who live in northern Ontario while you're going to school in Peru – and finding out you're in the same time zone so you can actually talk, via ZOOM, every day![26]

Fundamentals in Our Countries & Cultures take shape based upon student, teacher and community, and government interests. Many stories involve colonization. There are inconceivably vast oceans – people traveling across those oceans to trade, conquer, rescue, exploit, and do all sorts of interesting things. There are natural resources, population shifts and there's climate change, too. High mountains, mountain ranges, animals that live in those mountains, rivalries, weird weather patterns, interesting art, and more. Río de la Plata because is the local river for Buenos Aries and Montevideo, but the Paraná River is South America's second largest (Amazon is first), so these rivers are interesting to students in lots of places beyond Asunción. Still, local priorities always shape Fundamentals.

Year after year, students collaborate, challenge one another, write reports, produce videos, interviews one another, create pictures, make music, and attempt to explain the world to one another – but their output is rarely shared. With a central repository, students may assemble the largest repository of information about the world and its people in human history – their stories, their contain stories, pictures, maps, insights, interviews, projects and far more than any museum collection could accommodate. It is possible today, and it can take shape in a remarkably short time. More in Chapter 5.

Learning Category #5: Our Planet & Beyond

One Fundamental starting place is the story of earth itself, beginning 4.5 billion years ago when it was mostly gas, and unimaginably hot – "the surface remained molten for hundreds of millions of years."[27]

Fundamentals could explain what's below (mantle, core) and above (moon, sun, stars, clouds). Earth supports plant and animal life; humans have not identified another planet that supports life, but the search continues. There are many types of animals and plants on earth; they depend upon one another in many different ways (including eating one another). Lots of life forms are still to be discovered – especially in the deep oceans. The list of potential Fundamentals is enormous – remember, it changes every year – so children, teenagers, and

hopefully, community members will learn a lot about forests, comets, bird migration, soil, invasive species, aquifers, tide pools, frozen ponds, and bees, or whatever they choose for this year's Fundamentals.

Everywhere, imagination is captivated by dinosaurs, continental drift, Neanderthals. Each is ideal for a deep dive into Big History, anthropology, archeology, collecting fossils, carbon dating, and science museum visits and projects.

In Old School, the focus is on what humans already know. In New School, the focus expands to what humans want to know. So much is still invisible, undetectable, unimagined, unplotted, not understood. Improvements in digital imaging and other technologies continue to reveal more, but much of what is known is also unfathomable. Some of these ideas are categorized as supernatural phenomena — ideas not yet understood, perhaps unworthy of primary and secondary school study. New School removes that barrier, encouraging students to explore.

And then, there's climate change, which presents, in the words of former U.S. Vice President Al Gore, "An Inconvenient Truth." Humans and their governments continue to make terrible decisions about life on earth in order to maintain economies and industries.

If students and teachers concentrate on climate science, they will know more about biodiversity loss, wildfires, atmospheric rivers and the melting of glaciers, but problems will continue to worsen. Instead — and controversially in some sectors — students must focus on "coal, oil, and gas burned by humans [as] the primary cause [of climate change], followed by deforestation and intensive farming."[28] "Must" is a strong word, but school is the only large-scale alternative to media, and media is largely controlled by governments and industry. If most people in the world continue to learn about climate change through media — climate change will continue to accelerate.

Many communities will include climate change as a Fundamental. Some will do so with a point of view: How to stop the destructive practices of government and industry? That is, some Fundamentals and some Personal Learning may inspire activism among students and their communities — and collaborative activism with other communities.

If students are connected to one another, they can share ideas and organize a movement. They might take a stand. They might strike. They might convince their families to stop eating beef, demand that local stores and restaurants stop selling beef. They can self-educate so they understand damage caused by beef. They have power: strength in numbers; their ability to instantly share ideas, images, graphics, music; enormous influence on parents (about 1/3 of the planet's adult population — plus grandparents). There would be pressure, and perhaps, conflict, because jobs and local industries are at stake, along with a great deal

of money. Students efforts may generate international media attention. Along the way, students will learn a lot about how public policy is shaped in the 21st century.

It is not the intention of New School to foment unrest, but students with freedom of thought and freedom of expression will encounter the unrightable wrong. They may choose to leave it alone – perhaps it's not their job to change the world – or they may do what needs to be done. When adults do not control everything children and teenagers learn, children and teenagers learn to think for themselves.

All over the world, there are wrongs to correct. "PM2.5 air pollution in New Delhi is causing an estimated deaths of 25,000 lives since January 1, 2021. It has cost the city's economy around US $3.7 billion so far this year."[29] Today's children and teenagers should be deeply concerned about the air they breathe, the water they drink, the food they eat, and more. They see adults not solving the problems. They see the problems getting worse. The only sensible thing to do is to begin solving these problems on their own. Otherwise, their personal and collective peril accelerates and dangers become more formidable.

Certainly, there is value in learning about wind farms, zero-emission homes, reforestation, and the metrics of climate change. These paths lead to careers. There is a value in learning about international diplomacy and the role of business in government, too. Empire and colonization remain important topics, especially for nations that once dominated other nations (and perhaps continue to do so), or were subject to them. Slavery may be central to the story, but what of countries on earth attempting to colonize parts of the sky, perhaps to mine asteroids?

"I don't think anyone owns space. I think it's okay to have like a space force to explore space, but not to own it. Humans own the world. It's their job to care after it and not to damage it. I think we're doing pretty bad, looking after our planet. There's pollution always happening. People throwing rubbish into the sea. And plastic in the sea, which kills fishes. Humans must be careful and take care of the earth because, right now, that's our only place to live. If we damage earth too much, we would have to go into spaceships to another planet. I think that's going to work out pretty badly. First of all, we won't have materials to build. Second, if we did, it would take a very long time. I think there might be life on Mars. I mean, there's only, like two droids on Mars to investigate. Out of the whole Mars, there might be some place for us. If we move to Mars, it is our fault – first, we destroyed Mars, and if there is life on Mars, and I believe there is, we would be taking away their planet."

–Philip, 10, Southport, England [Kids on Earth interview]

Today's students possess two remarkable advantages. They are located all over the world (nothing new), and the majority can communicate with one another (very new). As each student pursues many Personal Education projects each year, they can collect and share data,

and offer observations (including sound and video files). Their geographic diversity makes it possible to learn locally – about oceans, shorelines, glaciers, air quality, climate and its impact on people and communities, microscopic worlds in ways that were never practical before. This diversity also presents an opportunity for global observation of local climate change – diligence that could be transformative. In short, individually and collectively, children and teenagers could know more about the local effects of climate change than anybody else on earth.

Learning Category #6: Our Futures

Does contemplation of migration to Mars or asteroid mining belong in Our Planet & Beyond, or Our Futures? Just about anything in Our Futures will overlap with at least one other Learning Category. As with My Life, Our Futures is a flexible learning space to reflect on the rapid multi-directional change so much a part of growing up in the 21st century.

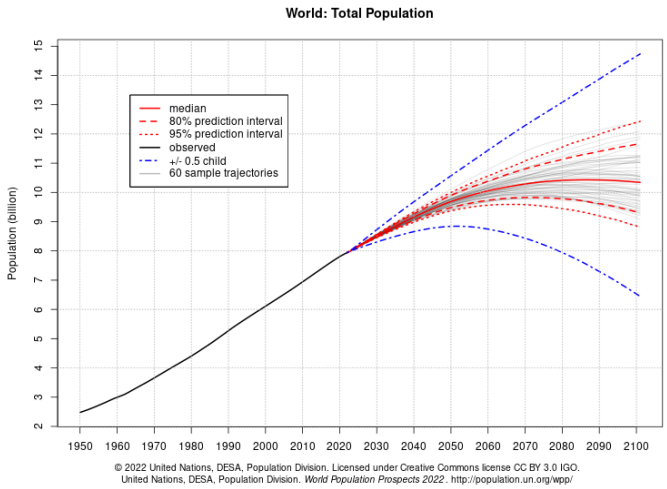
Most Our Futures studies attempt to answers this question: "Between now and 2050, how will _____ change?" Our Futures is kin to science fiction (less so to fortune telling) because the investigation usually begins with "What do we know today about the world tomorrow?" Rarely is the answer "nothing" or "not much." There is always a place to begin.

Skills developed in Numbers & Money (below) are useful here – data gathering, sample sizes, geographic and cultural differences, identifying bias, asking questions such as "How long has this been going on?," "How many people have been affected?," "Can I graph a long-term trend?" They'll answer those questions by reaching out to other students, teachers and experts, build a glossary, develop hypotheses and refine their questions. In Our Future(s), each of these could be a Fundamental skill, expanded through Personal Education – into statistical modeling, creating beautiful charts and graphs, organizing useful information, reaching out to students with similar interests nearby and far away.

Primary and secondary students are not professional futurists, nor should they be expected to be (some will surprise us). Fortunately, professionals have been developing future scenarios for a very long time. There is a lot to learn by studying the history of the future – the progress of videogames, vaccines, or electric vehicles, for example.

Throughout this book, one persistent theme has been population growth. How did scientists figure out that 8+ billion people live on earth? How do they know – why do they believe – nearly 10 billion people will live here by 2050? That half of new children will be born in Africa? Most students won't be familiar with the Population Division of the Department of Economic and Social Affairs of U.N. Secretariat, or its publication, *2022 Revision of World Population Prospects (27th edition),* but it is not out of reach, even to primary students.

"It presents population estimates from 1950 to the present for 237 countries or areas, underpinned by analyses of historical demographic trends." So far, not so difficult once the term "historical demographic trends" is explained. Let's keep going. "The 2022 revision also presents population projections to the year 2100 that reflect a range of plausible outcomes at the global, regional and national levels."[30] Lots of professional language, but go slowly and ask the teacher to make sense of anything you do not understand. Look up "plausible," it means something like "reasonable."



How about the graph?[31] At first, it seems complicated, but it's not. The black diagonal line shows global population from 2.5 billion in 1950 to about 8 billion today. The blue lines show what some people believe likely. The grey and yellow lines are other forecasts. What matters here? By 2100, it looks like global population will droop. Nobody seems to be saying earth's population will grow to 20 billion or drop to 5 billion. Instead, there's a range we found by studying a graph. Not so difficult!

Is the graph correct? Check another reliable source! Fortunately, UN's Population Studies group also publishes summary documents (students quickly become superstar web researchers). One is called "Ten Key Messages." The first one: "The world's population continues to grow, but the pace of growth is slowing down."[32] Aha!

That "aha!" is the key – figuring out what's likely and not likely! Students who learn how to think clearly about Our Futures are not so easily fooled. They ask questions and see beyond click bait and media headlines.

Electric vehicles are likely to replace many vehicles powered by fossil fuel. This will require a different approach to delivery of power for those vehicles, and, probably, new designs for roads and highways. Students considering possible futures may stop to wonder where the electricity for those vehicles comes from. A Honda Civic weighs about 3,000 pounds (plus passengers and cargo). How much energy would be required to move 3,500 pounds at 60 mph for 100 miles? How much wind energy would that vehicle generate while it is in motion? (Maybe figure this out in Numbers & Money.) How much solar energy could it collect and store in a day? If wind and solar cannot provide the car with what it needs, then electricity and/or fossil fuels must provide the rest (until cars are powered by nuclear energy, or some

other way)? How to generate that electricity? Would we use fossil fuels (like coal) to generate electricity to power electric cars (if yes, why not bother?).

These questions are not beyond the reach of many students, but they make faster, more efficient progress by working together (again, the internet is a necessity). For example, a student in Bratislava, Slovakia might run a small team to work the calculations. A group of students in Aqaba, Jordan might study solar energy and solar batteries for cars. A student in Georgetown, Guyana, whose mom is a petroleum engineer, might add insight about anticipated changes in her industry. Together, students may endure early morning and late night ZOOM conversations, and exchange a lot of information via the internet, but they can and will answer questions like these — and attract some media attention for their efforts. Along the way, they build resumes and learning portfolios for higher education and employment opportunities, and perhaps, solve some problems, too.

As students become familiar with the power and versatility of scenario planning, they will find all sorts of interesting things to do. Moreso, with the addition of AI. Some will learn and share ideas about alternative housing, the wisdom of fighting in a war for one's country, and where they should (and should not) live. Mostly, discussions about each year's fundamentals in Our Futures will be dominated by students eager to learn what they need to know for their own careers in the 2030s and 2040s.

Not everything must be serious. Students will attempt to answer all sorts of questions about their individual futures: "Will I be happy? Will I be rich?… whatever will be, will be." Does a 6-year-old think about this stuff? You bet!

Learning Category #7: Words & Stories

The next three Learning Categories — Words & Stories, Numbers & Money, and Sounds & Images — emphasize the importance of human communication, individual expression, and clear thinking. They embrace a broader conception of communication within and across cultures than their predecessors, Language Arts, Mathematics and any version of Music, Media Arts and such. International and intercultural sharing of ideas is also front-and-center.

With student engagement at the core, every New School student is encouraged to express their own ideas and actively attend to ideas expressed by other students. Words & Stories imports reading and writing instruction from Old School, but adds listening and speaking because they are more frequently used.

Learning to read and write requires concentrated attention every day in primary school. Similarly, initial instruction in arithmetic and basic money skills requires extra time in the primary grades. As students master the concepts and skills, the extra time is converted to create more Personal Education hours in the schedule.

Chapter 4:
New School

13,483 Words

With the rampant popularity of Sounds & Images, it is difficult to make a case for reading and writing as a widely-used forms of human communication. Instead, there is a case to be made for reading and writing as useful tools for clear thinking and clear expression.

Old School concentrates on reading; writing is necessary, but less of an emphasis. In New School, the model is flipped because the best way to develop clear thinking is to write. The written work need not be very long, but students should write something meaningful at least once a week. Writing a lucid, compelling paragraph, a page, or several pages requires a viable structure, careful selection of words to convey specific meanings, and a credible argument in the form of a story, description or other expressive form. In Old School, writing is done either during available minutes in class, or in a (noisy, distracting) study hall, or at home, as homework (also, sometimes, distracting). New School recognizes that good writing requires sufficient time, and a quiet place to write. Students may learn, or brush up on specific writing techniques and practices through Fundamentals, but mostly, they need the time to write — and in New School, they can spend several hours a day writing because half of each day's school schedule is devoted to Personal Education.

In school, teachers are always available. So are fellow students to offer feedback. New School supports a rigorous approach — writing a second, third and fourth draft are part of that rigor.

Hand-written drafts are fine — a good way to get started, but writing and rewriting is often easier with a computer. Drafts are more easily stored and shared. Students acquire discipline as they maintain each draft, date it, file it for later use.

> "I want to write about stories about how women are now making a big leap. I think I have the skills, especially with so many [good] teachers in my area. I have built up the tenacity to do this. It's something I'm really passionate about. So many females have been getting involved in politics and sports. They've made international news. I remember a conversation with my brother who asked, 'well, what are you doing to be like them?' I started a club at my high school through a Girls Up organization. They're all about fighting for women's equality in any way possible, fighting the wage gap, getting involved in politics and education. We just want to be viewed as equals. I have so many classmates who are fighting the same fight I am… I want to be a writer: a journalist."
>
> — Katie, 15, New Jersey, U.S. [Kids on Earth interview]

Reading is useful because it allows a student to see how other writers compose and present their ideas, widens perspective, enlarges vocabulary and knowledge of structure, and introduces possibilities of writing about ideas not previously considered. Students should

spend meaningful time reading just about every day – if assigned homework survives into New School, it might take the form of a requirement: read for 20-30 minutes every day without interruption.

Should every young teenager in every English-speaking country read Shakespeare's *Romeo & Juliet?* That's a Fundamental community decision. The entire community may decide to read one book and talk about it (One Book, One Philadelphia, etc.) There are no rules here – except to make sure every student can listen, speak, read and write effectively, and by extension, their parents and grandparents can, too.

A good story captures and retains attention. Writing good stories comes easily to some people, but not for everyone. Fortunately, there are many ways to learn to become a better storyteller – a useful Fundamental skill worth learning and improving over a 13-year school career. UNESCO Story Circles helps people tell their stories. They advise, for example, to "share simply and clearly, uphold positive intention, be authentic, be open to learning, and listen for understanding."[33] As the world becomes more diverse, students must learn to express themselves in different languages. And, they must be able to listen and read what others are telling them.

In some communities, fluency in more than one language is essential. For most students, familiarity with a wide range of languages is useful because languages connect to diverse ideas and cultures (this work may be pursued in Our Countries & Cultures, and My Life, too).

Over time, many students become familiar with various forms of Arabic, Chinese, Bengali, Hindi, Farsi, Hausa, indigenous languages, tribal languages, Spanish, French, Italian, and more. Some students will go further, looking at similarities and differences amongst Arabic as spoken in Tunisia, Yemen, Morocco and Indonesia in Personal Education. They learn symbols and structure, and become attuned to sounds and symbols of many different languages. Some may develop fluency and literacy in Guaraní (a Paraguayan national language), translate lyrics from Dagbani (spoken and sung in Ghana) to French, and explore international sign languages. Technology can help: DuoLingo is a popular app for practicing and building vocabulary, and Google Translate is one of many useful tools. As a community project, learning an unfamiliar language as a Fundamental for a week (or more) would be fun for everyone (children, teenagers, adults). Connecting in a meaningful way with people who live in a place where that language is spoken enhances the experience.

Words & Stories bridge oral traditions, songs, music, art, video, textiles, music video, games, more. With the coordinated guidance of teachers in Words & Music and Our Countries & Cultures, students will be encouraged to learn more about places (the music and art of Morocco), types of visual expression (graffiti, street art, murals), performing art (modern dance, ballet, folk dance, opera, hip-hop). They become familiar with all sorts of digital storytelling, word games (crossword puzzles, local variants on Wordle, etc.)

Students find surprising variety in Words & Stories. For example, journalism, poetry, and blogging reside here (and in other categories), and so does poetry, rap music, and stand-up comedy. All are equally important.

Learning Category #8: Numbers & Money

As with Words & Stories, more time is allocated to Numbers & Money in the early grades to assure sufficient instructional time and desired levels of competence. Some Old School Mathematics curriculum is included here – mostly numbers and arithmetic – but Numbers & Money covers more territory. The underlying philosophy assumes a more modern shape, too.

The purpose of Numbers and Money is clear thinking and reasonable decision-making. Numbers are used for many purposes, including measurement. Money is primarily used to express value for value-based transactions, but money is such a ubiquitous part of daily life throughout the world, it has gained parity with numbers. For students, for application in other learning, or, for a career is completely within reach the combination of Fundamentals and Personal Education provides flexibility to learn what each student wants and needs to know.

Thanks to Old School Mathematics, early Fundamentals are easily defined: arithmetic, fractions, decimals, and the rest. Secondary students should be familiar with trends, data analysis, probability, statistics, and also aspects of logic, coding, and more. There will be debates: which aspects of algebra and geometry must everybody know, and what should be studied individually and in small groups during Personal Education?

Regarding Money, every student should learn Fundamentals about earning, saving, spending, debt, consuming, budgets, supply and demand, wealth, poverty, middle class, and something about running a small business. Fundamentals should differ from place to place, and from one year to the next.

On the clear thinking side, 21st century students should learn to collect and share data through local and international collaboration. Almost every important issue can be made more clear through of data and analysis from multiple perspectives. Numbers & Money helps students tell, and decode, important stories, and, bring about meaningful change.

Learning Category #9: Sounds & Images

Sounds & Images is New School's home for music, visual arts, and much more. Most children happily sing (and dance), or pound on a drum or any old pot or pan. They draw on any available surface, with any available tool. They make up stories on the spot. It comes naturally. Fundamentals add some training: there are many types of music instruments, a clarinet sound like this; how to paint (without making a mess); when drawing a human face, the eyes should

be half-way between the top of the head and the chin; it is possible to see into space and into microscopic worlds and beyond the visible spectrum.

Students should explore the spectacular soundscape of life on earth: birdsong, the din of a construction site, humans shouting, dogs howling, cats meowing, an opera soprano at top of range and a *basso profundo* at bottom; the sound beneath the ocean; breezes across a field of flowers, sounds just above and below human sensitivity.

Night and day, the sky is shows off, sometimes in subtle ways (overcast sky), sometimes in vivid colors (Northern lights). A photograph is a collection of tiny images, but the human brain sees the image as a unified picture. Human eyes cannot see infrared light, but we've invented infrared photography to see what we cannot. Stars and planets are far away, but we can see their long-ago images with telescopes (a connection to Our Planet & Beyond). It's not possible to see inside the body without opening it up, but digital imaging technology changes those rules. Speed confuses human perception; photography can stop motion. On the maker side, stop-action allows real life objects (such as clay figurines) to move as if they were alive. Images frighten, persuade, generate joy, capture memories and recall, family history, see sub-microscopic objects. The image universe is full of wonderful surprises.

Each year, each community must decide upon its Fundamentals for every Learning Category, including Songs & Images. The mix can be thrilling: Bob Marley & the Wailers, pointillism, Times Square's giant illuminated signs, behind the scenes at *Wicked* (a Broadway musical with plenty of special effects), marching band acoustics (while marching), fireworks, music of indigenous people, making a giant mosaic, producing a documentary, the business of being a rock star (featuring a bona-fide rock star), color psychology (including painting classrooms different colors), so much more. Some Fundamentals involve making things. Others involve history, psychology, perception and emotional reaction to media. This widens everyone's view of learning, and expands the idea of education.

Participation in 21st century life often involves making sounds and images to express ideas, work out feelings, capture attention, gather a crowd, make an impact. Today's students ought to know how to do these things — but doing these things requires time and scheduling flexibility, which Personal Education provides. A musical theater production requires students to select a project, make creative decisions, decide who will do which job and play which role, design and paint scenery, light the stage, arrange the music, memorize singing and instrument parts, rehearse, and much more. Students learn much more about Sounds & Images in practice than in theory — they experience, and sometimes participate in, making difficult (sometimes tricky) creative decisions (cut that song, recast that role), pace, clarity, and more. And, they perform for a real audience that laughs, applauds, or remains strangely (uncomfortably) silent. Learning about Sounds & Images is learning about creative judgement. It's not always rational, doesn't always make sense, but always instructive.

And, there is technology – producing the sounds and images, recording and mixing music, figuring out the storage configuration and the best ways to share files. Technology makes animation possible, video games, virtual experiences and all sorts of magic possible (though some students may decide to make their magic via the older process of cel animation).

For centuries, scholars have studied Words & Stories, and Numbers & Money. The study of Sounds & Images is a much newer field, but does not diminish its importance.

Learning Category #10: Movement

Students move their bodies to improve strength, agility, endurance, flexibility, balance, and fitness. Bodies stretch, walk, run, dance, doing gymnastics, compete. For at least an hour every week, very student is very active, in their own way. Engagement always involves a combination of fun and challenge, guided by teachers and other students.

In My Body, students learn what muscles do. In Movement, muscles learn by doing. Students to move faster, smarter, more efficiently and effectively, more gracefully, with greater control. Fundamentals concentrate on the operation of the body in motion. Students become familiar with every muscle group, how it works, its role in the body, how it becomes stronger and more flexible, and how it repairs when injured. Students understand how strength, endurance, balance, flexibility and a growing body all work together. Routines evolve over time. Personal safety and steady improvement are critical – staying healthy, avoiding injury, and the mental game are all part of learning. Students learn how to set, manage and achieve goals based upon their own lives and bodies. The objective: powerful understanding through direct experience.

Unlike most Learning Categories, Movement should be part of every student's daily schedule. This can be accomplished in 15-20 minute segments before school, in the morning, in the afternoon, and after school, for a total of about 1 hour of movement every day (including weekends, holidays and vacations). Movement involves engagement with the outdoors, which becomes a community priority, especially for students moving without direct supervision.

Think about this: fully 20 percent of New School's Learning Categories are devoted to individual learning about health and fitness.

A New School Schedule

There are 10 Learning Categories, so 10 of each week's 20 hours of instruction per week are assigned to specific Learning Categories. Students use the other 10 to pursue Personal Education. The exception: in early primary grades, more time is allocated to robust Fundamental instruction in Words & Stories and Numbers & Money.

Early on, all students take responsibility for their own learning. Beginning in kindergarten, they accept responsibility that comes with freedom. They rely and monitor one another because they all want to learn without disruption. Teachers become less concerned about classroom management, discipline and lousy behavior because students are engaged, or will soon be. Nobody is being forced to learn, not for very long, anyway. Every student knows the teacher is available anytime things go sideways. And, every student is supported by a community dedicated to provide support and resources. This is a different way to think about children and teenagers in school. It's based upon helping them to learn and develop, not teaching what adults insist they must know.

A Better Alternative

All over the world, private schools and some public schools provide viable examples of alternative primary and secondary schooling. Below, Mira's transition is not unusual.

> "I taught in an inner city school in Pittsburgh, Pennsylvania. I taught at this super creative elementary school but as a teacher I could feel that my ability to do the kind of things that [micro-schools do] were being taken away from me…slowly. It was kind of like being the lobster in a pot of water and you turn the heat on and very slowly you come to realize that you're getting cooked. I got some more education and I [became] a teacher-trainer and then I went to work for a school district. When my job got eliminated, I decided to do something different… I started thinking about bringing back the one-room schoolhouses of the past but with all of the new modern things we have available the technologies the ability to communicate with other people all around the world the ability to travel and all. I think a lot of people have the same ideas; [this] isn't new. There's something called the alternative education movement which has been around for a long time. People will know schools like the Montessori schools, the Waldorf schools, the Sudbury schools, the Democratic Free schools…"[34]
> — Mira Linaberger, Founder and CEO, Microschool Builders [Reinventing School interview]

Alternative schools offer many lessons that can be used to build the much larger, scaleable solution suggested by New School. Small-scale solutions, perhaps shared by a handful, or even a hundred, schools are inspiring, but New School is concerned with a much larger scale of transformation.

Remnants of Old School Ideas

Standards, testing, grades / report cards, and homework are defining features of Old School education. How do they fit into New School?

Chapter 4: New School

13,483 Words

Standards evolve to become Fundamentals. They are developed bottoms-up by students, teachers and other adults, community members and experts, and revised for each new school year. There are far fewer Fundamentals than there were standards. Fundamentals are worked out by people who are visible to students, available, and engaged, but they come about in collaboration with government, and with other school districts. They are based upon best practices and shared ideas.

In New School, students and teachers assess students' individual progress during, not after, learning. With few exceptions (early literacy, basic arithmetic), it no longer makes sense to test students or to collect and analyze post-testing data. It's just the wrong tool to evaluate learning. Better ways will emerge but, mostly, not as mass assessment.

How will each student's work be graded? Once each month, the student writes a one-page reflection and assessment of their work in each Learning Category, and the teacher does the same. They read one another's document, discuss it in person. They may annotate their own and one another's documents. Then, the material is stored in Global Brain, which uses AI to extract patterns and trends for students, teachers and parents (see Chapter 5). There is no letter grade. One-on-one discussions about what has been learned, why, how much, and the value of the work, as well as ideas for improvement, and plans for the immediate future. To provide feedback, and to encourage local adult responsibility, students are asked to assess teachers, schools and districts for review by government officials and the public..

Will there be homework? Teachers assigning (and grading) homework should be a thing of the past, but students have work to do — including the suggestion that they read for 20-30 minutes each day and write something meaningful once each week. Every month, for every Learning Category, students are asked to explain what they have been doing, why, and to reflect on their interests, progress, and possible future directions. Global Brain provides a forum to store and share ideas. Student who collaborate across time zones may work at home late at night, early in the morning, or on weekends and vacation days, but this is not homework in the Old School sense. Personal Education hours fill half the daily New School schedule, but some students, and some projects, require more time or custom access to resources.

With Fundamentals determined by local communities, and updated annually, and with Personal Education replacing standardized curriculum, textbooks seem to be a 20th century idea past its prime. Classroom materials remain useful, especially in literacy and numeracy education in primary school, but the focus is shifting to digital media. There will be a crying need for support materials, in all media, related to the many popular Fundamentals. There is far too little media available for students to learn about My Body, My Mind (big need here), a wide range of countries and cultures, Our Futures, Money, Sounds & Images, and Movement.

Without standardized curriculum, the textbook industry will evolve — and focus on 21st century ideas about school, education and learning.

What about students who prefer to learn — and teachers who prefer to teach — in the Old School manner? They are the rule-followers, the ones who prefer not to figure things out for themselves. There's nothing wrong with following the instructions of traditional teaching and curriculum, but this is not likely to be the dominant way. Still, for the small number of advocates, New School's flexibility can generate something akin to Old School — without negative consequences.

Outcomes

As a student completes or leaves secondary school, several paths come into view: (1) a job; (2) military or in public service; and (3) higher education.

Old School is designed as if most students move on to higher education, at best, 1 in 2 of students do that. Most go to work, either in whatever job they can get or by starting their own small business. A small number go into public or military service.

Generally, students who opt for college do so because they believe higher education will lead to better opportunities, more higher salaries, and social and professional connections with people who are more likely to be healthy and secure. They believe that the loss of several years of employment income, plus the cost of tuition and other expenses (which may exceed the cost of tuition) are worth the investment because of potential long-term return.

Unfortunately, the linkage between a college degree and high-value long-term employment is unreliable. There have always been more graduates in certain majors (psychology, for example) than available positions, but in other majors (nursing, for example), there are more openings that qualified candidates. Now, as more students opt for college, much of Africa (for example) does not offer the robust employment marketplace to absorb their knowledge and skills. As AI transforms jobs and careers, students find their hard-earned degrees may not yield the anticipated returns. This has led to increasing fragmentation in higher education offerings; mini-degrees and specialized short-term certificate programs satisfy some employment requirements without the larger investment of time and money. To invest 4 years (or more) and significant cash, and perhaps, to carry large debt, begins to make less sense if certificates suffice, and if a new certification may be necessary every few years in order to keep up with a changing job marketplace.

New School prepares students to become versatile, accustomed to change, agile. Their learning cuts across many topics and categories, so they can more easily imagine pursuing more than one career over a lifetime. The distinction of their early efforts, in primary and secondary school, and in Not School (see Chapter 5) become obvious to college and military

recruiters, who are less impressed with grades and test scores than accomplishment, potential and the whole person. These recruiters know there are better ways to evaluate candidates than grades and scores on standardized tests.

Greg Roberts, Dean of Undergraduate Admissions at The University of Virginia, described a variety of inputs considered, including each student's unique package of activities outside of school, and an evolving learning portfolio they may choose to share.[35] He explained one of several trends affecting admissions: "[the] emergence of more local, regional, and national Community-Based Organizations (CBO) that help schools identify and recruit high achieving, low-income, first-generation, and underserved students."[36] Michael Mills, Director of National Fellowships and Scholarships at SUNY Geneseo in western New York State, works with students in need and students with unique opportunities. Grades and test scores are less meaningful than each student's combination of personal interests, accomplishments, capacity, capabilities, relationships, community connections, international awareness, demonstrated history of leadership and collaboration history, and their ability to develop scenarios for the future.[37]

"A major goal of school is to prepare students for flexible adaptation to new problems and settings."[38] New School shifts responsibility for learning from teacher to student. School provides the facilities, structure, access to resources and teachers. Parents and peers provide the encouragement. The community provides the best available resource for learning – for every student.

In Old School, parents look to school to carry much of the burden of the education of their children and teenagers. They outsource responsibility, often for good reason. For half of daylight hours, half the days of the year, school is a free, generally safe, well-supervised and productive baby-sitting service. Basically, the system works, but the burden has become excessive. School must focus on learning, but school has become a community service center because communities fail to provide necessary services. This is understandable: parents are busy, many work more than one job, people work on different schedules, transportation is often a problem, connectivity is better at school than at home, and so on.

We have forgotten how to draw the line. Students and families require a high-functioning "Not School" sector. It is time to share the burden.

END OF CHAPTER 4

[1] https://www.merriam-webster.com/dictionary/assimilate

[2] https://www.azquotes.com/quote/708513

[3] HB: Find the original citation – the book and page number.

[4] https://www.britannica.com/topic/monoculture

[5] https://education.nationalgeographic.org/resource/invasive-species/

[6] https://www.newsweek.com/how-many-people-died-hiroshima-nagasaki-japan-second-world-war-1522276

[7] https://www.bbc.co.uk/bitesize/topics/zk94jxs/articles/zh9dwnb#zn7sf82

[8] https://www.britannica.com/topic/casualties-of-World-War-II-2231003

[9] Apple dictionary, used in connection with Apple Pages word processing software on March 15, 2024.

[10] https://www.artst.org/cloud-paintings/

[11] https://www.merriam-webster.com/dictionary/subjecting

[12] https://www.merriam-webster.com/dictionary/subject

[13] Check potentially troublesome "accuse" in "Late Latin *categoria*, from Greek *katēgoria* predication, category, from *katēgorein* to accuse, affirm, predicate, from *kata-* + *agora* public assembly, from *ageirein* to gather"

[14] BP: I noticed that the colorful chart includes YOUR Body but the text includes MY BODY. I kind of prefer MY BODY because it is personal. We are not consistent across all Learning Categories. Probably worth a brief discussion.

[15] All of these stories were published in August, 2023 on https://www.healthline.com/health-news

[16] https://www.who.int/data/gho/data/themes/health-workforce

[17] https://www.who.int/data/gho/data/themes/health-workforce

[18] https://www.britannica.com/science/brain

[19] Example from https://en.wikipedia.org/wiki/Spirit_photography - "Spirit photograph" by Édouard Isidore Buguet

[20] Tish Jennings, LinkedIn post, March 14, 2024

[21] https://firstaidchampions.redcross.org.uk/en/primary/first-aid-skills/

[22] https://wisqars.cdc.gov/lcnf/ - these are U.S. statistics for 2021

[23] Malagasy are indigenous people who live in Madagascar.

[24] *Languages: Babel: Around the World in Twenty Languages* by Gaston Dorren, New York: Grove Atlantic, 2018, page 9

[25] https://www.fifa.com/fifaplus/en/tournaments/mens/worldcup/articles/south-america-conmebol-qualifying-qualifiers-dates-teams-places-world-cup-2026

[26] "During the winter (summer in the Northern Hemisphere), Peruvian Time is the same as North American Central Time, while during the summer (winter in the Northern Hemisphere) it is the same as Eastern Time." - https://en.wikipedia.org/wiki/Time_in_Peru

[27] Macquarie University Big History Institute, *Big History*. New York: DK Publishing, 2016. Pages 98-99.

[28] *The Carbon Almanac*. New York: Pantheon Books, 2022, page 21.

[29] https://www.aqi.in/dashboard/india/delhi/new-delhi - Source of statistics is Greenpeace.

[30] https://population.un.org/wpp/

[31] https://population.un.org/wpp/Graphs/Probabilistic/POP/TOT/900

[32] https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/undesa_pd_2022_wpp_key-messages.pdf

[33] UNESCO Story Circles Train-the-Trainer Event - live event online presented by Darla Deardorff, February 1, 2024 at 1030AM eastern time.

[34] Reinventing School, Episode 40. https://www.youtube.com/watch?v=iNn7GxLhpJA&t=619s

[35] Personal interview with Greg Roberts, University of Virginia, May 4, 2022

[36] https://www.forbes.com/sites/brennanbarnard/2020/12/31/a-decade-of-change-in-college-admission/?sh=383d4e313ee9

[37] Personal interviews with Michael Mills, SUNY Geneseo, August 5, 2019 and September 11, 2019.

[38] National Academies Press, *How People Learn*, *Revised Edition*, pages 235-236

Chapter 5:
Not School

12,884 Words

When school is in session, it occupies about 70 hours a week, and, for students, sleep should occupy about 70 more. That leaves about 30 hours to do everything else, including learning in "Not School," and thinking about the future.

"Yes, I am taking dancing lessons. We learn dance moves. Then, after, the [dancing] teacher puts on the music and we dance to it. Then, every day, every time we have a dance lesson, we learn new moves and [practice] until we get it right. And after that, we perform on the performing day."

– Joana, 8, Kampala, Uganda [Kids on Earth interview]

"When I grow up, I'd like to be an actor, a singer or a coder. So, I'd make computer games. Right now, I'm doing quite well down the acting path. I've just got a job with *Priscilla the Queen of the Desert*. It's a big hit! It is about three drag queens who go through the desert in a bus called Priscilla. I heard about it from a friend, and I thought, that would be quite fun! So, I went to the audition. I actually made it to the second round. After the first round, they kicked most of the others out – [nearly] 40 kids. They kept 12 for the second round. And they let you know later who were the 4 who got in. [I got in!] At the beginning, I thought, 'this is not something I think I can make,' but my mom thought I was perfect for the role. That was my motivation to keep going. I made it through. Now, there are so many posters up [all over the city]."

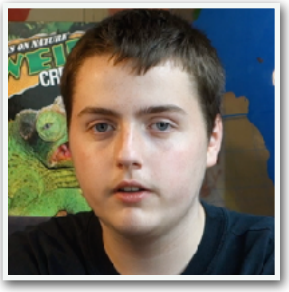
– Thio, 11, Hong Kong [Kids on Earth interview]

"My hobbies? I love to read books and go outside and cycle. Every weekend, me and my dad go to the park. We cycle, we sit in the grass. And in the winter, we'll have snowball fights, make snowmen. There's always a different hobby for each season. I've been to London, Birmingham, Manchester. I do travel quite a lot. Every year, we try to make a trip to a foreign country. Some of the countries we go to, my dad and my mum's friends stay there, and I make friends with their children. We have relatives in Ireland who I talk to and chat with quite a lot. We just talk about the recent things that go on, the votes, magazines, all the way to Charlie Chaplin and Laurel & Hardy – they are probably my favorite films. I love fantasy books. I've read all the Harry Potter books by J.K. Rowling. I've just started to read *The Three Musketeers*. Another book I adore is Gerald Durrell's *My Family and Other Animals*. You never know what's going to happen next when he puts a snake in the bathtub, a gecko in the ceiling, bumblebees in your father's cigarettes… You just don't know!"

– Debanik, near Altrincham, England (near Manchester) [Kids on Earth interview]

Chapter 5:
Not School

12,884 Words

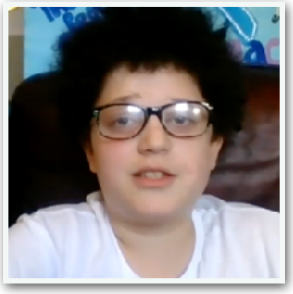


"If you hunt from the trees, you would need a stand to sit on. You would need the bait to get the deer. You also need camouflage. You [need] an orange vest when you go hunting so you don't get hurt. You also need some kind of gun. Or you could use a bow and arrow. I think killing animals is okay because you can eat them. You can make them into a jerky. In our area, I think it's okay to kill animals because we can use the fur, sell it, make it into a little rug for us. Some animals could be going extinct, or they could be endangered, but animals around here are not going extinct or anything like that."

– Kristian, 12, Letcher County, Kentucky, USA [Kids on Earth interview]

"In the Middle East, I hear a lot of stuff that is going on. There are a lot of continuing wars, in Pakistan, Syria, Gaza. And I really feel bad when I watch the news and I see young kids going through that because I'm a kid myself, and if that would happen to my country… I just feel really bad when I see the images all over the internet when something happens. I see the pictures and sometimes, I really cry. This is something that happened to Kosovo. [In countries with an ongoing war] kids just need to be careful where they go, stay with their family. It's not in our hands. How does it stop?"

– Mirela, 16, Damanec, Kosovo [Kids on Earth interview]



"Before I used try to ignore them, try and push them away show them that what they do, it doesn't affect you. Now, I'm going to a different lane. Now, I'm saying, you tell them how you feel. You explain your anger and your frustration. You have to stand up to them. You have to show that you're the superior over them because bullies try and pick the weaker ones. (I don't like to call it the 'weaker ones.') You have to show them that you have the courage to stand up. If you're hurt… that's how I found my strength. While I was being hurt, while I was so sad, I showed my sense of frustration in front of them. If you just write it down on a piece of paper, then crumple it up and throw it in the bin, that's good in one way, letting your stress go, but it doesn't stop the bullying in any way. Instead, why don't you speak to the bully and tell them how you feel?… It's like you're carrying a bag of rocks *[points to his upper back]* and your stresses are just let go. You tell them you'd had enough. I don't think the bully will cope. There is a possibility it will make it worse, but you just have to stay strong."

– Nik, 11, Weston-super-Mare, England
(Diana Legacy Award holder for good work on behalf of others)
[Kids on Earth interview]

Chapter 5:
Not School

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"Some of the problems are crime and drugs, chemicals and pollution, it goes on and on. The rivers are dirtier, there's trash everywhere, drug addiction, schools are closing because they don't have enough funding. This is really bad! Nobody's fixing it, either. Nobody does nothing about it. I won't be here when I'm 18. When I become 18, I am moving to the West Coast and Seattle. I really like Seattle because they have everything that West Virginia wants. They have a good economy. They have good jobs. Good houses. Smart people. Happy people. The only thing they have as bad is the homeless rate. But their unemployment rate is really low. I know all of this because I Google it. I teach myself. The education system here is so bad, I actually learn more from YouTube… I'm just hoping to live in Seattle and be happy."

– Markel, 13, South Charleston, West Virginia USA [Kids on Earth Interview]

"I've been in Boy Scouts since, probably, third grade. I know there's troops in other parts of the world. There's this pretty big summer camp that we all go to. There's been troops from Egypt, all over. We have to each do a research thing where we each research a Scout troop in a different part of the world. So some people did a troop in China, and in England. [Later,] we camped out at this Coast Guard base in New Jersey, the next state over [from Pennsylvania]. We got to see some of the people training, and we got to go on the boats, and that was really cool. I thought that was pretty interesting. I'm thinking I want to go into the Coast Guard Academy. Once you go there, you've got to go into the military afterwards, for 5 years. They'll give you, like, 4 years of college for free. They pay for everything. Then, you have to serve 5 years. But then, when you get out, you can do whatever. So I was thinking I could be an engineer afterwards. I want to be an engineer because really like making models, and building."

– Kevin, Richboro, Pennsylvania, U.S. [Kids on Earth interview]

Why Not School?

If the question is "Why Not…School?," the answer is that even the most ambitious version of New School cannot teach every student everything they want to know or need to know. School will always be constrained by physical space, number of teachers, site location, community norms, and other factors. Old or New, school can learn a great deal from Not School.

If the question is "Why…Not School?," the answer is because Not School includes access far beyond the reach of school. Less formal, less structured, more often connected to relationships with family and friends, deeply focused on personal interests and individual responsibility. Not School exists in people's homes, neighborhoods and in the great

outdoors. It is connected to family, friends, the professional world, travel, evenings, weekends, summertime, tromping through deep snow and taking very long walks far from home, visiting museums, watching TV and listening to podcasts. In a lifetime, school fills about 10,000 hours, but Not School occupies more than 150,000 hours. There is more time to learn in Not School, and more flexibility, too.

Admittedly, Not School is not an ideal descriptive term. The best alternative, "learning outside of school" is problematic; it suggests the outdoor area immediately adjacent to a school building, and, worse, it positions Not School as secondary.

> "A growing body of research supports adopting an asset model of education in which curricula and instructional techniques supports all learners in connecting academic goals to the learning they do outside of the classroom and through learner experiences and opportunities from various settings that are leveraged for each [individual] learner."[1]

In 2005, Emily was preparing for her bat-mitzvah, a Jewish coming-of-age ritual. Emily loves music, plays the violin, and finds joy in helping others. She was looking for a mitzvah (good deed) project when her music teacher told her about a Norwalk (Connecticut) Youth Symphony Concert. Each audience member was asked to donate one dollar to help the Greater New Orleans Youth Orchestra (GNOYC), which was devastated by Hurricane Katrina. Acting on her own, Emily sent an email to GNOYC Executive Director Marianna Roll and requested a wish list. Then, "Emily went to work, devoting every free moment after school and on weekends for several months. She called area music stores, which donated music stands, rosin, clarinet reeds and violin strings. At her middle school she asked her music teacher if she could set out a box for students to donate music instruments. She also sent newsletters and emails asking for contributions." Emily delivered everything on GNOYC's wish list and more — 27 instruments, 'loads of equipment,' and $2,072. She even convinced United/Mayflower Van Lines to ship the items to New Orleans for free…"[2]

In 2006, Andy also collected musical instruments for victims of Hurricane Katrina. His project was called Mississippi Music March. It began when his mother noticed an article in a local newspaper. Through the Bux-Mont Katrina Relief Project,[3] Andy connected with a high school marching band in Bay St. Louis, Mississippi. The goal: replace instruments lost to the floods. Andy decided this would be his Eagle Scout project, which he would complete days before his eighteenth birthday (Scouting's deadline). He began with his local church, then involved his high school marching band. Several local newspapers picked up the story; that led to television coverage on the local FOX station. Andy exceeded his goal. He collected 110 instruments, including 80 that needed repair. A hoagie[4] sale in space provided by his church raised over $4,000 to pay for those repairs (340 hoagies), provided at cost by two local businesses. Funds raised by Boy Scout Troop 99 families, his church and the marching band provided $1,000 to buy replacement sheet music. Bux-Mont Katrina Relief sent 3 trucks, filled with instruments, to Bay St. Louis, so many that the high school shared the bounty with nearby

high school that also lost its instruments in the flood. Andy's thank you note acknowledged those who pitched in – his church pastor and board, 2 professionals who cleaned, evaluated and repaired instruments, 2 office workers who managed instrument drop-offs, local families for their instrument donations, and the band director.

Working with every available resource (in their cases, perhaps more than most), Emily and Andy each engaged in a personally meaningful service activity to help others. They were attracted to, motivated by, galvanized by their projects. They learned a lot about communication (often with adults), soliciting help, assembling and managing a team, tracking progress in a complex undertaking, acquiring resources, keeping volunteers and helpers active and engaged. In countless reports and documents, employers, educators, and policy-makers have described these as 21st Century skills, wondering how they could be taught in school. Many schools strive to press these skills into an over-crowded and impersonal curriculum. Certainly, public service should be an aspect of learning in school, but as Emily and Andy demonstrated, the work was a better fit for Not School.

All over the world, students tell similar stories about needs of others and their ability to help. Young people demonstrate their ability to get things. They identify a need, create a plan for action, reach out to people they don't know, work with partners and deliver the goods. Adults help, but kids do the work.

In a growing Paraguayan neighborhood in Remansito, just up the Paraguay River from Asunción, Yanina opened a small store. There is constant bicycle traffic, and some motorcycles, too. Mostly, people walk, so they pass her store often and buy because there is no other store nearby. Yanina's store is open all day – when Yanina is not there, her mother tends to customers.

> "This is my store, as you can see. If you want to buy something, you are welcome. As you can see, the vegetables, the lettuce, are my own production from my vegetable garden. You can make juice from the bananas, right here. There's also Paraguayan tea if you want that. What I want to do, what I want to be in the future is accounting or a business manager."
>
> – Yanina, 13, Remansito, Paraguay [Kids on Earth interview]

What is Not School?

In Not School, children, teenagers and other people can sit or run or bicycle next to a river and watch it flow. Some may travel the river by boat, canoe, raft, or tire tube. The air feels hot, humid, cool, breezy. It smells like the river. Some people spend hours in a boat or on the

shore, hoping to catch fish for dinner. Some volunteer and clean the river. School reduces the experience of a river to photographs, videos, maps, historical and descriptive text. Based upon available resources, school presents the idea of a river, not the river itself.

When children and teenagers learn about a river in Not School, they get wet.

For most of human history, learning has taken place in Not School. Before humans invented writing, before school became a common idea, children and teenagers learned about social hierarchies; hunting, farming and food preparation; how to survive; how to fight; the power of group collaboration; and their role in community life. They endured rough circumstances (many died young), took care of people in need, did their chores, shared stories, made up and played games, and apprenticed to develop useful skills.

The widespread development of public education started over 300 years ago, but in some places, less than 100 years ago. France was an early proponent of organized schooling: "…by the middle of the 18th century, nearly every parish in Paris had a free school for boys, though only half as many provided for girls. Most children stayed in school long enough to read and write."[5] However: it was "..not until the latter part of the 19th century, however, did public elementary schools become available to all children in nearly all parts of [the U.S.]. In 1830, about 55% of children aged 5 to 14 were enrolled in public schools; by 1870, this figure had risen to about 78%."[6] In many countries, widespread public education, attended by most children, did not materialize until the 1960s or 1970s. Instead, most of the world's children and teenagers learned in Not School.

Thanks to improvements in transportation, there was more interaction with more people by the mid-1850s: more stories, more retail stores, musicians and speakers on the streets, more foods to sample, occupations to dream about. Public venues opened: lecture halls, theaters, opera houses, and sometimes, parents brought their children so they could learn a thing or two. Traveling lecturers and entertainers began to travel from one venue to another, sometimes with tent shows, sharing their ideas, sharing the gospel, and selling goods. Sports clubs began to compete and form leagues; drawing a crowd, they constructed local facilities. Public libraries opened their doors to many (not always all) people, and encouraged them to borrow of books. With new shopping districts, access to foods and goods became easier, the offerings, more diverse (sometimes, fresher, too). In the U.S., even minorities become welcome (if they sat in approved sections of the theater). Children and teenagers took it all in, participating with or without adult permission. The 1920s and 1930s add motion pictures, radio and phonographs. Decades later, television adds pictures. By 2010, there are mobile digital devices, and by 2020, there is widespread access to people all over the world via video conferences. Almost all of this activity takes place in Not School.

Alongside this formal activity, there's community activity to keep children and teenagers occupied and productive way during non-school hours. Social movements emerge, including

Scouting, church youth groups, Little League and other organized sports for kids, 4-H clubs (learning agriculture), and more. And, kids figure out what to do on their own.

Generally, learning in Not School takes place without a standardized structured curriculum, without homework assignments, grades or formal tests, usually without fixed schedules. Depending upon the activity, kids operate Not School on their own or with a bit (or a lot) of adult guidance. Local activity may or may not operate under the auspices of a larger organization. It may rely on volunteers. Resources may be as rudimentary as an animal's head (to kick around as a football), or as lavish as a local performing arts center.

Whether learning involves relationships with friends and family, learning new skills, pursuing personal interests, traveling, playing video games, daydreaming, or media, the awesome reach and power of Not School deserves more attention.

Adults: Proceed with Caution

Much of the magic of Not School is its informality and lack of structure. Often, well-intentioned adults seize the opportunity to help their children and teenagers by adding structure, focus, schedules, and inclusive practices. The result is not always positive. Many Not School activities are free-form by design, . As adults enter the picture, children and teenagers may lose some control, and some interest. Subtle (sometimes, not subtle) loss of control introduces discomfort and anxiety, and changes patterns of participation.

Yes, there are spaces within Not School where adult contributions can make things better, safer, easier, more fun, and more productive, too. (But that doesn't always make them better or more appealing!) Appropriate adult participation in Not School must be carefully considered and monitored by neighborhood children and teenagers. Adults need to teach themselves to do as little as possible because their intervention is may be destructive.

Not School Is Under-Valued

School is a unified, well-organized, adequately funded, consistent operation with clearly identifiable characteristics known all over the world: students, teachers, full-time staff, curriculum, graduation, school buildings, and more. Not School has been around much longer, but never as a unified concept, or held in the same regard as school.

The diminished view of Not School is counterproductive. It ignores reality. It devalues huge swaths of learning, engagement, and human development. It suggests ideas and capabilities developed outside of school are generally unimportant, except, perhaps to hang around with friends, or round out a resume.

And yet, most people would acknowledge: before, during and after school, most children and teenagers learn essential skills and build a useful base of knowledge under the leaky Not School umbrella. Not School is not perceived as a coherent, proscribed, or significant collection of activities. Instead, it is seen as assorted activities that may or may not contribute to meaningful or essential learning. Inventing a sophisticated game with peers is not taken as seriously as Mathematics. Lashing long logs to build a 20-foot-high signal tower matters less than sitting in Social Studies class. Learning to ride a horse, or take care of the neighborhood street dogs, matters less than Science.

The diminished view discourages academic study of Not School, and reduces the importance of almost everything not learned in school. Not School remains a lesser candidate for community, government and philanthropic investment. By design and in practice, the Not School sector is diverse and robust. It isHabitat for Humanity (building homes for people in need) and helping a neighbor, making media, mastering a video game, volunteering at a local medical clinic, plus a thousand other things that take place at home and around town, usually with limited adult supervision, and never appear on standardized school curriculum.

Governments and foundations feed funding into some Not School activities, but the effort is rarely coordinated or sustained.

n and around Pittsburgh, Pennsylvania, U.S., Kidsburgh brings together museums, local television, universities, caregivers, and other community resources, including schools.

Ara Taiohi is "a network aimed at providing 'one voice' for the youth sector" of Aotearoa (New Zealand). Originating in Maori culture, it organises an annual Youth Week campaign, biennial national *wananga* and regional workshops. Ara Taiohi supports lesbian, gay, queer, trans, and bisexual youth through advising mainstream youth organisations on how they can provide safe and positive activities for all young people."[7] Related activities and organizations include Girls' Brigade New Zealand: 'empowering girls to succeed in tomorrow's world.' Aim: combine confidence in outdoor activities, friendship, learning new skills and faith. Like Boys' Brigade, it's associated with ICONZ: girls' programmes aimed at 5–17 year olds that offer 'values based activities in a safe environment'."[8] ZEAL's mission is to make transformative spaces and experiences accessible to all young people, supporting *rangatahi* to connect to their mana, innate self-worth and sense of belonging. Its vision is for "all young people in Aotearoa living full lives of meaning and purpose. "All *rangatahi* (young people) feel seen, valued, safe, empowered and have an equitable shot to thrive."[9]

Structure of Not School Learning

In school, learning takes place within curriculum, a schedule, mandatory attendance, government laws, paid staff and physical facilities built for school's purpose.

Chapter 5: Not School

12,884 Words

In Not School, form follows function. Learning takes place anywhere, anytime. It makes use of every available resource. Learning about a mountain involves visiting a mountain, or, at least, making a fake mountain. There may be no specific goal in mind, but that does negate the presence of meaningful learning. Taking a walk in the forest, students of any age (including adults) find plenty to learn about growth of trees, regeneration, shelter, water flows, temperature, humidity, ground cover, canopies and more. A branch is more than a dirty piece of wood; it becomes a walking stick, a sword, an art object, a fetch toy for a dog. Rocks become a dam, a fort, a trail marker, things to throw across a river and make a big splash. Sand and mud can be used to make castles; wet sand can be sculpted to become a mermaid. That mermaid can become part of a story. This is learning unbounded by time or space.

With a helpful guide, a walk in the forest can become a more formal lesson. Why do white birch trees grow on that ridge, but not on that one; why do sugar maple tree leaves turn red in the autumn, then fall to the ground? To study the shapes of leaves, make spatter prints. Moss and ferns tell an interesting story about plants without seeds, and the life cycle of trees.

Is there structure here? There may be specific learning in mind — differences between white oak, red oak, black oak, pin oak, chestnut oak. Experience forest bathing. There may be structure, but each person explores and interprets the forest in their own way, constructing their own structure. The learning palette varied, vibrant and endless.

Not School is spending time at home and the neighborhood, learning informally, and sometimes, as with religious instruction or when learning a craft, very formally. It includes consuming and making media, following stories about Syria and refugees, reading books, listening to music, finding more about anything via the internet, or through conversation. It's observation and taking notice, seeing what was there before, how it may have changed, and why. In Not School, structure of learning materializes at the moment the learning takes place.

We Love Reading

Around 2010, Rana Dajani, a molecular biology professor returned to her home country, Jordan. Raising her own children, and hoping to instill a love of reading, but noting that Jordan has no public libraries, Dajani approached the imam to use the local mosque as a public place for a small read-along. Local mothers thought it was a good idea, so they brought their children to read religious books in the mosque. They were surprised to find that the read-along was secular, intended to encourage children to love books. It just happened to take place in a mosque. It was a good idea. Children who read for pleasure develop strong language skills, achieve better academic results, and more powerful emotional intelligence. The read-along program became popular. Dajani trained other mothers to conduct read-alongs in more than 7,000 other places! Today, We Love Reading operates in more than 60 countries, and also in many refugee camps. It publishes children's books, runs libraries, participates in scholarly research and much more. It is managed by Taghyeer, a nonprofit

organization. Its "philosophy is based on the butterfly effect – the concept that small actions can have far-reaching consequences. We believe that just one person can make a difference and that the contribution of each individual matters. Through collective effort, transformation unfolds."

Pictured: We Love Reading *ambassador Asmaa Al-Rashed in a reading session in Zattari camp.*[10] *(In October, 2018, Zattari was home to nearly 80,000 refugees, mostly from the Syria wars; nearly 20 percent were under 5 years old.)*[11]

Scouting

Despite serious problems in the U.S., the WOSM and WAGGS movements that, together, comprise World Scouting, were "nominated for the Nobel Peace Prize for their work in 'giving young people the tools they need to solve the challenges of the future, while building strong civil society.'"[12] WAGGS is the global organization for Girl Scouts and Girl Guides; it focuses on 10 million girls and young women in 152 countries. Collectively, WOSM, which welcomes boys and girls, has been associated with 16 million community service projects and nearly 3 billion community service hours[13] (WAGGs adds even more). Both are actively involved with "a wide network of partners, including UN agencies and non-governmental organizations, to support local projects led by Scouts."[14] Most work is conducted by children and teenagers with some help and guidance from adult volunteers. Snapshots below:

> "…the national Scouting organization of Burundi, was founded in 1940, and became a member of [WOSM] in 1979. The coeducational Association des Scouts du Burundi has 32,340 members as of 2020 [ages 7-19]. [It] is oriented towards rural needs of the population [including] farming, reforestation, erosion control, and village health."[15]
>
> "Scouting was founded in 1914 in East Bengal, now Bangladesh. The organization changed its name to Bangladesh Scouts in 1978. The organization has 1,474,460 members as of 2015… Scouting has grown over the years in the face of considerable difficulties. Scouts are involved in community service, major areas being agriculture, health and sanitation, child welfare, community development, construction and repair of low cost housing and sports. During national disasters, such as the many floods that strike Bangladesh, Scouts are called to help with flood control, relocation of citizens and organizing shelters. Membership is open to youth between 6 and 25 years of age, regardless of caste, creed or color. Bangladesh Scouts receive strong support from the government, which recognized Scouting's value in citizenship training."[16]

From Girl Scout Daisies guidebook (kindergarten and first grade):

- "Encouraging girls to express their individuality… remember, there isn't just one way to look, feel, act or think."
- "Trusting girls to plan and make key decisions. Girls learn from trying something new and making mistakes."

Each individual Scout scores their own progress. Each Scout participates in solo and group activities to attain a rank or a merit badge, which recognizes individual accomplishment in community service, cooking, first aid, or hundreds of other fields worldwide. For example, to earn the Coconut Growing merit badge in The Philippines, a Scout must "tell the value of coconut as food;" give examples of uses of parts of a coconut tree, discuss seedling and soil; explain plantations and harvesting, and pests; and the importance of coconuts in the world market).[17]

Connecting Not School to Home (and Local Neighborhood)

Lots of Not School learning takes place with family, friends and neighbors as they talk, joke around, cook, do small projects (fix the gutters, clean the alleyway), share ideas, cry out when something on TV seems crazy (and discuss why). As electricity, space, connectivity and devices allow, home is often the place where hours are passed watching videos, browsing social media, listening to music, writing short messages, Animals require care. Home is the launching pad for Not School learning — and for school-based learning, too.

Family and friends visit. They bring stories, and the stories cause children and teenagers to ask questions: "What's it like to serve in a peacekeeping force in the Middle East? To travel to Dubai or Shanghai for business? To eat in fancy restaurants and go shopping in Dar-es-Salaam or Kuala Lumpur? To stay in a fancy, or not fancy, hotel? To study in a university where nobody looks or talks like you do? To live on your own, with roommates? To fall in love with someone who doesn't speak Farsi?

Many children and teenagers are attracted to the jobs that their parents do. They listen to the day's stories, watch their mother or father put on a uniform, and perhaps, save a life. We learn best when we are connected through a meaningful relationship. Based upon limited information, children and teenagers consider the possibilities, and shape their own lives, and values, as a result of what they learn at home, in Not School.

Connecting Not School to Community

Kids like to play. They like to run around. Many participate in games and sports. In many communities, there is some sort of park, wooded area, a shoreline, or some other place where kids can get together and have fun. Problem is, not all places in all communities are ideally situated, or suited, for children, teenagers, or learning.

Chapter 5:
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12,884 Words

In theory, kids can run around anywhere – on roads, on private property, in shopping areas, and so on. In practice, there is discomfort and potential danger associated with many of these places because they were never intended to be recreational and learning zones for children and teenagers. Adults get upset when they see kids playing in what they believe built for a purpose other than kids' fun. Some places are unwelcoming to pedestrians (most kids are small pedestrians), and to kids on bicycles.

Every community should include public parkland. Not one park, but several kinds of parks, with shade, running water, clean restrooms. Indoor facilities, too, because sometimes, it's hot or rainy or air quality is poor. First aid supplies, outdoor lighting, law enforcement nearby. Multi-generational facilities are pleasant, safer and interesting for everyone. Given the opportunity (and perhaps some training), people of all ages will walk, run, cycle and exercise.

"Exercise encourages optimum brain function, decreases stress, reduces the tendency to gain weight, improves outlook, mitigates the severity of illness and disease, extends healthy life, and reduces reliance upon pharmaceutical solutions. In fact, the single most important job of 21st century school is to prepare students to keep their bodies, and minds, operating in optimum condition for a lifetime."[18], and…

"…exercise improves learning on three levels: first, it optimizes your mind-set to improve alertness, attention and motivation; second, it prepares and encourages nerve cells to bind to one another which is the cellular basis for logging new information; and third, it spurs the development of new nerve cells in the hippocampus"[19] which receives new input from working memory, cross-references that information with existing memories for the sake of comparison and to form new associations…"[20]

—John Ratey, *Spark: The Revolutionary New Science of Exercise and the Brain*

Public Spaces to Nurture and Grow

In more than 50 countries, more than a half-million adult volunteers work with more than 6 million young people in 4-H clubs. These community activities began with local agriculture; they are now very much involved with leadership, technology and other forms of 21st century self-directed learning.[21] Building community projects around food promotes intergenerational relationships. Growing a community garden provides food and lessons, plus, emotional nourishment. The magic of starting from seed and serving homegrown food up at a community picnic is a peaceful, loving experience.

Every place on earth is part of nature, and every place on earth can trace its history. Therefore, every community could build, operate and benefit from a nature center – with marked trails with signs that tell a story, updated annually. And every community on earth should tell its

own story, both in a dedicated facility (even a hallway or the outside wall of a store will do), in a public area, and outdoors, again through signs and trails, so people can walk their own history. Imaginative children, teenagers and adults will bring about more ideas – nature and history are a good start. Remember: stories don't begin with humans show up; lots of interesting stuff happened before "civilization."

A maker space requires a physical location, some machinery and supplies, and a few key people to make it all work. In many communities, this can be put together fort the short-term and can become a long-term community asset. It's a wonderful means for people of all ages to learn from one another as they create, experiment, build, repair, and learn through the use of physical tools and materials. Not only does this lead to potential hobbies and careers, it is likely to become the factory where, for example, new benches are made that seem to sprout on every community street corner, where those in need can get their furniture repaired free of charge (perhaps, their home, too).

A visual arts space is a complement – a maker space devoted to drawing, painting, and more – with easy access, volunteer and professional support, and ample exhibit space for all ages. If there are adults around, they will suggest free classes for the kids. Happens all the time.

Every community ought to include a performance space, too – a place to operate a theater, and teach students many different hard (build scenery) and soft (accept criticism) skills. Developing and producing a show brings people of all ages together – with lots of hard work and laughter, and pleasure when the larger community members enjoy the work they have done. This is an ultimate Not School experience! It need not be limited to one or two shows per year. A theater is also a place to rehearse and perform music, watch movies, and attend lectures from visiting luminaries, adding to the argument for frequent use. More interactions between students and the adults who live in the community, more frequent contact, generates more opportunities to learn from one another, and have fun.

Public Libraries

Every community ought to include a public library – a place to encourage multigenerational, lifelong learning. A safe, air conditioned and heated, place for seniors to spend time with one another, in comfort, acquiring and sharing ideas. A place where parents can have others read to their young children – where the youngest begin to accept responsibility as they borrow their first books. A place where children and teenagers of any age can explore, study, read, do other work, use a computer and connect to the internet. A public library is an explicit expression of personal education, and it costs them nothing at all – mostly, libraries are free (funded by community, foundation, and government sources)

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Communities can and do build their own public libraries. Clarie Odhiambo and John Malamba did just that in the municipality of Siaya in southwestern Kenya, near Kisumu, the country's fifth largest city.

> "The Library is registered as a community based organization by the Ministry of Gender, Children and Social development. IDAP launched this project in the pursuit of support to education programs, including adult literacy, rural schools to provide a center for community education and cultural activities. The Library runs a wide range of services for the community, and makes use of a two-way information flow so external information and local knowledge is shared. Its main services comprise providing reading materials, including formal educational resources and locally produced information pamphlets on agriculture, health and literacy. Siaya Community Library carries a wide variety of resources for adults: latest bestsellers, hardcover and paperback books, large print books, newspapers, magazines, audio books, DVDs and CDs. It also services and items for loan to teens such as novels and curriculum books. It… is now embracing information technology through electronic book readers." The busy new library is pictured below.

Worldwide, there are about 1 million public libraries. Libraries are very popular. "Five times more people visit U.S. public libraries each year than attend U.S. professional and college football, basketball, baseball and hockey games combined."[22] We wonder: why are cities are okay building new stadiums, and but not new libraries?

Around the world, some countries are heavily invested in public libraries, but others are not. For example, there are about 140,000 public libraries in the U.S.[23] – that's 14 percent of the world's libraries for about 4 percent of its population. Former Soviet Socialist Republics – Belarus, Georgia, Azerbaijan, Latvia, Ukraine, Moldova and Estonia – [24] are home to a lot of

public libraries. For more detail, consult The Library Map of the World, maintained by the International Federation of Library Associations and Institutions (IFLA).[25]

For every paid library worker in Europe, there are nearly 5 volunteers.[26] The Library Policy and Advocacy Blog of the IFLA describes a very wide range of community benefits associated with the presence of a public library. Clarie and John are building a floating library – a book boat – to travel to other places around Homa Bay. It's related to the bookmobile concept used in several boroughs of New York City, Detroit, and, back to 1858, in Warrington, England (with horse-drawn van). Book mobiles are active in 1,900 Bangladeshi communities.[27]

Print Media and Not School Learning

"It is hard to imagine a world without books for children. There have been children's stories and folk-tales ever since man first learned to speak" wrote C.M. Hewins in the January 1888 edition of *The Atlantic Monthly."*[28] She quotes William Makepeace Thackeray: "Many [children's stories] have been narrated, almost in their present shape, for thousands of years… to little Sanskrit [sic] children. The very same tale has been heard by the Northern Vikings as they lay on their shields on deck; and by the Arabs, couched under the stars in the Syrian plains, when the flocks were gathered in and the mares were picketed by tents."

Children's book publishing is a global industry. The U.S. section of International Board on Books for Young People, USSBY publishes recommended titles annually. From 2024:[29]

- *Adam and His Tuba* by Žiga X. Gombač, from Slovenia & Switzerland, about discomfort with flashy showmanship.
- *The Shade Tree* by Suzy Lee, from Korea, a folktale about ingenuity and generosity.
- *Wild Poppies* by Haya Saleh, from Jordan, a narration between two brothers who are refugees dealing with violence and radicalization.
- *Hopeless in Hope* by Wanda John-Kehewin, from Canada, about Eva, who lives in a foster home and discovers her mothers' dairy and her heritage as indigenous Cree.
- *The Invisible Elephant* by Ann Anisimova, from Russia, about the sensory experiences of familial relationships, city adventures and budding friends from the perspective of a girl who is blind.

Although children and teenagers read books in school, they have much more time to read in Not School. There is even more material to read online – from all over the world, representing every conceivable point of view, some true, some not, some timely, some not, all contributing to today's wealth of available knowledge and insights.

Radio & TV

Since the 1930s, educational radio programs have been produced for children and for teenagers, but mostly, they preferred music, comedy, and serial adventures – with multi-

episode story arcs, and cliffhanger endings "continued next week." Some shows were based on newspaper comics – *Terry and the Pirates*, *Little Orphan Annie*, *Red Ryder*. Kids learned all sorts of things – Anne Airlanes was an "Air Hostess" for Interstate Airways (her boyfriend was pilot Jack Baker); Buck Rogers, who lives in the year 2419 AD, and learns about the marvelous inventions and ways of the future in his many adventures; *Sergeant Preston of the Yukon*, a Mountie during the Gold Rush. For two decades, CBS radio ran *Let's Pretend*, "radio's outstanding children's theater."[30] Radio provides the soundtrack; imagination fills-in the rest.

Although radio remains an important news, entertainment and education medium in many parts of the world, podcasts – essentially the on-demand, anytime-anywhere equivalent – are now very popular. For kids who enjoy learning by listening, the U.S. clearinghouse Common Sense Media[31] recommends *Tara Tremendous* (female superhero adventures), *The Genius Generation* (interviews with young inventors and entrepreneurs), *The Big Melt* (climate change), *Sssh! Periods* (puberty, adolescence), *Lost Women of Science* (historical STEM women), and *Dream Breachers* (reality-bending adventure), and more. Podcasts are usually too long for in-school listening, so they're better for Not School.

As television began to take the place of radio, there were popular children's programs, some of them educational, or socially instructive. For more than 20 years, *Captain Kangaroo* began CBS's U.S. broadcast day with sketch comedy, puppet characters, songs, lessons, and grandfatherly guidance. Members of that show's creative team went on to build *Sesame Street* for a then-new public TV network, PBS. The concept grew into a global educational media enterprise operating in more than 100 countries, seen, mostly, at home, not in school..

Mostly, kids watched, and continue to watch, entertainment, but learned a lot along the way. Beginning in 1960, the ABC (U.S.) prime time series *My Three Sons* followed a non-traditional family's life at home. Before the series began, the boys' mother died, leaving dad to raise children and earn a living. Their maternal grandfather, Bub, steps into the mom role to run the household, cook and clean. A decade or so later, *All in the Family* featured 4 adults living in the same house – an opinionated, often racist and sexist father, his patient and verbally abused wife, their loving daughter caught up in rapid social change, and her liberal, argumentative spouse. Comedy brought viewing families together –– sometimes prompting a household's first serious conversation about racism, prejudice, bigotry, feminism, and progressive social values. At the time, these topics were approached with caution, if at all, by classroom teachers.

When educators discuss television as a medium for learning, they usually discuss educational programming, or they analyze comedy as social commentary (etc.) Learning about the White House, U.S. politics and the U.S. government from 154 episodes of *The West Wing* provided a civics education in compelling story form. Many people learn about law enforcement and judicial systems from TV dramas. Learning about Botswana from *No. 1 Ladies' Detective*

Agency, or 20th century veterinary medicine from *All Creatures Great & Small*, may not equal a complete education, but it's a start, and it's fun, too.

A sterling example of learning via television has engaged people of all ages, from pre-schoolers to seniors. Seen in more than 200 countries. *The Great British Bake-Off* (*The Great British Baking Show* in the U.S.) is probably the most-watched TV series on earth, especially when local versions are counted: *El Gran Pastelero* [*The Great Baker*] in Chile; *Bake Off Romania*, *Den store bagedyst* [*The Great Baking Bout*] in Denmark.

As a result of what they've learned, viewers of all ages understand a great deal about how baking works. They can explain *choux* pastry, lamination, soggy bottom, proving, fondant, tray bake, perhaps Genoise sponge, blind bake, using dowels to support a multi-layer cake… a long list! *Bake-Off* encourages home participation ("I want to bake that!"), and aspirational interest ("someday, I will bake that!," or better, "dad, let's bake that one together on Saturday!)

YouTube

Lots of people learn to bake and cook by watching YouTube videos, too.An incomprehensible amount of new learning material becomes arrives on YouTube every day. Making use of low-cost, easy-to-use tools in a largely unregulated 21st century ecosystem, YouTube provides the platform for hundreds of millions of people to now create, produce, and distribute original video about anything that interests them — and find a willing audience. Most YouTubers work without significant financing, without trade unions, without editorial review or gatekeeper approval, without formal educational credentials, with minimal technical personnel or physical facilities (such as TV studios). YouTubers changed every rule associated with the development, production, distribution and marketing of TV/video programming — and they're made deep inroads among the world's greatest sources of learning. And, YouTube is not the only video platform; TikTok has become a very significant source of learning, via internet video, too. TEDTalks is a long-term success story based entirely on learning new ideas not typically studied in school. Brené Brown's speech about "The Power of Vulnerability," released in 2011, has been watched over 20 million times. Like most TEDTalks, it runs about 20 minutes, and features only one person speaking on an otherwise empty stage. "The History of our world in 18 minutes" from noted historian David Christian is slightly shorter and it has been watched by about 8 million people.

Headliners get the attention, but deeper power of YouTube is its long tail — billions of videos on specialized topics (the equivalent of Personal Education) watched by thousands or tens of thousands of people. For example, Denise Soden produces and hosts "paint outs" of specific watercolor pigments, comparing one brand to another."Color Spotlight - Venetian Red, Indian Red & Caput Mortem (PR101)" has 35,000 YouTube views; others in the series include Hansa Yellow Deep (PY65) with 16,000 views, and two dozen more.

Art for Kids, a small family operation, posts a new art lesson daily on YouTube. It offers 2,400 short-form videos on its YouTube channel with 7.13 million subscribers, resulting in more than 2.5 billion views since February, 2012. "How to Draw Hello Kitty" has been viewed 68 million times, but "How to Draw a Dachshund" is more typical with 5.9 million views.

> "Danny Joe's Tree House invites kids to slow down and engage with a wide range of topics, providing them with valuable life lessons, strategies for self-regulation, early STEM concepts, and digital media literacy skills, while also sparking their imaginations with arts and crafts projects, sing-along songs, and other DIY activities."[32]
>
> – Danny LaBrecque hosts, writes and produces the series with his wife Stefani in their home's basement studio

Media is a big part of Not School: books, websites, podcasts, YouTube videos, social media interactions, motion pictures, streaming services, live theater, music performances, public art or newspapers. Media is lifetime activity, the world's most ubiquitous educator.

Community

> "I don't live in… a close-knit community [the way] my parents did or my grandparents did. Talking to grandparents, I learn so much. I remember once I went to one of my friend's grandparents—she's also a South African Indian, like me. My friends came and we all watched her grandma knitting. And we learned how to knit in those three hours. We knit our own squares, and we knit all those squares together to make a blanket. I think that was a big part of our grandparents' culture – actually making their own clothes when you couldn't go out and buy the clothes."
>
> – Almaaz, 15, Johannesburg, South Africa [Kids on Earth interview]

An even bigger part of Almaaz's grandparents' culture was spending time together, talking, preparing and eating meals, raising kids, doing chores, performing their role in the community. Today, in cities and suburbs, there is less multi-generational street life, less vibrancy, less informal Not School-ish interaction. Technology makes it easy to spend a day watching TV, or being outside, communicating via smart phone with people who may or may not be nearby. Traditional family meals, at home, are difficult to schedule because so many people are active outside the home – and on their own school, work or other schedules. Yet, with technology, more people are connecting with others not nearby.

Moving forward, the challenge is to amplify everyone's involvement in local communities, and many peoples' involvement in what is becoming many international communities – especially among students, teachers and researchers.

Computers

Like motion pictures, radio, television, newspapers and magazines, computers were, mostly, a one-to-many medium. Online services and email allowed users to connect with one another, but, for most people, this was, and is, more like leaving a message than conversing. Text messaging began to change that, but in limited ways, and mostly, for young teenagers, but social media began to grow with Apple's 2007 iPhone debut, smart phones from other companies, and new applications, such as WhatsApp.

Even the dusty concept of an encyclopedia became a collective enterprise. By 2005, it was clear that Wikipedia could become the world's most widely-used reference source – even though it was written and edited no academic credentials. Wikipedia became more accurate because users identify and correct errors, a new form of collective wisdom that works surprisingly well, within standard procedures. It remains a nonprofit organization. After Google, YouTube, Facebook and perhaps Instagram, Wikipedia retains its place as one of the world's largest websites.[33] It is not perfect, but nowadays, Wikipedia is probably much more accurate than print encyclopedias of the past.

Disruption

In Not School, and sometimes, in school, more and more students rely upon their digital devices and the internet to learn, but most curriculum and school lessons are based upon Old School rules. It's an uncomfortable balance, but the trend is clear: more digital learning, and the need for the teacher's role to change.

When disruption becomes widespread, existing systems become difficult to manage, and their power and authority begins to erode. Typically, existing systems attempt to regain power by making and enforcing rules, and introducing incremental improvements. Meanwhile, disruptors gains adherents, forcing the incumbent to make progressively worse decisions.

The distinction between disruptive and incremental innovation was developed and deeply investigated by Harvard's Clayton Christensen. His colleague, Michael Horn, focuses on disruptive innovation on school and education.[34]

> "Our schools, as they were built, were not built to optimize learning… our society has fundamentally changed. We're no longer living in an industrial economy. We're living in a knowledge

> economy where every single student needs to be able to find their passion, and fulfill their potential… We need a system that can customize or personalize for every single individual learner…"[35]
>
> — Michael Horn
> Author, *Disrupting Class: How Disruptive Innovation will Change the Way the World Learns*

Transformation is well underway. School is far behind, unlikely that it will catch up in the next decade (or more).

> "Children will learn more and more of what we used to learn in school out of school, through media, the Internet and from different social networks to which they belong. This will lead to a situation in which an increasing number of students will find teaching in school irrelevant because they have already learned what is meaningful for them elsewhere."
>
> — Pasi Sahlberg, *Finnish Lessons*[36]

Thought Experiment: Starfish

Unlike many animals, starfish are found all over the world — "from warm, tropical zones to frigid, polar regions…"[37] Starfish are fascinating: they date back at least 450 million years (not many animals are older); they have 5, 6, 7, even 10 or more arms; if they lose an arm, they can generate a new one; some starfish change gender from male to female. They look cool. They're easy for a child to draw. Many starfish live in tide pools or near the shore, so it's easy for a young child to take a picture of starfish, or record a short video.[38]

Imagine a global starfish project. Children, teenagers, classes and teachers gather, collect, create and share a large amount of information about starfish. They organize the information in an international database with built-in language translation, post their insights and ask one another questions. It's fun, it's a great way to learn from and about one another, it builds human knowledge and it builds self-confidence. Some starfish questions may be answered by Dr. David Pawson. He's an expert and he regularly works with students. Dave Pawson is a Senior Research Scientist and Curator of Echinoderms (emeritus) at the U.S.'s Smithsonian Institution; Easily found on the internet, his email address, is *pawsond@si.edu*.[39] Many experts are easy to find.

Another Thought Experiment - Scale

Assume more than 500+ million students in K-12 public education worldwide possess the necessary tools, access and training to produce text, photos and other media assets related to starfish. If 1 percent of them (1 in 100) made just 1 asset per school year, that's 7 new million assets per year. By 2035, it is not unreasonable to envision more than 100 million

assets specifically designed for use by children and teenagers, powered and managed by Not School communities. With the involvement of government agencies producers of instructional material for many different purposes), nonprofit organizations, aquaria (aquariums is also correct), creative professionals, teachers and others, even more assets may be produced. Not only about starfish. Not just about curricular subjects. About everything.

Initial development of this concept, called Global Brain and described below, would become a version of the internet specifically designed for use by children and teenagers as they learn. Global Brain can become the primary tool for gathering and sharing information, especially in Personal Education, and for the resulting collaborations with peers all over the world. It can also become first step on the path to certifications for skills and knowledge acquired by individual students and small groups of students. These credentials may be very useful in, for example, college placement and future employment.

The cost? If the service was comparable in scope and scale to Wikipedia – but organized differently because the audience and need is different – it might cost about $150 million per year.[40] For a comparable, look at the 519th most populous metropolitan area in the U.S. – Portland, Maine's annual school budget is in that range.[41],[42]

Roles for Artificial Intelligence

Artificial Intelligence (AI) adds a significant resource to learning, but also introduces the potential for inaccuracy and distortion. While this is unfortunate, the technology moves very quickly, and the user base is quickly becoming engaged, so the ability of government or educators to regulate AI's use is very limited.

As an advanced search engine with the ability to connect ideas, AI provides a useful starting place for first draft understanding – with the caveat that the information may be incorrect, plagiarized, or connected in hallucinatory ways that defy fact-based understanding.

As a means to explore imaginative possibilities – a dinosaur bus to the moon, an infinite number of monkeys writing an infinite number of books – AI can be fun, and provocative.

As the basis for a learning project, AI works quickly. It's more often right than wrong.

A monkey is not a starfish – and AI can quickly and efficiently sort the anomaly. When thousands of children submit photos, drawings and text about starfish, AI provides a first line of defense against inaccuracy and essentially runs a checklist.If and when it works – that is, most of the time – pictures of Vladimir Putin do not end up in the starfish bin.

AI is a very powerful tool, but it is most useful when employed *with*, not *by*, humans.

AI & Adaptive Learning

AI can adapt language to the individual user.

> "In physics, gravity (from Latin *gravitas* 'weight') is a fundamental interaction which causes mutual attraction between all things that have mass. Gravity is, by far, the weakest of the four fundamental interactions, approximately 10^{38} times weaker than the strong interaction, 10^{36} times weaker than the electromagnetic force and 10^{29} times weaker than the weak interaction."[43]

Clearly, this Wikipedia excerpt (from "Gravity") was not written for children. ChatGPT quickly estimated the paragraph's Gunning Fog score at 16.98 and Flesch Reading Ease at 49.28. Recommended Gunning Fog scores for high school seniors are typically 10 to 12; the Flesh score suggests suitability for people who have completed a high school education.[44] When asked to "rewrite for a 10-year-old," ChatGPT immediately responded with competence and flair (but failed to explain strong and weak forces clearly).

> "In physics, gravity is a force that pulls things toward each other. It's like a special magnet that makes objects with mass (or weight) stick together. Gravity is the weakest force compared to other forces in the universe. It's much, much weaker than the strong force, the electromagnetic force, and the weak force. Actually, it's so weak that it's about a trillion times weaker than the strong force! But even though it's weak, gravity is still really important because it's what keeps everything on Earth and in space from floating away."[45]

When asked to translate this paragraph so it could be understood by children in 10 other languages, it quickly went to work and produced useful results.

Machine Learning (ML) can "train… machines to learn from data and improve their performance over time."[46] As more and more information about starfish becomes available from children and teenagers all over the world, ML's Deep Learning is a branch of AI that "uses neural networks with multiple layers to extract high-level features from raw data. It has shown remarkable success in tasks such as image and speech recognition."

> "Machine learning is a subset of AI that focuses on training machines to learn from data and improve their performance over time. Deep learning is a specific branch of ML that uses neural networks with multiple layers to extract high-level features from raw data. It has shown remarkable success in tasks such as image and speech recognition."[47]

The combination of age-leveling, instant translation, ML's harvesting of raw data, and AI's integration of that data in learning, potential for new learning systems in Not School's arena — where most media- and computer-related learning currently takes place — outruns school's

ability to compete. Disruption at this scale will cause school to lose much of its power and authority — unless school integrates New School with Not School's rapid progress.

"I learn from family, I learn from friends, anybody! I learn from teachers, my principal… and even in books, I learn stuff, like reading, math, science, stuff like that. I watch YouTube, but I don't watch YouTube all the time. There's not that many videos on there that teach you about stuff. Whenever I have free time, I do watch stuff that isn't about learning. Sometimes, our teacher lets us watch a little bit of YouTube, like at recess. I want to be a teacher when I get older.."
— Jamesyn, 9, S. Charleston, W. Virginia, USA [Kids on Earth interview]

42, or Global Brain

42 is a reference to the all-knowing computer in Douglas Adams's book, The Hitchhikers Guide to the Galaxy. *Unfortunately, at a critical moment in that story, 42 failed. There is now good reason to believe a Global Brain, powered by the world's students and teachers, might succeed if it was developed and managed in the Not School sector.*

A Repository of Knowledge for Children & Teenagers

In an ideal world of the future, school would evolve to a point where it could successfully manage an enormous, dynamic database filled with knowledge, insights and ideas from billions of children and teenagers, and manage vast numbers of external relationships.

In the practical world, it seems very unlikely that school could build or manage anything like a global repository. In part, this is because school is not organized or designed to do that job, and in part, it's because school isn't one thing — it's more than a million buildings, and many more teachers and classrooms.

If it's desireable, Global Brain could be built and managed in the Not School sector, essentially as a gift to school, teachers, and students. The Not School sector could manage relationships with thousands of national, regional and local governments; and even more nonprofits, creative professionals, publishers, and other parties.

In short, Global Brain ought to be developed and managed as a nonprofit organization, an NGO, and funded through a combination of grants and donations from all over the world. In essence, this is the Wikipedia model (perhaps employing something similar to the Wikipedia Foundation). Global Brain should be operated as an independent entity. It should be planned as one of the world's largest websites and digital services. And it could be reality before 2030.

Think of this repository not as a replacement for anything. Instead, think of it as a platform that houses assets and resources by harnessing media and connectivity, and the work of hundreds of millions of children and teenagers, as part of their New School experience.

Repository Structure

As a starting point for development, assume every child or teenager has an account with appropriate privacy protection. The account holder – the user – can add assets (text, video, photographs, drawings, music, etc.) and make changes as they wish. They can also enable others to view and interact with the assets in their account. The user controls the assets. Original work belongs to the originating child / teenager (more precisely, and legally, to the minor's parents until age 18), not to the Global Brain. In addition, all users can access assets from teachers, creative professionals, government agencies, NGOs and so forth.

Designed for use by children and teenagers, Global Brain emerges as safe and reliable means for the storage and sharing of information, ideas, designs, and other interesting stuff in a centralized digital system. Most young people will probably use Global Brain as they do any internet service – mostly in Not School, unless New School becomes a partner.

New School & Global Brain

The structure of New School –- the Learning Categories, the Fundamentals and Personal Education – are well-suited to Global Brain's structure. For example, My Body, My Mind, My Countries & Cultures may serve as high-level Learning Categories in Global Brain as well as in New School. Each Fundamental – there will be a lot of Fundamentals because they are determined by local communities – could be represented by many assets. There will be many videos and other assets that explain, for example, how the human heart works – and all of them can be available for use by any teacher, anywhere in the world, and by any student, too. Similarly, many students in many parts of the world will develop projects as they pursue their Personal Education; much of their work will be available in Global Brain. Leapfrogging from a human heart Fundamental, a number of students are likely to develop projects about heart attacks – they would begin that investigation by checking out work done by past students before beginning their own (and, as they do their own work, adding to that knowledge). There is a place for cardiologists and academic/medical community to contribute assets – video, podcasts, charts, animations, interactive games, articles, book excerpts.

Interactive Engines

Still, it is difficult for a student to study the human heart because all working hearts are inside living human bodies. Echocardiograms and CT scans are not easy to interpret; neither depicts the heart as an easy-to-understand diagram. In fact, it's challenging to see any internal organ clearly. Muscles, bones, other organs get in the way. And, by the way, it's dark in there!

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For so many reasons, it's easier to work with a simulation — or, in Global Brain lingo, an interactive engine of the human body. Whether seen on a 2-D or 3-D screen, or through VR goggles, or as a robot in human form, the simulated body begins with default settings — variables the user can change. The body's chronological age could be reset, along with eye color, skin pigmentation, family history, medical history, current wellness/sickness (allergic to cats). The view could be zoomed out, or in (to see a cell in action). Processes can be slowed down (a heart beat), or sped up (digesting a slice of pizza), shown in detail (sound enters the ear…) The user is in control, but the body performs as a body does in nature. None of this is beyond the reach of present-day technology. It's just expensive to create in small quantities — but at scale, the economics begin to make sense.

So: the user decides to begin with a 12-year old male with dark skin, brown eyes, a family history of heart disease, 5 feet, 2 inches high, 136 pounds. Now, what happens? Try feeding the body a healthy meal, observe how it is digested. Now, have it drink a gallon of water and watch how quickly it wants / needs to urinate. See how quickly it burns calories running a half-marathon. Track data; patterns emerge. Now, create a digital buddy — same everything— but feed it only Coca-Cola and potato chips (or crisps — either way works). With no exercise, either. What happens? How long does it take? Connect this body to others; machine learning can log the emerging patterns, similarities, differences. Now, age the body so it's not 12 years old, it's 62 years old. What happened? With a simulator, aging can be done very rapidly.

And, what if the body was a dog?

More Engines

A Time-and-Place Engine expands the concept of a timeline by placing the user in control of variables. The user establishes time period (with pinpoint precision or within a general time range — both are useful), and place. AI scans the internet to collect and, in some cases, compose images (a 360-degree view of a 1928 London intersection from multiple still images). The very large number of Internet users and the abundance of visual and textual information provides tremendous context, but then, users make their own additions and corrections, and connect one time line to another (as people do with genealogy software), adding even more assets as they go, often from family or community sources. Although coverage will never be complete, many questions, interests, projects and studies can be clarified and enhanced with the addition of historical timelines, events happening at about the same time, maps, paintings, biographical and historical text, numbers and trends, even a sense of being there. This engine makes use of software and technology such as ArcGIS, a visualization tool for mapping, and the large user community that is constantly improving its real world uses — but its real power comes from hundreds of millions of students contributing new material (new maps, new photos, new family and town histories) every year.

With a Data Analysis Engine, numbers are put to work telling stories. When a student possesses sufficient information to detect meaning, trends and patterns, stories come alive. Often, in a classroom, the amount of information is minimized to illustrate an example. Equipped with a Data Engine, enabled by AI and machine learning, every student gains access to much more information, along with software tools to collect, organize, contextualize, graph, illustrate trends, and recognize potential patterns.

For example, a student who lives on an island may be curious about potential climate change impact. One student would require a lot of time to research both sea levels of individual islands and the historical and likely future impact of local sea level rise, as well as a lot of expertise in finding and interpreting scientific data. With a Data Analysis engine, the student queries the system, saves tons of time, solicits data from other interested students throughout the world, sees the information displayed in a user-friendly way, and can immediately interact with it. As with other engines, a Data Analysis engine allows students to share data across projects in the quest for knowledge.

Certainly, it would be productive to brainstorm more concepts for interactive engines.

Missing Pieces: Safety, and Policies for Intellectual Property

Chapter 6 outlines the roles for adults. Here's a pair of items for their to-do list. Any student using Global Brain must be assured of personal safety, freedom to learn, and privacy, but it's not yet clear how to do this. And, there is no clear policy for the use, or reuse, or intellectual property generated by students (and teachers, and creative professionals) as their work is seen, and perhaps used and replicated, in ways they cannot control.

In both cases, adults must develop systems, even negotiate treaties, to assure a reasonable balance of progress and protection. The current systems are inadequate and often difficult to monitor and enforce. Higher-level thinking is required.

Most of the material generated through Global Brain will be useful for its original intention – learning from one another. From time to time, however, a child or teenager will generate intellectual property (IP) with significant commercial value. It must be clear who owns and controls the IP – the answer should be creator, regardless of their age or situation. Everyone involved in learning must be aware of the rules so they can follow them. This will not be easy to do, but right now, those rules require much more attention.

Global Brain & Disruptive Innovation

Global Brain becomes a virtual place that stores each student's completed work, and the artifacts of their works-in-progress. The combination provides every student with a portfolio

of their personal interests and progress over more than 12 years of childhood and adolescence, and their growing ability to do their own work and collaborate with others.

Testing and assessment of large numbers of students who are learning different things is difficult, but it becomes easier if the range of each student's work is available for reflection, trend analysis, future forecasts, and more. Students share their own learning journeys and challenges with one another. If they trust their teachers, this material becomes the basis for ongoing discussion – with real data, real history, real documentation. Of course, some students and some parents may be encouraged to pursue deeper knowledge through the use of technology, notably AI.

There is deeper value here. Each student's learning history – and their approach to learning – can be plugged into various measures of competence and potential, which may link to possible community service, employment, higher education, and other opportunities.

As with any technology, personal security and control are vital. As mentioned earlier, overzealous adults can ruin a good thing, transforming Global Brain into a massive sorting mechanism. Identifying that potential danger from the start, and protecting individual rights, should be paramount.

Research & Development; Funding

Not School is a spectacular, large-scale, up-and-running global laboratory for 21st century learning. It is populated with more than 2 billion children, teenagers, teachers and community members, many of them deeply committed to learning, actively engaged, and willing to share their time and insights. It is less restrictive than school – and more flexible.

We tend not to think about Not School that way – as an enterprise comparable to, and significantly larger than, school itself. There is so much to learn, study, develop, improve, build. With additional academic research, Not School becomes stronger and more suitable for funding – but it must navigate those paths to preserve its free-spirited individualism and powerful community connections already in place (some for many years).

Where to begin? Mostly, the need is support for existing and potential new activities. Examples: funds to clear and establish a community garden or a park with rest rooms; construct and operate new public libraries, early professional training in healthcare, small business, and more. These are not crazy, ambitious, never-going-to-happen endeavors. Many are already in motion, often with insufficient resources. The world just needs more of them. This is a push concept – communities apply for assistance, and either an NGO or a government agency provides the necessary resources and support. A central clearing house could help communities learn from one another, and help to develop larger projects.

Example: upgrading the quality and quantity of public libraries in Asia (Turkmenistan; Bangladesh; Indonesia) and Africa (Nigeria; Angola; Uganda),[48] as well as the size of their collections and their range of services would be a worthy public service in each location, and would provide ample new information to drive academic research about the role and value of those libraries in their communities. This research can amplify the investment, generating even more libraries and even more measurable impact.

The obvious gap is internet service. Whether for reasons related to politics, investment, infrastructure, competence, intentional deprivation or other factors, academic research should be brought to bear so the connectivity needs of the remaining 25-30 percent of global students are met quickly, efficiently, and without compromise. Both in school and in Not School, growing up and learning without high-quality Internet service has become almost inconceivable. The world is connected, but some students (and their communities) are unable to participate. This is a clearly defined problem with practical solutions — and if it's unlikely that connectivity will reach 100 percent by 2050, 85 or 90 percent is within reach. Adults must make the decision to make it so.

It is not too soon to begin active research, development, prototyping, testing, and funding of Global Brain. Today, creative professionals, educators and technologists can build the wireframe, the data architecture, the initial versions of the user experience, the international relationships, and more. Within a year, a working prototype can be up and running, and in active testing. Within 2 or 3 years, 42 / Global Brain can be part of the Not School learning experience for tens and perhaps hundreds of millions of children and teenagers — and it can be plugged into New School as soon as that's ready.

And, it's not too soon to develop interactive, video, audio, and other assets for high-likelihood Fundamentals in the New School structure — students will need to understand how the human heart and the circulatory system operate (and they can also be used in a Not School, even an Old School setting). It is not too soon to figure out how the Body Engine might operate, or the Time-and-Place Engine.

It is time to build a global collaboration that allows anyone to play with these ideas and develop a plan. It's time to initiate seed funding for these collaborations, making it possible to convene in person, develop hypotheses, conduct experiments, collect early data, develop the technology, set it all in motion.

Adults in the Neighborhood

Playing with the cardboard box is fun, but it's getting dark outside. It might rain tomorrow, so the kids need to store the box someplace it won't get wet. Two dogs run by. The kids decide the dogs are more interesting than the box. The kids run after the dogs, then go home.

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Next day, it doesn't rain, so the box should be okay. But the box is gone. One kid's stomach is upset, but others go out to find the box. Instead, they find a few kids in a vacant lot, playing football (soccer, to U.S. kids). Now, there are too many kids to just kick the ball around. They organize teams, add some rules. The green broken-down truck and that weird yellow-and-purple log will mark out-of-bounds. Goalies construct rough markers. Just as teams take the field, it starts to rain hard, with wind and thunder and lightning. Everybody runs away. One kid shouts to the others: let's read comic books at my house! Seven kids do. Three others play in the rain, laughing and sliding around in the mud.

Time passes. Summer's over. School's in session, and there's homework to do. Now, the kids schedule time to play. And, the field is no longer available. There's a fence. Someone's building a store. They need a new place to play.

Long winter. New apartment buildings opened up. There are more kids around. Anyone who doesn't know how to play, they teach them, but there's a problem: every time they find a good place to play, somebody chases them away. Kids complain to their parents. They want someplace that's safe – with lights so they can play when it gets dark. Rest rooms, too, please! The kids need help from adults. Adults meet. They will raise money to build a facility and start a neighborhood league. Games will be scheduled on Saturday morning because that's convenient for the parents. Free breakfast between 8 and 830AM, games start promptly at 845AM. And, there will be rest rooms. And someday, lights for night games, too.

The kids lost control of the ball. It's now in the hands of adults.

Some kids wander off, hoping to find another box.

END OF CHAPTER 5

[1] National Academies Press, *How People Learn - Consensus HPL 2,* page 7

[2] https://americanprofile.com/articles/hurricane-katrina-greater-new-orleans-youth-orchestra-instruments/

[3] Bux-Mont is a combined effort by Bucks County and Montgomery County in the U.S. state of Pennsylvania.

[4] A hoagie is the Philadelphia version of a submarine sandwich, Italian sandwich, wedge, hero sandwich, or grinder – a long sandwich roll filled with meats, cheese and vegetables.

[5] Burns, James MacGregor, *Fire & Light: How the Enlightenment Transformed Our World*. New York: Thomas Dunne Books, an imprint of St. Martin's Press, 2013, page 96

[6] *Center for Education Policy, History and Evolution of Public Education in the US*
https://files.eric.ed.gov/fulltext/ED606970.pdf - page 4 -

[7] https://teara.govt.nz/en/youth-organisations/page-3

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[9] https://zeal.nz/whoiszeal/

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[11] https://en.wikipedia.org/wiki/Zaatari_refugee_camp#cite_note-Reliefweb-19

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[19] Ratey, John with Eric Hagerman, *Spark: The Revolutionary New Science of Exercise and the Brain.* New York: Little, Brown, 2008. Chapter 2 provides a detailed explanation; the quote appears on page 53.

[20] Ratey, pages 41-42

[21] https://en.wikipedia.org/wiki/4-H

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[23] https://www.oclc.org/content/dam/oclc/reports/librariesstackup.pdf

[24] https://about.proquest.com/en/blog/2018/these-countries-have-the-most-public-libraries-per-capita/

[25] https://librarymap.ifla.org/about

[26] https://blogs.ifla.org/lpa/tag/librarystatoftheweek/page/3/

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[29] https://s3.us-east-1.amazonaws.com/WebVault/SLJ/EDIT24/USBBY-2024-SLJ-download.pdf

[30] https://www.otrcat.com/childrens-radio-shows

[31] https://www.commonsensemedia.org/lists/great-podcasts-for-tweens-and-teens

[32] https://www.youtube.com/watch?v=nvhjQQodu08

[33] Twitter, now known as X, was once in this top-five list, but it is rapidly fading.

[34] https://hbr.org/2020/01/the-essential-clayton-christensen-articles

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[36] Sahlberg, Pasi, *Lessons: What Can the World Learn From Educational Change in Finland?,* New York: Teachers College Press, 2011, pages 140-141

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Chapter 6:
Adults

14,430 Words

Solomon Schwartz was an art teacher in a public school in Brooklyn, a borough of New York City. A talented artist, Mr. Schwartz's real gift was recognizing students with potential. Norman was growing up poor. He liked to draw pictures for fun. Sensing talent, Mr. Schwartz arranged for Norman's admission to the prestigious High School for Music and Art, hoping the young teenager would become a fine artist. Norman enrolled – and quickly realized the school was not the place to learn to earn the money his family needed to survive. Norman transferred to back to his neighborhood school, Eastern District High – but he struggled. Failing French, he was not doing so well in several other subjects, either. One day, his French teacher, Mrs. Cozzens asked him to stay after class. He worried about being expelled. Mrs. Cozzens smiled. She knew Norman could draw, and told him, "it was a crime to waste talent at a school like this." Mrs. Cozzens found another school, made arrangements and insisted Norman enroll. The School of Industrial Art's slogan was "To Train Artists and Designers for Industry."

By his own admission, Norman was a competent artist, not a shining star. In fact, he spent most of his time at The School of Industrial Art writing, producing, directing and emceeing stage shows. Later, he did the same thing in the U.S. Navy, entertaining several thousand men on the U.S.S. Oklahoma City. After military service, Norman worked briefly as a commercial artist, then switched to a more promising young industry – television – initially as an art director, then as producer of popular long-running network series.

"I am here talking to you because of the access and opportunities that I was afforded. I am here having achieved in schools, having been able to have a conversation, knowing that young people, friends of mine, neighbors, relatives much smarter and more brilliant than I, some not even on this planet anymore, did not have the same access and opportunities that I had. [For example,] an English teacher broke policies, broke rules in the school district to allow me to take Honors English at our high school. Now, people didn't like it. They were mean! They were upset!! I saw how educators and my peers, people treated me differently. I had access to vocabulary, ways of writing stories I couldn't have imagined [before]. Now I can think back to those specific experiences. I think the key to me achieving in school was 'yeah, go ahead man.' [I think to myself:] *You're the keeper of those rules now.*"

– Dr. Luvelle Brown,
Superintendent Ithaca City School District, Ithaca, New York, USA[1]
[Reinventing School interview]

Norman in New York City, and Luvelle in rural Virginia, got lucky. A teacher (in Norman's case, two teachers) built a trusting relationship with a student, and changed a life. As adults, our job is to increase the odds of young people getting lucky.

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21st Century Adults

Today, more adults live on earth than ever before: about 6 billion adults, rising to 8 billion by 2050 or so. The number of children remains stable: 2+billion. People live longer, so there are more adults. People aren't making enough babies (except in Africa), so children's numbers don't change. A larger adult population will demand more social services, more care, a larger portion of public spending, so investment in primary and secondary education will decrease.

Only about 1 in 4 adults have schoolchildren living at home. Half of adults never marry. Many adults know almost nothing about the lives of 21st century children or teenagers. However, they do pay taxes, so they fund primary and secondary school. If they vote, they pay more attention to party loyalty than candidate voting history. When school funding issues arise, many adults prefer to repair roads and bridges, complain about law enforcement, or build a new sports stadium. Even if there's a pressing local issue about school funding, most adults are easily distracted.

Citizen disinterest allows people who work in government, and people who influence government, to operate freely. Sometimes, a President, Prime Minister or regional Governor encounters an education issue, but they rarely get involved. Legislators try to keep constituents in their base happy, but they vote with the party or sway in the political wind. This leaves the internal agency for education as the sole government entity that deals with school regularly. Typically led by a political appointee and staffed with long-term experts, their powers are limited by law, practice and politics. Mostly, they defer decision-making, but sometimes fund region-wide projects. A very small number of adults make nearly all important decisions about the education of the world's children and teenagers.

A school board is a group of local citizens with oversight responsibility for one, several or many schools — and in one form or another, they exist almost anywhere there are schools. Their members are concerned parents, local politicians (typically on their first career rung), people involved in public service (law enforcement, nurses), attorneys, accountants, and others appointed by local politicians and/or elected by local voters. Their independent operation does not require experience or knowledge of education, the science of learning, curriculum, or school operations. Most board members are unpaid, and sometimes surprised by hefty demands of the role.

In the U.S., school boards have been around since 1647. There are now 95,000 school boards and similar entities in the U.S. Their main responsibilities: approve the annual budget; monitor school policies; and employ a superintendent.[2]

Following government regulations, mandates and responding to political pressures, school boards are influenced by parents, students and teachers. School boards do not, as a rule,

address instruction. Mostly, they leave this work to building principals, who leave it to teachers.

Every district employs a workforce to manage facilities, HVAC, technology, transportation, food service, cleanup, security, and office functions, such as scheduling and accounting. Districts and schools also employ learning support specialists, mental health professionals, and other adults. For every teacher, there's roughly one additional non-teaching adult. Everyone is supervised by a senior executive (a superintendent, for example) who reports to the school board and manages the entire operation, managing with a small staff.

Each school is managed by a building principal, or an equivalent. In the U.S., "public K–12 school principals spent an average of 58.3 hours per week on all school-related activities." On average, more than half of that time is spent solving problems and working out short-term plans with teachers, students, and parents.[3] A principal can make a big difference in the life of a student. "…next to teachers, principals are the most important factor in improving student achievement. About 25 percent of a student's academic gain can be attributed to an effective chief administrator."[4] And yet, "nearly 30 percent of principals who lead troubled schools quit every year. By Year 3, more than half of all principals leave their jobs."[5]

Demographics of U.S. school principals have changed. Females now slightly outnumber males.[6] Racial diversity is taking longer, but progress has been steady.[7] Students see themselves in school leaders.

Adult Responsibility

Responsibility for health and well-being of the world's children and teenagers is not solely the responsibility of parents of today's children and teenagers. Part of our role as adults is to care for people younger and older than ourselves. And, for those who do care for the younger generation, the legal, moral, ethical and social responsibility runs deep — it begins during pregnancy, and continues into early adulthood (sometimes, longer).

No child or teenager should have cause to question adult's intentions or actions on their behalf. This may seem obvious when the adult is a parent, or perhaps, a grandparent, aunt or uncle, perhaps less so when the adult is a teacher, school administrator, or government official. Often, the question is raised when adults attempt to do the right thing in order to to comply with a rule, or a law, to protect large numbers of children and adults, or when they adhere to a particular social, political or religious philosophy.

Similarly, no child or teenager should have cause to question adult competence, or adults' ability to comprehend a current or future situation based upon a reasonable interpretation of facts, trends and velocity of change.

These expectations place considerable pressure on adults involved in public education of children and teenagers.

Top-Down Responsibility

It may be difficult to see in any one classroom on any one school day, but education is closely aligned with economic development, political stability, workforce development and the success of social systems. Nations that do not invest wisely in their young people struggle to make progress, and fall behind as other nations move ahead.

When adults make decisions that advance student success through modern, relevant, useful, interesting school experiences, students learn to think clearly, connect ideas, and make wise decisions. Young people prepare for a future beyond their parent's comprehension. Students learn from one another, and from a world of information and ideas – universal internet access is so important to every student. To make progress, they rely upon a high-functioning school system and relevant, useful learning. Along the way, they learn to despise political corruption and blind allegiance to political leaders because their ways inhibit progress.

Populist leaders can control the media, limiting public inquiry about, for example, climate change or corruption. When the focus is small picture and information is biased and incomplete, bad actors easily foment conflict. This is the way things work in many countries. A modern education, akin to New School, helps prevent this nightmare.

Support for education does not prevent bad things from happening, but it does reduce frequency and intensity. This is the principal case in favor of modern schooling. Another case: today's children will render care and control social services for today's aging adults.

Parents & Families

It is always wise to begin a conversation about parents and family without any assumptions at all. Just as every child and teenager is unique, every family is unique, too.

"It is a common thing in my community to have large families. Nine grandchildren were from my grandmother, and two of them were from my grandpa's first wife. At my mother's side, they have seven kids. I am planning to be the mother of six children. In my mind, I have thought I am going to have three sets of twins! I am getting my (first) college degree at the University of Nairobi. It is the best university in Kenya. I was actually looking forward to getting my undergraduate degree in another country, but I also wanted to get the experience in Kenya first, then get my graduate degree in another country. The reason why I am becoming a nutritionist and dietician is because, where I am coming

from, there is a lot of lifestyle-related sciences and (concern about) consumption of high calorie foods. This is an emerging field. I can contribute to saving a lot of lives, not only in my community and in Kenya, but in other countries as well."

– Binti, 21, Nairobi, Kenya [Kids on Earth interview]

Some children do not live with their birth parents. Adoption, foster care, and children growing up without parents or families are significant considerations everywhere. In the U.S., each year, about 100,000 children and teenagers are newly adopted,[8] and about 400,000 are under foster care, so more than 2 million young people are either fostered or adopted in the U.S. – that's about 1 in every 36 people under age 18.[9] Worldwide stats are hard to find.

"I have 3 foster siblings and 3 of my sisters and brothers, so there's 7 kids. There's so many! My foster siblings… their mom couldn't take care of them anymore, so my mom decided to take them in as her own, and do the best she can to provide them the family they weren't able to have. It just happens kind of unexpectedly. In the end, it's the thought of giving them a roof over their heads. There's a lot of love. It has taught me a lot as a person about how to care for myself. Actually, when I grow up, I want to be in the medical field to help other people. I want to be either a doctor or a nurse. I want to give back to other people. Any way that I can help. In low income neighborhoods, locally. Maybe a fund for Christmas gifts for children. Maybe Fridays, we do dinner, and we come together and we become a community. And then, after all that, we can make the project go bigger and do worldwide things. I don't know, maybe people in villages that don't have much and try to give them water and food and school supplies. It's going to be a long time until we get to that, but I know it's possible to accomplish that."

– Sianni, 14, Richboro, Pennsylvania, U.S. [Kids on Earth interview]

Parents Care, but Face Issues of Their Own

Parents are hyper-focused on school as it applies to their own family, less concerned about theories, reforms, and ideas about school's role in society. Instead, parents attend to the cough causing the child to be absent, the C+ that could have been a B+, the student's inability to conquer spelling.

Ideally, an attentive, caring parent is the child's advocate and taskmaster, but some parents cannot or do not provide this level of attention and care. They may be distracted, caught up in their own issues, busy with other children, working several jobs to feed the family. They may be incapable, unwilling, reluctant to make a mistake and seem a fool, so they hang back, hoping the child will succeed on their own. They may not be able to manage their child. Parent-child relationships are not always happy or high-functioning.

Chapter 6: Adults

14,430 Words

In many countries and cultures, parents' school experience was relatively brief; perhaps half as many years as students attend today, perhaps with more truancy. What they learned, they may have forgotten. What is learned today may be unfamiliar. Education may not have been so important in the parent's childhood. Past experience may be unhelpful. A parent may be reluctant to show a teacher, or their own children, how little they know (or remember).

Instead of engaging deeply, and learning the curriculum as it is today, they dream through their children. They foster diligence and good study habits, wishing for a good outcome. Sometimes, parents are demanding because they can see possibilities in their children they never saw in their own lives.

Parents Speaking Out

When their child or teenager complains of unfair treatment, or a teacher seems act unreasonably, a parent may speak up. Parents' concerns are handled, managed, and resolved, usually without the school changing anything much at all.

Sometimes, parents band together to cause dismissal of problematic school personnel. Sometimes, they attract media attention — in the U.S., parents may demand the banning of certain books from the school library. Local "culture war" kerfuffles attract press attention, but exert little consequential impact on what children and teenagers learn in or out of school.

Most parents choose battles with care. They do not want to be labelled a troublemaker because that could cause long-term problems for their children. Parents are also reluctant to challenge what is taught in school. They understand the teacher is required to follow a certain curriculum, and that curriculum decisions are beyond the teacher's control. They understand complaining to a school principal or higher-up will usually do no good (and, possibly result in consequences for their child or teenager, or a well-meaning teacher). If they take on a big fight alongside other parents, they sign up for a lot of hard work because everyone must remain aligned and focused on the critical issue, and that doesn't happen often. Besides, by the time anything meaningful happens, the student will be on the way to graduation.

Parents Imagining Alternative Futures

One of New School Learning Categories is Our Futures. For at least one hour each week during their entire school career, every student learns construct and evaluate future scenarios. They gather and analyze data, review historical attempts at change, consider variables, and frame likelihoods.

When parents contemplate their kids' future, they begin by thinking about their own schooling — dismissing how much has changed since the 20th century. It is not easy to imagine the world as it will be from 2025 to 2050, and into the second half of this century.

They are concerned about computer automation and social media, not nanotechnology, biotech, zoonotic diseases, and genetic engineering. In short, most parents are out-of-sync, cannot conceive of the details of their children and teenager's likely futures, and poorly prepared to challenge school's lack of education. This is doubly so in areas of innovation and potential international opportunity.

Teachers

Teachers are education experts. They are professionals who know more about how students learn, succeed, fail, get distracted, forget, remember, and behave than any other adults.

Most of the world's primary and secondary teachers do the same things in the same ways. They carry most of the burden of instruction, but the process is often exhausting and maddeningly ineffective. Students do not remember much of what was taught.

Investment in professional development is helpful, but it does not address the larger problem: there is too much material to be taught, and not enough student interest in learning or remembering the curriculum. Teachers are caught in the middle – they must teach the full curriculum, but the curriculum does not engage the hearts and minds of many students (especially in secondary school). As a result, Old School feels like a ceaseless, senseless game in which students want to learn relevant, interesting, useful material, and the teacher wants to teach them what they want to learn, but rules prevent everyone from doing the right thing.

Busy teachers have no time to question the process, and little appetite to do so – this is the way Old School works. Attempts at change are futile. And yet, few careers offer the joy and the sense of personal and professional accomplishment that teaching provides.

Teaching Workforce

Worldwide, 70+ million people work as schoolteachers. If the world's teachers gathered in one country, its population would be larger than France (the 23rd most populous country).[10] In fact, the world needs 100+ million teachers, closer to Japan's population (12th most populous country). There are more teachers than there are employees in almost any other profession. For most of the last 50 years, teaching has been the single biggest employment sector for graduates of U.S. higher education institutions.

Most school teachers are female. In the UK, 85 percent of primary school teachers are female, decreasing to 65 percent for secondary school.[11] In 2015, 90 percent of Brazil's teachers were female, and in Germany, 86 percent were female. In China, 62 percent of teachers were female, but in India, the male/female split was 50/50.[12] An OECD survey of 28 countries found that women made up 70 percent of lower secondary school teachers.[13]

Chapter 6:
Adults

14,430 Words

Apparently, mass public education's origin story goes back to Edward Thorndike, whose system for public education was to be led by men. They would hire mostly women to work as teachers, and tell them what to do.[14] The model took hold, not just in the U.S., but all over the world. It has been reinforced by minimizing teachers' pay, partly to dissuade men from pursuing careers as teachers. "While Thorndike's work was hugely influential on modern educational ideas and practices, he was also a proponent of eugenics, and held racist, sexist, and antisemitic ideas." So reads the press release from Teachers College at Columbia University in New York City which also announced the removal of Thorndike's name from a prestigious campus building.[15]

Appeal

"I am a first grade teacher in Baxter, in middle Tennessee. This will be my fifth year teaching. I remember as a child playing school. I always wanted to be the teacher. I loved to read to my stuffed animals. And to my cousins. I guess my love for learning, and my love for reading, I wanted to do that for my students."

– Sarah Vaughn, First Grade Teacher,
Putnam County Schools, Tennessee, U.S. [Reinventing School]

"My mother was a teacher. She used to teach primary. I used to go with her to school and watch her teach. She taught for 38 years, and [even after retiring] she has never really stopped teaching! I want to be like my mother. All of our neighbors were teachers, so I used to see teachers every day, teaching and interacting with students. I also admired an old man who used to teach history. When I teach, I have ideas in my head. And there's a bunch of students who want to go play, or do something else. The first thing you have to do, you have to identify each student according to their ability. You get to know this one and that one. You get to know that this one is quicker and this one needs extra time. There might be a student who hasn't understood. They are looking at you. When you know something, and a student knows a different thing, you have to give them time to express their views. The student brings their own research, so you share. Every kid, in every country, thinks they know better than the teacher. Every kid can be naughty. Every kid thinks their point is always correct, that they are smarter than the teacher. Oh…I do like teaching. I do love teaching!"

– Rosa Nabulonde, High School teacher, Kawempe High School,
Kampala, Uganda [Teachers on Earth interview]

Teaching can be a very appealing profession, a long-term commitment to make the world a better place, one child at a time. Acknowledging low salaries, stress, lack of respect, and other tiresome issues, spending days in a classroom with students, helping them learn and

find their way, probably ranks among the world's most satisfying work – if the conditions are right. Unfortunately, too often, teachers are not afforded the respect they require to do their jobs. It is a system in need of repair, but most teachers lack the available time to deal with the big picture. Unions may be helpful, but often, their concerns go beyond the local school or district and they attempt to hold ground or manage larger issues.

Power

"I want to be teacher. When I was younger, I wanted to be a veterinarian, but I'm not so good with blood, so I don't think I could do surgery or anything. I want to be a teacher because I was right in the middle of the teacher's strike a month ago, and that just made me want to be a teacher even more. I really love kids. When I was in sixth grade, West Virginia didn't really spend that much money on education, and I guess the teachers, they didn't feel like they got paid enough, so they all got together and there was this big strike. Since we didn't have school, I stayed with a friend, whose mom was really close with a lot of teachers. We went to the Capitol every day of the strike. We met up with the teachers. We were socializing – me, my sister, a couple of other kids. When West Virginia went on strike, it caused people in other states to go on strike. I actually liked it. I liked how the teachers took a stand and actually caused other people to stand up, too. They fought for better wages. They fought for better health benefits, like insurance. They also fought for better things, like some schools in West Virginia, they didn't have iPads or laptops. It was pretty hard to learn. They were taking a stand so other kids would have a chance to learn."

–Kaia, 12, South Charleston, West Virginia, U.S. [Kids on Earth interview]

Teachers on strike! Kaia is clearly benefiting from lessons about taking a stand, and fighting for a better life, but teachers should never be put into this position. Instead, the system should be respectful of their professional role. When the system is unresponsive, is it wise for teachers to coordinate their efforts and brandish power to bring about meaningful change?

"Instead of trying to cover every single thing, how do we give… students skills with which they can… understand how… topics are interconnected? This *Trivial Pursuit* model of [Social Studies and] history just doesn't work. Maybe if we're getting ready for *Jeopardy!*, great, but we're getting ready for life, and we need the skills necessary to navigate, and to vote!"

–Nathan McAlister, History Teacher, Seaman High School;
D.A.R. Kansas Outstanding Teacher of the Year[16]
[*Reinventing School* interview]

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Mr. McAlister is not a radical educational theorist. Instead, he is an outstanding history teacher, well-regarded by students and peers. He works on the front lines, sees the need for change every day. So what's the next move?

Ineffectiveness Increases by Grade Level

At first, the problem is not easy to see because students in the early grades usually enjoy school, and learn a lot about things they really want and need to know. Kindergarteners and first graders learn so much from their teachers, not only about basic skills like reading and arithmetic, but also about how to get along and how the world works. There's lots of affection between teachers and their students. Lots of trust. Lots of room for imagination and discussion (and lots of naps!) It works – apart from an occasional (and inevitable) upset and crying fit, students and teachers are happy most of the time. Learning is fun, rich, and abundant.

Later in primary school, some problems emerge, but they're not a big deal. Students begin to express disinterest in certain topics, then certain subjects, and begin to find better things to do and other things to learn. It's not that they don't want to learn… they just don't want to learn what's in front of them. Still, they see everybody else doing the work, and not suffering much, so they go along. It's a bit mind-numbing – learning something that doesn't hold much interest – but in the years before adolescence, children tend to comply.

The part that requires a closer look: students are not learning to think for themselves. Instead, adults tell them what to do. Students try to please their adults, so they comply. Teachers watch initiative, creativity and curiosity melt away.

As students enter lower secondary (middle) school, patterns are easier to see. They want to think for themselves. Students want to concentrate on topics and skills that are interesting, relevant and useful. At a time when their brains and bodies are oriented toward independence and self-actualization, their freedom in school is restricted, and if they do not behave, they are threatened with disciplinary action. The result: lots of unhappy students, unhappy parents and unhappy teachers. For many middle school students, it's a mess. Schools blame raging hormones, but they're misdiagnosing the problem. Aggressive government-mandated curriculum is in conflict with what these emerging teenagers want and need to learn. School's structure conflicts with their developmental needs.

For much of secondary school, teachers do their best in a system rooted in the belief that every student is equally interested in the mandatory curriculum. It's a lousy design because students are not allowed to pursue their own interests and teachers are not free to guide them to more relevant or useful work.

Project-based learning cleverly masks the core problem. Students and teachers follow curriculum, but PBL provides a gentle workaround. Teachers hand students some responsibility for learning to students. Students develop and implement projects of their own choosing. It's a step in the right direction, but students who try to make more decisions about their own learning must somehow fit into a system not designed for that purpose.

Incremental Improvements

It would be unfair to claim nothing changes in Old School. Teachers, principals and school districts frequently experiment with new approaches. There are many examples including schools with two or three grade levels so all students are of similar ages, occasional internet conversations and joint projects with students in other countries, special opportunities for some or all students related to model governments, the space program, academic competitions, and more. Students, parents and teachers find these interesting, but they're exceptions. They do not guide most school days – except, perhaps, for small numbers of fortunate (often gifted or troubled) students.

All of these ideas have merit, but they are difficult to scale and sustain within the Old School philosophy. Mostly, that's because the mandated curriculum occupies a much higher rung on the ladder of priorities.

Teach Students, Not Subjects!

This rallying cry suggests each student is a human being capable of learning what interests them, or what may be useful. It also suggests subjects are a thing of the past.

If Old School subjects remain each day's organizing principle, students are quick to realize they are secondary to curriculum dissemination. In New School, teaching exposes students to Fundamentals but the operative term is not teaching – it's learning. And yet, some people are very good at this version of school and education. Below, Chris is a standout.

> "At the end of four years at our school, I want every kid to feel… that we have helped them to become fully actualized, fully realized citizens of the world, ready to go out and thoughtfully be able to make change. Our job is to help them develop necessary skills."[17]
>
> – Chris Lehmann, Founding Principal, Science Leadership Academy, a progressive science and technology public high school in Philadelphia, Pennsylvania, U.S.

Respect

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There's a chronic shortage of 15+ million teachers in sub-Saharan Africa.[18] The obvious solution is to spend more money, but money provides insufficient motivation for a difficult job that requires great dedication. In Thailand, for example, "teaching is not an interesting job like doctors or engineer, so a mindset shift is the solution."[19] Still, more money would help.

In the U.S., public school teachers spend their own money to make their classroom an inviting place to learn. Many U.S. teachers now work second jobs because their salary is insufficient to fund a decent place to live, food, clothing and transportation. They work long hours to teach a curriculum many know to be excessive, largely irrelevant, and dull, but they teach what they are told to teach. Teachers are professionals, but they are not allowed to make the big decisions about teaching or learning.

When teachers leave the profession, or contemplate leaving, they often cite low pay, insufficient support, long hours, overcommitment, inadequate resources, mental health issues, and, in lower income districts, insufficient funding. Violence, poverty, crime, family challenges, and drug abuse are among the toxins that make their way into schools and impact teachers. Old School perpetuates these problems because students receive little one-on-one attention, except when they do something wrong.

When the pandemic hit, teachers bore the brunt of society's failure to respond constructively. As if by magic, teachers were required to convert in-person teaching to virtual lessons for students via ZOOM. No matter that students lived with other people, and quiet places to participate in group conversations were hard to find. No matter that students found it difficult to focus with 16 or 25 other tiny faces on the screen. No matter connection problems, audio problems, attention and distraction problems, and boredom. Everything about the misadventure was poorly planned.

Teachers learned an important lesson. Without in-person, one-on-one interaction with student, the new learning model was fairly useless. Technology was a nonstarter. The teacher needed to be in the physical space with the student — not a virtual space. In so many ways, their presence mattered.

Teachers are in the game because they can make a difference in a young person's life. Look what teachers did for Norman and Luvelle (whose stories began this chapter). Just before Norman died, at age 97, he wrote a thank you essay to Mr. Solomon and Mrs. Cozzens. His respect for them, and what they did for him, stayed with him all his life. (Norman's son, Howard is happy to deliver the heavenly message.)

Teaching in New School

According to the Oxford English Dictionary,[20] the first sense (meaning) of *teach* is:

> *"To impart or convey the knowledge of; to give instruction or lessons in (a subject); to make known, deliver (a message).*

The first sense (meaning) of *learn* is:

> *"to acquire knowledge,"* which expands as:
> *"To acquire knowledge of (a subject) or skill in (an art, etc.) as a result of study, experience, or teaching."*[21]

The Old School purpose of *teaching* is the preparation and delivery of curriculum-based lessons to students. The *teacher* is the protagonist, the active participant.

The New School purpose of *learning* is the acquisition of knowledge and skills by various means including study, experience and interaction with a teacher. As the protagonist, the *student* uses various means to achieve desired outcomes.

Teaching always requires people to learn, but learning doesn't always require a person to teach.

"The word, "education" is derived from two Latin roots: *educare*, to train, to mold, and *educere*, to draw out, to lead out."[22] Both are relevant.

New School Teachers Are Responsible for Student Engagement

Freed from tyranny of standards and tests, every New School teacher's priority shifts from curriculum to student engagement; to forming and building upon a personal relationship with each of their students. Details matter; here's how it can work…

By design, New School students and teachers are partners in learning. Along with other community members, they review this year's Fundamentals and plan next year's even-better batch. Anything that does not make it to the list can be pursued as Personal Learning. Teachers coach, help to keep students focused and productive. No teacher can do this on their own; they involve student peers, teacher and community members. Parents are likely to take an interest, and sometimes, learn alongside their children because the material is fresh, relevant and personally meaningful.

> "We guide. In fact, the most important thing that we do is guiding the learners. Guiding them to achieve the goals, but not deciding for them. In most cases, it's not very good to decide for someone what to do. Your work is only to guide this student, depending on what he or she wants. Because we are not supposed to be a dictator. [Our biggest problem] is when you look at the number of apparatus [resources] that you're supposed to use to make sure

> that the learning process becomes a success. Our [resources] are very limited. If you have 2 apparatus but 10 students, that means that you are leaving out some students. The internet is very poor. Internet moves hand in hand with the learning process. So that is also a challenge."
>
> — Abdullah Turinawe, Biology Teacher, Kawempe High School, Kampala, Uganda [Teachers on Earth interview]

Student engagement requires a teacher's keen understanding of, and deep experience in, human development, relationships, and cognition. The teacher provides expertise and guidance rooted in scholarship and academic excellence, careful and effective research, and many practical skills and benefits — this why the teacher was hired, to do the job as a professional. Teachers mentor and guide so students learn, improve project planning, relationship building, project management, flexibility, resourcefulness, mitigation of obstacles, resilience, work-arounds, reshaping, navigation of shady information, managing frustration, dealing with changes in direction, insufficient context… the teacher's toolkit is huge. And teachers willingly pass on everything they know to their students.

Teachers are co-conspirators; they help students exploit New School's flexibility. A project begun in one Learning Category can be pursued in others. They help students make the most of instructional time. Ideas are connected, and always lead to more ideas.

For Example: What Is a Country?

Every week, within each Learning Category, the process begins with a Fundamental. From the teacher's perspective, how does this work?

In Our Country & Cultures, *"What is a country?"* seems simple, but it's not. It is the sort of Fundamental that works really well in every grade level (some are grade-specific). In a lower secondary classroom, a Fundamental lesson might go something like this (with lots of maps and photos, and some video)…

- There are about 200 countries in the world. Most are less than 100 years old.
- The newest country is South Sudan, separated from Sudan in 2011.
- The oldest country is probably Algeria.
- Countries are formed when groups of people decide to — or are forced to — draw boundaries around their land, and follow the same laws.
- A country may be very small (Vatican City), very large (Russia), or in-between.
- A country may be mostly land (Afghanistan), mostly water (Maldives), or a combination (Canada).
- A country may be an island (Cuba), or many islands (Indonesia).
- A country may be home to a lot of people (China or India), or very few (Tuvalu).

- Most countries did not start as countries, but as regions where independent tribes lived, and still live (New Zealand, many areas in Africa).
- For most of human history, many of today's countries were part of much larger empires.
- Today's borders may not make sense.
    - People from one *culture* may live in several *countries*.
    - People in one *country* may come from many different *cultures*.

(Note: It is reasonable for students who have previously learned this material to present a Fundamental lesson as a Personal Education project.)

After 20 minutes, the Fundamental lesson ends. Students are anxious to get to work on their own Personal Education projects. Some/many will expand upon what they've just learned about countries. Not everybody will move in that direction. The teacher is ready for action.

Just After the Lesson…

Students who know what they want to do just get started. Some students consult with other students to get some feedback on their ideas before they start, or before they discuss their ideas with the teacher. It's a team effort because all students want to be sure the teacher can spend as much time as possible with students who may be disengaged, confused, distracted, etc. They are the ones the teacher visits first. (At some time or other, every student feels this way, so they watch out for one another – they've been learning this way since kindergarten). Still, the teacher keeps an eye on everyone.

Every student knows they will touch base with the teacher before the hour is over, and that later that same day, or first thing tomorrow, there be time to discuss ideas, concerns, resources, and potential partners. Students know how to reserve time on their teacher's schedule. They are confident the teacher knows them as individuals and has their interests in mind. They also know how to post their project-in-development, objectives, deliverables, anticipated completion dates in Global Brain. When they need help, other students are the first place to look for assistance. Teachers are always available if and when they are needed – and some students will require more time with teachers than others. This, too, maximizes teacher time for every student. And because any substantial engagement on behalf of another student can be logged as Personal Education, there's a lot of student-to-student interaction (especially older students helping younger ones). Teachers are the key to personalizing Personal Education.

Personal Education

In the above list, and the one below, students are about 13 years old. They've just spent 20 minutes learning about the concept of a country. They've spent a few minutes time thinking

about what to learn next. Some students will work together, but most will work on their own. What will each one learn? *[And what kinds of help will they ask of the teacher?]*

1. Is Taiwan a country, or is Taiwan part of China? *[Do we know anyone who lives there?]*
    1. *Next project:* Why isn't Puerto Rico a country, and why isn't it a U.S. state? *[Same]*
    2. *After that:* Why does (small) Denmark still control (gigantic) Greenland? *[Do I find out from the U.N., U.S. State Department, the Danish embassy, or a Greenland website?]*
    3. *Which leads to:* With global warming, will the natural resources under Greenland's melting ice sheets make Denmark a lot of money? *[Good question, but teacher needs to think about possible resources; makes some general suggestions.]*
    4. *[leads to questions about the economics of natural resources, studies that might be pursued in* Our Countries & Cultures, Our Planet & Beyond, Numbers & Money*]*

2. How big was the British Empire? And when did it happen?
    1. *Next:* How did (small) England get so big, it controlled 23 percent of the world's population?
    2. *After that:* Was the British Empire bigger and more powerful than the Roman Empire?
    3. *After that:* Why did the U.S. leave the British Empire?
    4. *And:* What happened to the British Empire? Does it still exist?

3. My family's country — the Dominican Republic — shares the island of Hispaniola with another country, Haiti. How did that happen?
    1. Haiti has a lot of problems. Should the D.R. merge with Haiti? Would a merger make our country worse, or their country better? (I want to help the Haitian people because they are our neighbors).

4. What can I learn from a (big and heavy) world atlas?
    1. *Next:* What can I learn from a globe I can't learn from an atlas (and vice-versa)?
    2. *After that:* What is a Mercator Projection, why does it exist>
    3. *And:* How does it differ from a Mollweide?

5. What was Yugoslavia? Was it one country, or was it a bunch of countries, like Slovenia, Croatia and Northern Macedonia are today?
    1. What was Czechoslovakia? Same basic story, or a different story?
    2. What was the U.S.S.R.? Same story? Different story?

6. My family comes from Vietnam, but we don't know anybody who lives there. How can I meet and talk to kids who live in Vietnam? And do they speak French? (French is the only language I can speak)
    1. Is Vietnamese still a language? If the yes, how do I learn to speak Vietnamese?
    2. If I traveled to Vietnam, what should I do there? I want to go, but not until I am older?
    3. Are there Vietnamese movies I can watch and understand (in French)?

7. Why is Chile skinny? Was Chile once a big country? Did they lose a war or something? Did they lose to Brazil, which seems huge?
    1. The bottom of Chile is really close to Antarctica. Do penguins live there? What kinds?
    2. When it's winter in Canada (where I live), it's summer in Chile (and in South America and Africa). This is *so* confusing! How is that even possible?
    3. With global warming, will they still have winter in Chile, or will it be summer all year??
    4. Pretty sure Chile has one of the world's biggest and more powerful telescopes. How can I look through that telescope? Do I have to go there, or can I use a computer?

8. Should Scotland be an independent country?
    1. How does a country declare independence? How would the other country respond?
    2. What was or is Brexit?
    3. If Scotland did declare independence, what would probably happen next?
    4. If Scotland declared independence, might other places follow, such as Wales, or new countries in other places?

No way does a teacher know all of this stuff — but every teacher will learn a lot in New School!

How Does a Teacher Guide Each Student? Mostly, by listening, paying attention, helping the student to think clearly, helping to narrow and refine every Personal Learning project, jointly brainstorming about possible resources, then ensuring access to those resources. Most of the time, neither student nor teacher will know enough, but Wikipedia can quickly establish the visual difference between Mercator and Mollweide. That is, not every question must be answered. It's okay to do a reasonable amount of work, and then, just move on.

Can Students Manage Personal Learning?

Angie Mikula is an art teacher in a K-8 school in Sergeantsville, New Jersey, U.S. Her large classroom is organized by workstation (Drawing, Painting, Collage, more). Beginning in first grade, as Angie's students enter the art room, each one selects their workstation. Each student places their personal marker on a planning board (pictured), then goes to that workstation. The board allows each student to choose among available seats (Relaxation Station is full, but there's open space in Fiber and Print/Stamp). This eliminates disruptive arguments, and removes Angie from the mediator role. Angie reminds the class to keep every workstation clean, but rarely inspects or cleans them. Shifting responsibility from teacher to students — remember, these children are 6 years old — Angie spends her time with individual students and their projects.

Chapter 6: Adults

14,430 Words

Day In & Day Out

Teaching should not be stress-filled and emotionally exhausting. It should not require a 50+ hour work week. In New School, any task that draws a teacher away from engagement of individual students is secondary — and should be minimized through administrative reshuffling, technology solutions, reshaping the work so students can self-manage or help others. For example, students enter details, and software prepares progress reports. If a dozen second grade teachers in the district, or the state, are presenting a Fundamental about Iran, they should work together and share — it's senseless for each teacher to prepare the same material for one 20 minute lesson. Far more time is devoted to Personal Education, which does not require lesson planning or delivery. Far less time is devoted to dissemination. Parents may monitor their children's and teenagers' work directly in Global Brain. Students do not learn the same things, so standardized tests are obsolete — which means teachers do not spend time on test prep, proctoring, grading, or reviewing test results and answers.

A new school day begins. Students are ready with their questions, but not "can I have one more day to finish my report?" Instead, they patiently wait their turn (because they know everybody gets as much time with every teacher as they want or need). And they ask, "What's the best way to start on…" or "Do you know someone who can help me with…" Forget "the dog ate my homework." (Dogs have better things to do with their time.)

Not Everything Works Out as Planned

A geometry teacher prepares an Old School lesson: a quadrilateral proves to be a parallelogram if and only if its diagonals bisect each other. The result is predictable: the calculation always works out the same way.[23]

When New School students pursue their own projects, some go sideways. Errors and mishaps are not personal deficiencies. Instead, they are part of learning — a part without predictable results. Working together on a project about Indonesia, 3 students insert Poland's white-and-red flag in place of Indonesia's red-and-white flag, realize the error, then accidentally replace it with Monaco's red-and-white flag. They laugh. Then, they wonder why these flags are so similar. Turns out, during the Middle Ages, Poland's royal banners were red-and-white, and the combination celebrates Poland and Lithuania's historical alliance.[24] The origin of Indonesia's flag dates back to its Majapahit empire; red symbolizes courage, white, honesty.[25] Monaco's flag is older than 1339.[26] Another student looks on, and switches Personal Learning to other look-alike flags: Senegal and Mali, Romania and Chad, Ireland and Côte d'Ivoire, Venezuela and Ecuador and Colombia, the Netherlands and Luxembourg, Slovenia and Russia and Slovakia. Two other students try to figure out why that happens.

Some mistakes are just mistakes; some flops are just flops. Fix them; move on! Persistent errors may indicate a student inattention, poor planning, or sloppy work. Then again, an error-prone student may be pushing boundaries and quickly failing to find correct answers faster. Teachers help students understand the difference.

Trust

Old School is not a system based upon trust. New School is a system based on trust.

In Old School, teachers are told what to teach, and students are told what to learn. If teachers stray, they are admonished, and risk job loss. If students stray, they are categorized, labeled, and sometimes punished or penalized. Students are doubtful about whether to trust their teachers because, in the end, it is the teacher who grades their performance.

It's a bad design. A cause for anxiety and stress. A trusting relationship between each student and a teacher is the foundation of learning. In the fog of Old School education, this is often overlooked or ignored. Based on contemporary measurement of educational activity, it would be reasonable to assume that relationships have nothing to do with school or student success. Survey data tells school and community leaders about the importance of belonging and supportive relationships in the school environment. Old School's structure makes sustained widespread improvement difficult, if not impossible, and so, there is little confidence that trust will materialize for the world's students.

Top-down, the education system must trust students and teacher to function at a very high level, and support their efforts to do so everyday. School, administrators, government and parents must trust students to learn in a responsible, productive, forward-facing way. Leaders must trust the teachers they have hired and trained to be function as autonomous, expert professionals who know and care about the children and teenagers under their supervision. When the situation becomes difficult, support must be reliable and student's trust must be complete. School personnel must be well-trained. Best practices must be shared because this is a massive cultural shift.

For meaningful learning to take place, the teacher must trust the student to take responsibility for learning, act responsibility, and to be honest. The student must trust the teacher to do everything possible to help, including listening with an open mind and heart, opening the door to additional resources, and not buying into the student's own nonsense. This is New School thinking about trust.

Regular interaction between each student and at least one teacher – and the flexibility to move to another teacher who might be a better fit – should reduce student and family concerns about learning, conflict, social issues, isolation, even negative feelings about school. For the student, it's clear somebody is actually paying attention. For the teacher and school,

the student is no longer an unsolved puzzle or a powder keg about to explode. The student is a person. It's up to the teacher to cultivate potential and help overcome negative feelings. New School provides teachers with time and resources to do that job properly.

Trust is not a given. It's easily damaged, and difficult to repair. Being a teacher doesn't guarantee trust from any student. Teachers must earn their students' trust, and they must be empowered to do so (and not encumbered so they cannot do so). When a teacher requires students to do things they don't want to do, to learn about material that seems irrelevant or useless, trust falls apart. This is a persistent Old School design flaw.

Trust cannot be constructed or mandated top-down – the system is too big, and the top is too distant from individual students' lives and experiences. Instead, trust must cultivated by individual teachers, one student (and parent) at a time. Teachers build trust by engaging with every student on that student's terms, based upon that student's interests. Trust becomes the license for a teacher to guide each student in new directions, and away from unproductive projects and bad behaviors. Students talk to one another and share their feelings of trust (or distrust or dissatisfaction). As relationships grow, trust becomes stronger.

> "I think we can honestly reimagine the way we think about school buildings and the evolution of a classroom and what it looks like… Teachers understand what responsibility is. We're in the 21st century. Maybe it's time for us to re-look, reimagine, rethink, refocus. But we simply won't do it by simply hoisting more responsibility on teachers without thinking about the professionalism and the respect that we deserve."
>
> ––Fedrick C. Ingram, Secretary-Treasurer, AFT (American Federation of Teachers)[27] [*Reinventing School* interview]

New School Training & Professional Development

Free from the bondage of Old School educational philosophy and design, some teachers will expand their role as guides and mentors because New School provides time and means to do so. Other teachers may struggle to shift from command-and-control to a classroom controlled by individual students with their freedom, agency, foibles, inconsistencies and complicated personal lives. The inability to rely upon curriculum and tests as a source of power and authority may cause resistance. Some may stop being teachers.

Retraining a million or more teachers begins with a commitment to pivot from Old School to New School at scale. Whether this decision, or this set of decisions, is made at a national, regional, state/provincial, or local level, it requires a lot of teacher and student involvement in the planning process, a clear operating plan, updated governance and support, and general agreement on new forms of assessment. Clearly, these activities involve more than just the

teachers, but it is the teachers who must manage the process so that it works better than Old School for every individual student.

And, as with any large-scale (think: corporate) exercise in significant change of culture, there will be resistance, and a sense of displacement. Although companies and schools operate in their own unique ways, a sensitive balance between the new operating plan and its expectations, and the inertia of human behavior must be achieved. Some teachers will leave the profession, but most will not because the job still offers a healthy dose of joy and satisfaction, and nearly-adequate compensation and benefits. Some teachers will resist, and organize greater resistance by joining with other unhappy teachers, attempting to explain why the new concepts will never work and will, in fact, harm students, but over time, if the operating plan is reasonable, teachers who are happy with the new ways of working will gently affect the resistors. And again, some will continue to cause trouble, or leave. Again, all of this is normal change management behavior, and there is abundant professional help in the marketplace to get through this period.

After several months, the initial wave subsides. That's when the hard work begins. Teachers' focus shifts from dissemination of curriculum so that 20 or 30 students can pass a test to encouraging individual student engagement so that every student's curiosity drives the learning process.

For some students, and some teachers, the process will be fluid and natural. For others – both students and teachers – training will be essential, and ongoing (though most robust during the first year of New School). Training programs must be devised for a wide range of situations – a third grade classroom teacher and a high school Foreign Language teacher will likely face different issues. Although online training may be tempting, this type of training requires personal interaction – and not just from professional trainers. Students are experiencing the same process as teachers – and their one-on-one insights may be especially effective. Interaction between teachers and college admissions, military recruiters, and job recruiters will be essential. There must be a sense that the community favors this new approach, and that the community will provide every available resource to make things work for students and for teachers.

Training is not magic. Preparation for a new, more energizing role is clearly understood and routinely practiced in many professions. Needs change. Competition requires adaptation. It happens all the time in almost every industry.

Training should be wide and deep. It should include many conversations with other teachers in other schools, all over the world. There should be online support groups, preferably with regularly scheduled sessions and online message boards. There will be books and magazine articles, websites and podcasts, teacher union involvement and government programs to encourage appropriate and abundant training and re-training. Many forms of professional

training will be helpful – and not only training that's directly related to school and education. Change may be new to teachers, but it is not new to others in the work place. Learning about change in the workplace, and making the best of new situations, are steps in a positive direction. Watching and listening to students learning in new ways – helping those who are struggling – are the among best ways to learn about change.

Many teachers are familiar with the work of Carol Dweck. For teachers accustomed to teaching students about a growth mindset, it may feel strange to look in the mirror. Staying with a system of education that offers frustration and lackluster results has resulted in a *fixed mindset* (Dweck's term) of global proportions. Envisioning a future that embraces a more productive and satisfying role for each teacher leads to a growth mindset for both students and teachers. students. A teacher developing a growth mindset becomes a role model.

"The passion for stretching yourself and sticking to it, even (or especially) when it's not going well, is the hallmark of the growth mindset. This is the mindset that allows people to thrive during some of the most challenging times in their lives."[28]

– Carol S. Dweck, Ph.D.
Professor, Psychology, Stanford University
Author, *Mindset: The New Psychology of Success*

All over the world, colleges and universities prepare undergraduate students to become new teachers. Students learn in well-designed, time-tested, sometimes online, courses in such as "Educational Technology for Teaching and Learning," and "Managing Engaging Learning Experiences."[29] Many school districts set aside several days a year for Professional Development. In New School, two newer forms of training gain prominence: many teachers share and collaborate across the internet, and students become valuable resources who provide knowledge, and feedback. (Without grades, and with a sense that the teacher is on their side, students can speak their minds and share their ideas.)

In New School, students begin to see teachers as real people – approachable, multi-dimensional. Just as every student is seen and valued, every teacher is seen and valued, too. When confined to *the one who delivers curriculum*, a teacher might share a small portion of their own interests. In New School, students and teachers have more to talk about. A teacher who volunteers at a local animal shelter may be planning a trip to Japan to study Buddhism, spends winter mornings snowshoeing, and bakes French pastries (currently, m*ille-feuille*) often with terrible results (and keeps trying).

Teaching becomes a much more satisfying profession. Teachers serve as a conduit to a world of relationships, opportunities to learn, exploration and discovery, and people who share interests. In New School, teachers are exposed to many ideas and requests for resources from students, so they communicate with other teachers in other countries. Teachers connect with

scientific, medical, museum, archeological, anthropological, arts, theater, and music professionals. Teachers are trained to pay attention, to encourage students to learn from one another. This is not something students easily do on their own.

"My school is an international school. That means kids from other countries can go to our school. It's kind of unusual. They talk in Slovene, English, German, Russian… but they are on a different side of the school. It's very exciting because you hear a lot of different languages when you walk around. They think that we don't understand them (but we do!). When we talk with them, we usually talk English. But we don't hang out. They hang out separately, and we do, [too]. I want that to change. I want to speak with them, but we're all isolated from each other. I think we should approach first because we're the majority in the school. And maybe if we talked to them, learn from them, I think it would be fun. Nice to meet people from other countries."

— Lara, 14, Ljubljana, Slovenia [Kids on Earth interview]

Author and naturalist Tristan Gooley explains:

"…curiosity is an itch. We feel it when we have some information but we sense more is missing… knowing something makes us more curious than knowing nothing. Some information lights the fuse of curiosity in a way that total ignorance doesn't. The great news is that we can create gaps – we can engineer our own curiosity. The trick is making ourselves curious about any puzzle is to fill in some of the blanks."[30]

Librarians

As a rule, people trust librarians. Parents trust librarians. Students trust librarians. The role is clearly understood: librarians help individuals learn, on their own terms, based upon their own interests. Librarians are familiar with a wide range of available resources. If they do not have the book or other material in their own library, they routinely contact other librarians in other libraries to satisfy the patron's request.

Librarians are aware of resources in other libraries, and online. They routinely introduce students to online resources, such as OED (Oxford English Dictionary), the BBC's Muzzy Language Learning, and databases filled with newspapers and magazines, and much more. For students with sophisticated needs, they can provide access to university libraries, science centers, history centers, and museums.

In their chosen fields, librarians also keep up with new or especially useful books, and other resources. They respond to suggestions from students and adult patrons, and, as budget allows, routinely update their collections. If a particular title is unavailable from their own library, they can source it from another library. The librarian's purpose: to provide every available resource for learning in response to every student need. In public schools, there may be one or two people working in a school library, but often, there is no school library at all (something other adults can fix, if they make library a priority).

This is unfortunate for the obvious reason — students lacking exposure to books, and librarians — but it's unfortunate for a not-so-obvious reason, too. In school, adults trust the children to borrow books, take care of them, and return them in good condition when they are due. In Old School, this model — adults routinely addressing the needs of each individual student, and trusting each of them — is extraordinary.

Other School Specialists

In secondary school, guidance counselors (also known as school counselors) usually work one-on-one with students to improve school success and look ahead to the future. Counselors can become the catch-all for students with problems teachers cannot solve, but that's a reactive solution. A proactive solution places the counselor in the midst of relevant several Learning Categories, such as My Mind, My Life, Our Countries & Our Cultures (especially our cultures), and Our Futures.

Some schools employ a psychologist part-time, full-time or as a consultant. Mostly, school psychologists respond to students with specific issues, but Fundamentals and Personal Learning in My Mind changes the dynamic by educating all students. All students become familiar with psychology, cognition, behavior, identity, happiness, grief, brain imaging, and more. Leapfrogging Fundamentals, they go deeper on their own with the help of every available resources, including the psychologist (and students at a nearby university, and some of their faculty, etc.). This elevates the psychologist's role — as the person as someone who knows a lot about the human mind (and that's pretty cool). Once again, New School shifts some of the burden of learning from the adult professional to the individual student. This repositions the adult expert to provide higher-level guidance and provides the adult with more time to deal with troublesome situations. And it helps students decode what they read to self-diagnose on the internet. Also, if there is a problem that requires treatment, the student, teacher and peers are more likely to recognize danger signs.

Other professionals work in the school environment, but they are not currently trained, or allowed, to help students learn, despite the relevance and utility of their skills and knowledge to some and perhaps many students. For example, many students are interested in the foods they eat, and cooking. In school, and in the district, food is selected, prepared, cooked and served to a lot of people every day. This is done without student engagement — children and

teenagers eat whatever is served. This a missed opportunity. As students learn more about what they are eating and how it is prepared, they will learn more about food sources, food safety, and nutrition. This opens the door to food supply and food preparation in the community – and questions about what happens to food that is not eaten.

Similarly, every school operates a functioning physical plant. Most schools employ at least one person to keep the plant running. How does it work? Where does the power come from? What is HVAC? How does the air flow; how is the air cleaned? Is the building secure? What if there is extreme weather? What if somebody gets sick – how are other people protected? What does the roof do? What's underneath the school? What kinds of maintenance are required? How does the plumbing work? How old is my school building? Should it be repaired – or replaced? Fundamentals introduce every student to the ways buildings work. Some, perhaps many, students will be interested in details. As yet another learning venue opens up, more adults help more students.

Some students are interested in security and safety. In the U.S., students undergo some training (shooter drills, etc.). It seems reasonable to move in the direction of knowledge and preparedness, but that's a tactical response. Should students learn about the bigger picture, the strategies, the range of other possible responses, the statistics? Presuming involvement from local law enforcement (and other experts), this must be done carefully because a shooter may be a former student exploiting a school's vulnerabilities. Cyberattacks are more complicated because they may originate from so many different sources. All of this should be known to more students – for their own safety, the safety of their families and neighborhoods, better decision making, and career potential.

University Researchers

With some exceptions, university researchers are not central to school operations, but they are adults whose work is relevant to school, children, teenagers, and learning. Researchers study specific aspects of learning, or school and education systems, typically with a small populations of local students, or via surveys, in very limited ways with larger numbers of students. Researchers tend to document their work in professional language, so reports are often difficult to decipher, difficult to share, and difficult for teachers to put to practical use.

There is no easy way for many teachers to gain a clear understanding of what researchers have learned, or to put it into action. Most research work is known to other researchers, not by students, teachers, parents or others responsible for schooling. There may be some consensus, and little unified problem-solving. This book grew from the work of many notable researchers, and attempts to connect their ideas to the day-to-day realities of school and the potential of New School and Not School learning.

Chapter 6:
Adults

14,430 Words

Sometimes, during professional development and the occasional educational conference, teachers interact with researchers and pick up on their ideas, but teacher engagement is usually scattered and intermittent. TEDTalks, YouTube, and selected books and articles may be helpful, but would be better if relevant research was organized, compiled, and made accessible for use by teachers, and interested students.

If some secondary students devoted time to finding, reading and summarizing useful research reports, they could learn a lot, and share. Useful information could be compiled in Global Brain – and soon! Researchers are busy, but they could be available to students to confirm and correct students' summaries before posting. Powered by students, guided by teachers and researchers, this contribution to the world's knowledge is aligned with Personal Education. It would help researchers disseminate their good work. The effort is well-suited to foundation and government funding, and international collaboration.

Paying Attention to Students

Times have changed, but deep down, many adults continue to subscribe to a very old English saying, "*A mayde schuld be seen, but not herd…*"[31] Roughly, the old saw suggests girls or children, should be seen but not heard. In the 21st century, few kids think this way. Children and teenagers are human beings with knowledge, skills and plans for the future. Kids understand their ideas may not be reasonable or fully formed, but that doesn't mean adults should dismiss them. Students practice active listening in school, but adults sometimes forget how to listen effectively. Adults can do a better job, paying attention to kids' ideas.

"[We could design a robot that's similar to a person.] It's possible. It's possible! But it's difficult!! There is a big difference between a human and a robot. We could develop something similar, but two will not be identical. Human beings think differently. But robots can save lives."

– Lucas, 10, Montevideo, Uruguay [Kids on Earth interview]

"My mother's house is far from the school, so I have to go on a motorbike (my father drives it), or take a bus. I love it. I was three when I started riding on a motorbike. It's normal for me. I think you have to be about 16 to get a license. When I grow up, I would like to be an inventor…or maybe a movie actress. One of my dreams is to fly. I would like something that you could put into your hands, and fly away. Above the clouds. Something like a motorbike and a skate, but the skate has an engine, and the skateboard can fly."

– Guillermina, 8, Montevideo, Uruguay [Kids on Earth interview]

Chapter 6:
Adults

14,430 Words

"I would like to travel around the world, meet other cultures. I want to be a professional, but I don't know what kind of professional. I didn't think about that yet. I like drama, I like all kinds of art, but I also like history and geography. I like the history of Montevideo – there's an old part of the city that was surrounded by a great wall. I want to know about our heroes, the warriors. They fought the Spanish people [for our independence]."

–Larisa, 10, Montevideo, Uruguay [Kids on Earth interview]

"I am interested in people who think big. Creativity is within everyone the whole world. Everyone has something special. Everybody can be very good at something. For example, my dad (who is an artist) is unique. No one is the same as my dad. Creativity runs in genetics, from person to person in a family. You may be creative, you may not be creative, but everyone can learn."

–Guadalupe, 9, Montevideo, Uruguay [Kids on Earth interview]

Should Adults Decide What Children & Teenagers Learn?

When individual New School students decide to learn about sexual behavior of bonobos, the causes of diabetes, or to compare various religion's beliefs, must they proactively inform their parents? If students make decisions, they some of their choices may run contrary to some beliefs held by parents, family and/or community about what is and is not appropriate to learn in school. When students make these decisions, teachers, principals, superintendents and school boards will be held responsible.

> "California's attorney general, Rob Bonta, filed a lawsuit against a Southern California school district on Monday, asking a judge to halt a new requirement that parents be notified when their child changes pronouns or gender identity."
>
> – *The New York Times*, August 29, 2023

Who is responsible for keeping parents informed? Perhaps this is the wrong question. Parents should not need to be informed –– except under extraordinary, immediate potentially dangerous circumstances. If students use Global Brain for research, notes, reports and finished projects, their parents may freely review their work. Parents are legally responsible for their actions of their minor children and teenagers, so students' school work, as a rule, should be accessible to their parents.

There is law, and there is common practice. For example, any student who wants to know about bonobo sex will find out what they want to know. In a free society, it is difficult to prohibit learning. And remember: there are many ways to learn outside of school. Arguing, and adopting strict rules, is rarely productive. Perhaps compromise or distract the learning

process: Bonobos share 99 percent of human DNA – learn about that instead. Or, raise the level of discourse, and force the debate.

Students should be part of the debate. Parents and community members may not be thrilled, and a teacher or school may take some heat, but that's nothing new. Debate provides opportunity to learn about human behavior, anger management, negotiation, and conflict resolution. Every step of the way, students should be invited to engage. Parents may win the battle, but kids always make the final call. It's part of growing up.

"Partnership with Families" is a claim many schools make. In New School, that claim becomes routine and meaningful.

To-Do List for Adults

More than 6 billion adults on earth are responsible for the success of more than 2 billion kids. Collectively, we exert a profound influence on what they know, how they learn, and how they will survive and thrive.

We are failing to build a system of education for 21st century students. We rely upon ideas and methodologies that were outdated decades ago. We do not hire enough teachers, For the most part, we pay them poorly. We do not listen when students complain about curriculum irrelevance; we just smile and acknowledge that school was like that when we were kids, too. We don't think much about classroom acoustics, or replacing half-century-old schools. We do little to make commuting to and from school shorter and safer. Internet access is essential, but remains unavailable or unreliable for 3 of every 10 students.

To clarify, and prioritize what adults ought to do for people growing up in the 21st century, here's a to-do list. It should be shared, through honest conversation, in schools and communities, with people of all ages, to produce a clear and actionable plan that holds adults responsible for substantive improvement.

Progress on education cannot wait, but progress does not require every adult on earth to work out the future of education. There are other priorities to be addressed by other adults who specialize in policy, technology, economics and social change: eradication of poverty, and the provision of reliable electricity and connectivity for every child, teenager, and teacher on earth.

Number one on U.N. Sustainable Development Goals, poverty hits children and teenagers very hard, and makes their education especially challenging. Poverty is often multi-dimensional – associated with abbreviated schooling, inconsistent attendance, inadequate nutrition, questionable drinking water and food supply, unreliable electricity, lack of family assets, housing issues, and more.[32] Eradication, or near-eradication, of poverty is not an

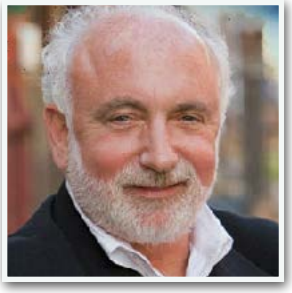
impossible dream. In India, extreme poverty dropped from 63 percent in 1977 to about 40 percent in 2000 to about 10 percent in 2019. In Brazil, the extreme poverty rate was 16 percent in 1996, but it's less than 2 percent today.[33] Still, the problem persists: "A full 25 percent of children in New York City lived in poverty in 2022, the highest rate since 2015."[34] Poverty exists everywhere, so it can be addressed everywhere. Students should know poverty can be eradicated, and help adults take action.

Reliable internet access is essential for every primary and secondary student. A third of the world's students cannot access the internet in a reliable way. Service requires (a) reliable electricity, (b) reliable hardware and software, and (c) reliable connections. In some places, the combination remains a struggle. Often, the problem is not technology – it is political will. Provision, maintenance, repair and replacement are not mysteries. Instead, they are practical and logistical problems to solve. There are no good excuses – adults must work together and get this done. A student growing up without connectivity places that student at a significant disadvantage in the workplace, and as a global citizen. A region or a nation in which many students, and many other people, cannot access the internet assures economic strife and political unrest (which is dangerous for the whole world).

Secure in the belief that powerful, dedicated, capable adults will solve the poverty and connectivity issues, we can begin the to-do list for the many adults involved with the education of children and teenager from now through, at least, 2050.

1 - Make sure children and teenagers face no significant obstacles to learning. Every kid needs a safe place to live and study, nourishing food to eat and clean water to drink. They require reliable transportation to and from school, medical care, places to exercise. Growing bodies require lots of sleep. Often, these local issues require collaborative assistance from people who may not live nearby – without harming the local culture. This is not easy, but, adults can figure it out.

2 - Respect children and teenagers. Engage and appreciate young people on their own terms. Adolescent development allows them to be especially passionate and vital – they are well-suited to change the world. Once activated, and comfortable with their role, subsequent increases in experience and wisdom invigorate the next generation. Adult interaction with teenagers is vital to their self-confidence and power – and teaches adults a lot about how to live their own lives.



"We now know that adolescence is a similarly remarkable period of brain reorganization and plasticity. This discovery is enormously important, with far-reaching implications for how we parent, educate, and treat young people. If the brain is especially sensitive to experience during adolescence, we must be exceptionally thoughtful and careful about the experiences we give people as they develop

from childhood into adulthood."

— Lawrence Steinberg, *Age of Opportunity*[35]

"I think the world has to stop eating meat. We have a lot of (what is the world in English?)… deforestation! The Amazonia is at risk. They have a lot of wildfires. A lot of animals are dying. It is something that we have to preserve. It's our home! We have to preserve it. No pollution! We use a lot of plastic that causes a lot of ocean deaths. The future affects us!!"

— Brenda, 17, Rio de Janeiro, Brazil [Kids on Earth interview]

3 - Build, fund and support a 21st century framework and practical operation for learning. Please stop replicating your own 20th century education on behalf of your children and teenagers. Stop insisting every student learn the same things in the same ways. Stop incessant testing. Stop homework. Stop pretending standards are essential for modern public schooling. Instead, involve the entire community — especially the students and the teachers — in a collaborative global framework. New School provides such a model. Use it! Encourage others use it, too!

4 - Stop telling teachers what to do. Trust teachers to do their jobs as education professionals. Hire the best available teachers, pay a fair wage, make sure working conditions safe and appealing. Support teachers and students with trust and the resources they need to succeed. Do not second guess. Get in there and help students by expanding available resources and sharing your experience — without a political or social agenda. Eliminate government frameworks, mandatory curriculum and standards-based testing because their time has passed.

5 - Focus on resources and collaboration. For every student, provide every possible resource for learning for every student. Inevitably, adults will continue to chase short-term problems, but most adult time and energy should concentrate on more and better resources for learning, and robust connections to other communities.

Specifically, students require safe and secure outdoor spaces to run, walk, play and exercise from early morning through the evening, with rest rooms, with proper lighting and security, and available food and water. They need small, medium and large places to gather, and probably, fewer traditional classrooms. They want maker labs, with people to teach them to use equipment and materials safely and responsibly. Some want to grow their own food, tend to animals (if practical), and cook for themselves — with appropriate instruction. They should have access to an in-school medical facility, with staff, because learning about the human body is essential for everyone, and because, from time to time, everybody needs care. They benefit from more and better public and school libraries. More community interaction — local and global — is necessary, too.

8. Guide young people toward ideas that matter. Although New School students are responsible for their own learning, they are influenced by adults. There are many ways to influence students.

One is to tell them what to do. Another is to foster adult community interest in ideas that matter – get the conversation going, and kids will grab on to the parts that interest them. For example – returning to the eradication of poverty – how is it possible that 1 in 4 New York City children and teenagers are poor? In one of the richest cities in the world? Why? Has this always been true? Who are these children? Do they live in troubled neighborhoods? Why are their neighborhoods troubled? Why are their families suffering? Is this true in other big cities in the U.S.? How about cities in Europe, or Africa? Why shouldn't there be a regular series of community get-togethers for everyone to talk about big ideas?

Why should media and news sources control the conversation? Today, most people can't name many African countries or cities, and can't distinguish between Nairobi and Namibia. Adults can change this – and Not School offers abundant opportunity to organize community viewings of movies, music videos, to watch TV shows together, to discuss and engage people of all ages. Communities can and should get together to discuss more than the current hot issue – learning how people live and learn all over the world is sufficient to engage public interest.

Regarding climate change, people of all ages see coverage of drought, flooding, extreme heat and climate migration. Most adults and children know that humans must change their behavior – immediately and in very substantial ways – but rarely come together to discuss how, learn more, and take action. The pressure points are clear, but media covers such a small portion of the issue, and so little of the likely local impact. Adults are responsible – we must help children and teenagers learn the truth about climate change, not political and industrial mythology. Connect with other communities; share ideas and solutions; build social and political pressure. Build relationships. Cultivate the power of communities learning together about ideas that matter.

9. Engage government and philanthropy. Government and foundations spend a great deal of money on primary and secondary education. They spend a lot of money on pre-school and higher education (tertiary: colleges and universities), too. The results are often disappointing because results rarely scale, and often fail to germinate meaningful, sustainable collaborations or transformations. A promising solution may be effective for 100 schools and 50,000 students, but 10,000 schools and 5,000,000 students seems inconceivable (even though 5 million is only about 1/3 of 1 percent of the world's students). In the Old School model, Schools, teachers and communities in a region or around the world do not routinely communicate with one another because collaboration has been difficult and cumbersome. For the majority of schools, teachers and students, this has changed.

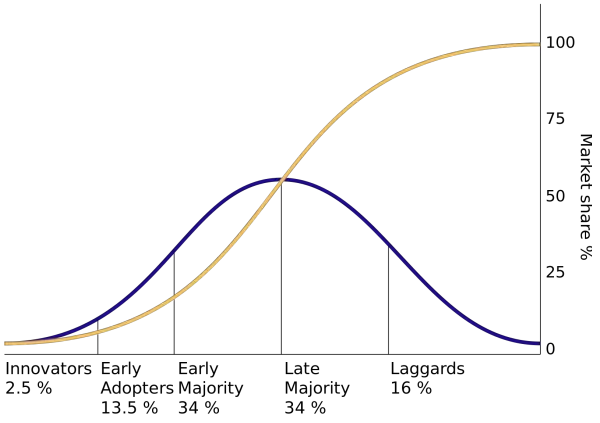
New School greatly increases the rate of human interaction, and the size of the international learning network – a network that can now be operated with technology (excluding those who lack internet connections; see above). The funding community should see the need to add staff to follow the many exciting opportunities emerging in New School. If the entire system is re-energized, good things can happen.

10. Make it happen – and don't let it fall apart! New ideas are fragile. They are easily criticized, wounded, and destroyed. People are easily discouraged. Despite problems, the old ways seem more reasonable. Change is difficult. And yet, as this book has insisted, Old School offers an unreasonable solution because it disregards the wants and needs of many and perhaps most students, relies upon misbegotten ideas about learning, disrespects and disengages teachers, does not produce a desireable return on investment, and fails to provide most students with the necessary training to earn a good living. Pivoting to New School requires adults – many adults – to understand Old School is a poor solution, and to support a new solution. Models that describe change are useful here..

One is the Kubler-Ross Change Curve, developed to explain stages of grief related to death and dying.[36] Below, grief is associated with Old School learning's demise.

- ***Denial*** is a common defense mechanism used to protect oneself from the hardship of considering an upsetting reality.
- ***Anger*** is commonly experienced and expressed as people concede reality. It is potent, and often directed at others. It may be long-lasting.
- ***Bargaining*** typically manifests seeking, or grasping, some measure of control.
- ***Depression*** expresses as sadness, fatigue, disengagement, and an inability to feel pleasure.
- ***Acceptance*** describes the recognition of a new reality – a difficult diagnosis that will remain, so there is no reason to protest or struggle against it.

Rogers' Diffusion of Innovation Curve may be familiar because it is widely used to explain consumer markets – for example, growth of video streaming services or electric vehicles. It is also useful to explain stages of social movements, such as women's right to vote, or LGBTQ+ rights. In the early stages, a relatively small group of people pay attention because they are attracted to a specific innovative idea. They share their enthusiasm, so early adopters buy-in. Media takes notice; a trend begins. If successful, more people buy; even more take notice. By now, more than half of the population has bought-in and even the more reluctant people (the late majority") are aware and interested. This is when the yellow line



becomes important – it is no longer necessary for everybody to buy into the new idea. The new thing has a life of its own. It has become a dominant force in the marketplace. "This process relies heavily on social capital. The innovation must be widely adopted in order to self-sustain."[37]

Today

Transformation of school and the student experience is moving into the early adopters stage. Unfortunately, there is no single, coordinated effort. Instead, many small, interesting projects dominate, and although each may be promising, they collectively fail to harness the social capital necessary to move engage the early majority. In short, transformation is stuck, unlikely to move forward without a coherent effort.

That's why we developed New School and Not School as singular concepts that embrace many modern school reform ideas, but push toward collaboration and widespread adoption of a unified framework.

If adults continue to behave and believe based upon 20th century philosophies, nothing will change. School will become less useful and less worthy of investment (remember: services for seniors are on their way to becoming a dominating, well-funded effort). If adults listen to children, pay attention to the enormous changes taking place everywhere, and commit to a coherent 21st century philosophy, everyone makes progress. This is not a given. It requires adults, everywhere, to work together for the common good of their children, their children's children, and everyone on earth. We have a lot of work to do.

END OF CHAPTER 6

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Chapter 7:
Progress

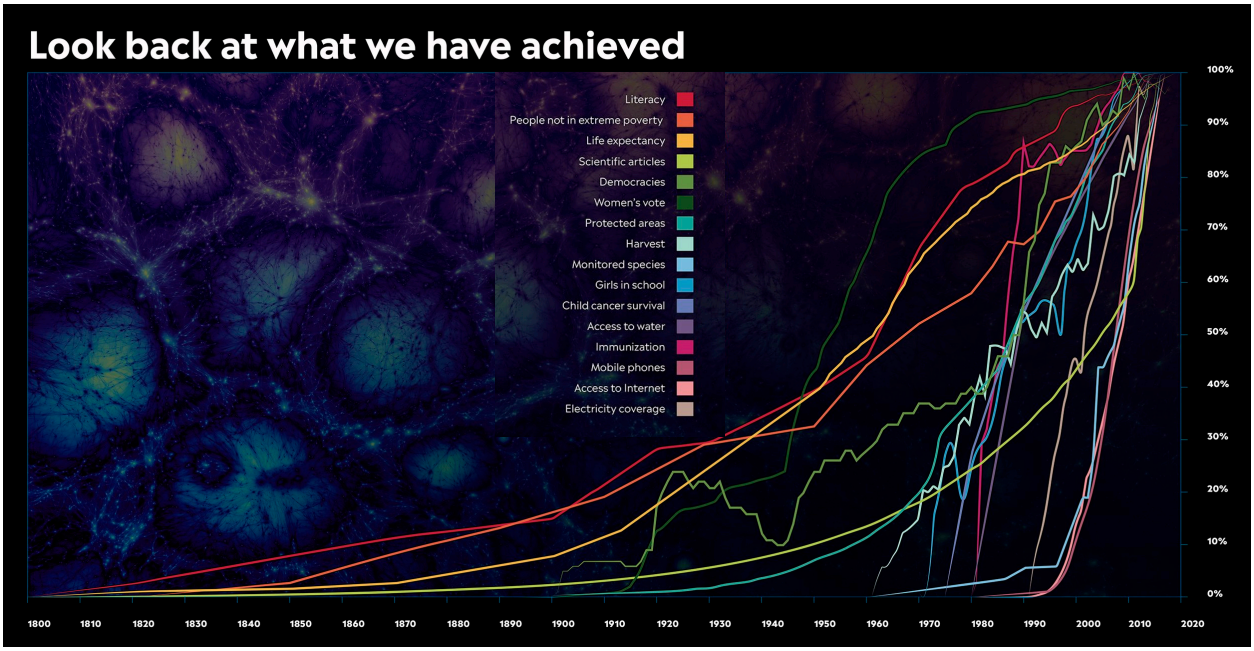
10,530 words

Progress and learning are closely related. Humans cultivate this relationship by requiring a robust education for their children and teenagers. Acknowledging economic and resource differences, children in primary schools in Tegucigalpa, Honduras, and Dushanbe, Tajikistan, and Copenhagen, Denmark mostly learn similar ideas in similar ways with similar resources: trained teachers, curriculum, pencils, paper, blackboards (whiteboards), even Chromebooks on recharging rolling carts. They pursue similar goals. Along with a million of schools, they are part of a global education system.

Education is a multi-faced, dynamic, global network. Education resists change, but it has begun a massive process of transformation. Powerful forces are at work – children and teenagers' push toward agency and identity, internet exposure to a world of ideas, a steadily growing middle class, technology, access to information, globalization, YouTube, shifts in parent's attitudes, evolving communities, a dynamic employment marketplace, the growing vitality of Africa and much of Asia among them.

Humans are trained to sense linear, incremental change, but we lack natural instincts to recognize transformation, which is what's happening to education today.

Below, a Gapminder graph shows the acceleration of transformation across many sectors.[1]Beginning around 1970, the pace of change quickened, but school largely resisted systemic transformation. Until now.



Multiple Systems in Action

School is unusual because it exists at the intersection of several large systems.

School is funded by a combination of national, regional and local governments. Each has their say about what is taught, how it is taught, and the results to be achieved. Most decisions are made for, not by, individual students. Everything is organized as a series of systems to serve large numbers of students.

Historically, students exerted little power. This is changing. More than half of the world's children and teenagers, soon to be nearly three-quarters and more, are now able to learn what they want, when they want, via the internet and from one another. They can distinguish between what they believe to be useful, relevant and valuable and what is not. They can and do determine how much time and energy to devote to learning any idea, any project. Many are concerned about grades and college admissions, but they are becoming wise; they recognize future employment will be determined by their personal accomplishments. Everything is now changing at a large scale, very quickly, throughout the world.

Parents, teachers, schools, principals and school districts are caught in the middle. Most of the adults in the system attended school decades ago – during the previous century – and followed a traditional path. That path is no longer reliable; for many, it is road to nowhere because school no longer leads to secure lifetime employment. The forecast is not promising.

Realignment: The Start of a New Era

After decades of increasing formalizing and centralizing, failures of 40 years of school reform are evident in student and teacher dissatisfaction, poor results, little year-to-year improvement, and massive inequity. School's general inability to serve the current generation's diverse learning needs no secret.

The time has come to support students and teachers from the bottom up. It is time to realign and refocus on provision of resources for Fundamentals and Personal EducationPolicies and investments must pivot. It is nearly impossible for nations and regions to battle the trend toward Personal Education. Half the world's adults, teenagers and children learn this way today. This shift is so powerful, so deeply engrained, that regression would be spectacularly expensive and would probably not work at all.

Government, policy and investment can transform the lives of children, teenagers, and teachers. They can and must provide a safe place to live and learn, reliable and affordable internet connections, the likes of Global Brain (see Chapter 5), and, at the community level, proper health care, sufficient nutritious food, other essentials. It is difficult to learn without these resources.

Realigning government and policy with social needs, and away from curriculum and testing, places teachers – our trained local learning professionals – in charge. It also provides

students with a vital lesson: each one is responsible for their own learning. Each student must be able to learn new skills and acquire new knowledge for their entire lives – the market changes quickly, and they must be prepared to approach their career with flexibility and confidence.

Scale

For the first time in history, billions of people can communicate with one another. This is new – it took shape during the past decade or so. Human can learn from the internet and from one another, regardless of where they happen to be, or the time of day or night. The scale of this activity is as tiny as one person on their phone, as large as social media. People can and do work together to gather and analyze information, consider consequences, explore alternatives, raise a ruckus, attract media attention, support, enable, take action. It's a new world! Older one-to-many institutions are losing their power: broadcasting, newspapers, even school and teachers. Physical retail is being replaced by e-commerce, which easily transforms a tiny enterprise into a global one. Sharing novel ideas is part of the game, so many people now know about the potential of, for example, making batteries from sand.[2]

A seemingly minor event in one country quickly and deeply affects others. A small village in England provides home and support for Ukrainian refugees. Hospitals share supplies when an epidemic flares. International collaboration and cooperation at a hyper-local level is becoming a 21st century hallmark. School is behind the curve, so students construct their own future. Students now follow this path to learn about climate change, and get involved.

> "Global warming is real, and it's changing climates a lot. That is coming from the usage of coal but not just coal, fossil fuels, burning carbon dioxide, releasing greenhouse gasses into the atmosphere. I'm pretty positive that global warming is real, and that humans are causing it. Global warming has not had an effect on my life. Yet. But it probably will later. By the time I grow up, climate will probably change drastically unless we do something. Humans, what we are as a species, we've got to change.
>
> – Ryen, 12, Richboro, Pennsylvania, near Philadelphia, U.S. [Kids on Earth interview]

Global Progress

Today's children and teenagers are the first generation of truly global citizens. They regularly see and hear stories from all over the world, listen to and watch music from many countries and cultures, make friends with peers who live far away, plan to study abroad and travel, and live in places their parents wouldn't have given a second thought. In all but few regions, they can talk to one another – and use emerging technology to clear the language hurdles.

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The word *foreign* is becoming objectionable because no place is "the other." Attitudes are changing, have changed. Unfair treatment based upon the color of a person's skill is no longer acceptable public behavior. Girls must be afforded the same opportunities as boys. Food must be safe to eat, and produced with sustainable practices. Everybody is entitled to an education. These ideas are widely shared by children and teenagers throughout the world. The U.N.'s SDGs harnesses energy of people everywhere to focus on good health and well-being, decent work and economic growth, affordable and clean energy, along with peace and justice and a dozen other big promises.

Progress Requires Trustworthy Information

India is now the world's most populated nation. It's larger than China. If projections hold, India becomes world's second largest economy by 2050.[3] Pay attention to Nigeria – it is likely to overtake the U.S. as the world's third most populated country. Depending upon U.S. immigration policy, the U.S. could drop from today's number 3 position down to 6, behind Nigeria, Pakistan and another country gaining prominence, Indonesia. Also by 2050, the populations of Tanzania, Uganda, Kenya, or Sudan will be larger than the populations of the U.K., France, Germany, or South Korea. By 2050, Egypt's population will be 150 percent the size of Japan and 250 percent its size by 2075. By then, Russia, the world's fourth largest nation in the world in 1950, will drop down to 15, smaller than Mexico.

For curriculum planners in Europe and the Americas, and Australia, these places seem very far away; these changes are difficult to comprehend. Future studies are not part of the Old School plan. Learning about multidimensional transformation is low-priority, but ignorance does not foster progress. Not learning about the world allows extreme nationalism to constructs walls at a time when bridges are required for progress.

"Fake news is stories made up to try to convince people that it's a real thing. Last year, we did research. We checked a lot of websites. A lot of them were kind-of saying the same things. It's really hard to tell whether something is fake news or not. Usually, you have to figure out what makes the most sense. Then, you can choose to believe that."

– Kirsten, 13, Richboro, Pennsylvania (near Philadelphia, U.S.)
[Kids on Earth interview]

The supply side (sender) of information may be murky. So far, neither government nor industry has succeeded in managing the flow. Nor has anyone taken serious steps to protect children and teenagers from inappropriate material on the internet – not in a reliable, sustainable way. The gutting of many news organizations, explosive growth of social media, poor governance, and lack of system-wide hygiene results in a mix of old, new, mostly correct, and dubious information on the internet. AI's quick-and-easy cobbling of multiple sources confuses every issue. Bad actors intending to persuade or misdirect easily hide

amidst chaos, disrupting the flow of accurate information, confuse matters in real time. The supply side does not contain the solution, not for the foreseeable future.

The burden goes to the demand (receive) side. Technology is effective for filtering to reduce vulnerability, but bad guys will always be a technological step ahead, and regulation will always be playing catch-up. The ONLY solution is clear thinking – which must be learned and practiced by children, teenagers, teachers and other adults. The routine is known. Consult only reliable sources. Cultivate trustworthy sources, trust and verify. Hone instincts. Confirm key assumptions. Document errors and questionable material, and share this information. Publicize unreliable and biased sources. Map everything on a shared system, along the lines of Global Brain (see chapter 5), where it can be scrutinized via collective intelligence. Think like a reporter on his, her, their best day.

How can Old School students and teachers find the time to think clearly? They cannot. They deal with far too much information. The sheer volume of government-mandated frameworks, curriculum, and lesson planning, tests and grading prevents meaningful consideration of incoming information. As students accept more responsibility for their own Personal Education, micro-management of individual learning by government and governing bodies becomes counterproductive. The massive forces of education lack the capacity and control to engage constructively, and this misalignment becomes an impediment to student progress.

In New School, and Not School, information can be revised in context, through multiple lenses, with collective research and fact-checking. These activities take place locally and engage individuals based on their own personal interests and relevance. The processes are meaningful to the individuals involved (whether they interact in the same room or across the world), and based upon human relationships with people they know.

If Old School remains dominant, students and teachers will continue to devote little time, energy, emotion, or attention to clear thinking. Otherwise engaged, and busy, without much time to think, teachers and students have no choice but to assume sources are generally accurate, timely, reliable and unbiased. As a rule, they will continue to accept what they are told, what they read, what they see in the media, and in their textbooks. In short, clear thinking means you've got to care – otherwise, why bother?

For decades, secondary school students in Mississippi were taught history curriculum that "omitted the horrors of slavery, lynching, the Ku Klux Klan and Jim Crow and largely skipped over the civil rights movement." Charles Sallis, a history professor, "had long realized that what he had been taught was wrong: Slave owners were not benevolent, Reconstruction was not a tale of Black corruption, and white supremacy was not inevitable." For 4 years, Dr. Sallis and sociology professor James W. Loewen worked with faculty and students on what became "a ninth-grade history textbook so vigorous, frank and unsparing in its review of the state's grim history that the Mississippi State Textbook Purchasing Board barred its use in schools

almost as soon as it appeared."[4] Sallis and Loewen, and their associates, fought for the right for students to think clearly about the authentic history of a U.S. state and its people.

Progress Requires New Ideas

Effective learning is easily sidetracked or interrupted. Modern life requires fully operational systems, but many of our essential systems are, or will soon be, in rough shape.

Progress demands new ways of thinking. Solutions are the result of clear thinking at a local level, hands-on experimentation and use cases, convenings of people and communities who share interests in exploring and solving the problem, and navigating the path to meaningful funding and public support. Given the diversity of problems to be solved over the next 25 years, generating new ideas and bringing new ideas to life must become priorities for teachers, students, and schools.

Education systems that recognize, support, resource and reward local problem identification, experimentation and solutions will be perceived as more relevant and useful than those who perpetuate the *status quo*. Learning environments that support these activities – schools, public libraries, museums, environmental groups, or other formal and informal entities – will be vibrant, responsive, productive, more likely to engage in a growing culture of progress.

Among many examples… "Vertical farming can use up to 99% less water to grow crops and can produce up to 20 times more crops per acre compared to traditional farming… It condenses the space required for agriculture by stacking plots vertically, optimizing the units of horizontal land used… Because the vertical farms are in a controlled environment, virtually no pesticides or herbicides are necessary. Most plants are also certified organic."[5] That's why Dylan Chung of Portola High School wrote about vertical farming in a *Los Angeles Times* opinion piece. It's why Mountain Vista High School in Colorado, U.S. has been farming inside railroad freight cars since 2017. In fact, Freight Farms is an international for-profit enterprise, and Mountain Vista High School is just one of more than 600 outposts associated with high schools, colleges, community organizations, and commercial operators.[6]

Progress Requires Safety & Security

Addressing perilous situations is part of human progress, and should not be ignored by contemporary education. Conflict, irrational leadership, corruption, power plays, incompetent governance, war – these issues are interwoven with refugee crises, prejudice, climate migration, social injustice, inability to provide food and water, uncertainty about education (including education for girls). Quickly and efficiently enflamed and engorged with misinformation from social media – the pace and intensity of escalation becomes dangerous, amplifying the need for investment, reliable infrastructure, productive employment, and social services on scale never before contemplated. The inability to provide these services in

a timely, responsive manner, short- and long-run, combine with advanced weaponry and intensify potential dangers. It is time that primary and secondary students learn about these aspects of 21st century life – in a manner appropriate to their emotional development.

"We are vulnerable and susceptible to cyberattacks. Not all hacks are the same, nor are all hackers. Intentions vary, capabilities vary. At the very high end of the hierarchy are nation threats. They're integrating cyber into their war-fighting strategies. The bar is really low for individuals to have cyber capabilities. We have seen data being manipulated, which I think is a significant concern. If we look at this problem from a vulnerability standpoint, we are never going to sleep!"[7]

– Frank Cilluffo, U.S. Department of Homeland Security's Advisory Council and Director, McCrary Institute for Critical Infrastructure Security, Auburn University, Mississippi, U.S. [Reinventing School interview]

New weapons are often invisible. A technology weapon may be deployed to destroy communications or transportation, food or water supply, or trust and confidence in government or the military. Stability and well-being are under attack, too.

In the past, attackers were easily identified – they wore uniforms of a particular color, they could be seen at a distance. In the 21st century, weapons are used by individual agents (school shooters, for example), and technologists who can wreak havoc from the comfort of their parent's basement. Media makes them celebrities. Attackers and their weaponry are poorly understood, but threats must be managed. To be critical thinkers and smart consumers of information, students must understand 21st century technology. They must also be familiar with investigation, law enforcement and defense, economic unrest, social instability and other core concepts. Some students will learn more, and build careers in this growing industry.

This is a lot for children to absorb. It's undeniably scary. As frequency and complexity continue to increase, attacks will become more aggressive. The biggest impacts are likely to occur in fast-growing regions where employment and personal income are still evolving.

Turns out, Systems Theory, Urban Planning, Decision Sciences and other college-level studies have a place in primary and secondary school learning. Set a high bar. We should not underestimate the capacity of children and teenagers – but we must provide the necessary emotional support so we don't terrify them.

Magical Thinking Impedes Progress

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Climate change is not going to take care of itself. If humans do not change the way we live, the result will be more and more extreme heat, unmanageable water conditions, severe storms, lengthy periods of discomfort, and destruction of local habitat.

Belief that the Old School curriculum (Mathematics, Science, Social Studies, Language Arts) and mandatory government frameworks will change any of that is magical thinking.

> "Stepping on a crack cannot, given what we know about the principles of causal relations, have any direct effect on the probability of your mother breaking her back."
>
> — *Scientific American*[8]

Electing a demonstrably unethical national leader with a criminal record and little experience with foreign policy, domestic policy, economics, government, or social issues who claims to be the only person who can solve the biggest problems is the result of magical thinking.

Learning how to read in English without decoding letters, words, sentences or paragraphs is magical thinking.

Most people do not live in the Americas or Europe. They live in Asia. In New York City, alongside some of the wealthiest families in the world, 1 in 4 children and teenagers really do live in poverty. Africa's population is tripling between now and 2050. Most people in Africa will be young. Necessary systems for social services, employment, economic growth and political stability are not in place. Optimism can be indistinguishable from magical thinking.

In the U.S., many people believe the education system is the world's best. This, too, is magical thinking. "Thirty countries now outperform the United States in mathematics at the high school level. Many are ahead in science, too." According to the Organization for Economic Cooperation and Development [OECD], the millennials in the U.S. workforce tied for last on tests of mathematics and problem solving among the millennials in the workforces of industrial countries analyzed. "We now have the worst-educated workforce in the industrialized world. Because our workers are among the most highly paid in the world, that makes a lot of Americans uncompetitive in the global economy. And uncompetitive against increasingly smart machines. It is a formula for a grim future."[9]

Christopher Columbus never stepped foot in what became the United States. To believe Columbus discovered America is magical thinking.

Is it possible to distinguish between magical thinking and fact-based knowledge? Just over a century ago, Alfred Wegener's theory of continental drift – continents moving over time – was thought to be magical thinking, because "scientists held fast to the traditional theories they'd spent careers developing."[10]

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It is possible that forest bathing – immersing yourself in the forest's atmosphere – provide specific health benefits? Initial scientific research suggests reductions in a stress hormone, higher levels of cancer-killing proteins, and immune cells, and regulation of blood sugar. "Taken together, the science on forest bathing makes a convincing argument that spending time communing with nature can improve stress, anxiety and depression."[11] Also: "Forest therapy can have a positive impact on the oxygen levels in your brain," Dr. Albers explains. That's because you're surrounded by trees and vegetation that engage in photosynthesis. The result: Plants absorb carbon dioxide and release oxygen into the air."[12]

To teach Columbus discovered America, when we know the idea is nonsense, does not promote progress. To explore continental draft or forest bathing, with the rigor of competent research, magic becomes science. Or it turns to dust. Or, it finds its way into an Old School textbook and stays there – and in the curriculum – for decades.

Learning & Self-Preservation

Among students, and teachers, intensity and pervasiveness of stress, anxiety, unhappiness, and mental health problems keeps growing, but social-emotional learning, mindfulness, resilience and other positive interventions are still treated as curriculum supplements. A possible cause: In Old School, individual freedom is restricted: students cannot leave the classroom without permission, cannot learn what they want to learn, must pay attention to the teacher, whether the material is interesting, useful, or relevant.

It's not unusual to hear a child or teenager say: "school feels like a prison." They are describing a day-to-day existence that limits intellectual freedom. Below, Jule lived in prison. Intense academic learning provided the way out. He proudly describes himself as the first formerly-incarcerated person to be hired full-time by the Ford Foundation. His job: analyze data and develop strategy for grants to advance gender, racial, and social justice.

"A lot has happened. I grew up in the 80s. I went through a lot of struggles to figure out who I was as a person – not the messages I was receiving from society. Now… people are so passionate about self-determination, about social justice, about equity. It's really beautiful. I don't know what brought us here, but I think we're in a good space to move forward. I am so honored. While I was in prison and taking classes, I knew we were doing something special. I believe you need to meet people where they are, and provide them with tools to learn that they are more comfortable with. For some, it may be watching a documentary. For others, it's maybe reading a book. Nonetheless, we are in a society that prides itself in being diverse, but we have only one way of teaching. I think it's really important that we understand that with diversity comes diverse ways of learning."[13]

– Jule Hall [Reinventing School interview]

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Learning & Progress in the Modern World

Old School finds itself in a tough situation. Many aspects of human life on earth are in the midst of major transitions, but school is designed for stability, not change. School is a massive institution – one of humanity's greatest inventions – but it is fragmented, structured from the top, delivered from the bottom. Education is among many old systems in need of renewal.

The recent COVID-19 pandemic demonstrated the inadequacy of public health systems and illuminated the likelihood of future viral outbreaks. Climate change is out of control, ravaging communities with dangerous storms, floods, extreme heat and threats to water and food supply. Years of inadequate attention to infrastructure are resulting in road and bridge failures, and revealing other structural deficiencies. Air quality is reaching high numbers, so outdoors is sometimes a dangerous place.

School is not resistant to change or modern ideas. Curriculum planners regularly update the long lists of what children and teenagers ought to learn in school. Schools do their best to provide necessary technology – digital smart boards, iPads, Chromebooks. Teachers work long hours so students learn what they need to know. Most students try attention in class, complete their homework, study for tests, and earn the best possible grades. It is unfair and unreasonable to criticize the people in school. They do their best under the circumstances.

Higher education contributes to progress by developing ideas, relationships, and collaboration. All over the world, universities, faculty, research facilities, and eager students partner, share, visit, discuss and connect – perhaps more in this sector than in any other. It is no longer unusual to meet someone like Rana Dajani, a Palestinian-Jordanian microbiologist who earned her Ph.D. at the University of Iowa (in the U.S.). She founded and directs We Love Reading (see Chapter 5). Modern universities thrive on their peoples' diversity and difference. It wasn't always this way.

Progress Connects Today with Tomorrow

Students – and adults, through tax dollars – invest in primary and secondary school education because the return-on-investment is expected to be high. This is a powerful belief. It propels students through primary school and into early secondary school. Then, many students begin to harbor doubts. Will school's curriculum make it possible to earn a sufficient living, raise a family, buy a home, manage a career, and navigate marketplace changes?

There is good reason for doubt. Technology is eliminating jobs and changing human behavior. The future is uncertain – always has been, always will be – but the relevance and utility of Old School curriculum can be a hard sell.

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Students sense a diminishing need for humans in the workplace. From customer service to manufacturing, routine jobs requiring only primary and secondary education are becoming automated. To remain employed, one must be versatile, constantly learning new skills, capable in ways that a robot is not – and do that for the next 30-40 years. It is difficult for secondary school to convince skeptical students they will be well-prepared to compete in a rapidly-evolving marketplace.

Growing up in the 21st century, it's wise to think strategically about choice of profession, schooling required to train for that profession, and location of the work. And personal safety.

> "Bulgaria is a small country. There's no danger that war will break out. I love living here in Bulgaria. I have many choices. I like dinosaurs and when I grow up, I want to be a paleontologist. Or a lawyer. I like to speak. My teacher can't stop me from speaking! I remember that on the news, they say that in Florida, that one child, he has a gun, and he shot some people and killed them! I was really sad because when I grow up, I want to go the United States. I think Russia has many problems with guns [too]. So, I may stay here in Stara Zagora, but I could live in many places. When it happens, I will think about that. The future will show me."
>
> – Vicky, 12, Stara Zagora, Bulgaria [Kids on Earth interview]

Assuming Vicky continues to live in Bulgaria, paleontology is a pretty good choice. There are not many paleontologists in Bulgaria, but the profession is likely to be enhanced, not destroyed, by technology. There is a strong international community of paleontologists working in museums and universities, and she can easily connect with them while living in Bulgaria (or anywhere else she chooses to live). Law is riskier – there are more lawyers than paleontologists, but routine legal work is already being done by AI. If Vicky starts learning about paleontology in secondary school, she gains a marketplace advantage, and a better sense of whether this career might be one she loves. She can easily connect school and her potential future, so it makes sense to invest time (and, later, money) in a paleontology career.

As Old School remains dominant, many students will continue to learn what everybody else learns (and for example, preparing to become attorneys in a fading market). Still, many parents support the Old School strategy – it worked well enough for them. Study, get good grades, do your homework, keep the teacher happy and everything will work out fine! Children and teenagers are wise to be skeptical.

Many will discover the old safety net – lots of available jobs – has holes in it. New patterns are taking shape. In the U.S., many companies hire many part-time workers to manage their payroll expense and avoid paying health benefits. Many people work more than one job, or do a side hustle in the gig economy. That is, people are not working full-time in jobs that pay enough to cover expenses, and cannot save for a long-term future or fund emergencies.

Without reliable employment and benefits, more people will require government intervention, perhaps Universal Basic Income, funded through sources other than personal income tax. (If people are not working, they will not pay much income tax.) For many, Old School paves the foundation for a bleak economic future.

With a significantly larger number of seniors than ever before, the need for health care and social services is growing. Students familiar with My Body and My Mind will be preferred candidates for this reshaped employment landscape. Students familiar with issues and likely futures – the result of weekly study in Our Countries & Cultures, Our Planet & Beyond, and Our Futures – are also advantaged. As Personal Education gains prominence, more students will make their own decisions, and take action.

Progress through Diversification of Education

"You don't make progress by standing on the sidelines, whimpering and complaining. You make progress by implementing ideas."
– Shirley Chisholm
U.S. Congresswoman, 1977-1981,
Secretary of the Democratic House Caucus

Before 1779, the region that became western New York State in the U.S. was controlled by the Haudenosaunee (Iroquois) and Seneca nations – native tribes. By 1797, the natives had been cleared, and the region was in the hands of land speculators – and this was progress (through domination). Jeremiah Wadsworth, a sea captain who made his first fortune in the West India trade, and later became a U.S. congressman, bought large amounts of rich agricultural land in the area. As Wadsworth's sons increased their holdings, they benefitted from the 1825 completion of the Erie Canal (connecting New York City to the Great Lakes) and 1850s coming of the railroads (connecting the Genesee River Valley to prosperous Baltimore, Pittsburgh, Rochester and Buffalo). As settled the area, they needed schools and teachers for their children.

In 1867, the Wadsworth Normal and Training School was born – to train teachers. In time, the school became part of New York's new state university system, but remained limited to teacher training – slowly expanding to teacher-librarians, teachers of teachers of speech and hearing, and the "mentally handicapped," and also teachers of foreign languages, and early childhood specialists. The State University of New York College at Geneseo did not offer a four-year bachelor's degree in a subject other than education until 1964.[14]

Slowly, the small rural college began to diversify. In 1980, a school of business was added, with programs in accounting, management and economics. By 1983, there was a degree in computer science, and biochemistry, followed by biophysics in 1993.[15] "In 2003, the college

began the largest capital improvement project in the history of the SUNY system. The Integrated Science Facility… a 105,000-square-foot $32 million building equipped with a nuclear accelerator." It opened in 2007.[16] New curriculum and new facilities attracted new students with new interests, and their version of progress.

Today, SUNY Geneseo is New York State's Public Honors College, "named a 'best and most interesting' college by *Fiske Guide 2023* for the quality of academics and students' social and quality-of-life ratings." There are 18 academic departments including theater and dance, anthropology, music and musical theater, philosophy, geography and sustainability studies, political science and international relations, and more, serving fewer than 4,000 undergraduate and graduate students.

Progress through controlled diversification was a successful strategy, in part because Geneseo is part of a larger design. SUNY (the State University of New York) includes 64 campuses serving 367,542 students, but only 55 percent of students are enrolled in 4-year undergraduate programs, and nearly 30 percent are in 2-year programs earning associates' degrees. Geographically diverse, SUNY units are located in rural and urban locations, near public transportation and in farm towns with few commercial facilities nearby. Various colleges and universities within the SUNY system offer distance learning, certificate programs, adult education, and partnerships with industry and other institutions (for example, Geneseo's sustainability program is a joint project with Rochester Institute of Technology [RIT]). Again, greater diversification of offerings attracts greater diversity of students and student interests, which propels greater diversity of progress for individual students and the institutions.

Many colleges and universities have expanded their academic offerings, and become flexible by offering forms of Personal Education. For example, SUNY Geneseo "offers students the incredible opportunity to design their own major, creating a Bachelor's degree (B.A. or B.S.) that is ideally suited to their educational goals."[17] The use of the word "incredible" suggests this flexibility is unique, but personalized majors are (slowly) becoming more common.

As demographics shift – the number of people under age 20 is not growing, and in many countries, it's flat or decreasing – college and university expenses continue to increase. To make progress, colleges and universities can compete with one another for increased market share in a zero-sum game (complicated because some men are losing faith in higher education – SUNY's student population is 55 percent female). It's wise for institutions to focus on areas where population is growing – people over 60 years old, and people in Asia and Africa, for example. Some institutions have begun to reshape their offerings beyond 2-year and 4-year degrees, and reconsidering their (often valuable) real estate holdings.

The story is no longer rooted in taking land and resources from native peoples and domination by rich White landowners. Now, every SUNY campus now includes a Chief Diversity Officer, reporting to the campus President or Provost. The entire system is

committed to increasing diversity, inclusion and opportunity for prospective and current students, faculty and staff. And yet, the small college town of Geneseo remains intact. This is progress.[18]

Learning for a Lifetime

Old School serves people in between ages 5 and 18, perhaps between ages 3 and 22 in an expanded view. This leaves about 6 billion people (7 billion by 2050) without any form of schooling. Instead of school, they rely upon one another and learn from media. Certainly, media can be nourishing, accurate and free from nonsense, but most media is operated for profit or under government influence. The breadth and depth of stories told through media is not the functional equivalent of robust, lifelong 21st century education.

One solution: whatever it is, look it up. For the 2/3 of us with internet access, we can query "President of Bolivia," and there's the Wikipedia story about Gustavo Petro. Including his involvement, as a 17 year old, in the guerrilla group, 19th of April Movement, which evolved into the M19 Democratic Alliance, a political party.[19] President Petro has a YouTube channel[20] – you can watch him speak (in Spanish, with English translation). There are dozens of videos, some dating back 7 years. Amy Goodman interviewed him for the public media series, *Democracy Now!*; you can watch her 54-minute, September 22, 2023 interview online.[21] For context, you can also read 2018's *The Bolivia Reader: History, Culture, Politics: History, Culture, Politics,* available from Amazon[22] or from Duke University Press.

Most adults struggle to find Bolivia on a map. They may not believe Bolivia and its president matter to their lives. Bolivia is the 79th largest country by population, and 99.9% of the world's population does not live there. It's a poor country notable for "The World's Most Dangerous Road," which sometimes serves as click bait for internet sites. Without some form of organized lifelong learning, the likelihood of most people learning anything at all about Bolivia is remote. Knowledge is reduced to trivia.

Another solution: make 'em laugh. In the U.S., comedian (now, social commentator) Jon Oliver prioritizing issues, tells jokes, summarizing investigative journalism , offers context, and delivers reasonable (often funny) solutions. Seen on HBO and YouTube, Oliver's long list of popular programs cover Organ & Body Donations, the Israel-Hamas War, Elon Musk, Prison Health Care, Cryptocurrencies, Artificial Intelligence, the British Monarchy, Mental Health Care, Water, Police Interrogations, Trucks, Sex Work, Wrongful Convictions, Critical Race Theory, Voting Rights, Ransomware, Elections in numerous

countries (Italy, Brazil, India, Canada, more), Refugees, Retirement, Televangelists, Debt, Patents, Infrastructure, and more.

When addressing what he and many others believe to be corruption of U.S. Supreme Court justices, Oliver focused on one justice, Clarence Thomas, and the judge's apparent willingness to accept expensive trips and loan forgiveness on an expensive motor home from wealthy friends who interact with the Supreme Court. Speaking through television (not in person), Oliver asked Clarence Thomas to resign from his lifetime Court appointment in exchange for (a) a personal payment, from Oliver, of $1 million per year for as long as either of them lives, and (b) a much nicer, much newer $2.5 million motor home. Expressing disbelief that such a transaction was legal in the U.S., Oliver explained this was a limited 30-day offer – after that, no deal![23]

Attempt to break through: Grandstanding is one way to get attention. Creative people – authors, musicians, visual artists, radio talk show hosts, and other professionals– are among our shining lifelong learning success stories. The field is fairly limited. Sometimes, a TEDTalk or a documentary filmmaker will break through, mostly lifelong learning is the domain of bookstores, public libraries, book clubs and other small players.

Not School is the land of opportunity, a big open space for new ideas to grow. The free range of Not School includes media, play, travel, reading, hiking, kayaking, listening to music, going to the theater, learning to dance, food and cooking, and so much more. Imagine the potential! With few rules, nearly global reach, low cost structures, imagination, and desire, Not School is the broad venue for progress in lifelong learning.

Nothing Like School

Although the ride is bumpy right now, school remains the world's best, most trusted source of public education – with staff, facilities, structure and resources in more than a million communities all over the world. Wherever people live in communities, there is at least one functioning school nearby. School is a place where young people learn with guidance from trained adults, get to know peers who live nearby, and make friends. With notable exceptions, school is a safe place with clean water, reliable electricity, connectivity, at least one nutritious and free (or low cost) meal a day, plus some mental and physical health care, and regular adult supervision.

Adults are accustomed to paying for school with their tax dollars, not only for their own children and teenagers, but for all students. Local government is trusted and experienced in administering funds. Management is solidly in place. Parents and communities instruct their children and teenagers to attend school whenever it is in session, pay attention, and work hard. Everyone holds school, teachers and students to a high standard. In many countries and

communities, schools are now educating children under age five, and outside the U.S., college enrollment continues to increase.[24] All good news — school is a functional system.

In the U.S., more than 3 million public schoolteachers work about 180 days a year with nearly 50 million students in nearly 100,000 school buildings.[25] In the first 50 years of the 21st century, about half of the U.S. population will have been educated in U.S. public schools. Nothing in the world comes close to school in terms of service, number of people involved, or by any other measure. There is nothing else like school, not at this scale, not with its impact, longevity and potential. Nothing!

Health care is administered locally through hospitals, clinics, and doctor's offices, but most visits are occasional and rarely last more than a half hour, so most people have no regular daily or weekly interaction with health care. However, many more people work in health care than in primary and secondary education.

Similarly, most people do not interact with law enforcement. In some countries, under some conditions, police are more and less visible, but daily contact with large numbers of children and teenagers would be exceptional. The same is true for local fire departments.

The military exists in some form in every, or almost every, country, but military presence is unusual in most local communities, except during strife. Most people see or interact with uniformed personnel, weapons, or conflict only on occasion. In India, about 1 in 1,000 people serves in the military — but personnel are not usually seen in the daily lives of most citizens.[26]

In the U.S., over 10 million people work full-time for local, state and Federal governments (some education workers are government employees). About 6 percent work in hospitals and 5 percent work in the military. The remaining 42 percent work in a many other roles, typically with less direct, regular daily interaction with specific members of the public.[27]

No other institution employs large numbers of adults to supervise a nation's children and teenagers day in and day out. Only school does that. Given the sheer size, scale, presence of school, and potential future impact, it makes sense to build school as a global asset redesigned for 21st century students. School is the answer to the question, "how do humans assure progress and social good for everyone?," but not in its Old School form.

What School Must Do

Given the extraordinary position and value of school, and the lack of reasonable alternatives, school should be held to the highest standard within its core purpose — and to rely upon Not School to do the things that school cannot, need not, or will not do.

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There are many good reasons to support the idea and operation of school as the preeminent public provider of useful, relevant, meaningful learning for children and teenagers. There are, however, some things school should do to re-establish diminished glory. Mostly – in the words of some kids consulted for this project – school needs to "get over itself!" That is, school ought to stop demanding everybody salute its woefully outdated model. The model was never that great, even if it did serve a purpose for a time. That time has expired.

Throughout the world, there are small-bore examples of students engaged in future-facing programs, mostly in charter and private schools, and in variations on home schooling, and in some communities. Many show a glimmer of what New School (and Not School) ought to be, though rarely at scale. Now is the time for Old School to make the shift for the good of 5 billion people who are or will soon be in school – for the good of half of the people on earth.

Here's a note to school everywhere. Please excuse the direct language and candor, but it's offered with the greatest love and respect…

1. Think in terms of what students will learn and remember, not what you think they ought to know. With the best intentions, **you are teaching far too much information**. Students are massively overwhelmed. They forget most of what you tell them, and they cannot extract the big ideas. Teach less! Instead of presenting 25,000 or 30,000 items of interest in 12-plus years, think closer to 4,000. That's about 350 Fundamental items in each school year – roughly 2 ideas per day, not 10 or 20. If you choose those ideas carefully, students will learn, care, remember, and focus on what's important.

2. Stop organizing learning with 20th century school subjects. When most students hear the word "Mathematics," many (perhaps most) of them run in the other direction. Old School subjects were never perfect, but they've served their purpose. They are bloated, irrelevant, disconnected, and unhelpful to students who must make sense of the modern world. **Your subjects are no longer effective organizing structures.** They should be replaced. Fairly big changes are necessary because school schedules and staff assignments are based upon this Old School structure. Transformation is within reach; please do not underestimate the resilience of teachers.

3. **Don't fill school days with ideas and activities devised by adults.** Instead, do that for a small portion of every week. Allocate school's instructional hours for each students' Personal Education, based upon Fundamentals learned by everyone. Instead of disseminating information and managing classroom activities, support one-on-one and with small groups of students who pursue a wide, diverse range of ideas.

4. **Design a new structure based upon the modern world.** One new structure: reasonable, interlocking set of new Learning Categories, such as: (1) My Body, (2) My Mind, (3) My Life,

(4) Our Country & Cultures, (5) Our Planet & Beyond, (6) Our Future(s), (7) Storytelling & Language, (8) Numbers and Money, (9) Sounds & Images, and (10) Movement.

5. Do not assign homework. Students have plenty to do outside of school, and they learn a great deal from Not School. Your allocated time is, roughly, 9:00am to 3:00pm, half the weekdays of the year. Don't expand the school day, and or the number of school days per year. **Get your work done within the allotted time** – a good lesson for students to learn.

6. **Stop mandatory testing.** This is a major cause of stress for students, teachers and parents. It requires a lot of time that can be spent in far more productive ways. These tests do not respect teachers and do not respect students. Standardized results do not measure learning when it is happening, so they are not useful. Students welcome assessment if it helps them learn what they want to learn.

7. **Stop trying to do the job alone.** It is difficult to organize learning for more than a billion children and teenagers. Keeping every individual student engaged and productive for more than 8,000 hours of their lives is really hard! You are part of a local community where there are lots of useful resources – and many more outside your community. There are people who want to help. Ask for help – lots of ongoing, frequent help.) Even better, present a design for collaboration (borrow the design from the million other schools in the world, or make up your own). Rethink your structure so students and teachers can build safe and secure relationships, not only with people nearby, but with people they meet on the internet. Connect people all over the world. Diversity helps everyone. Be sure to work with your community to make sure school is safe and secure – no student should be afraid to go to school because they might get shot!

8. **Recruit, hire, train, support and value the best teachers you can find – and pay them a living wage.** Hold them to high standards for professionalism, contemporary knowledge, best practices, and skills in engaging and relating to students. Support them with time, attention, and resources so they can learn from each other and from their students. Make teacher's relationships with students a top priority. Pay teachers enough money so they can live without secondary employment; assure the best possible benefits, too. If teachers are not paid enough money, or their working conditions are unreasonable, work with your community to pressure government to change these unreasonable, arbitrary decisions. Accept nothing less than the best solution. This investment yields a very high return.

9.**Mental health and mindfulness are essential to learning.** "Mental awareness builds cognitive and emotional skills that cultivate inner strength, a sense of purpose, and the capacity for for continuous learning and flexible adaptation,"[28] explains University of Virginia Professor of Education, Patricia (Tish) Jennings, whose expertise in this field and ideas about learning have been instrumental in devising

New School for the 21st Century Learning Project.

A culture of mindfulness provides every student, and every teacher with a personal toolkit filled with practical strategies to regain focus, manage stress and negative emotions, and deal with the flow of daily life. In a New School environment, mindfulness becomes even more powerful, elevating hope and purpose to propel student curiosity into accomplishment never before contemplated by the human race. As Tish explains, "Positive emotions are self-reinforcing. Once you [the teacher] have mindfully and intentionally established a positive emotional climate in your classroom… your students will help reinforce it."[29] Without this philosophy, New School will feel like Old School.

10. **Stop pretending school possesses magical powers.** School is a place where adults help children and teenagers learn skills, gain confidence and acquire knowledge. Initially, students acquire capacity in order to feel good about themselves and to please adults, but after a few years in primary school, students begin to connect their life at school with their potential future life as a productive global citizen. Work with community and media to expose every student to the world, its issues, its opportunities, the wide range of possibilities offered by life in the 21st century. With clear guidance from teachers and university researchers, based upon contemporary scientific understanding of human growth and maturity, think very carefully before restricting access. And remember: every student is unique, so every student's path is unique, too.

11. **Get to work on pre-schoolers.** There is now sufficient evidence to support pre-school education for every young child on earth. That's more than 200 million pre-schoolers. They require teachers, classrooms, and their own smaller-sized facilities, mostly in Africa and Asia, but in many other places, too. Get serious about the value of learning for people who are under 5 years old — and the teachers who provide them with the foundation for a lifetime of learning. Pay pre-school teachers a reasonable salary, with benefits. Provide appropriate facilities — by design, not as an afterthought.

12. **Get to work on lifelong learning.** People older than 18 or 20 or 25 continue to learn for their entire lives. Media will not satisfy that need. The first 10 items on this list will keep you plenty busy, but this one is every bit as important, maybe more important because so many people need to learn for such a long time. How many? By 2030 — about 5 years from today — about 6 billion people, or 3/4 of the world's population. Again, do not attempt to solve this problem this on your own. Work with communities, technology, media, and government. Remember, many seniors vote, so they hold a lot of .

13. **Connect ideas** — do not segregate them in subject areas. It is nearly impossible to learn without connecting one idea to another. Learning about Nunavut — a northern Canadian province — shouldn't be relegated to Social Studies. Instead, it's a real (interesting) place — with real people, real kids, many speaking English and using the internet every day. It's

easy to connect ideas about living in a very cold region and its impact on My Body, My Mind, and My Life, and about Our Country & Cultures (possible Viking visits, certainly migration from Alaska), Our Planet & Beyond (global warning and its impact on more than just polar bears), Words & Stories, Sounds & Images — there is so much to learn.

14. **The best way to learn is to talk to other people.** There are 44 schools in Nunavut, and several thousand students. Most of those children and teenagers, and teachers, know as little about your life as your students and teachers know about their life. One conversation begins to change everything. Where to start? For general background, contact the *Nunavut News*. Their phone number is (867) 873-4031. Their website — https://www.nunavutnews.com/ — is helpful — but some of it is written in visual characters you may not understand: ᓄᓇᕗᒻᒥ ᐱᕙᓪᓕᐊᔪᑦ, for example, means Nunavut News. If you're a student or a teacher, ask an editor or reporter to connect you with the office at Inuksuk High School. Or contact the school directly — they have a Facebook page, and it lists the school's phone number and office email address (867-979-5281; IHS@gov.nu.ca). That bit of research required less than 15 minutes of work. Say hello for us.

15. **Do everything possible so every student learns based upon their own interests.** If you do that, students will share what they learn, and a tree of knowledge will grow. Like magic.

"I like listening to music, mostly rock, heavy metal, Guns & Roses, Metallica. I really like Queen. In my free time, I mostly play guitar and sometimes, I study. I like being on my computer, so I watch YouTube. And I watch television. With Photoshop, here is Einstein playing electric guitar [on my t-shirt]. I play electric guitar, but he didn't play guitar, he played violin. He was dyslexic. I know he created the Theory of Relativity. I want to be a physicist. When I was young, I wanted to know how nature works. From what parts is this made? Now, I know that it's made from atoms, but there are still some things we don't know about the world. I want to discover it. I want to be a doctor of physics. I want to invent new stuff like rocket ships, and… do research on quantum theories. I learned about quantum theory on TV [watching] Nat Geo, Discovery Science, and other scientific programs. None of my relatives are physicists or scientists. Quantum physics is hard to explain. It's a theory [about] how particles move through space. So: quantum duality… There is this experiment in which an electron generates a wave of probability of where it will land. This theory started in Einstein's time. We still don't know the answer. It's very hard to test, to measure. These are geniuses working on this… is it real, is it fake? Or (laughing) is it *magic*?

— Teo, 14, Piran, Slovenia [Kids on Earth interview]

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"Our schools today are going to be our economies and our society tomorrow. When countries and societies… make trade-offs between the present and the future, smart countries always prioritize the future… We have good [OECD] data that you spend one dollar, and you get many, many dollars back over the lifetime. There's no better bet that society can make, financially, economically, and also socially than in the education of children. If you come from a disadvantaged background, you have only one chance, and that's a good teacher and a good school."[30]

— Andreas Schleicher, Director for Education and Skills
Organisation for Economic Co-operation and Development (OECD), Paris, France

Our Next Steps

Mostly, we have learned by connecting and collaborating with children, teenagers, teachers and experts. Perhaps a thousand people in all. You've met some of them in this book. We want to build on the work we've done so far. We hope you do, too.

We begin by continuing what has worked very well for us all along. We will interview more children and more teenagers, and share those interviews on the **Kids on Earth** platform. In fact, most countries and most cultures are not yet represented, so there's lots of work ahead. Every child and teenager is interviewed one-on-one, typically in a school library or another quiet space. Each student talks about their interests and their plans for the future. The interviews help us to understand how Personal Education works. Interviews are edited into shorter segments (typically 2-8 minutes long) for easier viewing.

For similar and different reasons, we've begun a parallel service, **Teachers on Earth**. Similar: every teacher is an individual with their own interests and plans for the future, too. Different: teachers focus on student engagement. Teachers talk about their new role: guiding students toward new ideas and deeper exploration, finding resources, encouraging collaborations, dealing with Old School thinking in a New School world, reaching beyond borders and boundaries, and more. They talk about what they are learning from students and their varied interests. This is a global conversation, so a teacher in Abuja, Nigeria can learn from a teacher in Bélem, Brazil or Ho Chi Minh City, Vietnam. Along the way, we'll figure out how to translate so everyone can understand one another. (Improvements will flow through Kids on Earth, too.) Unlike Kids on Earth, where identities are protected, Teachers on Earth will include a connection feature — so a teacher in Abuja can easily contact a counterpart in Ho Chi Minh City and perhaps begin a conversation.

Old School may be reluctant to experiment with New School ideas, but no such limitation or structural resistance exists in Not School. So: let's **Experiment with Learning Categories, Fundamentals and Personal Learning** in communities' Not School space (where there are

fewer rules and less resistance). Many local, national and regional organizations, and projects, already exist, and some are likely to participate. Next step: collaborate with some of these organizations, and with students and teachers, to put together a plan, and then, try it. Make the results available, attract some media attention, and expand the circle. Gain experience. Fail, correct, try again. Share learning. Share knowledge.

Start today! Resist the temptation to analyze, discuss and debate. **Don't wait for permission.**

Use this book as a tool to get people talking, listening, thinking and learning – students, parents, teachers, principals, superintendents, school board members, elected officials, government staff, technologists, journalists. Whether through local, national and international convenings, or speeches, internet panel discussions, or media appearances, or meetings, we all need to talk to one another. Humans are easy to distract, but we need to construct a coherent storyline that moves 5 billion people to the land of clear thinking for the next 25 years. One purpose of this book is to keep everyone focused. Another is to capture the next generation of even better ideas in our second edition, then the third. We have a big job to do. It's not an overstatement to claim the fate of the civilized world relies on our shared success.

To advance from theory to action, let's **develop the first batch of Fundamentals**. This community effort should produce at least 350 Fundamentals – 10 Learning Categories multiplied by 35 weeks of the school year (plus another 150 to cover early studies in Words & Stories and in Numbers & Money). If a dozen communities around the world built their own lists over a 3-day weekend – with children, teenagers, parents, teachers and other adults participating – keeping in touch with one another – we could all learn a lot about how the process of *fundamentaling* (a made-up word) works. The important thing: get it moving. After we start, we can expand the effort and learn even more.

Leap from Fundamentals to Personal Education. Based on some of the newly-minted Fundamentals, teachers and other adults help students conceive and complete small projects, so there's a roomful of students learning about squirrels, the color blue, Putin, poutine, many other topics. And plenty of community support to help them learn. Lacking a tool as robust as Global Brain, simply blog and tag the work for rudimentary sharing. Completing warrants a global learning celebration, across time zones, with music and fun throughout a 24-hour day (nearly assuring global media coverage).

Two missing links involve technology. In the early stages, some communities will be unable to participate without reliable internet service. For those with internet service, there is an immediate need for a digital sharing platform for children and teenagers as they learn. The contours and some of the key features are clear, so let's **prototype Global Brain to learn how it works**, how it should be built and managed for long-term success. Simply writing a plan is insufficient. We must see it in action to encourage participation by teachers, students, technologists, funders in its development and implementation.

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Transformation

Students who begin kindergarten in 2023 will be 27 years old in 2050. As they grow, they will find more and better ways to learn. They will not require permission from adults. They will embrace independence, intellectual freedom and their own curiosity. They will make use of every available resource for learning. They will find their own way — because, beyond a certain point (which arrives early), being told what to do is not a good way to learn. They will set high expectations for themselves and their teachers — and have fun doing it. They won't care about Old School if it remains unwilling or unable to solve its own problems.

They won't pay much attention to material taught if it's not worth learning. If someone demands they learn material lacking purpose or utility or is just plain boring, they will find something more interesting to learn. Beyond Fundamentals, most students will not learn what other people learn. To remain relevant, and useful, school must adapt to each student's individual interests, their natural inclination to learn in their own ways. Learning in school diverges from uniformity and adopts diversity as the common standard.

Students and teachers will connect, communicate and collaborate with peers nearby, in person, and throughout the world, via digital technology. Time zones will become a factor; schools will need to accommodate sleeping schedules for students in Kuala Lumpur, Malaysia who collaborate with peers in Kingston, Jamaica, a dozen time zones away

Students become very aware of their use of instructional time. Every student is responsible for their own learning, so, on any given day, every student may decide to spend more time on one topic than another. A student deeply engaged in quadratic equations may not wish to be distracted by irrelevant events. Other students — and every teacher and every community member — will respect their decision to learn, and the right of every student to learn what they want to learn, when they want to learn, without disruption.

However, if their particular school, or classroom, is poorly managed, or stuck in Old School culture, there will be chaos.

When a student cannot go outside because air is too dangerous to breathe, or there is yet another heat wave, or a parent's career is obliterated by technology, or a girl cannot go to school because powerful people won't allow it, New School evaporates. For one student, then many students, the truth about school becomes clear. School is not the answer. It will not prepare earth's population for the future.

What if school is the answer? What if New School and Not School made students happy and helped them learn what they wanted and need to learn? What if every teacher was trusted?

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What if air quality wasn't a disaster? What if school prepared everyone to survive and thrive in the 21st century?

School could handle all of that. This is possible, within reach. Collectively, we can make the necessary decisions, and take necessary actions, to change rules, to put Old School to rest, bring New School to life, and animate Not School as its well-resourced partner in learning for children, teenagers and adults. Adults can do this, but so far, we have not.

We must make the necessary decisions, take the necessary actions. We must begin today. "We" includes not just the adults — it includes children and teenagers, too. Together, we must think clearly. We must figure out what each of us should learn, and how to learn it. We must work together to make life on earth better not only for our selves, but for the children who will grow up during our lifetimes, and not only the ones in countries whose names we know. For the good of families, communities, nations and more than 10 billion people who happen to live nearby, it is time to transform learning, and school for the 21st century.

END OF CHAPTER 7

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Acknowledgements

This project grateful to so many children, teenagers and adults — the sheer number of people who offered to help, and devoted meaningful time and effort is overwhelming.

Kids on Earth started in 2017, and the UVA 21st Century Learning Project began in 2021. Along the way, several hundred children teenagers, parents, teachers, researchers, and other experts have shaped the ideas in these White Papers.

We lovingly acknowledge Paul Falzone (Peripheral Vision, Kampala, Uganda), Nick Richardson (The Insights People, Manchester, England), the staff and extended family of #LearningPlanet (Paris, France, and elsewhere), The University of Pennsylvania South Asia Center and its counterpart in India, UPIASI, Kirsten Schneid (Prix Jeunesse Festival, Munich, Germany), Daniel Carmona Leite (ComKids, São Paulo, Brazil), Dina Borzekowski (University of Maryland's Global Health Center, College Park, Maryland), Metka Dedakovic (Radiotelevizija Slovenija), Pamela Wasserman (Population Connection), Alton Grizzle (UNESCO, Paris, France), Dean Jansen (Participatory Culture, Boston, Massachusetts), Deven Patel (University of Pennsylvania South Asia Studies), Martin Seligman (and the staff of University of Pennsylvania Positive Psychology Center), Laurie Santos (Yale University), Martin Burt and Fernando Pfannl (and the staff of Fundación Paraguaya, Asunción, Paraguay), David Venn (World Scouting), Jon Zimmerman (University of Pennsylvania Graduate School of Education), Gina Riley (Hunter College, CUNY), Steve Hargadon (Learning Revolution, Ashland, North Carolina), Anthony Seldon (England), Andy Hejnas, Andrew Sanko (Council Rock School District, Pennsylvania), Angela Mikula (Delaware Township School, Sergeantsville, New Jersey), Bodo Hoeran, Bettina Amrhein, (Universität Duisburg-Essen, Germany, Pamela Nicholas-Hoff (University of Virginia School of Education and Human Development), Kathleen Hirsch-Pasek (Temple University), Pearl Utuk (Teach the Children Initiative, Abuja, Nigeria), Tara Hofkens (University of Virginia School of Education and Human Development), Paul Little (Glasgow City College, Scotland), Mary Jo Podgurski (Center for Adolescent Health, Washington, Pennsylvania), Christian Long and the staff of Think Global School, Ed Dieterle, Jon Schatzky and the staff of Canadian Academy (Kobe, Japan), Danny LeBrecque (Danny Joe's Treehouse, Baltimore, Maryland), Rebecca Winthrop (Brookings Institution, Washington, DC), John Malamba and Clarie Odhiambo (Siaya, Kenya), Miranda Aggrey (Kampala, Uganda), Emma Wilson (Living School, Lismore, Australia), Félix Ríos Álvarez (Caracas, Venezuela), Joannes Paulus Yimbesalu (Cameroon, Canada, and now, U.S.), new friends all over the world associated with Catalyst 2030, and more than a hundred other teachers, researchers, and people who care deeply about the future of learning (Australia, Sri Lanka, Cameroon, Zimbabwe, Brazil, Chile, Canada, Mexico, Italy, Mauritius, Israel, Kosovo, so many more). All of you contributed to through many ZOOM and in-person conversations, and profoundly affecting our thinking.

Very special thanks to Patricia Jennings at UVA EHD for so many wonderful, thoughtful, thought-provoking conversations, a steady flow of ideas and encouragement, and the whole

idea of working with The University of Virginia's School of Education and Human Development. Also, thank you to Chad Ratliff for his extensive guidance and willingness to allow full access to students and faculty at Charlottesville Lab School, where so many of the ideas in these White Papers took shape. And to Chi Kim (Pure Edge) for her challenges, questions, friendship and critical support. Another special thanks to Ploi Sripoon and Hailey Costello (both UVA EHD undergraduates) for their excellent and helpful insights on various draft versions of the documents that evolved into this book.

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Endnotes

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