Future Play

Exploring a Futures Thinking Toolkit for Elementary Education

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Submitted to OCAD University in partial fulfillment of
the requirements for the degree of
Master of Design in Strategic Foresight and Innovation
Toronto, Ontario, Canada
2023

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Land Acknowledgement

Being a student at OCAD University, I would like to pay respect to the ancestral and traditional territories of the Mississaugas of the Credit, the Haudenosaunee, the Anishinaabe and the Huron-Wendat, who are the original owners and custodians of the land on which I stand and create, during the course of this project.

Acknowledgement

I would like this opportunity to express my gratitude to the people who have walked this journey with me, throughout the completion of my Major Research Project.

First and foremost, I would like to thank my advisor, Professor Angela Bains for her guidance, encouragement, and insightful comments that have greatly contributed to this project. Her constructive criticism, knowledge, and patience have been invaluable in refining my ideas. Thank you for always saying, “We’ve Got This!”

I would like to express my gratitude to Zan Chandler for generously sharing her connections in procuring research participants.

Thank you to my interview participants, whose valuable contribution inspired the outcome of this project. Their insights, perspectives and lived experiences have brought color and depth to this project, and paved the way for crafting a future that is co-creative, and inclusive of all voices. Their dedication and passion for improving the education system have renewed my hope for a better tomorrow.

To my parents George, Gladys, and Juliet, thank you for encouraging me to be the best daughter, wife, and mother I can be. I wouldn’t have had the confidence to move to Canada and pursue my dreams without you.

To Dhanya my friend, creative conspirator, and with whom I can be my most vulnerable self.
To Jim & Zarin, you showed me how to embrace uncertainty with grace.
To my cousins Anushka & Ben who helped me chase those rainbows.
To Minali & Sandy, things don’t seem as scary when you have friends like you.
To Naveen & Tracy for taking the stress out while transitioning to a new country.

To my family and friends in India, although I am far from home, your presence in my life has never faltered, and for that, I am truly grateful.

To my SFI cohort, who have been a constant source of motivation and support. I could not have imagined collaborating with a more creative, resilient, and passionate group of people.

To my husband Lloyd, thanks for being my rock, my support, and my sounding board. Setting sail together on this voyage fills my heart with gratitude and hope for the future, thanks to your unwavering dedication.

And finally, to my son, Jake. You are my biggest cheerleader and my inspiration. Your love, hugs, and smiles, have given me strength to persevere, especially studying after 14 odd years. Your enthusiasm for learning and discovery has inspired me to pursue my passion for research and knowledge.

Dedication

To My Son, Jake

May you playfully craft new possibilities to create your Preferred Future.

Abstract

The rapidly changing needs and expectations of society are driving contextual, technological, and pedagogical shifts in education. This research project emphasizes the importance of equipping young learners in Ontario's Public Education System with skills to adapt to an evolving world and to navigate uncertainty. It highlights the importance to prepare students for future challenges and emerging careers. By incorporating Futures Thinking into elementary education, students can develop an early understanding of continuous change and learn the skills needed to anticipate and shape that future.

The outcome of this research was a proposed hypothetical toolkit for educators, as a means of exploring Futures Thinking. The toolkit would assist educators in developing various activities and supply them with resources to teach and support the learning. Through this toolkit, learners would develop their own creative confidence, inspire others, take risks, have the agency to imagine, craft narratives and co-create their futures, through a facilitated approach.

Keywords

Creative Thinking, Creativity, Critical Thinking, Elementary Education Futures Literacy, Futures Thinking, Futures Thinking Toolkit, Imagining Futures, Problem Solving, Public Education, Systems Thinking.

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Glossary

Several technical or uncommon terms have been used throughout this research study. In order to support a common understanding of the use of these terms, the following glossary has been provided.

Parent
The word “parent” is used in this document to refer to parent(s) and guardian(s). It may also be taken to include caregivers or close family members who are responsible for raising the child.

Student/ Learner
In the document, I have addressed student as a “learner” in multiple sections across the research paper.

The Ministry of Education
The Ministry of Education is responsible for childcare and for administering the system of publicly funded elementary and secondary school education in Ontario.

Council of Ministers of Education Canada (CMEC)
CMEC is an intergovernmental body founded in 1967 by ministers of education to serve as a forum to discuss policy issues. The body also serves to share projects and activities, to consult and cooperate with national education organizations and the federal government and to represent education interests of the provinces and territories internationally.

Environmental Scan
A process that focuses on trends with a view to developing a better understanding of nature and the pace of change in the current environment. Environmental scans may seek to understand the near future, things that may happen over the next few months or years.

Horizon Scanning

A process for understanding emerging issues that are not yet well understood so that we may understand changes that may have a future impact, years, or decades down the road. Horizon scans draw from a wide variety of sources and across multiple domains. Typical frameworks include a combination of domains such as Society, Science, Economy, Ecology, Environment, Politics, Policy, Culture, And Values.

STEEPV

Exploring the drivers, external factors to determine trends, the emerging issues that are the building blocks of the future. STEEP-V is basically an acronym which stands for Social, Technological, Economical, Environmental, Political and Value changes.

Foresight/ Futures Thinking

The study of possible future conditions that may affect an organization's/ service operation. The insights gained from this work can be used to detect adverse conditions, inform policy development, shape strategies, and explore new products, services, and markets. In this context, Foresight/ Futures Thinking allows us to embrace uncertainty, to combine what we know with what we hope for and to make our experiences valuable by using them to create better futures.

Causal Layered Analysis (CLA)

The CLA is a futures theory and method, that is an integrated and layered approach to categorize different views and concerns about the future and then think about the future far more effectively. While CLA is not concerned with predicting a particular future, it does open up space for the articulation of constitutive discourses, which can then be shaped as scenarios.

Keywords/ Phrases

21st Century Learning, 21st Century Skills, Competency-Based Education, Cross-Curricular Competencies, Curriculum Design, Education Policy, General Capabilities, Global Competence, Global Competencies, Key Skills.

CHAPTER

01

Introduction

Sir. K. Robinson
(*Changing education paradigms,* n.d)

How do we educate our children to take their place in the economies of the 21st century given that we can't anticipate what the economy will look like at the end of next week?

1.1 Context

In a world that is changing at a breathtaking speed, the future of education and work needs to be evolving to meet the changes of a rapidly changing world. An acronym has emerged to describe a future that will consist of greater volatility, uncertainty, complexity, and ambiguity: VUCA (Fadel, Bialik, Trilling, 2015). In 2040, preschoolers today will begin their working lives. Schools today are facing increasing demands to prepare students for the rapid economic, environmental, and social changes, for jobs that have not yet been created, for technologies that have not yet been invented, and to solve social problems that have not yet been anticipated (OECD, 2018). Ultimately, preparing for an uncertain future is a shared responsibility that requires co-operation and a willingness to innovate and adapt to changing circumstances.

The need to prepare students for a fundamentally different world, plays a central role in statements of educational priority worldwide (Government of Ontario, 2016). It is critical for education to evolve in innovative ways to support these changing futures. Policymakers and educators are questioning if the current educational systems can respond adequately to the challenges characteristic of this century, or if a fundamentally new model is needed (Bolstad, Gilbert, & McDowell 2012; Government of Ontario, 2016; Phillips & Schneider, 2016). Education has a vital role to play in developing the knowledge, skills, attitudes, and values that enable people to contribute to and benefit from an inclusive and sustainable future. Learning to form clear and purposeful goals, work with others with different perspectives, find untapped opportunities and identify multiple solutions to big problems, will be essential in the years to come.

The public education system as we currently know has been around for more than 150 years. Education systems still seem traditional in their approach and have been under scrutiny, increasingly criticized of the archaic status of the industrialized approach and constantly threatened by disruptions (cf., Burwell, 2015; Bradbury, 2015). Even though, changes to the curricula have been made over time, the essence has remained the same. Students are still taught in a standardized, industrialized way, with a focus on testing, not accommodating to their learning needs.

Schools teach students what to think as opposed to how to think. There are important critical skills that are not taught. Do students truly question or challenge assumptions? Or perhaps, do they accept it as long as it confirms their biases? Questioning things is part of the analytic mind and a key to societal progress, but this takes a backseat to examinations. As with anything that comes from centralized control, the system is sometimes inefficient and mostly bureaucratic.

The last few decades have belonged to a certain kind of person with a certain kind of mind - computer programmers who could crank code, lawyers who could craft contracts, MBAs who could crunch numbers. But the keys to the kingdom are changing hands. The future belongs to a very different kind of person with a very different kind of mind - creators and empathizers, pattern recognizers and meaning makers. These people - artists, inventors, designers, storytellers, caregivers, consolers, big picture thinkers - will now reap society's richest rewards and share its greatest joys" (Pink, 2006).

Education can equip learners with agency and a sense of purpose, and the competencies they need, to shape their own lives and contribute to the lives of others. To find out how best to do so, the Organization for Economic Co-operation and Development (OECD) has launched The Future of Education and Skills 2030 project. The aim of the project is to help countries find answers to two far-reaching questions:

- What knowledge, skills, attitudes, and values will today's students need to thrive and shape their world?
- How can instructional systems develop these knowledge, skills, attitudes, and values effectively? (OECD,2018,p.2)

The book, *A Whole New Mind* takes readers to a daring new place and offers a provocative and urgent new way of thinking about a future that has already arrived. It states the 6 innate abilities for both professional success and personal fulfillment in the 20th Century which are Design, Story, Symphony, Empathy, Play and Meaning (Pink, 2006).

In Ontario's foundation document for discussion entitled *Towards Defining 21st Century Competencies* for Ontario, the authors note that, "Researchers acknowledge that the need to engage in problem solving and critical and creative thinking has always been at the core of learning and innovation" (Trilling & Fadel, 2009, p. 50 as cited in Ontario Ministry of Education, 2016b). In the 21st century, there is a growing demand for education systems to focus on developing key competencies in students through intentional changes in curriculum design and pedagogical practice. This emphasis is aimed at preparing students to tackle complex, ambiguous problems in a rapidly changing and globally connected world that is technology-driven. The goal of this approach is to equip students with the skills and knowledge they need to succeed in a competitive and dynamic environment, and to solve problems that may not yet even be fully understood. By prioritizing these competencies, education systems can help ensure that students are able to thrive in the 21st century and beyond. Many international thought leaders, business leaders, and young people themselves argue the case to address '21st Century skills,' 'higher order skills,' 'global competencies,' 'next generation learning,' 'deeper learning,' and 'connected learning' through public policy (Ontario Ministry of Education, 2016b).

1.2 Rationale

Our traditional model of education, a product of colonization, is increasingly recognized as ill-equipped to meet today's challenges, let alone the challenges of the future. As globalization and rapid advancements in technology continue to transform and disrupt the world of work, education systems have grown increasingly disconnected from the realities and needs of global economies and societies. In the context of job disruption and increased polarization, the school systems have a critical role to play in preparing citizens who have a global outlook and a shared view.

We are currently at the forefront of a technological revolution that is fundamentally changing the way we live, work, and relate to one another. The rise of Artificial Intelligence, Machine Learning, and other emerging technologies are reshaping our world and creating new opportunities and challenges. We need to shape a future that works for all of us by putting people first and empowering them. Education models must adapt to equip young minds to develop a comprehensive and globally shared view of an inclusive and cohesive world (Schwab, 2016).

As the world continues to change, the degree of interconnectedness between various systems, processes, and entities is constantly increasing, creating a need for collective action. Interconnectedness refers to the growing interdependence and connectivity between countries, economies, societies, and individuals, which highlights the need for cooperation and collaboration to address global challenges. By promoting resilience and cultivating responsible and sustainable behaviours through education, we can prepare ourselves to face the complex global risks and threats that are emerging due to the increasing interconnectedness between different systems and entities.

By aligning education with global trends, we can broaden our perspectives and make informed decisions. However, we must also anticipate the intricate evolution of current trends, as well as potential disruptions and advancements, in order to be future-ready.

As a student, a designer, and a mother, I am interested in exploring the connection between creativity and learning. I am curious about the notion put forth by Sir Ken Robinson in his famous TED Talk “Schools kill creativity” (Robinson, Schools kill creativity, 2006), which suggests that children’s creativity is being stifled by the education system. According to Robinson, creativity is just as crucial as literacy and numeracy, and it should be afforded the same level of importance and respect. It’s clear that this idea has resonated with people, as evidenced by the popularity of his talk, and still continues to captivate audiences.

In today’s world, the traditional education model of dividing knowledge into specialized fields and degrees is becoming outdated. To address the multifaceted challenges of modern times, a more holistic and cross-disciplinary approach is needed. Strategic foresight, as a comprehensive and long-term methodology, is well-suited to prepare students for the changes, challenges, and opportunities of the future.

In the current context, young people need to be equipped with the ability to comprehend, navigate, and adapt to a world of uncertainty and rapid change. Practicing foresight can provide them with an early understanding of the continuous evolution of the world around them. By embracing foresight as part of their education early on, can equip them with the skills they need to anticipate and shape the future, to succeed in a rapidly changing world.

Any job that depends on routines that can be reduced to a set of rules or broken down into a set of repeatable steps - is at risk (Pink, 2006).

1.3 Research Question

The focus of this research lies in the connection between advancing pedagogies and technologies and adapting to the changing needs of society. To accomplish this, the following Research Question will guide the research -

How might we integrate Futures Thinking into Ontario's Public Elementary School System and prepare children to adapt to a rapidly changing world with multiple futures?

This study will explore the potential value of teaching Futures Thinking to children.

Secondary Questions:

What knowledge, skills, attitudes, and values will today's students need to thrive and shape their world in 2035?

How do we ready children for a world where machines are replacing jobs?

Can teachers be empowered to be active participants to deliver Futures Thinking?

CHAPTER

02

Methods and Research

PURPOSE OF THE REPORT

This report aims to serve the system actors (educators, policymakers, and other stakeholders) in multiple ways.

As an advocacy tool to support the case for education reform by highlighting that it is achievable, despite challenges, and that resources are available to support it.

As a valuable resource to provide both insights and inspiration for those leading or considering education reforms within their education systems.

To encourage debate and to further research, and inspire others to share their lessons and experiences, ultimately promoting continuous learning and improvement in education.

2.1 Literature Review

A broad literature review was conducted to inform and validate the systems analysis, as well as inspire schools of the future. The literature review included thought-leaders' perspectives on education, case studies from pioneering education and learning systems, diverse skills development for the future, and alternative pedagogy. Additional domains included public, non-profit and private sectors who engage in practice and policy to re-imagine education. I was fortunate to also attend the Playful Schools Conference 2023, a virtual workshop, where experts and educators from around the world emphasized how play was the central point of formal education and how they brought play in their classrooms through various tools and activities. The data sourced from the conference contributed to the secondary research and informed the Research Question and hypothesis. Literature sources included books, academic articles, policy documents, podcasts, videos, and social media posts.

2.2 Interviews

Participant interviews were conducted with a small sample of system actors to gather perspectives on ideal education outcomes, and the importance of Futures Thinking to support the dominant ideologies. While these interviews supported the systems analysis and pathways to a preferred future, the facilitated conversations primarily defined dominant orthodoxies in framing present ideologies of education. The inputs from these interviews were used to develop a toolkit for elementary educators to explore the potential value of teaching Futures Thinking.

The participants were recruited through social media channels, including professional connections through LinkedIn, and other personal networks. Participants included three parents, two foresight practitioners who were also educators, and one educator who served as an expert participant. Participants like parents and educators were required to be actors from the Ontario Public Education System with a minimum experience of 2 years. The nature of the questions posed during the one-hour interview elicited participants' perception of the education system, the goals and purposes, the gaps and opportunity areas and the dreams and hopes for the future.

Foresight and Design practitioners who were also educators practicing futures work served as expert participants. The questions directed to them brought out ideas to understand the importance of Futures Thinking, validated the Research Question and how the thinking can add value to the education system. All the participants elicited what the growing trends shaping education were, and the innovative ways to introduce Futures Thinking, particularly in elementary education. There was a central point of discussion of what knowledge and values students would need to thrive and shape their future worlds. These viewpoints were further validated with the literature review to further explore the Research Question.

A small sample of parents, within the Ontario Public Elementary Education system, were interviewed to share their lived experiences, to understand their needs from the system and the sole purpose of what education meant to them. They were asked their perspectives on the pre and post pandemic phases of education and what aspects were deemed to be the strengths and weaknesses within the system and how the current system pivoted and adapted to the changing needs of society. In the concluding section of the interviews, parents were asked questions of a more general nature; what they believe should be the future skillsets important for their children and what might be changed to nurture creativity and learning in children and the influences of technology and future disruptions within education. Visualizing what schools would look like in the future brought out ideas of personalization, interaction, and engaging experiences to cater to the diverse learning needs of students.

2.3
Synthesis of Data

Even though there may be many different visions of "The Future We Want" or the future skillset required in children it is a shared responsibility between educators, parents, and actors within the education system.

The intention of this paper is to suggest an inclusive approach that empowers educators to explore the potential value of teaching Futures Thinking to children. The methods used, led to the synthesis of information and ideas, which led to building a toolkit for educators of elementary learners to give them the ability to teach Futures Thinking in the classroom. The toolkit helped to develop Futures Thinking skills and understanding through activities and resources. This framework facilitates a quick, low fidelity hands on approach to support the learning and application of Futures Thinking to children.

Key themes were identified from the interview data. This is not an exhaustive list, but served to indicate some of the main forces that were critical in building the toolkit. When establishing this list, I examined using the following criteria:

- Can Futures Thinking be explored at an elementary level within the education system?
- What are some of the concerns of the current ideologies of the education system?
- What are some of the best ways to deploy Futures Thinking in the classroom?
- Do parents identify with the rapidly changing futures and the need to address the same?
- Should the education system add the required knowledge and skill sets to adapt to the changing needs of society?
- Does the elementary education system constantly require innovative or new ways of teaching and learning characterized by the changes in the rapidly changing world?
- What skillsets are important as a parent for their child's education?
- How do we spread futures literacy in the simplest way possible and make it more accessible?

2.4
Study Limitations

The toolkit framework designed as the outcome of this project does not include a tested hypothesis, although the original Research Question and hypothesis are well-supported and open to further investigation by the student researcher or others who may be convinced of the utility of this project and its overall goals.

While the project presents several convincing reasons for educators to see the potential value of Futures Thinking to engage, challenge and support students to navigate uncertainty and prepare them for their future worlds, it could not find any empirical evidence that undeniably supports this proposition. As such, I hope this study finds its way into the hands of education researchers and policy makers that they might consider their influence as a lever of change.

With this approach, I hope that this study is found to be written in a language that is relatable, and inspirational. Where many reports and projects might include a great deal of academic jargon and might require pre-developed subject matter expertise or experience, this study is written with an underlying tone of storytelling.

Time and Resources

This study is limited by the timeframe of approximately three months, the counsel of one advisor, and the human resources of one graduate student researcher. As such, there was a limitation in activities and time spent on research to produce the findings of this study. Boundaries of this study could have been expanded over more time and human resource, as well as with more widely available accurate, reliable, and long-term data.

Sample Size and Range of Participants

This research was conducted virtually, and with less available education system actors for the interview, due to the conditions required to participate in the interview as an educator or a system actor from the Ontario Public Education System with a minimum experience of 2 years. More precise and detailed qualitative data could have been collected with more participant interviews, especially educators and policymakers to include more diversity and richness in opinion.

Qualitative Data and Research Methods

Other than the literature review, this study relied on gathered qualitative data based on actor perspectives and lived experiences. Though not to invalidate participant contributions, the small sample size might represent a limited reality of all system actor experiences and beliefs.

2.5 Research

The OECD Education 2030 contributes to the UN 2030 Global Goals for Sustainable Development (SDGs), aiming to ensure the sustainability of people, profit, planet, and peace, is through partnership (OECD, 2018, p.3). The OECD Learning Framework 2030 offers a vision and some underpinning principles for the future of education systems, which talk about education systems being about orientation, not prescription. (OECD, 2018, p.3)

In a world that is increasingly shaped by technological and economic advancement unless steered with a purpose, may widen inequities, exacerbate social fragmentation, and accelerate resource depletion. There is a need for broader education goals, individual and collective well-being.

To begin the literature review, I offer an introduction to the field of futures studies and its relationship to K-12 education. Bishop and Hines (2012) describe foresight as *the study of change, a process devoted to the study of the future, akin to the way "historians study the past," or journalists analyze the present. The future hasn't happened yet* (p. 1).*For most people the future is unknowable* (p. 2).

One of the key tenets of futures studies is the notion that 'the future' is not singular, but plural and the term 'futures' is found throughout the literature. The justification for this pluralization relates to the idea that the future, as Bishop and Hines (2012) put it, "is a set of plausible outcomes rather than one future to be discovered" (p. 8). Those engaged with the field of futures studies are futurists- who survey and explore the full range of plausible futures and share what they find. They help people expand their narrow focus on one future to a broader range of other possibilities (Bishop & Hines, 2012, p.7). This reflects the view of many futurists that while we cannot predict the future with certainty, there are myriad possible futures that could unfold. Students who are best prepared for the future are change agents. They can have a positive impact on their surroundings, influence the future, understand others' intentions, actions, and feelings, and anticipate the short and long-term consequences of what they do (OECD,2018,p.4).

> People use foresight every day. Why not explicitly teach students to use their natural human instinct to anticipate, plan, and influence their own future and the future of their organizations and communities. What greater mission could we as teachers have than to really prepare students for the future! (Bishop & Hines, 2012, p. xvii)

According to Sir Ken Robinson Ph.D., in the book Creative Schools: The Grassroots Revolution That's Transforming Education states

The *critique* that underlies the standards-based reform movement is that traditional academic standards are too low and have to be raised. The *vision* is of a world in which academic standards are very high and as many people as possible have college degrees, and there is full employment as a result. The *theory of change* is that the best way to do this is to specify exactly what the standards are and to focus relentlessly on them through an insistent process of standardized testing (Robinson and Aronica 2016b, p. 108).

In the report *"Rebuilding systems - national stories of social and emotional learning reform,"* the Lego Foundation interviewed policymakers from six innovative education systems: Australia, Colombia, Finland, Peru, South Africa, and South Korea. These interviews brought together policymakers with firsthand experience of working in government on reform efforts, offering their reflections, insights, and learnings to enhance students' social and emotional learning skills post the pandemic (The Lego Foundation, 2022). The case studies below showcase some exemplary education systems globally who have paved the way for the future, and are rethinking their purpose through design, and delivery.

Finland Case Study

Finland built a world-class education system during the past three decades. In Finland, schools are mandated to provide a well-rounded education that includes the arts, sciences, mathematics, languages, humanities, and physical education. However, schools and districts have considerable flexibility in delivery of the curriculum. Finnish schools place a strong emphasis on practical and vocational programs. There has been an open climate when it comes to Finnish schools and students are encouraged to be creative and curious. The country has also invested heavily in teacher training and development, resulting in it being a highly respected and secure profession (Robinson & Aronica, 2016b).

Education reforms in Finland place a higher priority on the professionalization of teachers, the development of instructional leadership within schools, and the creation of trust in teachers and schools rather than competition, choice, or external testing of students (Sahlberg, 2021b).

Finland's National Core Curriculum serves as a framework for the core content of Finnish education. Within this framework, municipalities and individual schools have the autonomy to formulate local curricula. This gives the teachers freedom to form and co-create their teaching methods in creative and innovative ways (The Lego Foundation, 2022, p. 33).

Australia Case Study

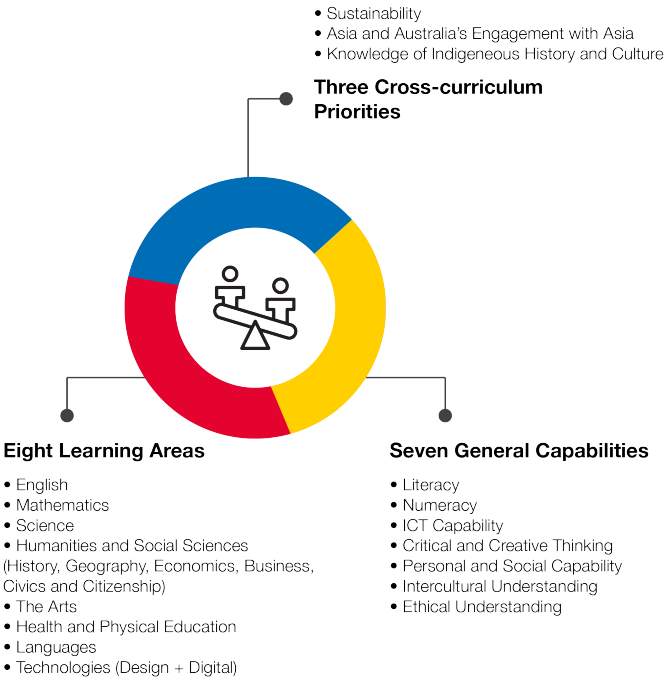

Figure 2. Adapted from (The Lego Foundation, 2022, p.15). The Australian Curriculum Focusing on Three Dimensions.

Robert Randall Former CEO of the Australian Curriculum, Assessment and Reporting Authority (ACARA) in the report states according to the preamble of the 2008 *Melbourne Declaration on Educational Goals for Young Australians* that the major changes in the world were placed based on new demands on Australian education. A globalized world, which was characterized by rapid technological advances, environmental, social, and economic pressures, and increased international mobility was a reality for Australia and its youth. The school system needed to pay more attention to developing the necessary capabilities (called general capabilities in Australia). The Australian Curriculum aimed to include intercultural understanding as one of seven general capabilities to account for its diverse population with Anglo-European roots. This curriculum had three dimensions: subject disciplines, general capabilities, and cross-curricula priorities. These priorities included improving knowledge of the history and culture of Indigenous Australians, a focus on sustainability, and to strengthen the Asia-Australia engagement (The Lego Foundation, 2022, pp. 12-15). Although the measuring of this new curriculum posed significant challenges, especially with the deeper learning and general capabilities the success is yet to be measured, but schools are taking the effort to reach out and engage with local communities through participatory projects in schools (p.18).

South Korea Case Study

According to a study by Oh Seok-hwan et al. (2013, as cited in The Lego Foundation, 2022, p.63),

> In accordance with the OECD survey results in 2006, Korean students' academic achievement was one of the highest among the OECD member nations but the competence to interact in heterogeneous groups, which means the ability to relate well to others and cooperate with, came in the bottom group.

However, for the Korean education despite it being viewed as exemplary, in the amidst of a cultural phenomenon that prioritizes academic performance, being measured by test scores, limits the education system's capacity to foster creativity and build character in students, despite having considerable resources and dedicated teachers. In addition, the report also stated, Professor Ju-Ho Lee, Chairperson of the Education Commission Asia emphasizes that there needed to be significant "Educational Diversification" considering the input from various stakeholders like parents and the industrial sector who demanded a change. The South Korean education needed to provide a greater emphasis on soft skills, creativity, collaboration, and social and emotional skills.

Following the learning, the 2009 curriculum emphasized on creativity and character education in every subject. The reform introduced **Creative Experiential Learning** (CEL), where students obtained creative hands-on activities and learning experiences both, inside and outside of school which nurtured their talents. The emphasis of **Extracurricular Activities** included CEL, and activities such as, sports clubs, and students' orchestra programmes. There was also a viable alternative setup to universities that emphasized on vocational and trade training to meet the changing needs of the economy and alleviate the burden of the admissions system.

Scotland Case Study

According to ("Considerations for the Future of Scotland's Curriculum for Excellence," 2021) The Curriculum for Excellence (CfE) in Scotland provides a motivating and broadly endorsed philosophy of education. Its framework enables successful curricular practices and the possibility of a truly fulfilling education for learners while providing the flexibility to enhance student learning. Students in Scotland engage in learning through CfE, which provides a holistic, coherent, and future-focussed approach to learning and allows schools the autonomy to design their curriculum based on a standard framework.

The two decades since the formulation of CfE's vision have been marked by accelerated changes, including in educational research, giving rise to new insights into student learning, pedagogy, and the kind of knowledge, skills, and attitudes students need to progress as learners. CfE's vision to achieve excellence for all students is widely shared by stakeholders and continues to be an inspiring example equated with good curriculum practice internationally ("Considerations for the Future of Scotland's Curriculum for Excellence," 2021).

Figure 3. Adapted from (What Is Curriculum for Excellence? | Education Scotland, 2023). The Four Fundamental Capacities of Lifelong Education and Learning.
Asset design from Rawpixel from Freepik: education-icon. Retrieved from: www.freepik.com

Curriculum for Excellence places learners at the heart of education. At its centre are four fundamental capacities aimed at helping children and young people become: (What Is Curriculum for Excellence? | Curriculum for Excellence | Policy Drivers | Policy for Scottish Education | Scottish Education System | Education Scotland, n.d.-b)

- Successful learners
- Confident individuals
- Responsible citizens
- Effective contributors

Stakeholder engagement is at the heart of Curriculum for Excellence and offers the possibility, with better structure, for shared ownership and effective leadership of CfE. With significant investment in training, greater flexibility and autonomy is built in the system to meet the needs of the learners.

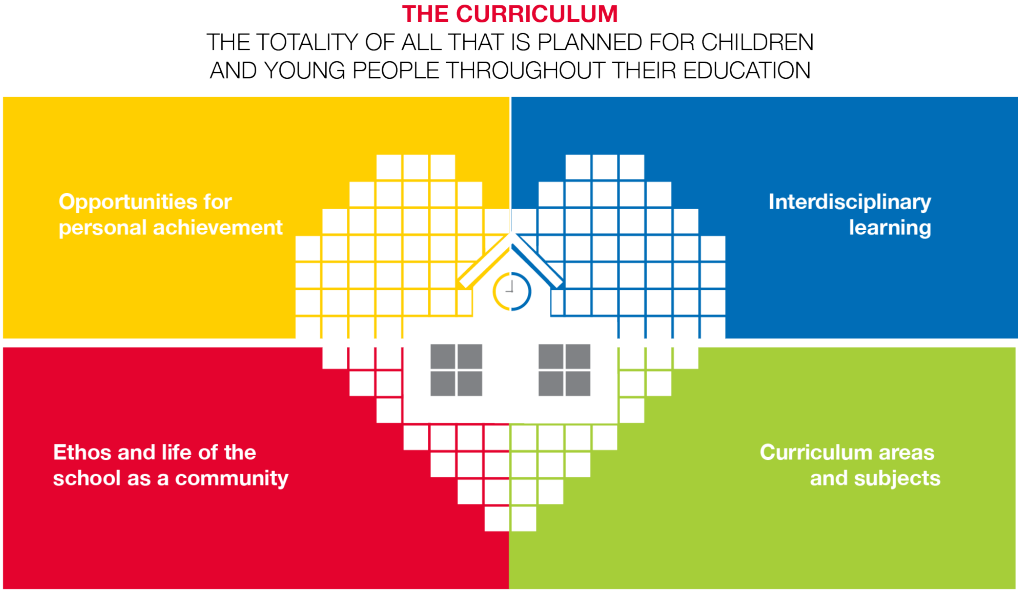

Figure 4. Adapted from Source: (What Is Curriculum for Excellence? | Education Scotland, 2023). The Four Contexts across the Curriculum.
Asset design from Freepik: heart-pixel. Retrieved from: www.freepik.com

Case Study Analysis

As (Donaldson, 2011, p.4, para. 3) re-emphasizes what successful education systems should do- the most successful education systems do more than seek to attain particular standards of competence and to achieve change through prescription. They invest in developing their teachers as reflective, accomplished, and enquiring professionals who have the capacity to engage fully with the complexities of education and to be key actors in shaping and leading educational change.

In the book, Creative Schools: The Grassroots Revolution That's Transforming Education, Sir Ken Robinson talks about "*revolutionizing education from the ground up"* (p.125).

He goes on to explain the natural ecosystems of responsibilities in ensuring an effective education, the following should be considered:

- Students: The primary focus of education must be on creating an environment that encourages them to want and be able to learn.
- Teachers: They should facilitate student learning.
- Principal: They should create conditions within their schools that enable teachers to fulfil their roles effectively and pay attention to leadership and the school culture.
- Policymakers: They should create favourable conditions at the local, state, or national levels, which enable schools and principals to fulfil their responsibilities.

He goes on to further explain that in order for schools to improve their performance, it is essential to comprehend the nature of learning itself, i.e., including the most effective ways for students to learn and the diverse methods they use to do so (p.126).

CHAPTER

03

Education And The Changing Landscape

3.1
Current state of Ontario's Public Education System

In Ontario, elementary school includes Kindergarten to Grade 8 (K-8). Schools may be organized in a variety of different ways, with some schools having enrolments from K-6 and others going from K-8. The purpose of elementary education in Ontario is to provide each student with a solid foundation upon which to develop each student's potential for further learning. In Ontario, special emphasis is placed on literacy and numeracy skills as building blocks to future academic achievement.

EQAO is an arm's-length government agency that supports student learning in Ontario. It plays an important role in Ontario's education system by conducting province-wide tests at key points in every student's primary, junior and secondary education and by reporting the results to parents and guardians, the public and the school system. The agency's data, research and resources empower parents, guardians, educators, policymakers, and others with information that allows them to determine how best to strengthen student outcomes, classroom instruction and improve school programming and trajectories across the province. These testing's help support individual student learning, and conduct research into the factors affecting student achievement, well-being, equity, and the quality of education. EQAO also reports the results of the provincial assessments publicly, which helps keep the public education system accountable to taxpayers (EQAO, 2022, para. 2).

In the past 10 years, the Ontario government has made significant investments to improve the quality of education and to increase student success, be it through the student class ratios or orientations and transition strategies implemented for students. All publicly funded schools in Ontario are required to use The Ontario Curriculum which outlines the curriculum requirements and specific learning expectations throughout each of the elementary and secondary school years. Teachers use these documents to develop lessons to encourage and support student success in attaining specific curriculum learning outcomes. Professional development for educators is mandatory and strongly supported, and teachers have on-going access to new teaching resources and the latest pedagogical research (OASDI, 2020). Assessment and evaluation practices throughout the province of Ontario are guided by a variety of Ministry of Education curriculum policies. The assessment, evaluation, and reporting requirements for all Ontario school boards are standardized through elementary and secondary report cards that indicate student achievement.

3.2 Moving Forward in the Covid 19 Era

The COVID-19 crisis marked a critical moment in students' learning pathways, and continued to impact with implications beyond the pandemic. In March 2020, Canadian education systems first began to close schools in response to the COVID-19 pandemic. In that relatively short (yet seemingly long) timeframe, there were many resources for teachers, parents and students that were developed in the form of webinars, instructional videos, live learning experiences, etc. Social media channels like Twitter and Facebook were used by educational thought leaders globally to document their challenges, and successes towards engaging with remote delivery models.

As remote or hybrid learning continued to become a norm in education, what needed the attention was what this future of schooling looked like? When school re-opened across Canada, it was not merely a return to schooling for students or learners but addressing the diverse needs of those learners. The overarching question - *What conditions need to be in place for students to learn and for teachers to teach, and how will leaders across the system adapt to support these conditions?* (Moving Forward in the COVID-19 Era: Reflections for Canadian Education | EdCan Network, 2020)

In the report *Right to Read: Ontario Human Rights Commission*, released a public inquiry into human rights issues affecting students with reading disabilities in Ontario's public education system. The report further stated that the inquiry is not just about an equal right to read – it is about an equal right to a future. ("Right to Read Inquiry Report," 2022). The Council of Ministers of Education Canada's (CMEC) research *Are You Smarter than a Fourth Grader* released in March 2021 was a poor attempt which put more emphasis on "reading literacy," and defined the capacity to understand and communicate in many forms and contexts rather than on reading fluency and comprehension, two critical indicators of reading effectiveness ("Are You Smarter Than a Fourth Grader," 2021).

According to an article published in the Conversation, policymakers missed the early warning signals of pandemic learning loss, which particularly affected students from disadvantaged, racialized and marginalized communities. Provinces made school closure decisions without any real knowledge of their impact upon

student learning and well-being. A few months into the pandemic, in the fall of 2020, other school models were being studied, to learn that students in the middle grades suffered learning losses in mathematics, language and writing skills. It took a U.S. management consultancy research summary, published in December 2020, to identify and provide reasonably reliable estimates of the total potential learning loss (amounting to five to nine months) to the end of the school year in June 2021 (Bennett, 2021). A policy reform advocate highlighted a group of children who were neglected during the pandemic and are now either disconnected from or absent in public schools. Will they now be regarded as the human casualties of two years of disrupted education? The COVID-19 pandemic has shown us we cannot take the future of education for granted.

Ministry of Education, Ontario launched its Plan to Catch Up that included several initiatives to support the learning recovery journey of all students, including those disproportionally affected by learning disruptions. These initiatives were supported with some historic funding to prioritise the learning and social development of students. Since 2022, school boards began providing enhanced tutoring support programs aimed at improving students' literacy and math skills. These initiatives were made available through the Ontario Government funding and are among the most extensive tutoring programs in the country. From May to June 2022, on an average approximately 49,000 students participated in tutoring programs each week, with an average group size of less than five students that provided tailored and focused support (Ontario Newsroom, 2022).

As stated in the document titled, *Lessons for Education from COVID-19: A Policy Maker's Handbook for More Resilient Systems*, emerged three insights. Firstly, that learning does not need to be constricted within the four walls of an educational institution but can occur from anywhere at any time and with the right relationships and mindsets. Secondly, the pandemic revealed that actors within the education system can work together to make changes happen. Finally, the crisis emphasized that only resilient education systems who planned for disruption, would be able to fulfil the fundamental human right to education, and would be able to withstand and recover from adverse events (OECD, 2020).

The learnings from the pandemic further emphasize that the education systems today face the critical task of balancing the crisis-induced urgent challenge of building greater resilience and the important challenge of increasing responsiveness to the changing needs of students in a post-industrial society.

3.3 Global Risks or Threats to the Changing Landscape

Figure 5. Protecting Earth from the Global Risks or Threats. Image by (Theis, n.d). Envato Elements

The Global Risks Perception Survey (GRPS) has underpinned the Global Risks Report for nearly two decades and is the World Economic Forum's premier source of original global risks data. The 2022-2023 GRPS has brought together leading insights on the evolving global risks landscape from over 1,200 experts across academia, business, government, the international community, and civil society. ("Global Risks Report 2023," 2023)

As stated in the report, A "global risk" is the possibility of the occurrence of an event or condition which, if it occurs, would negatively impact a significant proportion of global GDP, population, or natural resources. ("Global Risks Report 2023," 2023). According to the report, risks that were incorporated into the World Economic Forum's 2022 Executive Opinion Survey (EOS), was administered between April and September 2022.

As adapted from the "Global Risks Report 2023," 2023 the Top risks identified by the Executive Opinion Survey (EOS) for Canada were:

Risk categories

Societal | Technological | Economical | Environmental | Political |

1 Cost-Of-Living Crisis (Societal): There is a notable incapacity among wide segments of society to sustain their present lifestyle as a result of a surge in the expense of necessary commodities that is not accompanied by a corresponding increase in actual household earnings. ("Global Risks Report 2023," 2023).

2 Debt Crises (Economical): The difficulty of servicing the accumulation of debt in corporate or public finances can lead to widespread bankruptcies or insolvencies, as well as liquidity crises or defaults, and sovereign debt crises. ("Global Risks Report 2023," 2023).

3 Rapid And/Or Sustained Inflation (Economical): Supply disruptions, which at first impacted only a limited range of products and sectors, has now broadened to encompass everyday goods. The inflation has been aggravated by the unexpected war between Ukraine and Russia, leading to human suffering and higher prices for energy and commodities around the world. Those with fixed or modest incomes face particular difficulty coping with this inflation. ("Global Risks Report 2023," 2023).

4 Failure Of Climate-Change Adaptation (Environmental): The absence of implementation, investment, or enforcement of efficient climate change measures, including the inadequate development of climate-resilient infrastructure, by governments, businesses, and individuals, has resulted in an incapability to adapt to the consequences of climate change. ("Global Risks Report 2023," 2023).

5 Asset Bubble Burst (Economical): A growing disparity between real estate, investment funds, shares, and other assets, and the actual state of the economy, results in a significant decline in demand and prices. This trend encompasses various markets, such as cryptocurrencies, energy prices, housing prices, and stock markets, among others. ("Global Risks Report 2023," 2023).

Risk categories

Societal | Technological | Economical | Environmental | Political |

Apart from the 5 risks identified by the Executive Opinion Survey, other risks that could pose a threat to the global risk landscape:

E- Waste (Environmental): The expanding use of technology and the implementation of "designed obsolescence" have resulted in a mounting problem of electronic waste. To combat this issue, technology firms must develop programs that promote the recycling, reusing, and second-hand use of devices, which can bridge the digital divide and minimize waste. ("Global Risks Report 2023," 2023).

Natural Resource Crises (Environmental): The widespread depletion or mishandling of vital natural resources by humans has resulted in a global scarcity of commodities and natural resources. This issue encompasses various areas, such as chemicals, food, minerals, and water, among others. ("Global Risks Report 2023," 2023).

Natural Disasters, Extreme Weather Events And Ecosystem Collapses: (Environmental): The occurrence of severe weather events has resulted in a global impact, causing loss of life, destruction of property, financial loss, and damage to ecosystems. These events include land-based incidents such as earthquakes, volcanic eruptions, and wildfires, water-based events like floods, atmospheric events like heat waves, and extra-terrestrial events like comet strikes and geomagnetic storms. There is also destruction of natural capital, caused by the extinction or reduction of species across terrestrial and marine ecosystems, leading to severe consequences for the environment, humanity, and economic activity. ("Global Risks Report 2023," 2023).

Employment Crises (Societal): The weakening of work prospects or work standards is characterized by structural deterioration. This decline encompasses various factors, such as erosion of workers' rights, stagnant wages, rising unemployment and underemployment, displacement due to automation, stagnant social mobility, and geographical or industry mismatches between labour supply and demand. ("Global Risks Report 2023," 2023).

Risk categories

Societal | Technological | Economical | Environmental | Political |

3.4
Horizon Scan

A horizon scan was conducted, searching diverse sources including journal articles, news reports, blogs, social media posts, videos, and books for signals to understand how the education landscape may be impacted by technology, societal and global influences. To ensure a holistic understanding of the changing educational landscape, the STEEP-V method was used to explore different aspects of society: Societal, Technological, Environmental, Economic, Political, and Values (STEEP-V).

As we adapt to a post-pandemic world, there are new challenges to face but also an opportunity to rebuild for a better future. This study examines how education can incorporate emerging trends such as disconnections between learners and educators, social innovation, and advanced technologies.

While the effects of these forces can't be fully known, this research encourages you to continue the conversation and imagine how we might approach the design of education for the future.

STEEP V Categories

Societal | Technological | Economical | Environmental | Political | Values

The Impact of AI and Algorithmic Determinism on Our Society

STEEP V Category

Values

Our dependence on big data and algorithmic decision-making is impacting our choices on all aspects of society. This has potential benefits but also risks such as polarization, bias, misinformation. Unchecked AI models have the potential to perpetuate bias and discrimination by reinforcing existing beliefs. They become tools that maintain inflexible behaviour, which is dangerous to progress in any free society. While Generative AI has numerous potential uses in education, one of which is personalized learning content, that facilitates student growth. There is a huge concern, for bias in generated educational content. Ensuring generative AI systems are designed and programmed to be inclusive and equitable for all users will be the growing need for society.

Figure 6. Artificial intelligence. Image by (Lexx, n.d). Envato Elements.

Agents of Social Change and Innovation

STEEP V Category

Values

Higher education institutions are adopting design and systems thinking to prepare students to become agents of positive social change. By integrating social innovation across curriculum, research, community engagement practices, and extracurricular activities, students can develop human-centered and futures-focused mindsets. Creating a fellowship for leaders to work with communities could combine community engagement history with social innovation to shape equitable futures.

Figure 7. Social Change and Innovation. Image by (Dolgachov, n.d.). Envato Elements.

Mental Wellbeing and Self Esteem

STEEP V Category

Values

The Hechinger Report points to an April Institute of Education Sciences survey, indicating that 70% of public schools have seen increased mental health services sought by students. Post the COVID 19 pandemic mental health issues in children, adolescents, and young adults continue to be real and widespread. They struggled with feelings of helplessness, depression, and thoughts of suicide. The non-profit, Understood, believes that positive self-esteem for students is vital for young people to fully access the opportunities school offers. Through positive self-esteem they feel confident and capable, have a sense of control, and feel secure in forming relationships. The growing concern in education today is not only with students' academic performance but also with students' well-being making schools invest in more wellbeing programs.

Figure 8. Mental Health. Image by (Meyers.2019). Unsplash.

Bilingual Education

STEEP V Category

Societal

The cognitive benefits associated with bilingual education are increasing in importance. From higher test scores to surprising health benefits, the cognitive effects alone are enough to cement bilingualism as a permanent staple of the public school system. (Read Why Bilingual Education Is Important, 2021b). There is a deeper appreciation for different cultures and backgrounds though bilingualism. Changing demographics in Canada is only part of the equation. Canada has a rich linguistic diversity. Languages are an integral part of Canadians' daily lives - whether in infancy, at home, at school, or at work—and extend beyond the nation's borders into broader cultural and historical contexts. The languages known and spoken here are closely linked to the identity and culture of Canadians as well as to their relationship with their community (Government of Canada, Statistics Canada, 2022).

Figure 9. Diverse Students. Image by (Arcurs, n.d.). Envato Elements.

Gamification and the AR/ VR Innovations

STEEP V Category

Technological

Gamification is the attempt to enhance systems, services, organizations, and activities to create similar experiences to those experienced when playing games in order to motivate, excite, and engage users. By piquing the interest of learners through gamification, learners are inspired to continue their learning journey. Additionally, personalization of learning, observed progress or ongoing assessment, interactive learning, and the development of soft skills are all aspects of gamification. (Gamification in Education Is the Emerging Trend That Will Eventually Dominate Our Learning Settings, 2020). Through Ed-Tech platforms, the principles of Gamification, augmented reality and virtual reality have been applied to make learning an enhanced experience. Post the pandemic, the need for learning environments to be engaging and immersive has gained momentum.

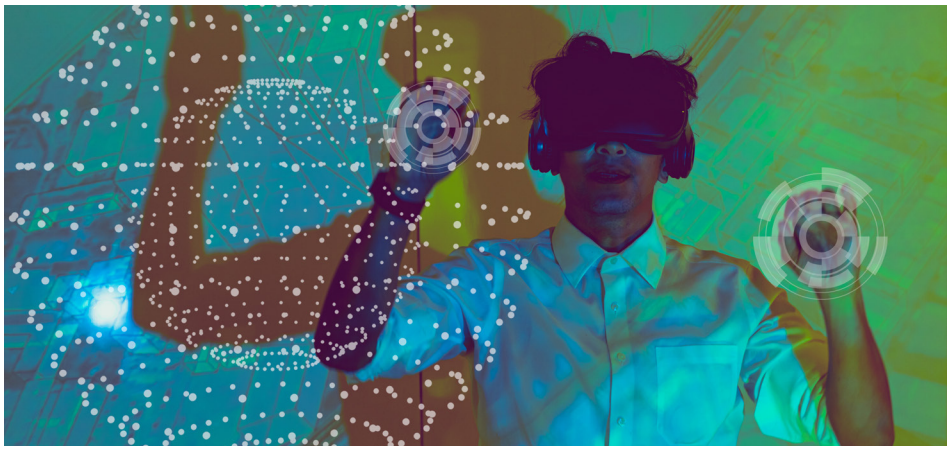

Figure 10. Gamification and AR/VR. Image by (Coffeekai, n.d.). Envato Elements.

Leveraging the Power of Networks

STEEP V Category

Societal

Finding meaningful ways to incorporate out-of-school learning into our vision for education is gaining importance. Educators are looking to address the persistent inequality in access to out-of-school learning if children's growth, opportunities, and fulfillment depend on the experiences they have outside the bell schedule (Gross, 2019). Networks are proving to be an engine for innovation for learners who need it the most. The schools need to be engaged in student-centered learning environments that empower robust learning opportunities, anytime, anywhere. They must ensure that students graduate with the agency, passion, and skills to be a productive, compassionate, and by being a responsible citizen. Leveraging, on a network approach can help identify common causes, shared visions, while distributing power and resources to involve many people in building equitable solutions.

Figure 11. Cultivating Connections between schools and community. Image by (Mstandret, n.d.). Envato Elements.

3.5 Pedagogical Trends in Education

(*The Scientific Case for Learning Through Play*, n.d.)

Children are born with the curiosity to experiment and learn through play; they are the world's natural scientists.

Learning through Play

Play is essential to how kids learn, including how they develop and test hypotheses, explore friendships, and make sense of their surroundings (Project Zero at Harvard Graduate School of Education et al., 2023). With the help of playful pedagogy, which combines children's playtime with academic learning, students are given the freedom to come up with their own solutions to both new and existing problems (Play Scotland, 2022).

The relationship between play and learning is well understood, but there has not been much empirical research on what it might mean to make play the focal point of formal education. The Pedagogy of Play (PoP) research project, funded by the LEGO Foundation, started looking into the characteristics of playful learning in schools in 2015. The project focuses on three main issues: why educators need a pedagogy of play; what does playful learning look and feel like in classrooms and schools; and how do educators create an environment that fosters playful learning (Project Zero at Harvard Graduate School of Education et al., 2023).

I was fortunate to attend the Playful Schools Conference 2023, virtually in March 2023, where experts and educators from around the world emphasized how play was the central point of formal education and how they brought play in their classrooms through various tools and activities. The Playful Schools Conference was a collaboration between the LEGO Foundation, Harvard University's Project Zero and the International School of Billund (ISB) in Denmark. The ideas shared at this conference sparked project-oriented ways of working and preparing students for the future.

By focussing on play, students develop alternate skillsets like self-management, research, and social skills. They experience autonomy, independence, agency, and responsibility. Through play incorporated through the learning in schools, the most important skillset of resilience is inculcated. Resilience enables students to adapt to and thrive in an uncertain and ever-changing future, a core focus of Futures Thinking. Therefore, by cultivating a culture of play in education, we can help students develop the skills, mindset, and resilience needed for effective Futures Thinking.

Through one of the workshops attended during the conference, on- re-imagining schools though play and nature, a school in Quebec, Canada emphasized the importance of outdoor play and learning. Play and Nature is about fun, curiosity, creativity, risk-taking, building connections with oneself and the natural worlds and exploring the world through the lens of a child through senses. The insights through all the workshop and the speaker series helped in understanding the context of play.

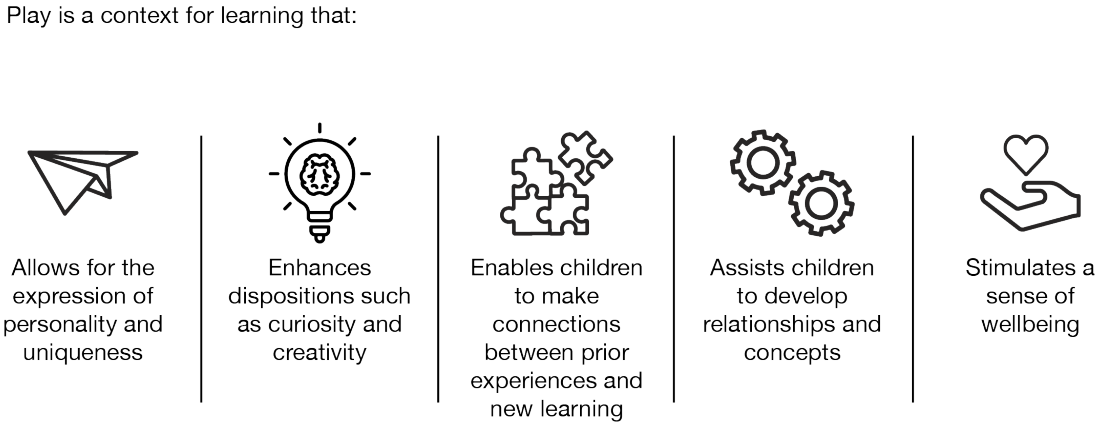

Figure 12. Play Based Approach to Learning. Adapted from (Department of Education and Training. (2019). Belonging, Being & Becoming: The Early Years Learning Framework for Australia, p. 10)
Asset design from Rawpixel on Freepik: education-icon. Retrieved from: www.freepik.com

One of the other central points of discussion in the conference was making assessment meaningful and joyful. Educators from Denmark, the Netherlands and Uganda shared their assessment practices. In Denmark, ISB crafted indicators of playful learning- choice, wonder, and delight. However, it was difficult to pinpoint exactly when learning through play occurred, and so they believed that when all three were “in play,” playful learning was most likely taking place. This was also the basis of their assessment practices. (Three Core ISB Indicators of Playful Learning - International School of Billund, n.d.-b)

By making assessment more meaningful within education systems could have a considerable impact on the outcomes of the learners. Although abolishing standardized testing could bring about a significant change, altering the method or content of evaluation has the potential to steer the direction of the curriculum as well.

Lifelong Learning

According to a 2017 *Harvard Business Review* article, lifelong learning has several benefits, including ones that are economic, emotional, physical, and social in nature (Coleman, 2021b). The necessity of lifelong learning has been apparent due to the rapid pace of development, an ever-evolving society, and the influence of technology on our work and daily lives. While it remains crucial to have essential skills, there is a growing emphasis on supporting the overall development of learners and assisting them in cultivating well-rounded abilities, including 21st-century competencies such as communication, collaboration, problem-solving, and creativity. These holistic skills not only contribute to success but also foster happiness in a learner.

Purposeful play encourages students to methodically explore, experiment, and iterate continuously. Purposeful play is rooted in the pedagogical approaches like project-based learning, which are known to increase student learning outcomes and, at the same time, enable a love of learning ("It's Time to Rethink Learning," 2021).

Rethinking learning and find ways to empower students to take ownership of their learning. Fortunately, pedagogical approaches that incorporate learning through play have been proven to drive improved learning outcomes ("It's Time to Rethink Learning," 2021). These approaches can ignite enthusiasm, motivation, and a lifelong passion for learning. Giving learners a voice and a choice in how they also learn, improves learning outcomes, primarily through collaborative play experiences, thereby building confidence and community ("It's Time to Rethink Learning," 2021). Purposeful play encourages exploration versus finding the "right" answer and this encourages the discovery aspect of learning.

We must rethink the current state of education to empower our children to help reshape their own future. To help prepare them for a future of emerging uncertainties, a transformative shift is needed in the way we educate our young people, emphasizing the development of a love for lifelong learning (Nast, 2021).

CHAPTER

04

Identifying Levers of Change

4.1 Causal Layered Analysis (CLA)

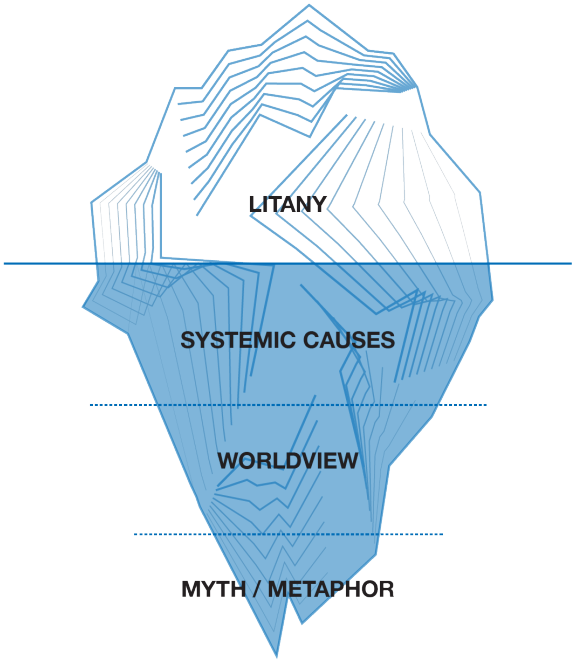

Figure 13. Fernandes, (2023). Causal Layered Analysis. Adapted from (Inayatullah, 2019, p.5)

The CLA is a futures theory and method, that is an integrated and layered approach to categorize different views and concerns about the future and then think about the future far more effectively. While CLA is not concerned with predicting a particular future, it does open space for the articulation of constitutive discourses, which can then be shaped as scenarios[1]. It helps in imagining alternative futures (Inayatullah, 2017). As seen in Figure 13, and as Inayatullah (2019) describes the CLA is a tool that helps us simplify our view of a complex problem, through the uncontested reality or the visible characterizations (litany), often short-term analysis, either single or multi variable concerned with systemic causes, including social, technological, economic, environmental political, and historical factors (systemic causes); deeper level concerned with discourse that supports and legitimates perspectives (worldview), to ultimately unearthing the deep stories, evoking visual, regarded as the root cause of questioning (myth & metaphor).

1 Scenarios in futures study help us understand different futures, different trajectories. It is a tool for building resilience in changing times, an exploratory path for innovation, a provocation to stimulate new thinking, a consensus building method and a story about what could be; a creative process. The term “scenarios”, now in common use, has come to denote stories or narratives of alternative possible futures. Herman Kahn (Kahn & Wiener, 1967) provided perhaps the earliest formal definition of scenarios as a term of futures art, “...a hypothetical sequence of events constructed for the purpose of focusing attention on causal events and decision points.” (Curry & Schultz, 2009)

The CLA in my paper was an integral tool to this study, allowing me to integrate the diverse perspectives of stakeholders, thereby creating systematic change and ensuring new measurements that reflect a vision.

We understand that learning is instrumental, about using the future to optimize the present, today with some improvements. We know from the literature reviews and with the perspectives from our interview participants, change today is dynamic and this is our current reality. Our current realities are too much to change in a short term.

As the literature review points out, that while the effects of the impacts of advanced and integrated technologies is not entirely known, there is a need to continue the conversation and imagine how we might approach this integration to design for the future. Our current realities as listed in the first half of this paper like Climate Change, Natural Resource Crises, Impacts Of AI And Algorithmic Determinism, E- Waste, Future Pandemics, etc. all focus on how much there is to unlearn and rethink. As such, this paper focuses instead on demonstrating how policymakers and decision-makers can be equipped with the necessary factors to create futures literacy in the context of the contradictions between the emerging future and the colonial past.

4.2 Future Narratives

In search of a definition of education that can inform a possibly more ideal myth and metaphor, I have gathered perspectives on the purpose of education, key features of learning, and on pedagogy. Beginning with a reminder of the Ontario Ministry of Education's definition of Education:

"To provide students with the opportunity to realize their potential and develop into highly skilled, knowledgeable, caring citizens who contribute to their society." (Education Act, R.S.O. 1990, c. E.2., 2021).

While I researched the future of education, my expert interviews with educators and practicing foresighters, many themes were consistent to the 21st century competencies needed to shape the future of education. The dedication to assisting all learners, from young children to adults, to realize their full potential in life is one of the greatest strengths of Ontario's publicly funded educational system (Ontario Ministry of Education, 2014, p.9). Ontario's education system has made notable strides in bridging gaps for many learners, there is still a requirement to address the diverse learning needs. Despite progress, equity in education is still a concern for parents and educators, as also indicated by my interview participants.

From the interviews, there were perspectives centered on what skills and knowledge are currently being emphasized, and what it means to be a caring and contributing citizen to the society. What it means to be a global citizen, having the agency to reimagine and shape their worlds, the conversations on children being prepared for the future, to adapt to change, be agile and resilient and most importantly learn from failure. To being able to create these co-creative experiences, as they begin the conversations of uncertainty and what lies ahead in their futures, speaking of empathy to collaboratively contribute to society.

I think education primarily is one of the most rigid and the most. I mean it's the most assessed, it's the most researched and maybe Healthcare is a little bit more. But I mean they are so integral into how we see our society being shaped and formed. The reality is that education hasn't really progressed very much in 150 years.
(Dr. R. Norman, Interview participant, Educator and Futures Thinker)

Through our conversation with Dr. R. Norman, we spoke about the education structures being embedded and rooted in traditionality. To begin talking about the future it was important to look at the barriers first and then to be able to weave multiple understandings together.

There were some interesting viewpoints on
We have to recognize that there is a growing percentage of kids that need to have different kinds of alternatives. Bringing in subjects like "deep democracy" which is built into the system and allows children to make choices from a very early age. It sets a tone of advocating for oneself and gives the children the agency to choose between the multiple alternatives?
(Dr. R. Norman, Interview participant, Educator and Futures Thinker)

Finally, he shared the idea of narrative and the storytelling, beginning from oral histories and indigenous cultures that have been part of the formations of knowledge.

This brings us back to that proverbial saying and the first question we are contemplating: What Is The Definition of Education? What are the Purposes and Goals Education? Let's break down the definition and identify gaps in alignment through participant perspectives and lived experiences.

The issue of skills, knowledge, and the growth to become active citizens who have an agency to imagine their worlds was a common emphasis in all participant discussions. Participants pointed out skills beyond academics or trades; they brought up pressing issues of Critical Thinking, Agency to make Choices, practical skills like Financial Literacy, Concepts of Inclusivity and Equity, Self-Awareness, Self-Expression, Social-Emotional Learning, Communication Self-Advocacy Skills, Independence, Environmental Inter-Dependence, and Power Literacy. Additionally, parents brought out ideas of what skillsets were needed to enhance their children's

learning experiences and emphasized strongly on Social and Collaborative skillsets and to be able to integrate their environments.

One of the biggest cracks pointed out during the interviews was how the current education module does not focus on the diverse needs of the students. Cracks through the traditional models of education focusing on the lack of critical thinking and problem solving, questioning the *Why* and *How* as against the *What* seemed to be challenges faced currently.

The learnings from COVID 19 further emphasized that the education systems today face the critical task of balancing the crisis-induced urgent challenge of building greater resilience and the important challenge of increasing responsiveness to the changing needs of students in a post-industrial world. As an interview participant shared an idea of bringing a community of people coming together to support children's learning needs and this emphasized that learning is a shared goal.

The literature review emphasized that the Industrial Revolution in the 19th century drove an expansion of access to education. However, to ensure universal, high-quality, affordable, and equitable access to education, today's technological revolution should be the driving force.

Finally, the emphasis is on tapping the human side of ourselves to shape new futures.

We should be tapping into more human elements of ourselves, rather than the things that can be done by AI. Anyway, what we need in the future is a lot of creative problem solvers, people who think outside the box because we're going to have to solve a lot of problems. And so why are we putting our children through an education system that's still geared towards worker bees when we need, like big thinkers? That's the issue I have is we do actually need the kids that are like, hey, what if I did this?
So, I think that's the that's where we are failing in some respects because we still have the same old education system. It's very difficult to change.
(Parent, Interview participant)

How might we integrate Futures Thinking into Ontario's Public Elementary School System and prepare children to adapt to a rapidly changing world with multiple futures?

Based on the Research Question, of *adapting to a rapidly changing world*, one of the highlights of these worlds were Technology. Parents and educators were asked questions on the expectations of the Future.

Considerations:
In an era characterized by an explosion of scientific and technological opportunity and a growing array of complex societal problems like climate change, depletion of resources, urbanization, etc. should the education system add the required knowledge and skill sets to adapt to the changing needs of society?

I employed a CLA to synthesize the qualitative data gathered from these interviews and literature review.

4.3 Unpacking How Technology can Shape the Future Narrative

In the section below we indicate the use of a CLA to unpack how technology could shape a new narrative **(Table 1)**. We began to see that due to COVID 19, education systems had to pivot to introduce online learning. While the educational community have made concerted efforts to maintain learning continuity during this period, parents and students have had to rely more on their own resources to continue learning remotely through the Internet, or other media. This crisis has exposed the many inadequacies and inequities in our education systems – from access to the broadband and computers needed for online education, and the supportive environments needed to focus on learning, up to the misalignment between resources and needs (Schleicher, 2020, p.4).

The CLA addresses what these new futures with the integration of technology within the education systems would look like. The alternative future portrayed through the CLA, would be that the future of learning technologies would bring in the equity and accessibility to learning, supported by the diverse needs of the learners. Through technology, educators can be connected across boundaries to explore and celebrate lifelong learning experiences. This would help to enrich the learning, to forge connectedness amongst children to pursue global projects together.

This CLA shows the tension between the goal of the current education system versus the desired. What is needed is not just the integration of new technologies, but to create a new digital pedagogy (Inayatullah, 2020). The CLA is an adaption of the views received from the interview participants, the literature reviews and Inayatullah (2020).

	USED FUTURE	CHANGING FUTURE	ALTERNATIVE FUTURE	PREFERRED FUTURE
LITANY	Standardized delivery of curriculum	Using technology to deliver the curriculum	Technology enabled learning in action	Technology + Digital pedagogy + Social learning + Wellbeing & safety
SYSTEMIC CAUSES	Limited control on accessing technology + Lack of knowledge of new tech innovations	Technology used but lack of awareness to use AI and other systems	Connecting educators through infrastructure of technology + creation of new digital pedagogies	Integrating tech seamlessly in curriculum, efficiently support diverse learning needs, creating safe spaces to minimize harm
WORLDVIEW	Industrial society	Techno-centred	Human-centered technology	Striking the balance Safety + Technology = Wellbeing
MYTH or METAPHOR	Teacher as a leader	Technology accessibility for all learners	Learning knows no boundaries through global classrooms	Humanzing Tech for the better!

Table 1. Fernandes, (2023). Causal Layered Analysis, Unpacking How Technology can shape a Future Narrative. Assets Retrieved from: www.freepik.com

4.4 Tensions in Traditional System v/s Emerging Opportunities for 2033

The statement from the interview participants and the literature reviews highlighted some of the significant changes that are happening in education and learning today. These changes include contextual, technological, and pedagogical shifts, which are driven by the rapidly evolving needs and expectations of society. However, the statement also suggests that while there is a willingness to change, stakeholders in education often lack the practical tools to guide them through the process of implementing change.

As a participant at the interview, points out,

> I think the reality is that when I take a look at the education system, it's going to be fragmented. I mean, there are going to be pockets where there will be a lot of innovation and change. But I think that the majority of the way that the education system is, rooted can't, it just doesn't have the capacity to change that quickly. So, in 20 years, it would be nice to think that we'd be thinking differently.
> (Dr. R. Norman, Interview participant, Educator and Futures Thinker)

Contextual shifts in education refer to changes in the broader social, economic, and cultural contexts that impact the goals and objectives of education. Technological shifts in education refer to the growing use of technology in the classroom and the integration of digital tools and platforms to enhance the learning experience. Pedagogical shifts in education refer to changes in teaching and learning practices that are designed to better meet the needs of learners. This includes a shift away from traditional lecture-based instruction towards more interactive, collaborative, and experiential learning approaches.

Overall, the statement highlights the need for education to be more responsive to the changing needs and expectations of society, and the importance of providing stakeholders with the tools and resources needed to navigate this complex and evolving landscape. The statements listed in **(Table 2)** are some of the viewpoints of my interview participants, including visions for the future from OECD (2019, p.11), and research paper of Jones (2012, p.26) showcased the importance of shifting from a static linear model of education to a dynamic non-linear model of education (OECD,2019).

The statements indicated in **(Table 2)** imply that the current pace of shifts in education is insufficient to match the rapid pace of societal changes, and hence, a more significant transformation in education is required. Nevertheless, the statement recognizes that executing such changes is a challenging endeavour that demands the provision of practical resources and assistance.

As Andreas Schleicher, Director of the OECD Directorate for Education and Skills, commented in 2019,

> Education is no longer about teaching students something alone; it is more important to be teaching them to develop a reliable compass and the navigation tools to find their own way in a world that is increasingly complex, volatile, and uncertain. Our imagination, awareness, knowledge, skills and, most important, our common values, intellectual and moral maturity, and sense of responsibility is what will guide us for the world to become a better place (OECD, 2019, p.2).

	TENSIONS IN THE TRADITIONAL SYSTEM	EMERGING OPPORTUNITIES FOR 2035
PEDAGOGICAL	Traditional Standardized curriculum Teacher as a leader Student as knowledge receiver Product-driven Learning within Lecture-dominated Assessment Measured by completion Learning within the boundaries of school Linear mindset Barriers to learning needs Memorization and rote learning Deficit-focused Outcome-focused Addressing change but subtly Short-term goals towards learning Adopting tested and structured pedagogies Enhancing technical skills Rigid and non-adaptive Questioning the 'WHAT'	Holistic (self, belonging, and environment) Co-created curriculum Teacher as a facilitator, guide Student as a discoverer Process-driven Learning from the context Creative partnerships Self-assessment Measured by problems solved Learning from the community Creative and growth mindset Addressing diverse learner needs Project-based learning outcomes Strength-based approaches Global citizenship and resilience Addressing agency Long-term goals towards passion Adopting play-based pedagogies, lifelong learning concepts Enhancing soft skills- creativity, compassion, collaboration Flexible learning systems Questioning the 'WHY & HOW' (Questioning, and challenging)
CONTEXTUAL	Isolated learning Learning within the classrooms Rigid Competition-based School as a community Isolated Addressing mental health Thinking of the past Concepts of colonialism Integration of knowledge in a few subjects Lack of environments to learn from Global contexts Top-down stakeholders	Social learning Learning from community and hubs Agile Cooperation-based Schools within communities Collaboration Well-being addressed Thinking of the future and acting in the present Concepts of 'deep democracy' Integrating knowledge through oral histories and indigenous cultures Diverse environments to learn from Global and local contexts Integrating stakeholders' opinions
TECHNOLOGICAL	Pockets of technology Adopting virtual learning systems Isolated learning options Traditional books Rigid approaches to technology AI still looked at as a threat Virtual classrooms	Integrated technology Adopting hybrid learning systems Blended learning options Digital learning management systems Open to AI and gamification approaches AI catering to the diverse needs of students Seamless boundaries to learning (virtual and physical exchanges, global classrooms)

Table 2. Tensions in the Traditional System v/s Emerging Opportunities for 2035 (Fernandes, 2023)
Note. The statements listed in are taken from the viewpoints of my interview participants. Statements also include visions for the future from OECD (2019, p.11), and adaptations from Jones (2012, p.26).
Icons adapted from Image by upklyak on Freepik: education-icon. Retrieved from: www.freepik.com

CHAPTER

05

Futures Thinking

5.1 The 21st Century Learner and His Environment

"What are 21st Century Skills? Why are they important?" These are questions often raised among those working in education circles today? We constantly talk of the need to transform education. International thought leaders in education, business leaders, policymakers, are calling for education systems to prepare students with "21st-century competencies" to tackle complex challenges. These competencies include knowledge, skills, and attributes that help students achieve their full potential and go beyond foundational literacy and mathematics skills and core learning in other subjects.

There is always an argument that schools needed to be boring and dominated by rote learning before deeper, more invigorating learning could flourish. Those who hold on to this view should not be surprised if students lose interest in or drop out of schools because they cannot relate what is going on in school to their real lives (Schleicher, n.d.). He goes on to argue,

"How do we foster motivated, dedicated learners and prepare them to overcome the unforeseen challenges of tomorrow?" (Schleicher, n.d.)

Educators often face a dilemma: routine cognitive skills, which are the easiest to teach and test, are also the easiest to automate or outsource. While expertise in specific fields remains valuable, success in education today, requires creative and critical thinking for problem-solving, effective communication and collaboration, and the ability to utilize new technologies while mitigating risks.

The terms *skills* and *competencies* are often used interchangeably, but they have slightly different meanings. A competency is more than just having knowledge or skills in a particular area. It involves being able to use a range of psychosocial resources, including skills and attitudes, to meet complex demands in a specific context. While skills are important in solving problems, competencies involve not just what you know, but how you apply the learning in different situations (Ontario Ministry of Education, 2016, p.9).

The demand for education systems to prioritize 21st-century competencies is closely connected to shifts society as addressed in Section 3 of this study. This is also linked to the growing evidence that technological advancements can optimize learning and transform education. Additionally, learners nowadays have higher expectations for education that is relevant and applicable to the real world. These factors have contributed to a renewed focus on 21st-century competencies in education to prepare learners for the challenges and opportunities of the modern world. These reasons are well-addressed in research studies, but beyond the scope of this paper to explore in-depth, rather focusses on exploring how we deal with uncertainty through a Futures mindset.

Groups like the OECD, the European Commission, the Partnership for 21st Century Skills (P21), and the U.S. National Research Council have shared frameworks, insights and evidence to the research and intellectual debate regarding 21st century competencies.

21st century competencies are associated with growth in the cognitive, interpersonal, and intrapersonal domains. These competencies have measurable benefits for multiple areas of life and therefore are critical for all students. (Ontario Ministry of Education, 2016, p.10)

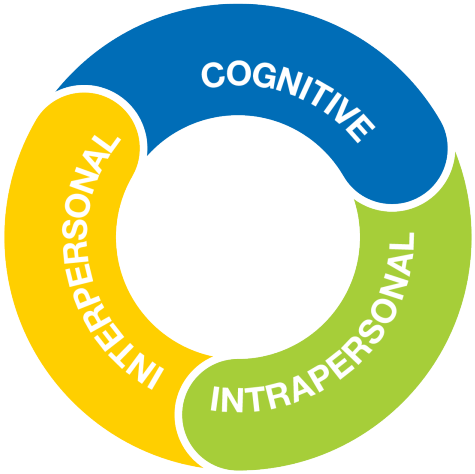

Figure 14. 21st Century Skills grouped in Three Broad Domains (Ontario Ministry of Education, 2016, p. 11).
Note. The 21st century's shifting economic, technological, and social contexts mean that interpersonal and intrapersonal competencies have become much more important than in the past. Employers and business are increasingly valuing "soft" skills like teamwork and leadership skills. Cognitive competencies in critical thinking, analysis, and problem solving have traditionally been regarded as key indicators for success. (Ontario Ministry of Education, 2016).
Assets adapted from pikisuperstar on Freepik: graph-circle. Retrieved from: www.freepik.com

In Canada, these 21st century skills are called global competencies. Across the country, the education systems are shifting. Building on strong foundations of numeracy and literacy, global competencies at CMEC is a pan-Canadian effort to prepare students for a complex and unpredictable future with rapidly changing political, social, economic, technological, and ecological landscapes. The six pan-Canadian Global Competencies are:

- Critical Thinking and Problem Solving
- Innovation, Creativity, and Entrepreneurship
- Learning To Learn/Self-Awareness and Self-Direction
- Collaboration
- Communication
- Global Citizenship and Sustainability

These competencies can equip learners with the ability to meet the shifting and ongoing demands of life, work, and learning, to be active and responsive in their communities, to thrive in diverse situations, become lifelong learners and become actively engaged citizens.

There is a demand for education systems across the provinces and territories to prioritize the development of these competencies emphasizing changes in the curriculum, programs, and teaching methods. While the research-based knowledge about 21st century competencies is dynamic and evolving, Ontario education system commits itself towards enabling students to develop the knowledge, skills, and attributes essential to thrive and contribute to a digital global knowledge society.

As the ministry of education, works towards fostering and assessing the global competencies, it is crucial for Canadian education systems to proactively cultivate these competencies while considering the Truth and Reconciliation Commission of Canada's Calls to Action for Education. What would add value to the competencies would be to incorporate Indigenous knowledge, perspectives, language, beliefs, histories, and acknowledging the sustained contributions of Indigenous peoples to Canada (Global Competencies - Pan-Canadian Systems-Level Framework on Global Competencies, n.d.).

5.2
Re-imagining the Purpose of Education

The Future we want for the education combines different elements- trends, plausible inter- relationships, and guiding policy. They are thus neither empirical (predictions) nor purely normative (visions). They can be constructed with certain timeframes approximately 10-15 years not so far off as to be remote to any futurist and visionary. They can be considered either as worlds or visions of what we could reimagine these models to be, what new dynamism, recognition and purpose would guide these models or schools of the future.

In the OECD, position paper of "Back to the Future of Education: Four OECD Scenarios for Schooling, 2020" 4 scenarios of schooling for 2040 are envisioned based on the changes that appear the most probable, including the ones that are not expected. The position paper was influenced by the OECD Schooling Scenarios, 2001.

The scenarios listed in the OECD, 2020 paper were the *big picture* of strategic goals for education intertwined with the complex and the long-term processes of change. The new scenarios presented future thinking in education but intended to be set around aspirational visions and roadmaps of desirable futures. These aspirational visions have been used to set agendas and spark dialogue among diverse groups of stakeholders about the curriculum, pedagogy and system delivery that would be needed to make these visions a reality.

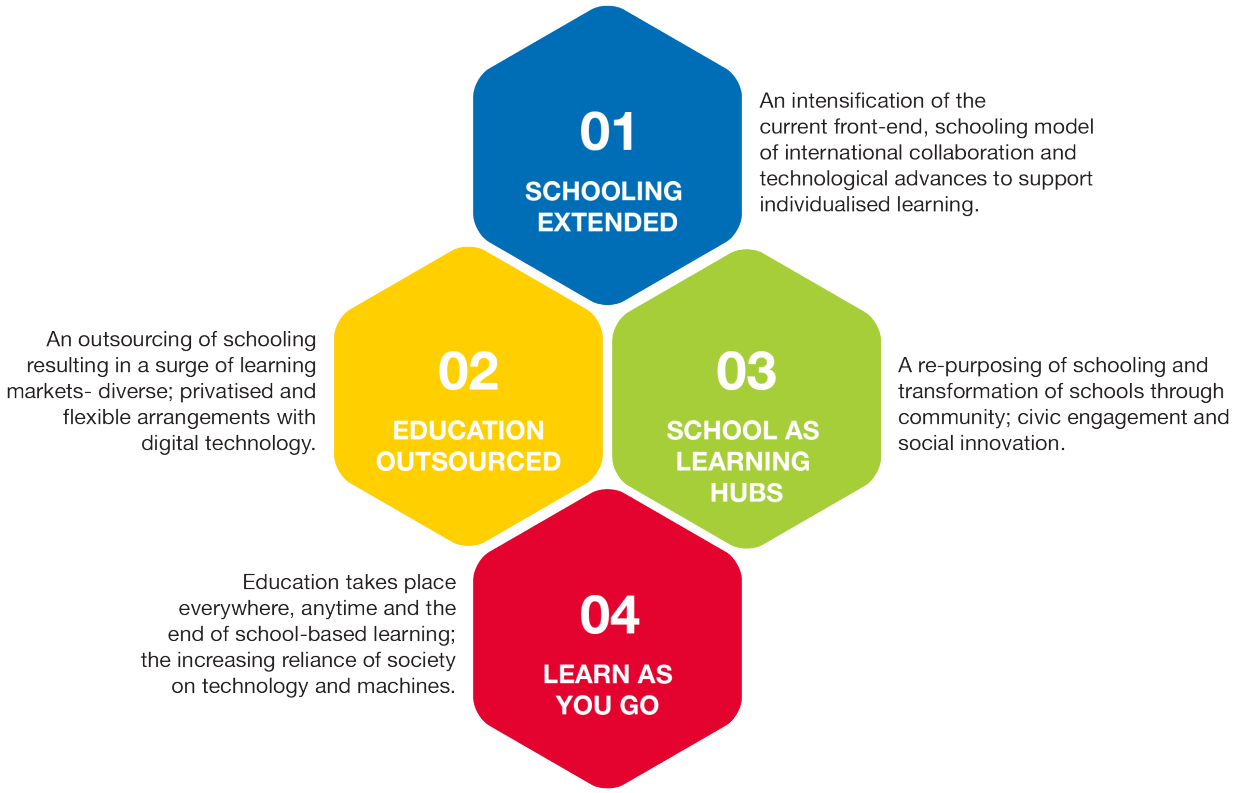

Figure 15. Adapted from (Back to the Future of Education: Four OECD Scenarios for Schooling, Educational Research and Innovation, OECD 2020). Four Scenarios for the Future of Schooling for 2040.
Assets adapted from Freepik.

5.3 Learning from an Uncertain Future

Educators play an integral part in shaping mindsets, behaviours, and skills for their students/learners within the education system. The global pandemic and the increased focus on social justice have highlighted the need for educators to design more equitable and abundant futures with and for their students. They go beyond just preparing students for the future and help them develop the imagination, agency, and the will to shape it.

Through student engagement, educators dedicate a significant amount of time in readying students for the future, assuming they know how it will unfold. However, in a rapidly changing and unpredictable world, mere preparation seems inadequate. As the number of unknown variables continues to surpass the known ones, there is an underlying question to be answered:

In what ways can we assist our students/learners to develop not only readiness but also to envision and construct the futures they want to build?

By integrating Futures Thinking and design practices into learning experiences for students can help build a futures mindset. This will allow us to envision a broader range of potential futures, while design enables us to work towards preferred futures by testing and refining ideas through iteration and feedback. By adopting a more human-centered and empathetic approach, educators can co-design experiences that foster intentional practice and provide a space for students to develop these skills, enabling them to make a meaningful contribution towards a more equitable, and humane future.

To adopt the perspective of a future mindset, there must be a fundamental transformation that challenges the beliefs, purpose, methods, and contexts of learning. While K-12 education primarily focuses on teaching about the past, there is a lack of resources, teacher training, and structured curriculum on intentionally shaping the futures we desire. While lesson plans and essay prompts exist for analyzing the present, there is no teacher preparation program that equips educators with the tools to teach about the future.

Teach the Future is a global non-profit movement that promotes 'futures literacy' as a life skill for students and educators. If students could learn to think critically and creatively about the future, they develop the agency to influence it, and this can be achieved through an educator being able to shape that curriculum.

To prepare students for a changing world, education must embrace interdisciplinary and holistic learning that enables critical thinking, contextual understanding, and emotional intelligence. This requires teaching students to be adept at making sense of the past, present, and unknown information, while considering equity, ethics, and power dynamics. Additionally, mental well-being must be integrated into the curriculum to promote future health and resilience.

Going back to my Research Question.
How might we integrate Futures Thinking into Ontario's Public Elementary School System and prepare children to adapt to a rapidly changing world with multiple futures?

Through a *Futures Thinking mindset* we must enable students to become navigators of their shifting contexts, learn to embrace ambiguity through co-creation, network building, and rapid experiments and be able to lead with purpose.

5.4
Futures Thinking and the Importance in Public Education

Engaging in strategic foresight can significantly enhance a learners' critical thinking abilities by encouraging them to challenge the status quo and explore diverse perspectives. Through reflecting on their values, expectations, and vision for the future, learners can critically evaluate the present and identify areas that require improvement.

Sharing their visions with classmates fosters collaborative thinking and empathy-building, which is essential for addressing the interconnected global challenges of today. By considering the wider implications of their actions, students can develop the necessary skills to become conscious decision-makers and responsible global citizens.

Using scenario-building exercises, learners can extend their thinking beyond the immediate future and envision different long-term possibilities. This helps them make informed choices and prepare for the changes ahead. The process of creating alternative scenarios also empowers students by providing them with the tools and confidence to shape their future.

Moreover, exploring alternative futures stimulates creativity, as learners are encouraged to think outside the box and make novel connections. This fosters a culture of experimentation and innovation, equipping students with the skills to generate breakthrough solutions for future challenges. Ultimately, strategic foresight can help learners develop the critical thinking and creative problem-solving skills needed to thrive in an ever-changing world.

Dr. R. Norman
Interview Participant, Educator and Futures Thinker

Bringing future work into the elementary school is you have to start to get these kids to imagine themselves looking different in the future, so what's left with a learner is a legacy of questioning, of challenging, of advocating.

CHAPTER

06

The Toolkit

Dr. R. Norman

Interview Participant, Educator and Futures Thinker

And I think that, that's what is important about bringing future work into the elementary school is you have to start to get these kids to imagine themselves looking different in the future, right?

6.1 Introduction

To introduce Futures Thinking in the classroom, I have identified and developed a range of strategies, tools, and techniques for effectively conveying the approach through an engaging learning experience. This by no means is a tested hypothesis but is an exploration of how a thinking or mindset shift can help students to develop the critical ability to navigate through change.

Future Play is a comprehensive resource, a toolkit designed to support educators who are new to Futures Thinking. Its primary aim is to introduce the fundamental concepts of Futures Thinking and explore the critical design questions of *What, Why, How, When, And Where*. To achieve this, the toolkit is organized into four key sections, each focused on a specific aspect of Futures Thinking: gathering intelligence about the future, exploring the dynamics of change, describing what the future might be like, and co- creating an artifact to solve a problem. By providing a step-by-step guide to each of these areas, the toolkit helps educators gain a better understanding of the future and how it can be shaped.

While developing the toolkit, my inspiration primarily came from the interview suggestions of framing the toolkit based on existing frameworks. However, with the engagement with my research participants, most of who were existing foresight practitioners a few insights were generated.

- Simplicity in language
- Easy to do tasks
- Conversation starters
- Use existing frameworks to build on
- An introduction to Futures Literacy through activities and exercises for educators who have no prior experience with Futures Thinking

One of the key strengths of the Future Play Toolkit is its adaptability. The toolkit can be customized to meet the unique needs of a variety of futures projects. Educators can use the toolkit as a starting point, and then tailor it to suit their specific goals and objectives. Whether developing a scenario planning exercise or creating a visioning session, the toolkit provides educators with the tools and resources needed to succeed.

6.2
Recommendations to Teach Futures Thinking in Ontario's Public Education

Strong and Bishop (2011) refer to Alvin Toffler an outstanding futurist and writer of the book, Future Shock who suggested incorporating a "future tense" in education to prepare students for the future instead of only focusing on the past and the present. Jerome Glenn proposed the idea of "futurizing" teaching methods instead of creating new courses to the school curriculum specifically dedicated to the future, in 1972 (Strong & Bishop, 2011). While many are hesitant to add more content to the curriculum, "futurizing" teaching practices can be achieved by making small changes to current methods.

This small tweak licenses the exploration of questions such as *what* could have happened instead, *What Might Happen If*, and *What Would You Like To See Happen*, creating wonderment through the toolkit. *Futurizing* assignments help students mentally prepare for their future. Jerome Glenn (1972) characterizes the objective as an attempt to get learners to develop 'a way of thinking' which will help them look beyond today and anticipate what they may be faced tomorrow (Strong & Bishop, 2011).

At the heart of the toolkit, is the introduction of *Futures Inquiry*, through teaching futures principles, techniques, and issues (Strong & Bishop, 2011). It raises the level of thinking complexity by adding the element of change, its dynamics, and its implications, in conjunction with futures concepts, trends and issues to classroom assignments. It acts as a resource for teachers and students to build critical thinking skills to navigate uncertainty. Through this toolkit, students or learners would develop their own creative confidence and inspire others, take risks, and persevere through tough projects or situations throughout their lives. It is a way for educators to explore the idea of "futures" through a conversation and facilitated delivery into the classroom, with no prior experience.
Through this approach three higher order thinking skills of Futures Inquiry are touched upon.
1) Systems Thinking, 2) Divergence Thinking, and 3) Futures Thinking

1) Systems Thinking is a discipline for seeing wholes rather than parts, for seeing interdependencies rather than things, for seeing patterns of unbalanced change rather than static "snapshots" of equilibrium (Strong & Bishop, 2011).

2) Divergent Thinking, another crucial aspect of Futures Inquiry, involves generating creative and problem-solving ideas openly. A divergent thinker exhibits fluency, flexibility, and originality while producing ideas in a short period (Strong & Bishop, 2011).

3) Futures Thinking is the third component of Futures Inquiry and is characterized by its multi-disciplinary and global approach, as the future is shaped by changes. It involves a reflective practice that considers the potential range of future possibilities in any field of study. The ultimate aim of Futures Thinking is to pave the way for a better tomorrow for individuals, communities, and future generations by actively studying the future (Strong & Bishop, 2011).

The goal of the toolkit was to introduce *Futures Thinking* into the curriculum [1]. The objective of teaching futures is dual in nature - to comprehend and contextualize the changes taking place in our world, and to establish a connection between the present and the future.

In the toolkit created we emphasize on the idea of *Futurizing* assignments to add a dimension of richness and authenticity as learners build anticipatory thinking skills and mental preparation for their future.

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1 Curriculum encompasses the academic content and lessons taught in a school, course, or program. It encompasses learning objectives, standards, teacher instruction, student assignments and projects, course materials, and evaluation methods.

In a nutshell, the first step is building the capacity to observe change. Student then explore *how we got here*, before projecting forward how the change might develop locally and globally. An opportunity to portray the future as multi-faceted entity emerges–the possible future (anything could happen), the probable future (believed more likely to happen), the preferable future (most desirable), the plausible future (could happen given the bounds of uncertainty).

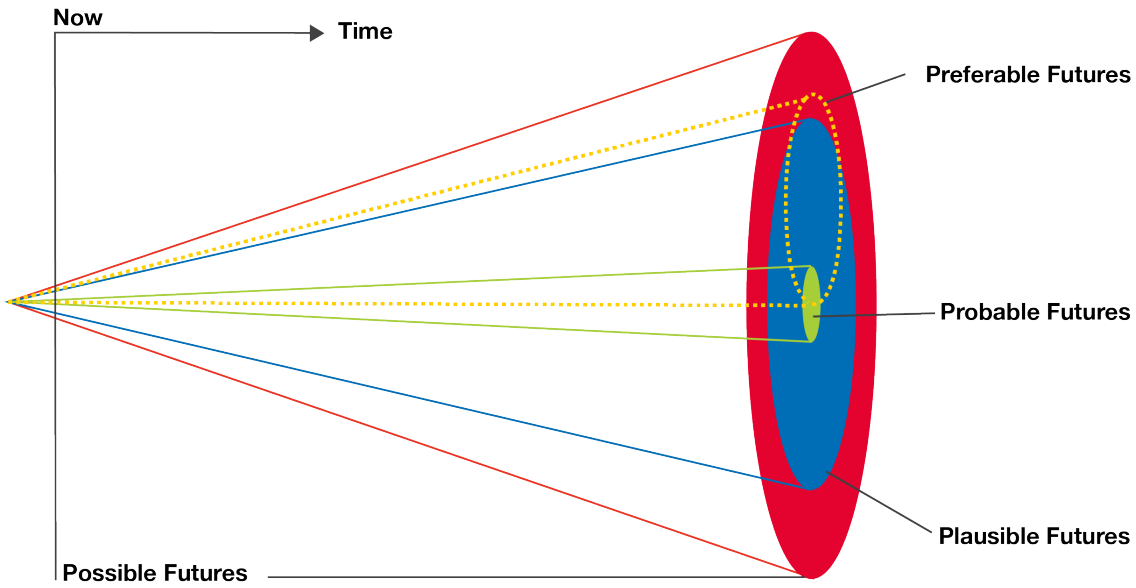

Figure 16. Adapted from Voros (2003). Cone of Plausibility (Fernandes, 2023).

A Structure of the Future Play Toolkit

It is structured on a simplified design thinking process comprised of four main blocks. This toolkit is adaptable and can be used independently or even paired with a lesson plan. It is structured in a modular way, with different activities that could be independently pulled out or even integrated into specific subject areas such as language arts, science, social science, or even a deep dive into the future.

The toolkit is developed into 4 blocks:
DEFINE > IDEATE > EXPLORE > CO-CREATE

PROCESS	CONTENT	METHOD
DEFINE	**Recommendations to Define** (defining Futures Thinking in the classroom)	***Instruction*** An Introduction through defining what encompasses Futures Thinking.
IDEATE	**Let's Talk about the Future** **Let's Talk about the Past**	***Demonstration-*** ***In Class Exercises*** Facilitating a discussion through practice exercises.
EXPLORE	**The Art of Storytelling** **The Act of Prediction**	***Demonstration-*** ***In Class Exercises*** Exploring the What Would Happen narrative through imagination.
CO- CREATE	**An Artifact from the Future:** (a playful way to hone collective imagination)	***Demonstration-*** ***In Class Exercises*** Using a play based collaborative approach to work on an artifact.

Figure 17. (Fernandes, 2023). Four Blocks of the Future Play Toolkit

Grade Level

The toolkit is designed for an educator who engages with students between Grade 3 and 4 in elementary education (age 8-10 years). Children's cognitive skills between the ages of 6 and 10 years develop the capacity to comprehend other people's points of view, concentrate for longer periods of time, have improved memory and problem-solving abilities, and can plan ahead, understand time, and have a vocabulary of 20,000 words by the age of 10. Their social skills are intensely interested in peers, develop friendships marked by give and take, mutual trust, and shared experiences, and have concern with justice and fairness ("Cognitive and Social Skills to Expect From 6 to 10 Years," 2017).

I was fortunate to learn from the cognitive and social skills of my child's age group during the development stage of this research idea.

Aim

This toolkit inspires students to recognize their individual and community roles in shaping the future. This toolkit will not offer a single solution for the future, but instead will ask students to envision and share futures that make sense to them. To an educator, it serves as a conversation starter and promotes the value of Futures Thinking in the classroom.

Skills

As a facilitator, it is important to understand that to think about the future effectively, participants need to develop specific meta-cognitive skills. These skills include critical thinking, systemic understanding, empathic reasoning, and creative thinking. Additionally, they need to be able to anticipate, be flexible, establish relationships, and utilize their imagination. We have incorporated exercises/ activities that focus on developing these skills, while also encouraging collaboration, communication, and presentation skills among participants.

Outcome

There are no right or wrong answers when thinking about the future because it doesn't exist yet. The focus is facilitating the conversation and insights gained, shaping participants' thinking and feelings to create their own future.

B

The Future Play Toolkit: Ideas, Lessons and Recommendations

Block 1 DEFINE

RECOMMENDATIONS TO DEFINE FUTURES THINKING IN THE CLASSROOM

This section offers an introduction to Futures Thinking and touches on the key principles of the concept. It is by no means an exhaustive or a complete list of definitions, but this section is an attempt to explore the concept and present it in a simplified manner.

As I began to develop the toolkit, my insights came from my engagement with N.Roces, an expert interview participant and practicing systems and foresight thinker currently working as an educator in K12 education with a private school. Our conversations explored the need for Futures Thinking in education so children can be prepared for the future, adapt to change, be agile and resilient and most importantly learn from failure. Concepts of Futures Thinking are often complimented with design and systems thinking approaches and opens the mindsets to debatable questions of the future, brings in the past, the present and supports the ability to imagine. Her engagement particularly with students in Elementary education involved using the existing toolkits available in the industry, like *Stuart Candy's The Thing from the Future* [1] but often sees the need to adapt these cards to make it simpler and understandable for her students.

This led me to assume that educators require a detailed overview of Futures Thinking in guided steps, so they feel *Futures Literate* [2].

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1 Stuart Candy's The Thing from the Future
The Thing from the Future is an award-winning imagination game that challenges players to collaboratively and competitively describe objects from a range of alternative futures. Lab, S. (n.d.). The Thing From The Future. Situation Lab. https://situationlab.org/project/the-thing-from-the-future/

2 According to UNESCO, Futures Literacy (FL) is a capability, the skill that allows people to better understand the role of the future in what they see and do. Being futures literate empowers the imagination, enhances our ability to prepare, recover and invent as changes occur. UNESCO. (2020, December 1). Futures Literacy. UNESCO. https://en.unesco.org/futuresliteracy/about

I listed a few recommendations as starting points to initiate the conversation on Futures Thinking.
The following recommendations can be used independently or even paired with a lesson plan across subject areas. These recommendations emerged from the FEDORA [3] research studies and are adapted to define the concept of Futures Thinking. Considering that this is just a preliminary exploration, more concepts could be adapted in the future. The list below is a hypothetical exploration and is not tested due to the limitations of this project.

Defining and Exploring the Unknown meant the following:

1. Get Ready for a World of Change
2. Embrace Uncertainty and Endless Possibility
3. The Past, the Present and Beyond
4. Thinking Long-Term: Making a Difference Through Sustainable Action
5: Thinking in Systems and Understanding Connections
6: More than 1 possibility
7: Curiosity and Imagination
8. Spotting Signals of Change
9. Diverse Voices for a better Future

Each of these 9 recommendations are showcased with an example, to elaborate and emphasize the learning. Insights from my interview expert participants emphasized that I primarily focus on keeping the language simple for an educator who has had no formal experience with Futures Thinking. To further illustrate, audio visuals tools could be used to explore the concepts further. While facilitating the learning in the classroom, an educator is expected to use the creative capacities and provide a holistic experience for the learner.

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3 FEDORA: A future-oriented model to enable creative thinking, foresight and active hope as skills needed in formal and informal science education. FEDORA. (n.d.). Teach the Future. https://www.teachthefuture.org/projects/fedora?lang=af

Block 2 IDEATE

The second block of the toolkit focused on putting the concept of Futures Thinking into practice. The exercises listed prompts students to envision and share their own futures, rather than offering a single solution. It emphasizes that the future is not predetermined and that everyone plays a role in shaping it. As Bishop and Hines point out, a fair amount in educational systems is studied about the past – as it should be – but why not study an equal amount about the future?

We should teach as much about the future as we do about the past. (Bishop & Hines, 2012, p.2)

By helping educators understand the importance of a "futures" tense as Alvin Toffler proposed (Strong and Bishop, 2011) is the first step towards integrating futures principles, tools, and concepts into the classroom.

By thinking about the future, we can better understand it and prepare with actionable directions and learn how each of us can affect the future. Ms. Sophie Kemkhadze, Deputy Resident Representative, UNDP Indonesia in her welcoming address of the Disaster Risk Reduction Webinar 1 stated that

> Understanding the future is not just about building a future vision for ideas or innovation, but it also builds a robust and calculative analysis of our present conditions and surroundings. No one is better positioned to meet future thinking than today's youth and young professionals, which will be in leading positions of the future. ("Reflecting on the Past and Present for Futures Thinking on Disaster Risk Reduction," 2022)

The activities listed in the two sections are inspired from the Futures Thinking Playbook: What Might the Future Be Like and What Can We Do to Shape It? (King et al., 2018). The ideas listed in the toolkit are hypothetical and can be used as prompts to facilitate the conversation. Although different learners require different media, it is likely that the use of graphics or visual aids to facilitate learning will be the most effective mode of communication especially to elementary grade learners.

The two sections in the IDEATE are activity based, practice exercises:

1. Let's Talk About The Future

This section focuses on long time horizons [1] to indicate the changes happening. By thinking about the future, we can better understand it and prepare with actionable directions and learn how each of us can affect the future.

2. Let's Talk About The Past

Can we truly understand the future without understanding the past? This section reflects on how things were different in the past and how they have changed. By understanding that change is a normal and being aware of it can help us being better prepared.

1 Time horizon is usually expressed as a number of years, like next year or the next five years, or as an exact year, like 2020 or 2050. The time horizon also varies with the domain, which is the area of the future being focused on. Climate change, for instance, has a long time horizon; it will take a long time for significant effects to occur (Bishop & Hines, 2012, p.27).

Block 3 EXPLORE

The third block of the toolkit focusses on *What Would Happen*. With Futures Thinking, we use the future to change the present. As I explored this section, insights from an interview participant who is an educator and a Futures Thinker emphasized on asking the basic question What Would Happen If? to begin talking about Futures work. He also emphasized on the power of storytelling in futures work which is a way of exploring and envisioning possible futures to make better decisions. Among younger students or learners, it offers a chance for them to exercise their imaginations, and to think creatively about problem solving in a non-traditional setting. As such, it generates high energy, well focused periods of graphic and descriptive output of longer than usual duration and is seen as a positive experience by both students and adults (Mack, 2011).

In Futures Thinking, *storytelling* can be used to create scenarios that help people imagine and prepare for different futures. A scenario is a story about the future (Bishop & Hines, 2012, p.12). By crafting compelling narratives that illustrate potential outcomes, futures thinkers can engage people's imaginations and inspire them to act towards shaping a desirable future. To create a scenario, which is one of the aspects of Futures Thinking, it is important to begin with the elementary learners to craft stories. Creating scenarios provides an opportunity to foster creativity and challenges oneself to consider not only *what is most likely to happen*, but also *what could happen.*

Through the exercises, taking inspiration from the resources of Teach the Future, the questions to the exercise in *The What Would Happen Narrative* are framed keeping in mind that the future is unpredictable, and so there is not just one future but multiple futures. As Bishop (2022) states-

What do you anticipate will occur? (expected, cause-and-effect thinking)
What alternatives might occur? (contingent thinking)
What do you want to occur? (preferred, value-based thinking)
How to generate stories based on different conditions and assumptions?

The second exercise, The Act of Predications follows a simple activity of creating a story. In Futures Thinking, the goal is not necessarily to predict the future with precision, but to develop the skills and strategies needed to navigate a complex and uncertain world. For elementary grade learners, understanding there are many factors that can influence the course of events are difficult or impossible to anticipate, however through this activity educators can facilitate creative and problem-solving skillsets, while also encouraging them to imagine and work towards a better future for themselves and their communities.

Block 4 CO-CREATE

A playful way to hone collective imagination. This Block of the toolkit can be used independently or in conjunction with the previous blocks. It can be independently pulled out or even be integrated with specific subject areas like language, arts, science or even a social science lesson or a deep dive into the future.

Artifacts from the Future are designed to spark thinking about what the future might hold. The physical nature of these artifacts, that can be worked in collaboration with the facilitator and the learners. The outcome drawn here can help bring some of the potential futures into focus. By visualizing the possibilities, our hope is that we may be more equipped to recognize both our preferred and non-preferred futures, pushing us to act now for the tomorrow we desire.

As elementary grade learners, it serves as an engaging way to play and build objects into unique *Artifacts from the Future* to provoke, excite, and inspire. The participant helps imagine and produce these future artifacts and share stories about the objects once created. At the end of the exercise, learners can collectively share their ideas in the classroom and learn from each other.

This exercise drew inspiration from Stuart Candy's The Future Bazaar [1] a public imagination toolkit from Situation Lab and BBC and another inspiration from an activity by Institute for the Future: Artifact Engine [2] .

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1 The Futures Bazaar is a design jam or creative gathering where people transform everyday objects into unique "artifacts from the future" to provoke, amuse, and inspire one another. Candy, S. (n.d.). The Futures Bazaar. Situation Lab. https://situationlab.org/the-futures-bazaar/

2 Institute for the Future: Artifact Engine is an activity, a great way to start a conversation about the future. It helps people of all ages creatively recombine ideas to envision possible future scenarios. IFTF: Artifact Engine. (n.d.). https://legacy.iftf.org/future-now/article-detail/artifact-engine/?p=future-now/article-detail/artifact-engine/

The exercise that has been developed has not been tested, or even fully executed, but serves as a starting point to introduce an aspect of *Play* into the learning. The reasons are well-addressed in this research paper, but beyond the scope of this paper to explore in-depth, rather focusses on exploring how we deal with uncertainty through a *Futures mindset.*

All the blocks created in this toolkit, are hypothetical and explored to communicate the importance of having a futures perspective.

This block follows a simple design process of
Identify A Problem > Research The Context > Create And Build A Future Product > Share The Idea

Identify A Problem

The participant is encouraged to choose one: a Future, an Object, a Subject from the prompt sheet. For the purpose of developing ideas, the prompt sheet is not an exhaustive list, but serves as a starting point. An educator here is expected to be creative or integrate along with a lesson intended to teach in the class.
Supplementary material too is expected to be used to create the final output.

Research The Context

This phase explores research development for elementary grades. This phase of the activity, introducing young students to basic research skills and helping them develop the ability to conduct simple investigations on their own. This can include learning how to ask questions, gather information, organize data, and draw conclusions. Some prompts are listed in the activity sheet, so an educator can facilitate this process.

Create And Build

This phase taps into the creative aspects of a students' learning. Students are encouraged to create, build, and work as a team facilitating a collaborative approach. They are asked to create a statement and build a future product or an artifact from the future based on the prompts collected in the Identify a Problem phase.

Share The Idea

Post building the artifact learners can collectively share their ideas in the classroom and learn from each other.

C

Limitations of The Future Play Toolkit

The scope of this research is extensive, and there are numerous opportunities to delve deeper into the problem from various perspectives. As I conducted my research, several questions and ideas served as prompts for further exploration. However, due to the constraints of time and limited resources, this project may only offer a limited contribution.

Research

The Futures Play Toolkit was created for educators without prior knowledge of Futures Thinking. The toolkit is based on literature reviews, limited participant data, and assumptions as a designer, a researcher, and a parent. As such, there was a limitation in activities and time spent on research to produce the findings of this study. More time and human resources, as well as reliable and long-term data, could have expanded the study's boundaries. The small sample size of research participants interviewed may represent a limited reality of all system actor experiences and beliefs. Educator perspectives would have benefited the activity and resources listed in the toolkit to provide a more holistic understanding. No prototype was created or tested, as it was beyond the scope of the research study. The toolkit adapted existing futures frameworks to explore the potential value of teaching Futures Thinking to elementary grade learners.

Use Of Audio-Visual Aids

Expert participants' insights emphasized the importance of keeping the language simple for educators with no prior experience in Futures Thinking. Audio - visual tools could be used to explore the concepts further. Educators are expected to use their creative capacities and provide a holistic learning experience. Emerging technologies, such as Artificial Intelligence and Machine Learning, can further enhance the learning experience. I acknowledge the fact that public education is limited in terms of its resources and funding, but this toolkit was primarily developed, as a low fidelity hands on approach to support the learning and application of Futures Thinking to elementary grade learners.

Expectation Of The Toolkit

The developed exercise serves as a starting point to introduce Futures into the learning process, and it has not been tested or fully executed. The reasons for this are explained in detail in the research paper, which aims to explore how uncertainty can be approached through a futures mindset. The toolkit's hypothetical blocks are used to highlight the importance of having a futures perspective. The prompt sheet provided is not an exhaustive list, but rather a starting point adapted from an existing framework for developing ideas. Educators are expected to use their creativity and integrate it into the lesson plan as needed.

Use Of The Toolkit

The toolkit was intended as a self-starter resource, but it is important to note that Futures Thinking heavily relies on collaboration and participation from diverse elementary grade learners. This assumption and expectation of the toolkit recognizes that Futures Thinking presents challenges that may vary based on the students' needs.

Design Of The Toolkit

As a professional graphic designer, I recognize the value of devoting additional time and resources to expand this toolkit. In particular, the branding and crafting brand stories is a significant aspect from a design standpoint, I aim to advance this project and enhance the existing framework through further research, content development, and design improvements. Additionally, I intend to seek funding for this research project in the future to evaluate and understand the outcomes of teaching Futures Thinking to children.

Future Research

All the blocks created in this toolkit, are hypothetical and explored to communicate the importance of having a futures perspective. Additionally, the adaptability of the toolkit makes it a versatile resource that can be customized to suit the specific needs and objectives of different futures projects. The exercises that have been developed as part of the Future Play Toolkit serve as a starting point for introducing an aspect of Futures Thinking into learning. While they have not been fully executed or tested, the toolkit is adaptable and can be used independently or paired with a lesson plan.

Additional methodologies that can be integrated into the toolkit built in for different age groups could be scanning through STEEP-V Analysis [1], 2X2 Scenarios [2], Scenario building through Jim Dator's Four Alternative Futures Framework [3], and many more to enhance creativity, imagination, and knowledge.

However, working with futures frameworks and making them adaptable for elementary grade learners presents a significant challenge. To address this, further research is necessary, involving researchers, educators, curriculum planners, policy reform advocates, and the required resources and funding to develop a futures curriculum or an educator's manual on Futures Thinking. A deep dive into the future can further expand upon these topics, but it requires significant effort and collaboration from various stakeholders.

To further develop this toolkit, it would be beneficial to validate its effectiveness for different age groups within elementary grade learners. While the current content is targeted towards Grades 3-4, there may be variations in expectations and delivery methods for Grades 4-6. For example, incorporating technology to develop game ideas that use gamification concepts could enhance engagement for older students.

By adopting a more human-centered and empathetic approach, educators can co-design experiences that foster intentional practice and provide a space for students or learners to develop future thinking skills, enabling them to make a meaningful contribution towards a more equitable future.

Lastly, the content discusses the importance of Futures Thinking, which requires a sustained investment in strategic foresight capabilities. Collaboration is crucial in every stage of the process, prioritizing group learning and learning from emergent insights. Ideally, Futures Thinking should be considered as an ongoing process, and not a one-time project.

Appendix A- The Future Play Toolkit

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1 Steep-V Analysis: Exploring the drivers, external factors to determine trends, the emerging issues that are the building blocks of the future. STEEP-V is basically an acronym which stands for Social, Technological, Economical, Environmental, Political and Value changes.

2 2X2 Scenarios: Create four contrasting scenarios based on two high impact, high uncertainty drivers of change.

3 Jim Dator's Four Futures: Jim Dator is a futurist who developed the framework of foresight scenario generation based on his extensive research and work in foresight. His belief was that all possible futures could be placed within one of these four scenario archetypes (Dator, 2009).

CHAPTER

07

Conclusion

7.1 Conclusion

This research paper emphasizes the importance of developing a future-oriented mindset in children. A transformational change is necessary in the beliefs, purpose, methods, and contexts of learning, and educational systems can shape this new curriculum to critically challenge the future. Being futures literate means having the skill to better understand the role of the future in what people see and do. It empowers the imagination, enhances the ability to prepare, recover, and invent as changes occur. Engaging in strategic foresight, in elementary education can enhance a learners' critical thinking ability to promote exploration of diverse perspectives and challenge the status quo. Futures Thinking emphasizes resilience, which is crucial for children to thrive in an uncertain and ever-changing future. Therefore, it is essential for education to evolve in innovative ways to support these changing futures.

For students to become actively involved in all aspects of life, they must learn to navigate through various contexts that involve uncertainty, such as different time periods (past, present, future), social environments (family, community, region, nation, and world), and digital environments. Furthermore, they should also interact with the natural world and understand its fragility, complexity, and significance (OECD, 2019, p.5)

As I explored the Future Play Toolkit, I developed it to support educators who are new to Futures Thinking and introduce the fundamental concepts and critical design questions of *What, Why, How, When, And Where*. The Toolkit is organized into four key sections, each focused on a specific aspect of Futures Thinking - gathering intelligence, exploring the dynamics of change, describing what the future might be like, and co-creating an artifact to solve a problem. This provides a starting point for educators to gain a better understanding of the future and how it can be shaped. It is built on the premise of being modular and adaptable to integrate additional Futures Thinking methodologies and tools for different age groups. It is a platform to exchange ideas, to investigate, and contribute to a changing learning environment through collaboration.

As a parent, I wish to democratize the future and empower every child to confidently explore, comprehend, and act on it. Granted a next phase to this study, I would like to scale interviews and industry expert guidance to confirm or challenge the findings, introduce the toolkit to a small number of educators, and based on response, feedback, and their input, potentially present it to the Ministry of Education for further research. An interesting adaptation to this toolkit would be to use it across different educational landscapes, including my home country, India. I believe that Futures Thinking can help tap into the full potential of future thinkers and leaders, which is crucial in a rapidly and ever-changing world.

This paper is just the beginning of my story of exploring the potential value of teaching Futures Thinking to children. In this light, I would like to encourage our children to have the ability and the agency to imagine their preferred futures. Since there is not a definitive "correct" vision of the future, any notion or concept, no matter how unusual or seemingly insignificant, it can serve as a starting point for generating innovative ideas and transformative changes that will have a lasting impact on both children and the future worlds they will inherit (Mack, 2011b).

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Figure 5:

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Figure 7:

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Figure 8:

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Figure 9:

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Figure 10:

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Figure 11:

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Appendix

The Future Play Toolkit

FUTURE PLAY

A Futures Thinking Toolkit
for Elementary Education

FUTURE PLAY

Introduction to the Toolkit

Welcome to Future Play, a comprehensive resource, a toolkit designed to support educators who are new to Futures Thinking. Its primary aim is to introduce the fundamental concepts of Futures Thinking and explore the critical design questions of what, why, how, when, and where.

To achieve this, the toolkit is organized into 4 key blocks, each focused on a specific aspect of Futures Thinking: gathering intelligence about the future, exploring the dynamics of change, describing what the future might be like, and co- creating an artifact to solve a problem.

By providing a step-by-step guide to each of these areas, the toolkit helps educators gain a better understanding of the future and how it can be shaped. This resource is designed to help educators foster Futures Thinking skills in their students or learners. Through this toolkit we endeavor to enable learners to develop their own creative confidence and inspire others, take risks, and persist through challenging situations. It is a way of exploring Futures Thinking through a conversation and facilitated delivery into the classroom. It does not require any prior experience in Futures Thinking.

It is a way for educators to explore the idea of “Futures” through a conversation and facilitated delivery into the classroom, with no prior experience. Through this approach three higher order thinking skills of

1) Systems Thinking 2) Divergent Thinking 3) Futures Thinking

1). Systems Thinking is a discipline for seeing wholes rather than parts, for seeing interdependencies rather than things, for seeing patterns of unbalanced change rather than static "snapshots" of equilibrium (Strong & Bishop, 2011).

2). Divergent Thinking, another crucial aspect of Futures Inquiry, involves generating creative and problem-solving ideas openly. A divergent thinker exhibits fluency, flexibility, and originality while producing ideas in a short period (Strong & Bishop, 2011).

3). Futures Thinking is the third component of Futures Inquiry and is characterized by its multi-disciplinary and global approach, as the future is shaped by changes. It involves a reflective practice that considers the potential range of future possibilities in any field of study. The aim of futures thinking is to pave the way for a better tomorrow for individuals, communities, and future generations by actively studying the future (Strong & Bishop, 2011).

In the toolkit created, we emphasize on the idea of "Futurizing" assignments to add a dimension of richness and authenticity as learners build anticipatory thinking skills and mental preparation for their future. Futurizing assignments help students mentally prepare for their future. Jerome Glenn (1972) characterizes the objective as an attempt to get learners to develop *a way of thinking* which will help them look beyond today and anticipate what they may be faced tomorrow (Strong & Bishop, 2011).

Glossary
Some activities reference the glossary definitions at the end of section 4.

Time
To be determined by the facilitator. 20-30 minutes (minimum).

Keywords
Foresight, Experiential Futures, Facilitation, Futures Thinking, Participatory Design, Play, Collaboration.

Grade Level
This toolkit is designed for grades 3 & 4, approximately age 8 - 10 years.

Aim
Future Play inspires students to recognize their individual and community roles in shaping the future. This toolkit will not offer a single solution for the future, but instead will ask learners to envision and share futures that make sense to them. To an educator, it serves as a conversation starter and promotes the value of Futures Thinking to the classroom. The objective of teaching futures is dual in nature - to comprehend and contextualize the changes taking place in our world, and to establish a connection between the *present* and the *future*.

Skills
As a facilitator, it is important to understand that to think about the future effectively, participants need to develop specific metacognitive skills. These skills include critical thinking, systemic understanding, empathic reasoning, and creative thinking. Additionally, they need to be able to anticipate, be flexible, establish relationships, and utilize their imagination. We have incorporated exercises/ activities that focus on developing these skills, while also encouraging collaboration, communication, and presentation skills among participants.

Outcome
The outcome of the toolkit is to facilitate a conversation and provide insights into shaping participants' thinking and feelings towards creating their own future. Since the future doesn't exist yet, there are no right or wrong answers.

PROCESS	CONTENT	METHOD
DEFINE	**Recommendations to Define** (defining Futures Thinking in the classroom)	***Instruction*** An Introduction through defining what encompasses Futures Thinking.
IDEATE	**Let's Talk about the Future** **Let's Talk about the Past**	***Demonstration-*** ***In Class Exercises*** Facilitating a discussion through practice exercises.
EXPLORE	**The Art of Storytelling** **The Act of Prediction**	***Demonstration-*** ***In Class Exercises*** Exploring the What Would Happen narrative through imagination.
CO- CREATE	**An Artifact from the Future:** (a playful way to hone collective imagination)	***Demonstration-*** ***In Class Exercises*** Using a play based collaborative approach to work on an artifact.

Figure 1. Four Blocks of the Future Play Toolkit

Structure of the Toolkit

It is structured on a simplified design thinking process comprised of four main blocks. This toolkit is adaptable and can be used independently or even paired with a lesson plan. It is structured in a modular way, with different activities that could be independently pulled out or even integrated into specific subject areas such as language arts, science, social science, or even a deep dive into the future.

The toolkit is developed into 4 blocks:
DEFINE > IDEATE > EXPLORE > CO-CREATE

How to Use this Resource

Future Play is adaptable to your needs and those of your students. The activities presented can be done in any order or combination. Its application is supported by a set of resources and activities that explore the concept of Futures Thinking. The toolkit can be used independently or paired with a lesson plan.

Table of Contents

01

Define

Exploring the unknown

Recommendations to define Futures Thinking in the classroom. The first block focuses on gathering intelligence

1. Get Ready for a World of Change

An important motive for futures work is to anticipate change and be ready for it (Hodgson & Sharpe, 2007). While it is comforting to believe that things will remain the same, that's rarely the case. Change can occur unexpectedly, and it is crucial to be prepared and accept it. By embracing change, we can open ourselves up to new experiences and opportunities for personal growth. So, instead of fearing change, let's view it as an exciting journey of discovery.

Example

Being aware of change is important to adapt to new situations. It is akin to knowing that winter is approaching, and you ensure you have warm clothing and a shovel at hand.

2. Embrace Uncertainty and Endless Possibility

Do you ever wonder what the future might be like? Well, nobody knows for sure what will happen, but there are many different possibilities! This means thinking about all the different ways things could turn out in the future and getting ready for any of them. We begin to get more comfortable with the idea that there's no one "right" answer. We can imagine different possible futures and work towards the ones we want to see. We can also think about how our actions might affect the future and make choices that will help create the future we want.

Example

Narrate an example to the class, about how scientists challenged the debate of the Earth being round instead of being flat. When we learn about science, we should learn to focus on not getting the "right" answer, instead, on understanding the different ideas and theories.

3. The Past, the Present and Beyond

Have you ever thought about how what happened in the past can affect what happens in the future? Things that happened a long time ago can still have an impact on us today. When we think about the future, we also have to think about the past and the present. This helps us understand how things have changed over time and how they might continue to change in the future. Futures Thinking makes us aware of history and reflects on the process of change.

Example

Showcase an example to the class, by asking learners to imagine a way of communicating with one another. An easy example would be, how we used a flip phone in the past and now a smart phone to show how technology changes and improves over time. Learning about how we communicate with one another through a simple device, enables us to think about how it was relevant to the past, is to the present and the future.

Facilitator Tip for 03.

Use a visual tool or an image, to showcase how phones have progressed over time.

Other Topic areas could be explored:

How has transportation changed?

How has your favourite sport changed over time?

4. Thinking Long-Term: Making a Difference Through Sustainable Action

Futures Thinking is an important tool for envisioning what the world might be like in 10, 20, or 50 years. By taking a long-term perspective, we can consider the big picture and think about the consequences of our actions and decisions not just for today or tomorrow, but for future generations. Engaging in Futures Thinking can help us come up with innovative ideas that have the potential to improve the world. So, when learning about Futures Thinking, it is crucial to consider the long-term implications of different scenarios [1] and envision a better future for all.

Example

Narrate an example how Futures Thinking encourages us to consider the long-term effects of our actions on future generations, akin to planting a seed and watching it grow into a tree. To create a better future, it is vital to prioritize sustainable solutions that don't harm the environment or make things harder for future generations. This is similar to taking care of a garden to ensure its continuous growth and thriving for years to come.

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1 Scenarios in futures study help us understand different futures, different trajectories. It is a tool for building resilience in changing times, an exploratory path for innovation, a provocation to stimulate new thinking, a consensus building method and a story about what could be; a creative process.
The term "scenarios", now in common use, has come to denote stories or narratives of alternative possible futures. Herman Kahn (Kahn & Wiener, 1967) provided perhaps the earliest formal definition of scenarios as a term of futures art, "...a hypothetical sequence of events constructed for the purpose of focusing attention on causal events and decision points." (Curry & Schultz, 2009)

5. Thinking in Systems and Understanding Connections

Have you ever thought about how one small change can have a big impact on everything around it? When we think about the future, it is important to think about how different changes and actions can affect not just one thing, but everything around it. This is what we call systems thinking. It means understanding how everything is connected and how different changes can have both positive and negative impacts on the entire system. Thinking in Systems is a discipline for seeing wholes rather than parts, for seeing interdependencies rather than things. By considering these effects and consequences of various changes in a holistic way, we can make better decisions that benefit everyone. By understanding the wider implications of implementing solutions, we can work towards creating a better future for everyone!

Example

Let's narrate an example of wanting to build a new road. Encourage a discussion on good ideas, thinking about how that road will affect the environment, the animals that live nearby, and the people who live in the surrounding area, considering the implications, as a system.

6. More than 1 possibility

Have you ever thought about what the future might hold? Sometimes we talk about the future like it is already decided and there's only one way it can be. But there are many different possible futures! That's why we use the term "Futures Thinking" - it means thinking about all the different possibilities and being open-minded about what might happen. We don't know exactly what the future will look like, so we have to be flexible and adaptable if things go unplanned.

Example

As a class you might want to ask the learners, "What do you want to be when you grow up?" As a facilitator, you could hear the viewpoints, and point out the endless opportunity areas, and be open minded to explore multiple possibilities based on the learners' interests and passions.

For example, if a child chooses- love for animals, you could point out the various career opportunities of becoming a veterinarian, working at a zoo, or even be a marine biologist.

7. Curiosity and Imagination

By staying curious to discover new sources of change and looking to broaden perspective, one can engage with the world and shape the future they want to see. Futures Thinking involves being mindful of the surroundings to notice signs of change that point to different paths for the future. Imagination is the key to unlock a world of possibilities and brings in all sorts of new and exciting ideas that can shape the future, by using activities like drawing, writing stories, etc. to explore new ideas.

Example

As a facilitator, ask the learners to imagine walking in the neighbourhood and noticing the use of electric scooters. This is a sign of change, because in the past, people might have used bicycles or simply walked instead. By paying attention to this change, learners might start to think about how electric scooters could become even more popular in the future. As a class, try to think about what could be improved, or what new kinds of services could be created to support them.

8. Spotting Signals of Change

Signals can be anything that makes one curious and want to learn more. They could be a new technology, a news story, or even just something strange one notices. These signals give us a glimpse into the future and help us understand how the world is changing. By paying attention to signals and sharing our observations with

others, we understand what the future might hold. As the writer William Gibson said, “The future is already here, it is just not evenly distributed.” There are things happening now that provide clues about what the future might hold. By paying attention to them, we can be better prepared for what’s to come.

Example

As a facilitator, as the learners to imagine the use of riding bikes rather than cars in the neighbourhood. This could be a signal of a future where more people choose to bike or use other forms of transportation that are better for the environment. By paying attention to signals like one can start to imagine what the future might look like and make choices that help create the kind of future learners want to see.

9. Diverse Voices for a better Future

In Futures Thinking, it is important to include diverse voices and perspectives in the conversations about the future. This means hearing from people who come from different cultures, backgrounds, and experiences than our own. By listening to and learning from these diverse perspectives, we can create a more complete and accurate understanding of the world around us and come up with more creative and inclusive solutions for the future. So, let’s make sure we are including everyone in our conversations about the future!

Example

As a class share a concept or a story about how to make our city a better place to live in. Consider diverse perspectives and learnings from the children in the classroom. By listening to a diverse range of voices, we can create a vision for the future that works for everyone. Some questions to discuss can be based around, who is the city for? What are the uses? What is the ease of mobility within the city? Are we integrating our natural and urban worlds within this city? What do we want the future inhabitants of this city to relate to?

02

Ideate

Let's Practice

Material

For the class

Computer with Internet connection and projection capabilities and/or individual student devices,

For the Individual

Sticky notes, pens, pencils, paper, any art material like crayons or felt pens.

Future Play emphasizes that the future is not predetermined and that everyone plays a role in shaping it. The second block focusses on exploring the dynamics of change.

Now that we are done exploring the idea of Futures Thinking it is time, we put this to practice. The Future Play Toolkit prompts students to envision and share their own futures, rather than offering a single solution.

Figure 2

Note. AI-generated image. Futuristic Car

Figure 3

Note. AI-generated image. Futuristic Building

Activity 1

Let's Talk about the Future

What comes to mind when you hear the word "future"? By thinking about the future, we can better understand it and prepare with actionable directions and learn how each of us can affect the future.

Now is the chance to choose a topic for exploration. Will you focus on the future of transportation, food, sports, or a specific area of interest like the future of cars or soccer? The possibilities are endless!

Time

20-30 minutes

For this exercise, imagine you are in a time machine. Consider what will happen to the future of a particular subject in a given timeline (the next three months, or when a student finishes high school, or in a decade from now).

Activity and Prompts

1. Pick a topic such as "The Future of Cars" or "The Future of Skyscrapers". Imagine possible inventions.
2. Based on what is happening now, predict what might happen in this future.
3. Discuss the factors that are driving this change.
4. Identify and evaluate the benefits and problems associated with this future. You could prioritize one benefit or one problem.
5. Determine the most important aspect to consider for this future. Create a list of pros and cons on sticky notes.

Remember

- There is no right or wrong answer.
- There are endless ways to express yourself, including presentations, in-class writing activities, drawings, picture collages, storytelling, songs, poems, or simply starting a discussion. The possibilities for mediums are limitless. All you need is creativity!

Figure 4

Note. AI-generated image. Vintage Car

Figure 5

Note. AI-generated image. Futuristic Car

Activity 2

Now, Let's Talk about the Past. Can we truly understand the Future without understanding the past?

You may choose to continue with the same topic in section 1 OR pick another topic of your choice. Our choices have shaped the world we live in today, as well as the dreams we have for our own futures. Let's take a moment to reflect on how things were different in the past and how they have changed. By understanding that change is a normal part of life and being aware of it, we can be better prepared for whatever comes our way.

Time

20-30 minutes

Activity and Prompts

For this exercise, let's compare life today to life in the past. The facilitator can project a collage of images to begin a discussion on the topic. Ask children to share any changes, differences they see, either by writing them on separate sticky notes or by discussing them out loud.

The picture prompts below offer insights into the past.

03

Explore

Let's Practice What Would Happen?

With Futures Thinking, we use the Future to change the Present.
The third block focuses on what the future might be like.

Activity 3

The Art of Storytelling

Storytelling can be a powerful tool for Futures Thinking, which is a way of exploring and envisioning possible futures in order to make better decisions today. One way to explore different possible futures is to create scenarios or stories that describe what the future might look like under different conditions or assumptions. This exercise is designed to help you think laterally and discover new ways of looking at the world. To create an excitement in the classroom, try to think of "What Would Happen?" question!

Time

20-30 minutes

Requirement

This exercise can be done either as a class activity with the educator serving as the facilitator or in smaller groups to promote collaborative skills. By working together and sharing ideas, learners can build important skills such as communication, teamwork, and problem-solving. Whether done individually or in collaboration through teams, Scenario thinking [1] can be a fun and engaging way to encourage students to think creatively and critically about the future.

Activity and Prompts

Exercise

The What Would Happen Narrative

1. Begin with a topic to work with, like the environment, technology, or transportation. Ask the students to come up with different scenarios for what that topic might look like in the future. You could use the prompts given or feel free to use your own topic.

Facilitator Tip

Through this activity educators can facilitate creative and problem-solving skillsets, in elementary grade learners, while also encouraging them to imagine and work towards a better future for themselves and their communities.

1 Scenario Thinking is the ability to entertain, mentally and emotionally, more than one 'reality'. Cognitive science refers to 'memory of the future' in which we visualize some, as yet, non-existent possible future situation (Hodgson & Sharpe, 2007, p. 123)

What Would Happen If we had flying cars?

What Would Happen If robots helped us with everyday tasks?

What Would Happen If you woke up as your favourite Superhero?

Through the above What Would Happen Question- An Expected, *cause-effect thinking* involves predicting what is likely to happen based on what we know about past events or current trends (Bishop, 2022).

2. Encourage the students to be creative and think outside the box. There are no right or wrong answers when it comes to scenario planning - it is all about imagining *What Would Happen*.

3. Another way of moving this story forward is through *Alternatives, contingent thinking* means considering different possibilities or outcomes that could happen instead of what we expect. This helps us prepare for unexpected events and be more flexible in problem-solving (Bishop, 2022).

Example
What might happen to flying cars instead of what we expect?

4. Moving forward use the story now, to talk about the "Preferred, value-based thinking" which involves considering what we want to happen in the future based on our personal values and beliefs. It is a way of setting goals and working towards a desired outcome (Bishop, 2022).
Example
What would we want this future of flying cars to serve?

5. Once they've come up with their scenarios or stories, have them present to the class or group. This can help them build public speaking skills and get feedback from others.

Facilitator Tip
Points 3 and 4 are optional and can be explored if needed.

Activity 4
The Act of Predictions

Let's make up weird, creative, stories on the spot!
Look around you and find something that catches your eye. It could be a tree, a bird, a rock, or anything else in nature. An example is illustrated below:

1. The facilitator starts the story by saying one sentence about the thing you see. For example, if you see a tree, you might say, "Once there was a tree that grew so tall, it touched the clouds."

2. Pass the story to someone else and have them continue the story with another sentence. For example, they might say, "The clouds were so soft, the tree felt like it was resting on a giant cloud."

3. Keep passing the story around, with each person adding one sentence at a time. You can add as many twists and turns as you like!

4. Encourage learners to make the story as weird, wacky, and wonderful as possible. For example, you might turn the tree into a magical tree that grants wishes, or the clouds into a fluffy kingdom ruled by a benevolent queen.

Facilitator Tip

The goal is to generate excitement and unleash imagination! Be creative and add an element of surprise to make the story exciting. Get the learners to include something extraordinary, cool, or even weird to add a sense of wonder to their tale.

04

Co-Create

An Artifact from the Future

A playful way to hone collective imagination.
The fourth block focuses on co- creating an artifact to solve a problem.

Exercise

Future Play is like a fun game where we imagine what the world might be like in an alternate future. We will use things you bring from home to create new things that could exist in the future. We will work together to turn ordinary things into cool, whacky and interesting objects from the future. Ask the learners to bring one or two things from home and to use their imaginations to create something new and exciting! There are a set of prompts to help you move on, in case you get stuck!

We follow a simple design process

Identify A Problem > Research The Context > Create And Build A Future Product > Share The Idea

Identify A Problem

Prompt Sheet

(Choose 1 from each section)

STEP 1

CHOOSE A FUTURE

- Beautiful
- Funny
- Creative
- High Tech
- Playful

CHOOSE AN OBJECT

- Clock
- Ribbon
- Toothbrush
- Mask
- Shoe Box

CHOOSE A SUBJECT

- Beautiful
- Health
- Transport
- Space
- Environment (Ocean / Forest)
- Friendship

Example for Step 1

High Tech > Mask > Transport

You may also choose to use the object you bring from home. Feel free to adapt

RESEARCH the context

STEP 2

2A

Learners are encouraged to discuss the uses of this new object and build interesting facts. You may list these on a sheet of paper.

Example

Used as high-tech mask to detect germs.

2B

Prompt Questions to think about

1. Who will use this product?

Example

Expand your audience like grandfather, a person who has allergies, etc.

2. Where would you wear this object?

Example

In the bus, while travelling

3. What does wearing this object make the Future feel like?

Example

Anxious, annoyed, funny, claustrophobic.

Prompt children to discuss their reasons and feelings.

Supplementary materials

Paper, cardboard, craft materials, coloured charts, art stationery like coloured pencils, sketch pens, sharpies, ropes or threads, candy sticks, glue sticks, tapes. Use what is available in your classroom. These materials are to support what the learner can use to make their object of the future.

Create And Build A Future Product

STEP 3

3A

Create a Statement

Students are encouraged to create, build, and work as a team facilitating a collaborative approach.
Use STEP 1 and 2 to create a Statement to begin building.

Example
High tech futuristic mask to spot germs, while travelling.

3B

Build a Future Product

Use STEP 1 and 2 to build your Future Product or Artifact.

Example
High Tech > Mask > Transport

Share The Idea

STEP 4

4

Working in a collaboration encourages new and exciting ideas, go ahead and share your artifact or Futuristic product to the world!

Future product or Artifact

Once the masterpieces, have been generated it is time to show it off. Ask the learners to share it and gain honest opinion.

Duration

Time to get creative! There are no time constraints or deadlines for this activity. Make sure to take your time and feel free to explore as much as you want. There is no right or wrong answer! The possibilities are limitless, and all you need is your creativity.

GLOSSARY

Meta cognitive Skills

Meta cognitive skills refer to one's ability to be aware of, understand, monitor, and regulate their own cognitive processes, as well as to use this knowledge to improve their learning and problem-solving abilities (Flavell, 1979).

Scenario Thinking

The essence of scenario thinking is the ability to entertain, mentally and emotionally, more than one 'reality'. Cognitive science refers to 'memory of the future' in which we visualize some, yet non-existent possible future situation (Hodgson & Sharpe, 2007, p. 123).

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Image Source (The Future Play Toolkit)

Figure 2 & 3

Fotor. (2023). *Fotor AI Image Generator.* [Digital Image]. https://www.fotor.com/features/ai-image-generator/

Note. Image generated using the prompt “Technology driven and futuristic cars,” by Fotor, 2023 (https://www.fotor.com/features/ai-image-generator/)

Note. Image generated using the prompt “ Futuristic buildings and green buildings,” by Fotor, 2023 (https://www.fotor.com/features/ai-image-generator/)

Figure 4

Gold, D. (2017, November 23). *Teal Volkswagen Beetle parked near brown house*. Unsplash. https://unsplash.com/photos/xBRQfR2bqNI

Figure 5

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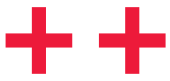

Future Play

Exploring a Futures Thinking Toolkit for Elementary Education

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