Inclusive Co-Design and Co-Creation: Enhancing Inclusive Design for learning Practices Through Parental and Student Engagement

This Major Research Project (MRP) report is submitted to the Ontario College of Art and Design (OCAD) University in partial fulfillment of the requirements for the degree of Master of Design in Inclusive Design, Toronto, Ontario, Canada - May 2025

By Elikem Akos Amevordzie

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Declaration

I declare that I am the sole author of this Major Research Project (MRP) which reflects the collective work of a parent and a student who are Co-designers in this project. Their contributions, knowledge, collective work, insights and ideas make up this project. This is a true copy of the MRP report, including any required final revisions, as accepted by my advisors Jutta Treviranus and Angelika Seeschaaf-Veres.

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Abstract

This research project addresses a significant gap in integrated Inclusive Education (IE) implementation: the absence of meaningful student involvement in developing personalized learning approaches. Through a co-design methodology, this study positions the Primary co-designer (a student with ADHD/ASD) as the central guide in creating an inclusive learning strategy that is both uniquely tailored to his specific needs and adaptable across diverse educational contexts relevant to him.

The project integrates multiple complementary frameworks to support the co-design process. Universal Design for Learning (UDL) principles provide flexibility in how information is presented and how students demonstrate knowledge. Experiential Learning Theory facilitates direct engagement with concepts through hands-on activities that avoided text-heavy materials that the student described as "can hurt me." Interest-Based Learning leverages the student's existing passions to increase engagement and motivation. Problem-Based Learning develops critical thinking skills through real-world applications to achieve deep learning. These frameworks are unified under Inclusive Design principles that recognize diversity as an asset while acknowledging inclusion as a challenge.

Central to this approach is the student's agency, expressed through their consistent assertion: "It is my choice." The co-design process honors this agency while balancing it with necessary structure and educational requirements. The parent (Secondary co-designer) provides crucial insights about knowledge transfer between contexts, noting that "English is in all the subjects," highlighting how reading comprehension difficulties affect performance across the curriculum. The facilitator helps navigate the delicate balance between providing appropriate challenges, balancing power, and maintaining engagement.

The strategy developed through this process is designed to be adaptable across different subjects, various learning environments, and with different facilitators or teachers. This adaptability addresses the parent's concern about transferring learning strategies between contexts while maintaining the personalized elements that make the approach effective for the student.

By prioritizing the student's voice in the Inclusive design process, this approach demonstrates how educational strategies can be both uniquely tailored to individual needs and adaptable enough to function in diverse contexts. This research contributes to the broader understanding of how meaningful student involvement can transform the implementation of inclusive education principles in practical, everyday learning environments.

Keywords: Inclusive design learning, Deep learning, co-design, personalized learning, inclusive education, ADHD, autism spectrum, student agency, Universal Design for Learning, metacognition.

Dedication

The Project is dedicated to my loving father, the late Surv. Vincent Bensah Amevordzie and my sweet mother the late Evelyn Yayra Zodanu. You were amazing parents and still supporting me even in your absence. You are both my inspiration; you are greatly missed and keep Resting in Peace.

Secondly, I dedicate this to my children, Selinam Analisa and Setriakor Ariela for their patience and support while I was away to pursue this program miles away from them. You both were my inspiration to pursue this and I am grateful.

Acknowledgment

To my Primary and Secondary Co-designers, who have opted to remain anonymous, thank you for your trust, honesty, and openness. My Master's research project would not have been feasible without the extensive contribution of your experiences, perceptions, analysis, knowledge, and commitment of time and resources.

To my advisors, Jutta Treviranus and Angelika Seeschaaf-Veres, I am grateful for your immense guidance, time and encouragement throughout the project, your suggestions and comments shaped this project till the end.

To all my teachers and professors during my time in Inclusive design 2023 to 2025 academic year, the international student office, the School of Graduate Studies, and the entire Inclusive Design community of OCAD University. It was an honour and privilege of learning from everyone, thank you for inspiring and influencing my perception and adding to my lived experience that will continue to shape my life.

To my classmates, thank you, you have all been an incredible source of support, inspiration, and encouragement. Great learning from all of you.

To Jude Vava Amevordzie, Elorm and Ernest Addae, Emmanuel M. Amevor for the extraordinary support, time and all contributions towards my academic adventure, words can not tell how grateful I am.

To my entire family, friends, and especially Emilia Appiah-Kubi family for being there to support me, I appreciate it from the core of my heart without your support back home this would not have been possible. Thank you for taking great care of my little ones, I am grateful.

Positionality

Recognizing that each individual is unique and different and functions in a variety of ways is the beginning of inclusion (Treviranus, 2018). My working history as a teacher and observing the uniqueness of the individuals I teach have enlightened me and I have come to the realization that we are individually unique as our fingerprints. My experience started at a Montessori school I taught casually between 2007 to 2011. I came to the understanding that activity is the underlying characteristic of the child's nature, which is expressed through their instincts, experience, interests and individuality according to (Achkovska Leshkovska & Miovska Spaseva, 2016), I further agree with Dewey's educational theory that says these activities represent a huge educational potential and starting point of the process of learning; but are not an end in itself, but I worry about the need for control, why do we not rather guide toward realization of goals predetermined with the individual that are participating in these activities.

I am a parent, wife, sister, product designer, craft maker, teacher, operations manager, graphic designer and a learner. I have personally home tutor my children and other kids having challenges in regular classrooms. My academic background as a Master's degree holder in Product Design from OSLOMET Norway and a Bachelor's degree in Industrial Arts from KNUST, Ghana; provides me with a basic understanding of design concepts which can impact positively inclusive design for learning and teaching environments.

I acknowledge that my lived experience and perspectives have been influenced over the years by intersectional factors such as beliefs, culture, ethnicity, social class, gender and all other environments I interact with. I am a Ghanaian born to a father who started as a teacher and later became one of the founding fathers of the Ghana institute of Surveyors and I was privileged to have my mother as a teacher and Librarian. I am a person with disabilities, Black African and immigrant and I am grateful to all immigrants, Black Africans and persons with disabilities who have worked together to support equity, inclusion, diversity, accessibility and uniqueness' in all aspects of their lives.

My unique experiences show some biases. Even though teaching and my education exposes me to the importance of inclusive educational practice as an insider, I am however, an outsider, now integrating into Canadian culture. I will need to understand how I can conduct my Master's Research Project (MRP) as an inclusive process. I, therefore, intend to use qualitative methods such as Co-designing and Co-creation, where the project is co-designer-led in an attempt to give agency to co-designer, broaden my understanding and Knowledge, break barriers, strengthen hidden voices and shift the power dynamics within the learning environment decision making (WEAVLY CO-DESIGN, n.d.). This process will enable me to both understand my research topic and integrate into Canadian educational culture, to contextualize the project. To this end, I have the assumption that I am about to deal with a community who cares a lot more about humanity, ethics, equity, diversity, accessibility ,inclusion and co-design could be a method to support the development of inclusive education in the case of edge users.

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Introduction to the Project

Background of the Project

> "Inclusive design recognizes that diversity is our greatest asset and inclusion is our greatest challenge."- Jutta Treviranus · March 29th, 2018

This Master's Research Project (MRP) is situated within the context of Inclusive Design for learning in Canada and partly, Integrated Inclusive Education, which has transitioned from segregation and exclusion to a philosophy embracing acceptance and integration of students with diverse needs in mainstream[1] Educational settings.

Over the years, inclusive education originated from social justice movements promoting equality and human rights and has become an essential aspect of modern educational methods, aiming to guarantee that all students, irrespective of their varied backgrounds and skills, have access to significant learning opportunities. (Inclusion Canada, 2020). The dedication to inclusive education is firmly established in historical progress toward equality and the acknowledgment of education as a fundamental human right (Right to Education Initiative, n.d.) (Inclusion Canada, 2020). To this end, it is imperative that nations endeavor to establish equitable learning environments by understanding the complexity and nuances of Integrated inclusive education across diverse contexts.

While Canada has made progress in implementing inclusive education, significant challenges remain, including:

1. Confusion between integration and true inclusion[2]
2. Inconsistent provincial regulations creating unequal access
3. Inadequate teacher preparation
4. Uneven resource distribution
5. Persistent attitudinal barriers

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[1] Mainstream education refers to the conventional educational approach used in most public and many private schools that serve the general student population. It typically follows established curriculum frameworks, teaching methodologies, and assessment practices designed to educate the majority of students.

[2] True Inclusion considers the full range of human diversity with respect to ability, language, culture, gender, age and other forms of human difference." Ocadu .This definition moves beyond simply accommodating disabilities to embracing all aspects of the individual to promote individual choice and avoid mismatch.

Notably absent from current Integrated Inclusive Education(IE) implementation is the meaningful involvement of students and parents in designing and implementing personalized educational approaches. This project addresses this critical gap by employing co-design[3] methodologies to develop personalized learning strategies hence Inclusive Design for Learning.

Challenges Faced by Co-designers

The Initial co-design (Phase 1: Understanding and knowing co-designer) revealed the direction to which this project will take. This project was entirely shaped by the Co-designers from the beginning to the end.

In this MRP, co-design methods were applied to create personalized learning experience with the Primary co-designer (Inclusive Design Research Centre (IDRC), n.d.-b; WEAVLY CO-DESIGN, n.d.). This collaborative methodology brings together a student, his parent, and facilitator (myself) to create a learning strategy that honours the Primary co-designer[4] (a student with ADHD/ASD)[5] while addressing academic requirements. However, this process is far from straightforward. The co-design sessions revealed a multifaceted set of challenges and tensions that each co-designer encountered from the get-go. Based on these challenges, the background of the project came to being. The background of the project highlights the complexities inherent in creating a truly inclusive Design for Learning explored with the Co-designers, which was guided by the Inclusive Design Framework.

The Student's Journey: Navigating a Neurotypical Educational Environment

During the recruitment process, the student was in an integrated classroom setting but moved to a specialized educational setting just before the co-design session began.

The Co-designers are an immigrant family new to Canada, with Arabic as a second language. They had challenges navigating the public school system in Waterloo region, leaving them no choice but to pursue a private Neurodiverse Education Centre that supports mental health & fosters inclusive learning. These challenges are further elaborated in Phase 1: Understanding and knowing the co-designer. For the Primary co-designer, the educational environment presented numerous obstacles that needed to be negotiated daily. Primary among these is attention regulation, which is the ability to sustain focus on non-preferred tasks

[3]Co-design in this project is by allowing users to become active participants in the design process by facilitating their direct input into the creation of solutions that meet their needs, rather than limiting users to the role of research subjects or consultants in traditional research.

[4] Primary co-designer is one student with ADHD/ASD experiencing learning and behavioural challenges in a classroom. Student in this project is used interchangeably with Primary co-designer.

[5] ADHD (Attention-deficit/hyperactivity disorder) and ASD (autism spectrum disorder) (Cleveland Clinic, n.d.).

while managing environmental distractions. When faced with text-heavy materials in a language that is not their first, the student expresses that "a lot of words...can hurt me," revealing how cognitive processing differences can transform assumingly 'normal' academic tasks into genuinely overwhelming experiences. This has prevented him on focusing on reading and comprehension activities. This challenge led us to introduce Experiential Learning.

Communication barriers further made it difficult for the student to participate in activities. Articulating precisely why certain tasks are difficult requires a level of metacognitive awareness that is still being developed. Instead, the student sometimes resorts to avoidance behaviors or topic-shifting when confronted with challenging content. This created a situation where the student needed to participate in designing solutions for problems, he struggles to describe hence the introduction of Problem Base Learning and Interest Base Learning through co-creation and co-design.

The most significant challenge was when the Primary co-designer makes effort to balance structure and autonomy. Throughout the sessions, the student repeatedly asserts, "It is my choice," demonstrating a fundamental need for agency. Yet he benefited from clear boundaries and structured learning frameworks which was done together with him. Finding equilibrium between these seemingly contradictory needs represents a continuous challenge in the co-design process hence the introduction of UDL principles.

The Parent's Perspective: Present and Future

The Secondary co-designer[6] (Parent) participating in co-design faced their own set of complex challenges. Foremost among these are reconciling immediate concept principles with long-term developmental goals. As the parent expressed, "I don't want him to only think on a specific topic," reflecting the concern that while interest-based learning is engaging, it might limit broader intellectual development. The Facilitator acknowledged that the Parent constantly navigated between supporting their child's current interests and ensuring he develops the needed strategy for future success. Keeping in mind the preference of the parent wanting the student to be in an integrated inclusive classroom setting eventually.

Knowledge transfer also presented another significant barrier for the parent. Strategies developed during the co-design sessions are unique to the Primary co-designer but should be adaptable to other contexts, for example different subjects, environments, and with different teachers, classrooms and schools. The Secondary co-designer bears the responsibility of ensuring continuity, working to apply scaffolding techniques across diverse settings while lacking the specialized training to do so. The parent brought crucial insights about how learning transfers between different contexts. "The issue is that English is in all the subjects," highlighting how reading comprehension difficulties affect performance across the curriculum.

[6] Secondary co-designer is a parent of the learner or student involved in the project. Parent and Secondary co-designer is used interchangeably in this project.

This perspective kept the co-design process focused on developing a strategy that can be adaptable rather than an isolated plan.

Additionally, the parent faces the emotional labor of setting realistic expectations. The desire to see rapid progress must be balanced with acceptance of their child's unique developmental timeline. This requires continuous recalibration of goals and a willingness to celebrate incremental progress rather than focusing solely on standardized benchmarks.

By emphasizing student agency, parent collaboration, and tailored learning approaches, this research aims to create effective strategies that could be adapted in other educational environments by the Primary co-designer. This aligns with the foundational principles of Inclusive design and Integrated Inclusive Education that prioritizes full participation, social cohesion, and the development of supportive learning environments that honor diversity and promote success for all students (see Appendix L).

My Experience as a Facilitator: Structure, Flexibility, and Progress

I explored a complex domain with my knowledge about teaching, product design and inclusive design. In determining the background, we engaged in responsive adaptation by adjusting approaches in real-time based on the student's changing needs while still maintaining progress toward established goals. When a planned reading comprehension activity becomes overwhelming, the facilitator pivoted immediately, also incorporating the student's interest in cooking to make the content more accessible.

I realized that creating effective scaffolding represents another significant challenge. Abstract concepts like "main idea" and "key details" must be transformed into concrete, accessible frameworks without oversimplifying the underlying skills being taught. We worked together to develop visual supports and representational frameworks (like comparing text structure to a recipe) to bridge this gap.

The most stimulating activity for me is the delicate balance between maintaining engagement and providing appropriate challenge. When I push too hard, and the student disengages; make tasks too simple, and growth opportunities are missed. As I noted, "I believe that if we insist on doing the comprehension, he might be overwhelmed, which is not a good thing for him, so let's ask him what he wants to do and what would make it easy for him." This constant calibration requires both technical skill and interpersonal sensitivity.

Collaboration within Different Perspectives

Beyond individual challenges, systemic tensions had to be navigated within the co-design sessions itself. Developing shared understanding across Co-designers requires creating common language and aligned expectations. sometimes the parent focuses on academic

transfer, while student prioritizes autonomy which led to us finding consensus through nuanced negotiation.

Traditional educational hierarchies positions the facilitator as the expert, the parent as the advocate, and the student as the recipient of services. But in this research project, co-design requires disrupting these patterns to ensure all voice, especially the Primary co-designer's voice meaningfully shapes the process. This will be revealed in the subsequent sections, a redistribution of decision-making authority did not happen automatically but an intentional space-making and power-sharing was created by allowing the Primary co-designer to choose if he wanted the Secondary co-designer to be part of his sessions, of which he said 'No' and allowing him to make his own choices.

The first session also showed there was limited time to explore complex or detailed topics. Our discussion about creating customized reading guides and the selection of which comprehension passages worked best with primary co-designer, demonstrates how much time it takes to co-design effectively.

Choosing to continue with Co-Design

After understanding our experiences and challenges observed, we agreed to co-design. Articles regarding the approaches revealed in the background were sent to the Secondary co-designer to have an in-depth understanding of the concepts that guide the project. She further explained the process to the Primary co-designer and prepared him for each co-design session. First of all, metacognitive prompting was prioritized, helping the student to articulate his learning experiences more precisely. Second, structured choice frameworks to balance autonomy needs with educational requirements. Third, multimodal learning approaches to reduce cognitive load while maintaining academic rigor. Fourth, open conversation to build trust and reduce frustration.

The primary goal of the Secondary co-designer is for the Primary Co-designer (a student with ADHD/ASD) to reintegrate into an inclusive mainstream[7] classroom successfully, but however, the Master's Research Project aims to co-design a personalized learning strategy with her grade 8 child as the Primary Co-designer and his parent as the Secondary Co-designer to examine the experiences and effectiveness of co-created individualized learning strategy. The overarching goal is to co-create an inclusive learning strategy uniquely tailored to the Primary co-designer while remaining adaptable across diverse contexts.

This approach emphasizes three key elements: student agency (giving the student voice and choice in their education), parent collaboration (working closely with families), and tailored learning approaches (customizing educational strategies to meet the student's specific needs).

[7] Mainstream education refers to the conventional educational approach used in most public and many private schools that serves the general student population. It typically follows established curriculum frameworks, teaching methodologies, and assessment practices designed to educate the majority of students.

The research aims to develop effective strategies that could be implemented by the primary Co-designer in his current educational settings. This approach aligns with Inclusive Education (IE) principles that prioritize full participation for all students, social cohesion within diverse classrooms, and the creation of supportive learning environments that value diversity and promote success for everyone involved.

Most importantly, co-design requires patience, flexibility, and a willingness to embrace the complexity inherent in truly collaborative processes. When a student can assert "it's my choice" while still engaging with challenging content, when a parent can see progress despite a non-linear path, and when a facilitator can adapt in the moments without losing sight of long-term goals then we can say, these represent the small wins that collectively transform educational experiences. By acknowledging these challenges honestly, we can design more realistic and effective approaches that are inclusive and unique to each individual.

Design Research questions

The following research questions guided the inclusive co-design project.

i. What are the benefits of adapting personalized instructional strategies from the co-designing perspective of a parent and student with ADHD/ASD to personalize learning and behavioral strategy? If any?

ii. How can the Primary co-designer explore and activate their agency in subject areas where he need support?

iii. How are school principals currently involving parent and students in modifying content, process, and product used in the class to meet individual student needs while maintaining inclusivity in a Canadian classroom setting?

iv. What challenges are encountered when integrating into a regular classroom in Canada from the viewpoint of the Primary Co-designer (specific student with ADHD/ASD) and the Secondary Co-designer (Parent)?

Research Goal

This Project aims to co-design a personalized learning strategy with a student with ADHD/Autism spectrum in grade 8 as the Primary Co-designer and his parent as the Secondary Co-designer to examine the experiences and effectiveness of co-creation in relation to the implementation of an individualized learning plan. The overarching goal is to co-create an inclusive learning strategy uniquely tailored to the Primary co-designer while remaining adaptable across diverse contexts.

Specific Objectives of the Co-design Project

i. To determine the challenges encountered in class and how they affect learning and well-being, with and from the perspective of the Co-designers.

ii. To examine how the student co-designer learns by giving him and his parent (Secondary co-designer) agency in the modification of content, processes, and products utilized in determining learning strategies.

iii. To co-create a learning strategy based on the interest of the student as the Primary co-designer with support from the parent as Secondary co-designer.

iv. To determine the success criteria and continuity plan of the co-created strategy with the Primary and Secondary Co-designers.

v. To document how to responsibly co-design the engagement beyond this research project inquiry to counter and eradicate potentially harmful or unproductive research practices.

Significance of the Inclusive Design Project

Co-designers will collaborate and co-create plans and strategies to mitigate their self-identified challenges. The findings hope to support individual plans, strategies and needs of the Primary Co-designer (student) in an integrated inclusive classroom setting and at home. The project also aims to provide valuable insights into the specific co-design process covered in this inclusive design Master research project and provide practical recommendations to the parent/ guardian, educators and researchers who are interested in alternative and personalized ways to support children with diverse abilities such as ADHD/Autism Spectrum in an integrated classroom setting. Further facets of adaptations that are required to make the educational system more supportive of edge users, in our case the students experiencing barriers, will come out of this project.

Organization of the Project

The master's research project report is organized into five parts. The first part is the introductory chapter which talks about the background to the project, the statement of the problem, the research questions and the objective of the project. In part two of the project is the literature review. The literature review is divided into conceptual, empirical and theoretical sections. Part three describes an overview of the methodology employed to undertake the project. Part four, the data captured is presented and as well the analysis emanating from it. The final part, five presents, the discussion, recommendations and conclusion.

Background Literature

This part of the project explored three aspects of relevant literature for the project. The initial part explores the theories used to guide the project in terms of analysis and interpretation of the findings. The empirical literature review also presented in Appendix K shows what other researchers have done in the field of inclusive education, thus identifying research gaps and outlining scholarly research problems that need to be addressed. This was done based on the fact that the Secondary Co-designer in the project intends to explore inclusive education. The conceptual literature review presented in this chapter seeks to lay the foundation to better understand the key concept relating to the project. The purpose of this is to enhance the understanding of the chosen Project area.

Conceptual Literature Review

The conceptual Literature Review talks about the concept of Inclusive Design for Learning - guided by the Primary co-designer (student), and how it interacts with Problem Based Learning, Experiential Learning, UDL Principles, and Interest Based learning (see Figure 1) to achieve Deep Learning and Integrated Inclusive Education. The facilitator dived deep into the concept of Inclusive education because the Secondary Co-designer's ultimate goal is reintegration of Primary Co-designer into a regular classroom (See Appendix L).

Inclusive Design for Learning: Centered on the Primary Co-designer

The diagram illustrates an inclusive design approach that places the student with ADHD/ASD (Primary Co-designer) at the center of the educational process, recognizing them as the only constant element while all other factors change. This framework addresses a critical gap in education: the lack of meaningful student and parent collaboration in learning strategy design.

The visual shows how systemic challenges (inconsistent regulations, inadequate teacher preparation), power dynamics (decisions made by external authorities), and friction points (attention challenges, task resistance, language, content, technology,) create barriers to genuine inclusion.

By centering the Primary Co-designer and their assertion of "It's my choice," the model depicts how teachers, subjects, environments, and other educational elements revolve around the student rather than forcing the student to adapt to rigid systems. The co-design process integrates theoretical frameworks with Problem Based Learning, Experiential Learning, UDL Principles, and Interest Based learning (see Figure 1) to achieve Deep Learning and create personalized strategies that are:

1. Unique to the student's specific needs
2. Adaptable across different educational contexts
3. Transferable between environments and subjects

This approach represents a fundamental power redistribution in education, honoring student agency while creating learning approaches that can be applied across diverse settings to achieve deep learning outcomes.

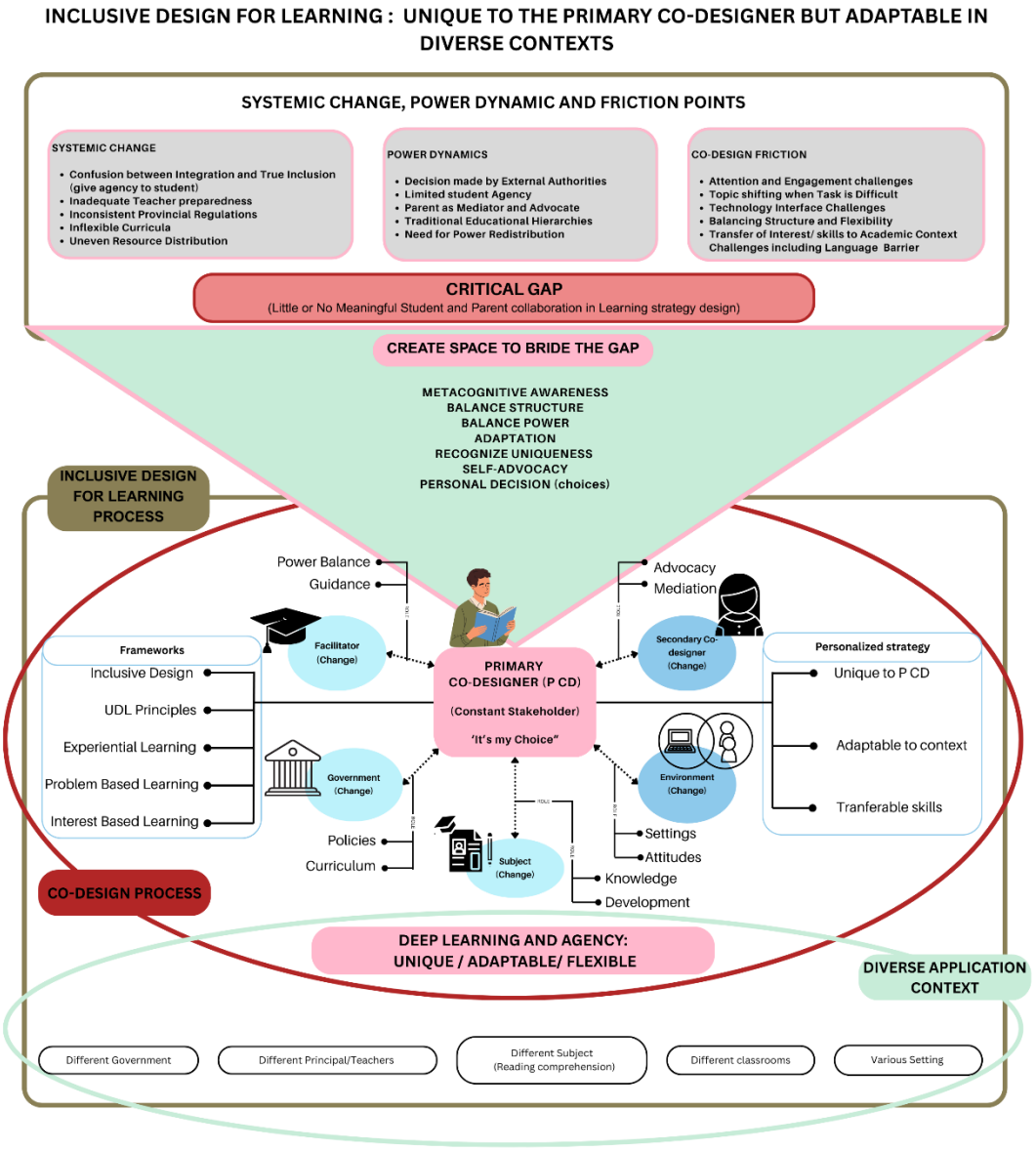

Figure 1 Inclusive Design for Learning- guided by the Primary co-designer (student): integrating UDL principles, Experiential Learning theory, Interest Based Learning, Problem Based Learning- systemic challenges, power dynamics and friction points.

Inclusive Design for Learning

Watkins et al., (2020) wrote that Inclusive Design for Learning (IDfL) is a dynamic, continuous practice and cultural approach to education that seeks to support the complete diversity and variability of learners. Saebones et al., (2015) noted that the rigid educational institutions prioritize standardization over individualization which presents structural obstacles for impaired students worldwide. Consequently, with an emphasis on adaptability, co-design, and learner-centered solutions, Inclusive Design for Learning (IDfL) provides a framework to solve the problems of societal structures that present obstacles for the inclusive learning environment.

In order to include disenfranchised learners in redesigned processes, IDfL uses student Co-designers (Treviranus, 2018). Deductively, vulnerable learners are more susceptible to rigid educational systems therefore; inclusive design turns passive-receiver models into active contributors. A dynamic, co-creative approach, inclusive design promotes lifelong and self-directed learning for everyone in order to address educational disparities (Watkins et al., 2020).
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Problem Based Learning (PBL)

PBL is a learning and teaching methodology, with the focus on allowing the learners the opportunity to solve real world problems (Duch et al., 2001). According to the authors, the PBL method allows instructors to structure their content in such a way that the whole of the content is geared towards providing space for the students to explore problems at their own pace and dictates.

Hung et al., (2010) mentioned the characteristics of PBL as student-directed and collaborative, incorporation of self-assessment as well as peer review, self-reflective, where teachers play only the role of facilitation. Hung et al., (2010) maintained that the core assumption of the PBL is that, in the process of solving real-life problems, learning automatically comes about.

Deep Learning

Deep learning is a concept applicable in the teaching and learning environment where both teachers and learners engage in fostering critical learning, discovery and knowledge construction as opposed to rote learning[8] (Biggs, J.B, 2003). According to the author, the

[8] Rote learning is a memorization technique based on repetition without necessarily understanding the meaning, where learners repeatedly review information until they can recall it verbatim. While efficient for learning specific facts, definitions, or formulas, it often lacks deeper comprehension and meaningful connections to other knowledge.

application of deep learning concept offers the benefit that allows students to evaluate evidence and distinguishing such from argument and conjecturing.

The concept of deep learning hinges assumptions. These assumptions are put forth by (Ramsden, P, 2003) as follows:

- There is the intention on the part of the learners, as aided by teachers, to understand any subject matter being taught by themselves.
- There is interaction with the content being taught through various means in a critical manner.
- Based on the previous knowledge of the learner, the new subject or topic being taught must be related to the knowledge base of the learner.
- It is important to identify patterns while also recognizing principles.

The project investigates Student co-designer's learning through enhanced agency. This promotes cognitive, emotional, and behavioral involvement and is consistent with deep learning concepts of active engagement and knowledge creation. Self-regulated learning abilities and metacognitive awareness are the results of students' involvement in choosing their own learning procedures. (see figures 3,4,5 and 6) on how deep learning was brainstormed.

Regarding the second objective of the study, it is expected that contextual learning and intrinsic motivation by working with parents will enhance co-created learning strategies based on students' interests. This approach supports the development of "knowledge-as-action" rather than "knowledge-as-information " consequently, consistent with the principles of deep learning.

The third objective involves determining success criteria and continuity strategies with both Primary and Secondary Co-designers, promoting metacognitive awareness and self-assessment capabilities on both sides. The project also emphasizes the importance of sustainability and adaptability in deep learning, fostering a growth mindset. The concept of deep learning provides a valuable conceptual framework for guiding these objectives, promoting critical engagement, meaning making, and knowledge construction.

The Educational Support Context Gap

This gap (see figure 2) was deduced based on literature review done to contextualize this project. (See Appendix K).

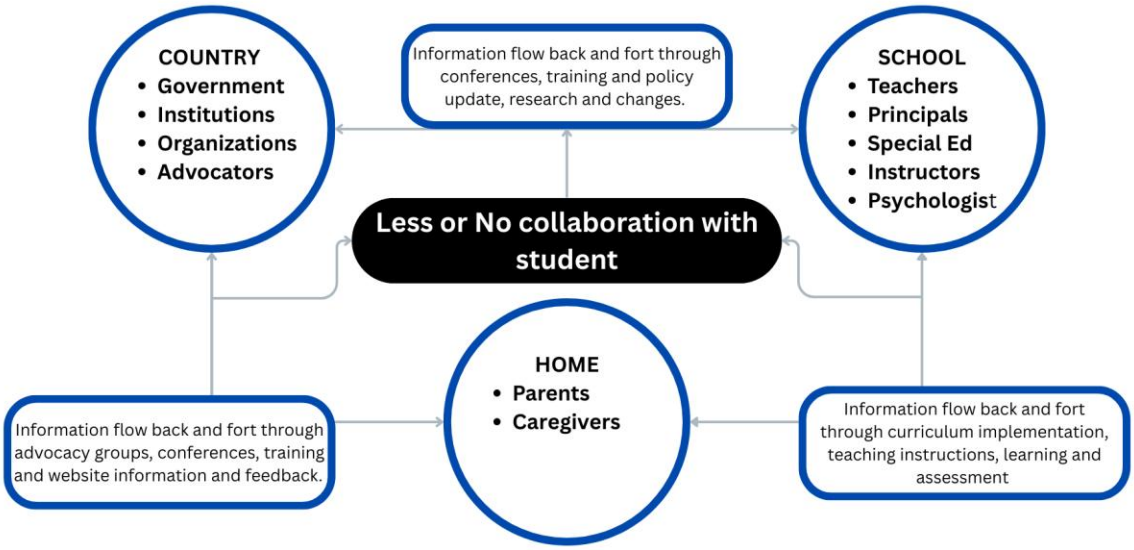

Figure 2 The Educational Support Context Gap deduced from the literature review for this project. In this gap the student is left out or has little input in the decision-making process and the parent represents the voice of the student in most cases. Students are used as a research subject instead of students being the primary decision makers when implementing educational policies that affect them directly. The users who are experts with lived experiences are left out in these scenarios.

Overarching Gap as brainstormed on Miro Board below

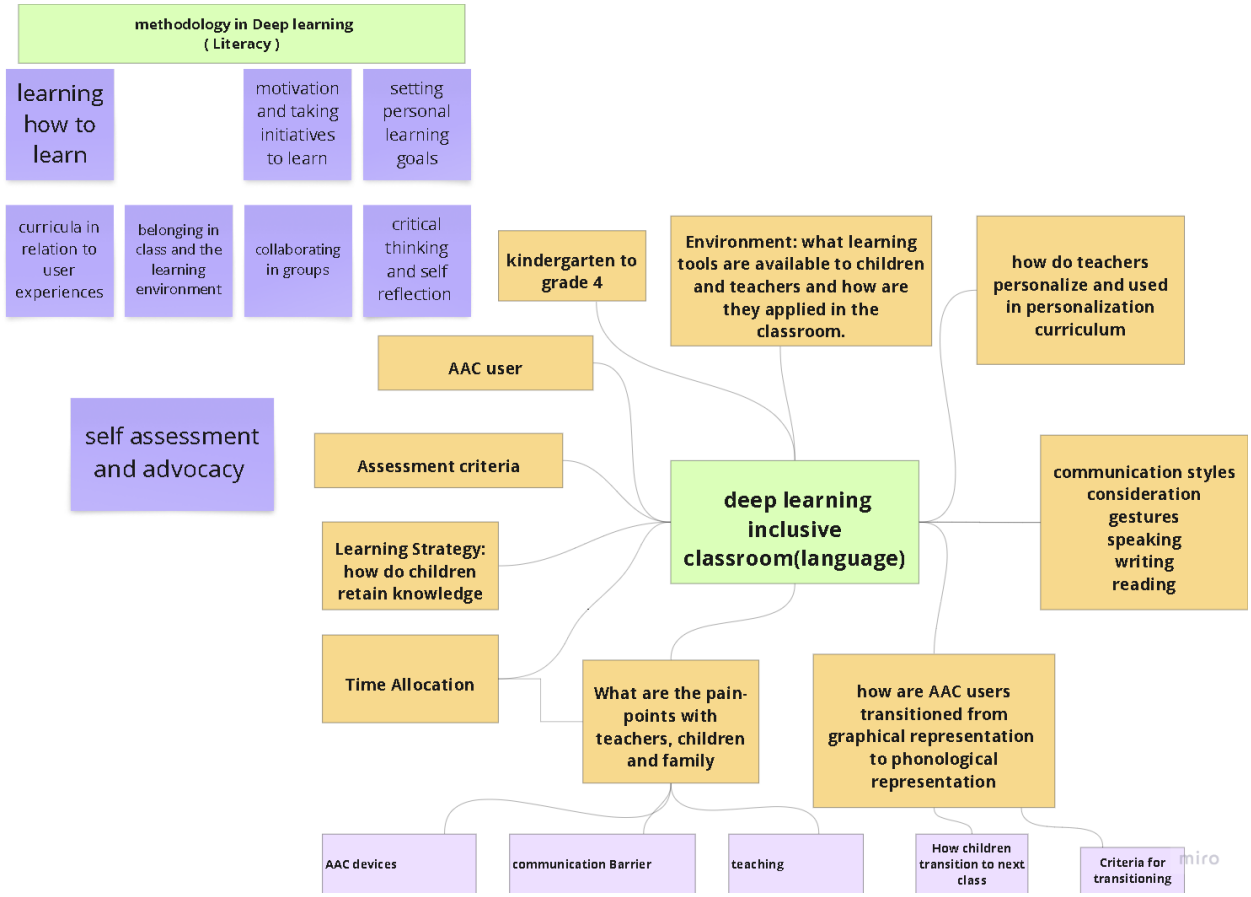

Figure 3 A diagram exploration of inclusive classroom in relation to deep learning (part 1)

Figure 4 A diagram exploration of inclusive classroom in relation to deep learning (part 2)

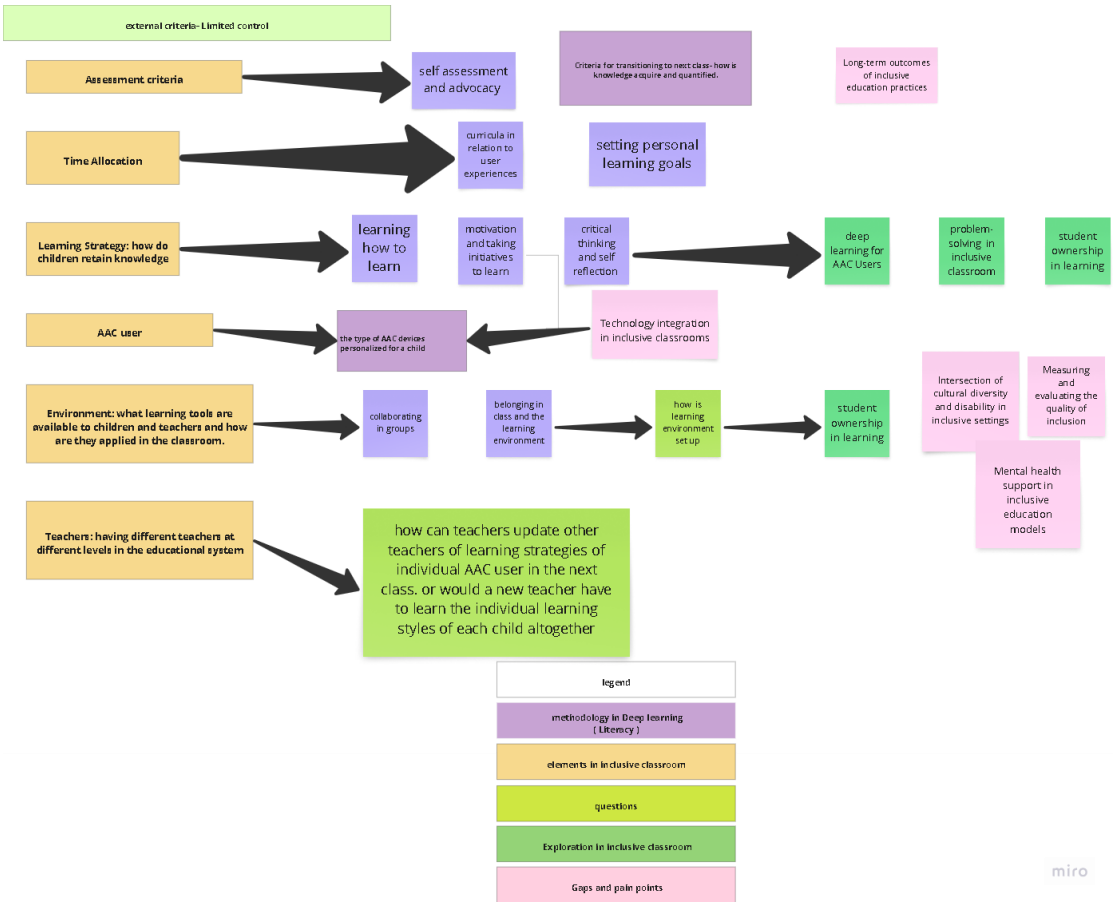

Figure 5 A diagram exploration of inclusive classroom in relation to deep learning (external criteria)

Figure 6 Internal criteria within researchers control narrowed down

Theoretical Framework

Theoretical frameworks are blue prints that guide a project, connecting abstractions with realities, by generalizing (Grant & Osanloo, 2015). Theories are statements that are used to explain how a particular event, phenomenon or actions come about (Ahiadeke, 2008). According to the author, theories are useful in the writing of academic and scholarly papers. Ahiadeke (2008) explained that theories are used to interpret the findings in research studies. In this MRP project, Inclusive Design for Learning- guided by the learner Co-designers integrates UDL, Experiential Learning, Interest Based Learning and Problem Based Learning frameworks to guide the project.

Inclusive Design Framework

This project utilized a co-design approach to direct the research process that actively engages a student as the Primary Co-designer and his parent as the Secondary Co-designer in the co-creation of personalized learning strategies in challenging subject areas within an inclusive educational setting. This methodology was based on the Inclusive design guide, a framework developed by Dr. Jutta Treviranus and the Inclusive Design Research Centre (IDRC)[9] team (Inclusive Design Research Centre, n.d.). The three dimensions of the inclusive design framework were used as the foundation approach in co-designing. These are,

1. Recognize, respect, and design with human uniqueness and variability. (Inclusive Design Research Centre (IDRC), n.d.-c).

2. Use inclusive, open and transparent processes, and co-design with people who have a diversity of perspectives, including people that can't use or have difficulty using the current designs (Inclusive Design Research Centre (IDRC), n.d.-e).

3. Realize that you are designing in a complex adaptive system (Inclusive Design Research Centre (IDRC), n.d.-d).

This approach encouraged co-designer to led the communication, trust and open analysis of the project. (Inclusive Design Research Centre (IDRC), n.d.-b; WEAVLY CO-DESIGN, n.d.; Wu et al., 2024). Above mentioned co-design strategies enable participatory approach in which Co-designers communicate their experiences, insights, and perspectives as edge users.

Universal Design for Learning (UDL) Principles

This project also adopts Universal Design for Learning as a framework to improve and optimize learning for the Primary Co-designer. The UDL framework, developed by CAST Inc., fundamentally

[9] Ideas - Inclusive Design Research Centre

shifts educational design by recognizing that barriers to learning primarily exist within environmental design rather than individual learners themselves. By incorporating flexibility into curriculum development from the onset, educators can create inclusive learning experiences that benefit every student, regardless of their learning preferences or needs. It is based on scientific insights into how humans learn (CAST Inc, n.d.). Rather than a one-size-fits-all approach, UDL recognizes the unique way each person learns and provides flexible pathways for education. The three core Principles of UDL are,

The Three Core Principles of UDL

Multiple Means of Engagement: The "Why" of Learning

This first principle centers on stimulating interest and motivation which are essential elements for deep and sustained learning. Educators implementing this principle create learning environments that offer meaningful choices and autonomy in learning activities. They enhance relevance by connecting content directly to learners' lives and interests while creating safe learning spaces by reducing threats and distractions. Effective engagement strategies maintain interest through varying levels of challenge, foster community through collaborative opportunities, and develop crucial self-regulation and reflection skills.

Multiple Means of Representation: The "What" of Learning

The second principle addresses the various ways in which educational content can and should be presented to accommodate different learning preferences and needs. Implementation includes offering multiple perceptual options across visual, auditory, and tactile modes. Educators clarify vocabulary, symbols, and syntax while offering alternatives for both auditory and visual information. They highlight patterns, critical features, and relationships between concepts, activate background knowledge, connect to prior learning, and support text decoding and mathematical notation comprehension.

Multiple Means of Action & Expression: The "How" of Learning

The final principle identifies that learners must have varied opportunities to demonstrate their knowledge and understanding. This includes presenting diverse methods for response and navigation of learning materials while ensuring access to appropriate tools and assistive technologies. Supporting multiple communication methods becomes essential, as does developing fluencies through graduated support levels. Educators guide goal setting, planning, and strategy development, assist with information management, and enhance capacity for progress monitoring.

The Transformative Impact of UDL

The power of the UDL framework lies in its appreciation that educational barriers typically stem from inflexible design rather than learner deficits. By proactively developing flexibility into curriculum design, educators create learning settings that work for everyone and not just those who conform to traditional learning models.

When fully implemented, UDL transforms educational spaces into inclusive environments where diverse learning needs are anticipated and accommodated from the beginning, rather than retrofitted as accommodations after barriers have already been encountered. This proactive approach not only benefits learners with recognized needs but creates an inclusive learning experience that work for everyone.

Experiential Learning Theory (ELT) and its Origin

Experiential Learning Theory states that learning is achieved by doing an action and then reflecting on the action in order to perfect and understand the said actions (Ecker et al., 2011). The focus of ELT is to highlight that experience is more important in the learning process, as compared to cognitive and behavioral aspects of learning (Kolb, 1984). The theory was propounded by David A. Kolb in 1984. The propounding of the theory was motivated by the fact that Kolb felt there was preference of abstract knowledge to practical activities in the learning process. More so, Kolb & Kolb, (2009) argued that, there are learning needs at work places where abstract knowledge is insufficient to resolve challenges.

The Assumptions Underlying ELT

There are assumptions that underlie ELT. These are as follows:

- **Relearning:** The individual learner has already learned a lot, and to be able to learn a new thing, they are relearning rather than learning from the onset. Consequently, learning must take place on the basis of the previous knowledge (Kolb, 1984).
- **Transformation:** Kolb (1984) learning takes place when experience is transformed into knowledge.
- **Development:** Learning brings about development and this is achieved through discovery of knowledge and then adapting to the new knowledge into the (lived) reality (Kolb, 1984).
- **Individual differences:** The learning process is different for each individual given that there are differences in psychological makeup of each person (Kolb & Kolb, 2009).
- **Social interaction:** Learning takes place by providing knowledge to an individual in social settings, where society and its members play mediating roles (Passarelli & Kolb, 2021).

Advantages of the ELT

The continuous usage of ELT is because it offers numerous advantages. ELT adopts integrative methodology that encompasses experience, perception, cognition, and behavior, providing an extensive comprehension of the interaction among thinking, feeling, perceiving, and acting (A. Y. Kolb & Kolb, 2005). Boud et al., (1993) stated that ELT promotes learner-centered education, highlighting the significance of direct experiences in the learning process, which enhances motivation, engagement, ownership and transferability into different contexts and learning challenges.

Eyler (2009) stated that other advantages of the ELT include its ability to enhance knowledge retention and practical application in professional education by involving students in meaningful experiences and encouraging reflection on their learning experiences. The ELT also promotes learning among diverse groups, thus enhancing inclusivity (Passarelli & Kolb, 2021). The authors posited that the theory is also known for its functionality of bridging abstract knowledge and practice while enhancing professional competencies.

The Disadvantages of ELT

Despite the advantages of the ELT, it has some drawbacks. According to (Miettinen, 2000) critics contend that ELT reduces learning to an oversimplified framework, as Kolb's cycle inadequately represents a complex, non-linear process that cannot be fully captured by a singular model. The theory is neglecting the significance of social, historical, and cultural contexts in the learning process, concentrating predominantly on individual cognition and psychology (Holman et al., 1997).

The ELT even though stipulates an inclusive framework, it has a weak empirical foundation to support its application. (Coffield et al., 2004) noted that the psychometric attributes of Kolb's learning style have been consistently scrutinized, and its validity is proving not to be held. More so, in traditional context of learning and teaching, the application of ELT is very challenging given that it takes lots of time and other resources to be implemented fully (Seaman, 2008). Even though the theory has some drawbacks, there are justifications for its application in this Project.

Justification for Using the ELT

The application of Experiential Learning Theory (ELT) in this research project titled "Inclusive Co-Design and Co-Creation: Enhancing Inclusive Design for learning Practices Through Parental and Student Engagement" is substantiated by several critical factors that correspond with the dynamic characteristics of Inclusive Education (IE) and the research's specific aims as well as with Universal Design for Learning (UDL) principles.

The fundamental principle of ELT underscores the importance of learning through experience and reflection, aligning closely with the participatory approach utilized in this project. As anticipated by (Arthur-Kelly & Foreman, 2020), the notion of Inclusive Education (IE) has evolved to a stage where equitable access to education for all children, especially those with disabilities, and deep learning

experience necessitates substantial involvement from both students and parents in educational activities. By prioritizing reflection on personal experiences, and designing by the user for the user, ELT enhances comprehension and adaptation of essential learning strategies in inclusive educational environments.

Moreover, the active involvement of a student and their parent as Co-designers corresponds with Kolb's (1984) claim that learning constitutes a transformation from experience to knowledge. This engagement is particularly pertinent to inclusive design, as it necessitates understanding and addressing the distinct challenges encountered by students, including students with ADHD or ASD, through insights derived from their lived experiences. The iterative feedback loops identified by (Carless, 2018) facilitate this transformative process, allowing Co-designers to refine and improve their learning strategies.

The focus on social interaction in English Language Teaching (Passarelli & Kolb, 2021) corresponds with the co-design strategy utilized in the research. Co-design fosters collaboration between students and parents, establishing a social environment that promotes a shared understanding and reciprocal learning (CAST Inc, n.d.). This participatory model recognizes individual differences and emphasizes the necessity of incorporating diverse perspectives, a vital component in developing inclusive educational frameworks that center and honor human uniqueness and variability (Inclusive Design Research Centre, n.d.).

Furthermore, the benefits of experiential learning theory—such as facilitating learner-centered education and enhancing engagement—are especially relevant in the realm of inclusive education, where motivation and ownership are vital for both students and parents (Boud et al., 1993; Eyler, 2009). This is essential for guaranteeing that strategies formulated through the research are both contextually pertinent and indicative of the genuine challenges encountered by families in inclusive educational environments.

In conclusion, implementing ELT alongside other relevant methods (see Co-design Process) in this project offers a comprehensive framework for comprehending and improving inclusive education practices via the co-design process. The emphasis on experiential learning, reflection, and social interaction cultivates an environment in which participants can articulate their distinct experiences, thereby fostering the creation of effective and inclusive pedagogical strategies. Considering the progression of IE towards a more cohesive and participatory framework, the principles of ELT are essential in fulfilling the project's aims while advancing equity and social justice in education.

Methods

This chapter outlines the research methodology, interpretive research paradigm, strategy, population, Recruitment method, sample size, data collection techniques, data types, analysis, reliability, validity measures, reflexivity and ethical considerations. The purpose of this chapter is to outline the procedure that informed the iterative co-design process of the entire research project.

Research Paradigm

The interpretive research paradigm[10] guided the analysis of the co-design sessions. This paradigm was selected due to its focus on comprehending the subjective experiences and viewpoints of individuals, rendering it especially appropriate for investigating complex interactions (Melnikovas, 2018) and significances that emerge in inclusive educational environments. This project does not aim for generalizability of finding but explore in detail the experience of a specific individual with unique challenges embedded in the larger educational system– posing various tensions and barriers.

The interpretive paradigm enables the Facilitator (myself) to thoroughly explore the lived experiences of experts[11] in the project, in my case the Co-designers. In application of this, a student and a parent during the co-design process shared their experiences, perspectives and approaches relating to the research questions. Consequently, the Co-designers of the project interpreted the contextual factors influencing their understanding of personalized learning strategies by concentrating on their narratives and distinctive experiences in the classroom and at home.

Research Methodology

The research employed a qualitative methodology to examine Co-designers' experiences and viewpoints regarding inclusive education practices. This method facilitated a deepened understanding of student and parent engagement in the co-design process, yielding insights grounded in their lived experiences. This method promoted active involvement, enabling Co-designers to articulate their thoughts and emotions candidly. Valuable data was collected through co-design sessions, informal conversations, interviews and participatory observation.

[10] The interpretive research paradigm (also called the interpretivist paradigm) is a philosophical framework for conducting qualitative research that emphasizes understanding human experiences and social phenomena through the perspective of participants. It was founded on the belief that reality is socially constructed and subjective, rather than objective and external.

[11] Expert in this research project refers to participants of the co-design session with lived experience.

(Creswell, 2014; Swain & King, 2022) mentioned that these methods reveal detailed issues in the context of this project and allow Co-designers to communicate easily in their natural environment. In this instance, the challenges and successes experienced in the co-design sessions were well explained by the methods. The authors also argued that the methods support a qualitative approach. To this extent the qualitative research methodology highlighted the significance of context, narrative, and subjective interpretation in improving inclusive education practices compared to quantitative and mixed methodological approach.

Research strategy

The theoretical framework and conceptual framework adopted were used in the project to determine Inclusive Design for Learning which was led by the student co-designer by integrating UDL principles, Experiential Learning, Interest Based Learning, Problem Based Learning.

This enabled us to explore diverse means to achieve inclusive learning experience. To this end, a student with ADHD/ASD led the co-design sessions and his parent supported prepping, interpreting in Arabic, guiding and directing sessions that the student allowed her to participate in. This allowed engaging in interactive activities that enabled them to identify and express their distinct challenges and preferences concerning learning in an inclusive environment which I facilitated. This method enabled them to actively influence the design process and ensured that the strategies developed were contextually pertinent and reflective of their lived experiences.

Also, the research project employed personal narratives to contextualize abstract educational concepts, enhancing the relatability of the data. Iterative feedback loops facilitated the continuous enhancement of co-designed strategies (Carless, 2018), giving the Primary Co-designer agency, accommodating varied needs, and aligning them with the values of the student and the parent. The co-design process prioritized agency, collaboration, personalization, and participant viewpoints to enhance inclusive education practices, thereby improving educational experiences for the student.

Co-designers

The project population comprised a student with Attention Deficit/Hyperactivity Disorder (ADHD) and autism spectrum disorder (ASD), integrated into regular classroom environments in Waterloo Region, Ontario, Canada, who acknowledges they are facing challenges in class. The choice of this population was based on the recognition that a child with ADHD or ASD possesses distinct traits and difficulties that require personalized educational strategies and therefore is an edge user[12] of

[12] Edge users, as defined by Jutta Treviranus, are individuals who exist at the margins or edges of mainstream design considerations - they are the outliers who cannot use or have significant difficulty using current designs, products, or systems that are typically created for the statistical "average" user. Treviranus describes them as "invisible and unsung

Regular classroom subject instructions. Also, the insight for One-Size-Fits-One (Inclusive Design Research Centre (IDRC), n.d.-a) which can encourage primary co-design to discover and choose the strategy that works best for him in context of this project.

Recruitment Process

Within the inclusive design process, recruitment process is different from standardized research process, it allows for flexibility. Based on the aim of this project an edge user who is experiencing a particular barrier was the target. The goal is not to create a generalizable design but to explore the existing system through co-design to provide insight on how to make the system more adaptable.

The Co-designers were recruited from Waterloo region, Ontario, Canada, to allow proximity to the facilitator for in-person co-design sessions. The student acknowledged having challenges in the classroom, and his parent acknowledged that her child has been diagnosed with ADHD/ASD and has challenges within an integrated classroom setting regarding learning and behaviour. The Co-designers were directed to Just Like Family Home Care (JLF) in Waterloo, Ontario, Canada (Just Like Family Home Care, 2024). This agency supports Seniors and persons with disability in their daily living.

The Secondary Co-designer, the parent, was contacted through email, recruitment invitation, consent, and attribution forms (see Appendix A) were sent to her before the start of the project to give them ample time to read and understand the documents. The first day of the co-design session was used to further discuss the recruitment invitation, consent, attribution, Assent Form for Youth, and consent to Child/Youth Participation forms with both the student and parent (see Appendix A, Appendix B, and Appendix C).

Furthermore, both the student and parent needed to be prepared to actively participate in the project, showcasing their dedication to the co-design process. This willingness was crucial for facilitating meaningful participation, enabling profound qualitative insights into the experiences and challenges encountered in inclusive educational environments. The Co-designers were not incentivized to participate in the project.

Data collection

The project employed structured co-design sessions for active engagement of both the child and the parent in data collection. The chosen data collection methods comprised interviews, participant-generated artifacts, and observational notes, all designed to capture the participants' rich narratives and experiences (Creswell, 2014). During the co-design sessions, the student and parent collaborated on tasks that allowed them to express their perspectives on personalized learning strategies and classroom behaviors.

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technology pioneers" who "have no choice but to risk the frontiers of technology design, and what they personally invest is profound and deep."(Jutta Treviranus, 2018)

The strategy generated was iteratively refined based on the feedback received about successes. The Facilitator (myself) discussed with the Primary Co-designer the areas of the strategy he needed changes. The Facilitator evaluated logistics and encouraged open collaboration.

The sessions featured practical activities that allowed participants to construct visual representations of their experiences, cultivating an atmosphere that encouraged them to share their insights. The utilization of visual aids and physical materials enhanced engagement and comprehension, allowing participants to express their thoughts and emotions concretely.

Furthermore, semi-structured interviews were performed to obtain comprehensive narratives of the participants' experiences concerning inclusive education. The interviews allowed the child and parent to articulate their narratives, describe specific challenges encountered, and explore their concepts (Abawi, 2013)for effective learning strategies. The adaptable interview format facilitated the spontaneous examination of pertinent subjects as they emerged during the discussions.

During the data collection process, the Facilitator carefully recorded observational notes to capture the interactions, dynamics, and context of the co-design sessions. This qualitative methodology documented both the results of the discussions and the engagement process, offering a comprehensive perspective on how co-design fostered significant communication between the child and parent. The integration of co-design activities, interviews, and observational notes produced a thorough data set that encapsulated the participants' lived experiences and guided the formulation of tailored educational strategies in inclusive classroom environments.

Data Analysis and Presentation

All the information we collected during our co-design sessions with the student and parent were analyzed using four different ways to understand the data. We did not just look at everything one way but instead, we combined different methods to get a more complete picture. The student and parent helped decide what was important to pay attention to. A process analysis was done to track how ideas developed over time during our sessions. The narrative analysis showed how the parent and student constructed and communicated their experiences, needs, and aspirations through storytelling during co-design sessions. The artifact analysis examined the tangible outputs created during co-design sessions, including sketches, prototypes, diagrams, and other visual or physical representations. This analysis traced how ideas occurred through these artifacts and how they evolved through iterations. Finally, the participatory analysis component actively involved the student and parent in interpreting the data collected during the sessions through structured reflection activities, Co-designers contributed their interpretations of emerging themes, assessed the implication of various findings, and validated or challenged preliminary conclusions.

This integrated analysis structure was particularly suitable given the collaborative nature of the research, where analysis parameters were determined with students and parents during the co-design sessions, reflecting the project's commitment to authentic collaboration and shared ownership.

Co-designed sessions data were interpreted through reflections (WEAVLY CO-DESIGN, n.d.) aligned with the success criteria, frameworks and theories that underpin this project . The reflection was on understanding the Primary Co-designer's need, logistic evaluation, inclusivity promotion, supporting open communication and documenting action items. After each session the action item was the reference point for refining the strategy. Data was interpreted with the help of the theoretical framework in the literature review that guided the project.

Reliability and validity

The project ensured reliability and validity through consistent data collection methods, such as co-design sessions, observation, visual Artifact, written reflection, digital captures and open conversation. This ensured comparability and accuracy in data collection. Validity was achieved through strategies like triangulation, which collected data from multiple sources and member checking, which allowed for cross-verification of findings. The combination of these data collection methods contributed to the project's credibility and trustworthiness, ensuring the findings accurately reflect Co-designers' experiences.

Ethical Considerations

The project focused on the welfare and rights of the student with ADHD and Autism Spectrum Disorder (ASD) and the parent. It ensured informed consent, confidentiality, and anonymity, with the Co-designers given the option to remain anonymous in the final report (Saunders, et al., 2015). Risk mitigation protocols were established to prevent emotional distress from discussing personal experiences. The co-designer had an option to not answer questions they were not comfortable sharing. Pseudonyms were used to represent identifiable information. Participation was voluntary, allowing Co-designers to withdraw at any point. Feedback and collaboration were incorporated throughout the process, allowing participants to take ownership over their contributions. These ethical considerations upheld the integrity of the research process, prioritizing the rights and dignity of participants while producing meaningful findings in inclusive education practices.

Co-design session schedules

The scheduling for this project was done by the co-designer and facilitator. The date and time to have the session were determined and agreed upon by Co-designers after each session (see Figure 7). The co-design sessions lasted 1hour to 2 hours with suggested 5-10 min breaks as and when determined by the Primary Co-designer. The sessions we divided into six Phases which are,

1. Understanding and knowing co-designer
2. Co-design session (Understanding Experience and Needs)
3. Co-design session (Strategy Exploration)

4. Co-design session (Strategy Development and Refinement)
5. Implementation
6. Co-design Session (Review and Refinement)

Co-design sessions	Status	Description	Start Date	End Date	Facilitator
Understanding and knowing co-designer	Done	introducing consent forms and get to know primary and secondary co-designer	Feb 14, 2025		Elikem...
Understanding and knowing co-designer	Done	conversation about experience, challenges, likes and dislikes	Feb 17, 2025		Elikem...
co-design session 1 (Understanding Experience and Needs)	Done	Student-led discussion about their classroom experience, Journey mapping of a typical school day and learning challange, Identification of key moments (both challenging and successful) and mom's views and experience on challenges, observed behaviors and needs.	Feb 21, 2025		Elikem...
co-design session 2 (Understanding Experience and Needs)	Done	Adapting interest base learning approaches through activities based on what works best for primary co-designer.	Feb 28, 2025		Elikem...
co-design session 1 (Strategy Exploration)	Done	Creating personalized stratagy to understand reading and comprehension through a various activities	Mar 2, 2025		Elikem...
co-design session 2 (Strategy Exploration)	Done	Creating personalized stratagy to understand reading and comprehension through a various activities	Mar 9, 2025		Elikem...
co-design session 1 (Strategy Development and Refinement)	Done	Improving on Created personalized stratagy to understand reading and comprehension	Mar 11, 2025		Elikem...
co-design session 2 (Strategy Development and Refinement)	Done	Improving on Created personalized stratagy to understand reading and comprehension . Also the student has agency to implement stategies in learning at home and in the classroom.	Mar 14, 2025		Elikem...
co-design session 2 (Strategy Development and Refinement)	Done	Improving on Created personalized stratagy to understand reading and comprehension . Also the student has agency to implement stategies in learning at home and in the classroom.	Mar 16, 2025		Elikem...
Implementation	Done	Child has agency to implement stategies in learning at home and in the classroom	Mar 10, 2025	Apr 5, 2025	Elikem...
Co-design Session 4 (Review and Refinement)	Done	Creating visual guides and reminders , naming the project, continuety of stratagy and use and defining sucess criteria	Apr 6, 2025		Elikem...

Figure 7 The Co-design session schedule followed in this research project.

Reflexivity

Coupled with ethical consideration, continued examination of my role in the research project was considered. My own background, assumptions, positionality and behavior may have an impact on the research process. To build trust, I shared my personal experience and stories about my child and how I withdrew her from school to give personalized teaching at home. At the beginning of the co-design session the Secondary Co-designer assumed I was teaching the Primary Co-designer. I explained and shared with her articles that explained to the co-designers what co-design and co-creation were about. I further explained what the inclusive design was and why I started this program.

Also, my experience as a teacher was a bias I had to overcome in this project. I had to reflect and constantly remind myself to give autonomy to the child. To mitigate that, the student was made aware that he had a choice and should speak up all the time. The student always said it's my choice, which was greatly encouraged.

My position as an immigrant and minority was also taken into careful consideration. My assumptions, that I am about to deal with a community who cares a lot more about humanity, ethics, equity, diversity, accessibility and Inclusion and co-design could be a tool to support inclusive education in the case of edge users were curbed aside. Reflecting on my subjectivity and knowledge as an outsider who had limited experience within the educational system in Waterloo Region. This was disclosed to the co-designer to know my level of knowledge and experience.

I acknowledged my identity, values, and perspectives shaped data collection, analysis, and interpretation. Constant reminder that the project was being done by the Primary Co-designer and together by providing support that allows agency and autonomy of his environment was examined through listening to recordings and questioning my biases after each session and adapting my facilitation process in a more inclusive manner.

Success Indicators and Achievement Strategies

The Success Indicators and Achievement Strategies was determined with co-designers based on their experiences in the co-design and co-creation sessions. Reflecting on the successes and shortfalls of the sessions were done by open interaction with Co-designers. These would guide future planning and implementation of project related to this project

1. **Student Engagement and Agency**
    - The student actively participates in the co-design process
    - Student demonstrates learning strategy and co-design
    - Increased self-advocacy
    - metacognitive awareness
2. **Parent-Student-Facilitator Collaboration Quality**
    - Balanced input from all stakeholders
    - Development of mutual understanding and shared goals
    - Improved communication patterns between Parent, student, and school
3. **Individualized Learning strategy co-creation and adoption by student**
    - Documentation of adaptations and modifications
    - Evidence of flexibility and responsiveness to emerging needs
    - Giving break time
4. **Academic**
    - Improvement in targeted academic areas
5. **Transferability of Co-Design Process**

- Documentation of replicable co-design methodology
- Identification of key components that contributed to success
- Development of guidelines for future implementation

Co-design Process

Co-creation and Co-design Process overview

A Co-design session schedule was created to structure the co-design process, this prevented wasting time and diverging away from the broad topic because the project time was limited and needed to be finished within a time frame. After understanding and getting to know Co-designers, we were able to determine the needed resources for an inclusive interaction. The environmental setting that would improve focus and enhance comfort was discussed based on the experiences of the Co-designers. A decision was taken to do it at home, where he would have more focus, and we could co-design with him in his natural environment. The co-design process involved a student with ADHD and ASD (Primary Co-designer), his parent (Secondary Co-designer), and a facilitator (myself). The project focused on developing personalized learning and behavioral strategies, particularly aimed at improving reading comprehension for the student. We examined how the co-design process aligns with the main objectives, success indicators, experiential learning theory, deep learning, Universal Design for Learning (UDL) principles, Problem Based Learning, and Inclusive Design Research Centre's (IDRC) co-design principles to achieve an Inclusive Design for Learning framework (see figure 8).

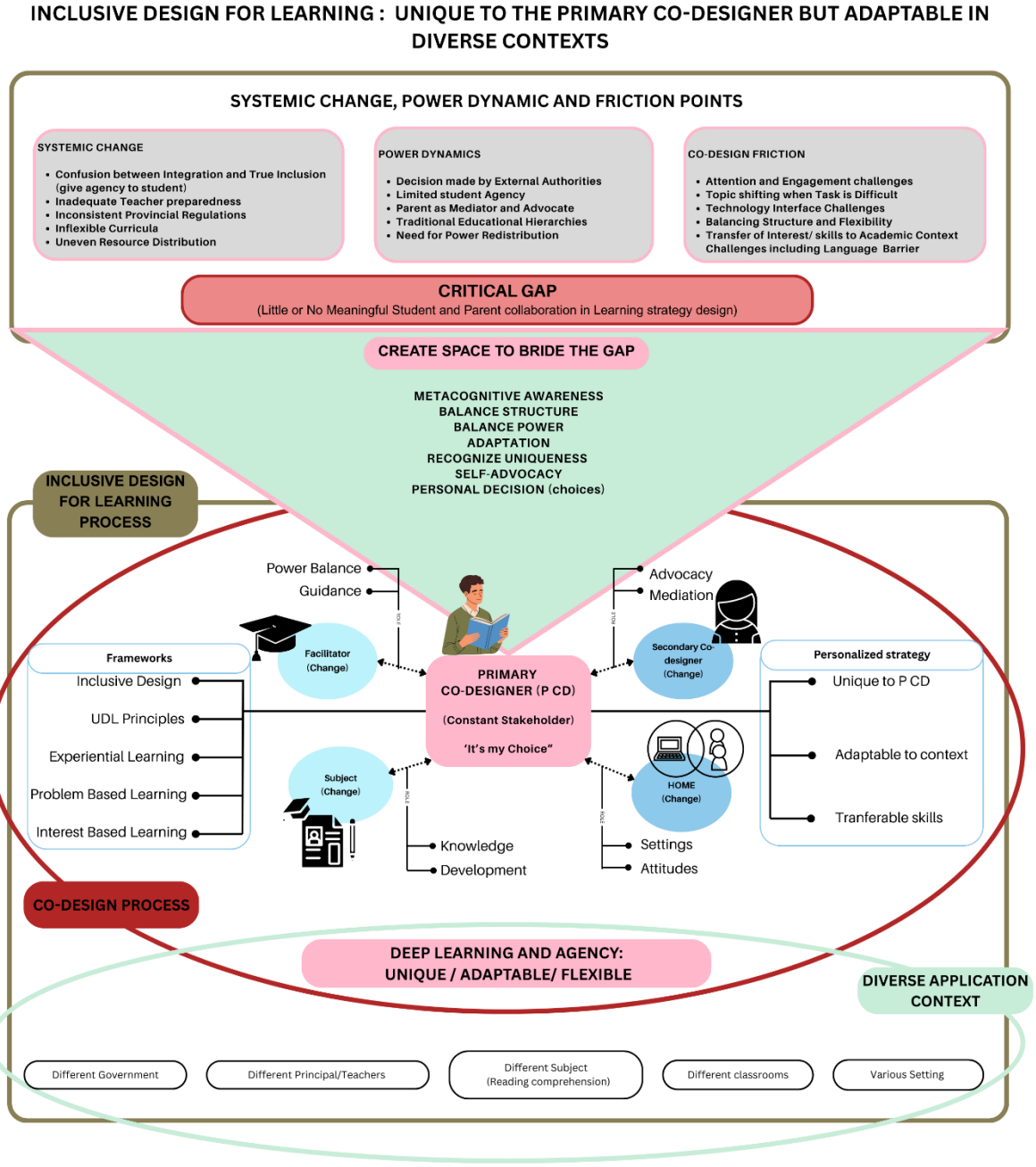


Figure 8 Inclusive Design for Learning- guided by the Primary co-designer (student): integrating UDL principles, Experiential Learning theory, Interest Based Learning, Problem Based Learning and Inclusive Design principles that is unique to the primary co-designer but adaptable in diverse contexts. -Systemic change needed, Power dynamics redistribution and Friction points between the different modes of system that create break points(This project)

Interest-Based Approach

The Primary Co-designer's capacity was built through interest-base approaches, according to CST saving article, students are more likely to pay attention, be engaged, process information more effectively and also increase performance, when subject matter aligned with their interests (CST Savings Inc, n.d.), by Identifying student's interests, strengths, and preferences, connecting learning strategies to the student's existing capabilities and framed challenges as design opportunities rather than deficits. The strategy for preferred communication style was also discussed. It was established that short sentences and simple communication styles were best to comprehend the project and he loved to cook, play with his pet, draw and decorate. We observed him cook twice in the project after the co-design sessions; this was his favorite thing to do. Also caring for and playing with his cat Romeo was what he loved doing. It was determined that cooking and Romeo took away his focus on other topics so we found a balance between interest that will make him focus on his challenge and ones that prevented focus.

Iterative Feedback Loops

Journaling was a simple technique used by the Primary Co-designer to collect data. His love for drawing and activities became apparent in his drawing and decoration during the festive season Ramadan hence the use of drawing as a technique for expression. We scheduled regular review meetings after each co-design session to evaluate the strategies effectiveness; it enabled us to have incremental adjustments based on real-time feedback for next sessions. The Primary co-designer made his choices throughout the project. His feedback was essential to progress from one phase to another.

Process Documentation

The use of mixed methods like observations, open conversation, project artifact discussions in this project allowed for detailed documentation. The co-designer's reflections were captured through approved media such as video, audio, notes, and journals. Co-designers agreed on Anonymity and therefore all collected data were anonymous using Pseudonyms. All identifiable information was removed from Primary co-designer's assessments reports and we only video recorded activities when without showing the face of Primary Co-designer. These supported us to track evolution of strategies and decision-making processes in this research project.

Support Mechanisms

Primarily, the Secondary Co-designer was the support system for the Primary Co-designer. She observes and practices the co-designed strategies with Primary Co-designer during Implementation

stages of the project; she also supported emotionally when the Primary Co-designer was overwhelmed. English was their second Language, and she provided interpretation in Arabic to increase imagination and understanding of activities. Both the Facilitator and Secondary Co-designer supported in prompting focus on reading to implement the drawing strategy. Co-design visual cues, check, reminders, and tools for accessibility were all created together with the Co-designers. Also, Romeo (cat), his pet, was a support partner throughout the research when he needed him. The primary co-designer often changes focus with conversations that calm him, like asking personal questions about pets, family, and friends, or other experiences, this allowed him to feel comfortable and not overwhelmed.

The Need for Power Distribution and Acceptance of Uniqueness for Agency

The project reveals a critical truth about the importance of Agency. Primary Co-designer (student) represents the only constant element across changing educational environments, while teachers, subjects, classrooms, and methodologies continually revolve around him. This reality necessitates a fundamental redistribution of power within educational systems to recognize and nurture the student's agency. When government policies, school administrators, teachers, and parents acknowledge the student's uniqueness and grant appropriate autonomy, they create conditions where deep learning can flourish. The Primary Co-designer's assertion, "It's my choice" perfectly summarizes this need for ownership in the learning process. Without this acknowledgment of agency, educational interventions risk becoming brief obligations rather than sustainable tools for growth.

The path toward genuine student agency requires a cascading acceptance of uniqueness that begins with governmental and institutional policies flexible enough to accommodate diverse learning profiles, continues through to teachers' willingness to adapt instructional approaches, and concludes with parents who advocate while gradually releasing control. The project demonstrates both successes and struggles in this power redistribution, particularly when the Secondary Co-designer notes concerns about institutional limitations while simultaneously supporting the Primary Co-designer in developing autonomy. The Secondary Co-designer functions as both mediator and advocate, challenging institutional assessments ("MG school is very bad school...this is wrong") while contextualizing the student's abilities and identifying systemic barriers to learning.

By recognizing that the Primary Co-designer must eventually navigate educational systems independently, all stakeholders can focus on developing his unique abilities for decision-making, self-advocacy, and metacognitive awareness. This distribution of power is not merely beneficial, but essential for deep learning that goes beyond any single educational context, allowing the student to

carry strategies and self-knowledge across the inevitable transitions of diverse educational environments. (See Power Dynamics) for a detailed reflection on how it played in the Project.

Co-Design and Co-creation tool bag

During the co-design session, tools were created together with Primary Co-designer to improve reading and comprehension. These tools were developed iteratively and gradually, and it guided the strategies created in the co-design sessions. Other tools that supported this session were fidget toys, emotion indicator toys, pens, pencils, colour pencils, scrap books, stories printed from the Lexia App, sticky notes, glues, ruler, Lego, snake, and ladder games.

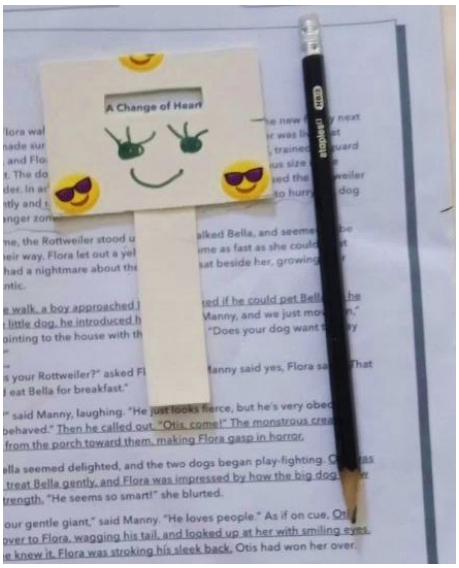


Figure 9 co-created reading frame tool to enhance focus. A pencil used as a pointer, drawing and writing.

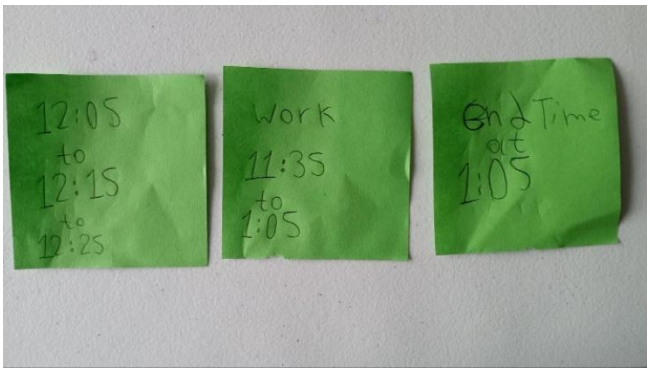


Figure 11 Image of how the duration of the co-design sessions were scheduled by the Primary co-designer.

Figure 10 Co-design session setup with all other tools

Figure 12 Comprehension and reading recipe created with Primary Co-designer

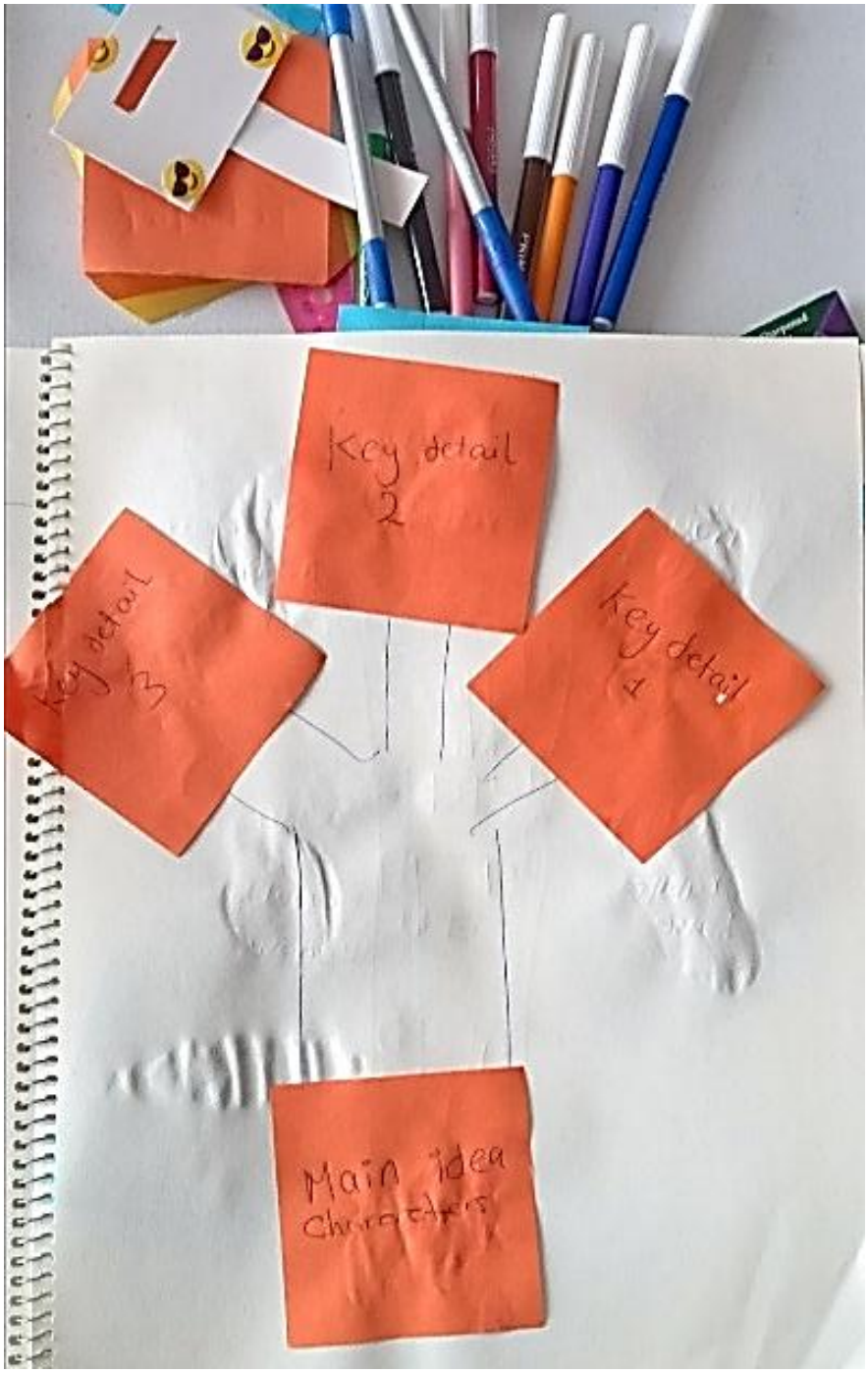
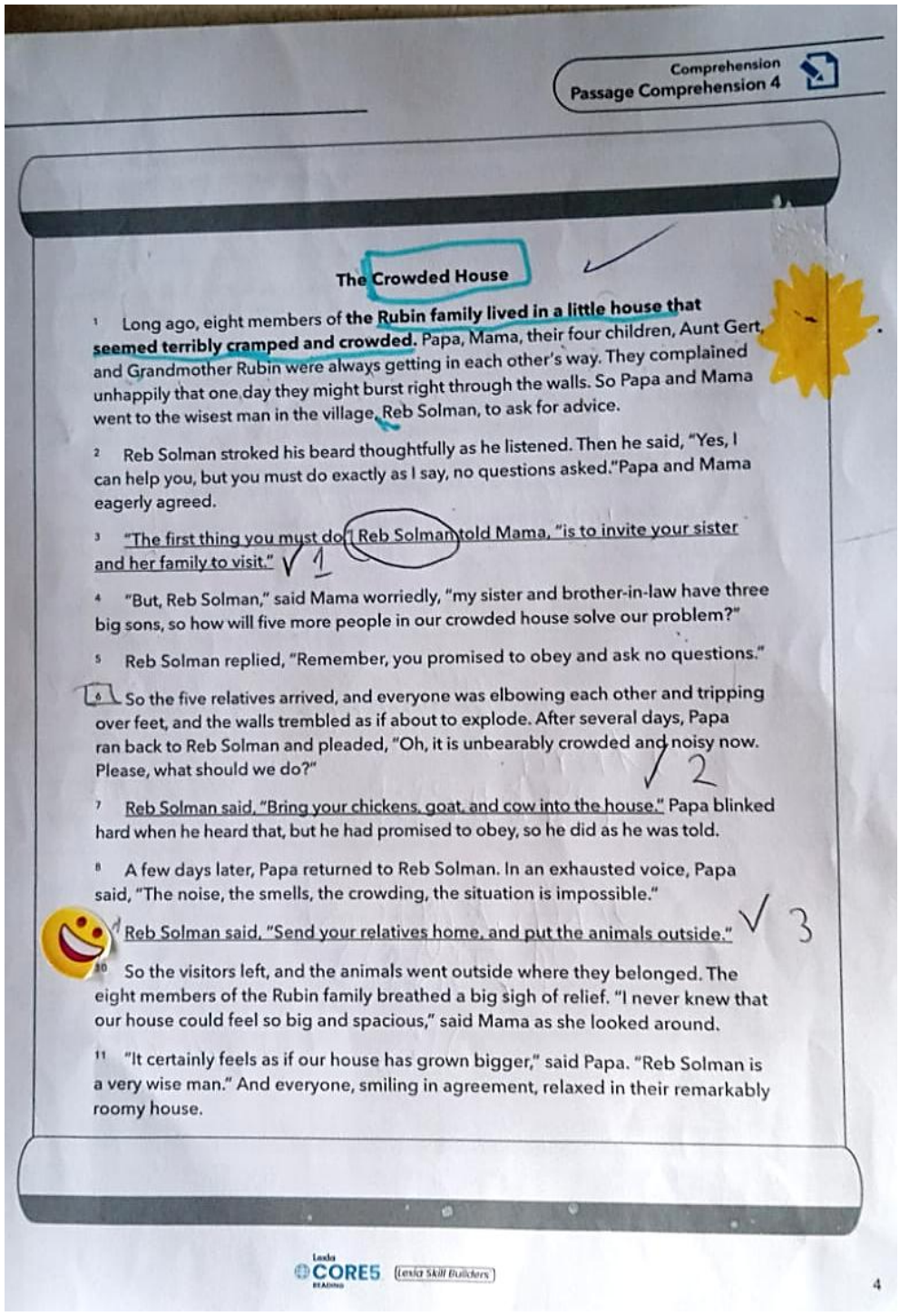


Figure 13 Comprehension and reading strategy suggested by Secondary Co-designer. Using parts of a tree. Root is main Character. and branches are key details 1,2 and 3



Comprehension
Passage Comprehension 4

The Crowded House

1 Long ago, eight members of **the Rubin family lived in a little house that seemed terribly cramped and crowded.** Papa, Mama, their four children, Aunt Gert, and Grandmother Rubin were always getting in each other's way. They complained unhappily that one day they might burst right through the walls. So Papa and Mama went to the wisest man in the village, Reb Solman, to ask for advice.

2 Reb Solman stroked his beard thoughtfully as he listened. Then he said, "Yes, I can help you, but you must do exactly as I say, no questions asked." Papa and Mama eagerly agreed.

3 "The first thing you must do," Reb Solman told Mama, "is to invite your sister and her family to visit." ✓ 1

4 "But, Reb Solman," said Mama worriedly, "my sister and brother-in-law have three big sons, so how will five more people in our crowded house solve our problem?"

5 Reb Solman replied, "Remember, you promised to obey and ask no questions."

6 So the five relatives arrived, and everyone was elbowing each other and tripping over feet, and the walls trembled as if about to explode. After several days, Papa ran back to Reb Solman and pleaded, "Oh, it is unbearably crowded and noisy now. Please, what should we do?" ✓ 2

7 Reb Solman said, "Bring your chickens, goat, and cow into the house." Papa blinked hard when he heard that, but he had promised to obey, so he did as he was told.

8 A few days later, Papa returned to Reb Solman. In an exhausted voice, Papa said, "The noise, the smells, the crowding, the situation is impossible."

9 Reb Solman said, "Send your relatives home, and put the animals outside." ✓ 3

10 So the visitors left, and the animals went outside where they belonged. The eight members of the Rubin family breathed a big sigh of relief. "I never knew that our house could feel so big and spacious," said Mama as she looked around.

11 "It certainly feels as if our house has grown bigger," said Papa. "Reb Solman is a very wise man." And everyone, smiling in agreement, relaxed in their remarkably roomy house.

Lexia CORE5 READING (Lexia Skill Builders)

4

Figure 14 Lexia Core5 Reading, level 16, passage comprehension 4 (The Crowded House)

Debriefing, Design choice and Co-designers' Learning

This session is about the design choices, Co-designers learning and debriefing of co-design session. The reflection on each co-design session was done with Co-designers to find successes and areas to improve. Debriefings were done based on the Co-design session schedules , understanding and knowing individual needs was key to improving support hence that was the first on the list. Throughout the project trust was built from the initial face-to-face meeting and continually developed which made the Co-designers comfortable to communicate freely.

Phase 1: Understanding and knowing co-designers

Student Engagement and Agency

There were mixed levels of student engagement during these sessions, this was held in two (2) co-design session. While Primary Co-designer demonstrated curiosity and social interest in asking personal questions about Facilitator's family and dogs, maintaining focused engagement on the research project tasks proves challenging because he was focused on repeating same questions again. The Secondary Co-designer recommended we do not keep him bored in other for him to be interested in the project. A variety of activities or by asking him what he wants to do for the day has been a strategy employed by his parent in getting him involved in activities.

> " So now he is in level 16. Okay, reading...give him the choice like what he wants to do today. I give him just to be ready with plans, read a book, do Lexia, or ask what do you want to do or just have ideas in your mind, and do not repeat the same thing, have a variety of solution or options."-Secondary Co-designer

Primary Co-designer shows willingness to participate in the journal activity by saying "I can do it". He made independent decisions, such as choosing not to have parent join sessions saying "No" when asked if parent should join. Focus is frequently diverted to unrelated topics like pets, elevators, and Canadian Tire. Primary Co-designer required frequent redirection where Secondary Co-designer would prompt him to focus now or listen to facilitator. Limited metacognitive awareness was demonstrated by repeatedly asking same questions.

Parent-Student-Facilitator Collaboration

The initial collaboration showed possibility to build a team though there were power dynamics that need balancing. Secondary Co-designer provided contextual information about Primary Co-designer's learning styles and preferences. She contributed insights based on her experience working on Lexia and lived experience about effective strategies. In decision about location of co-design sessions she said, "Don't put him in open places". She further supported the facilitator in redirecting Primary Co-designer when needed. Parent sometime intervened rather than allowing Primary Co-designer to respond independently and therefore more balanced input could be achieved with clearer communication protocols for Co-designers.

"You know now how Lexia works right, you read all and be patient and read and don't click directly on the answer, sometimes I am pulling his hand, read it all and then he can choose."-Secondary Co-designer

Individualized Learning Plan Development

These were the initial exploration phases of understanding Primary Co-designer's learning preferences and challenges. There were academic mismatch and a strong desire for age-appropriate academic work. Primary Co-designer said his preferred learning methods was writing. When asked how he understands things, he said "I have to write". Facilitator adjusted to Primary Co-designer's need for breaks. We negotiated break times to his preference. In our open conversation Primary Co-designer revealed preferences for more challenging work by noting that the current school (BW School[13]) gives "grade 8 work" versus previous school (MG School[14]) "grades 1 and 2 work". This phase was early to explore strategy creation but there were promising elements based on Primary Co-designer's interest in the Lexia program.

"Oh, MG School. They teach me grade 2 things. And they do not answer me all the time in my old school in MG School."-Primary Co-designer

[13] BW school is the pseudonym for current school attended by primary co-designer. They are private Neurodiverse Education Centre that supports mental health & fosters learning in Ontario, Canada. Primary co-designer learns in an alternative learning grade 8 classroom with part time one-on-one support from his teacher.

[14] MG school is the pseudonym for previous school attended by primary co-designer. They are public school in Ontario, Canada. Primary co-designer learns in a grade 8 classroom without a one-on-one support.

"Ms. M, she was grumpy at me, she was evil with me, and sometimes she stares at me when I do not do something and she gave me a grade 2 things, then I tell my *parent* I want to go to another." -Primary Co-designer

"It's very nice in BW school, the teacher is really nice. They are calm to me, they gave me hard work like grade 8, they gave me a grade 8 work." -Primary Co-designer

Academic and Social-Emotional Outcomes

Insights into Primary Co-designer's academic experiences and emotional reactions showed some strengths and challenges. He demonstrated reading ability during the Lexia app observation which gave the Facilitator a firsthand data about the App and reading fluency. He expressed positive feelings about current BW school environment. He also expressed negative experiences from previous schools and treatments received from his class teacher that made him leave the school.

Artifact created by Primary Co-designer

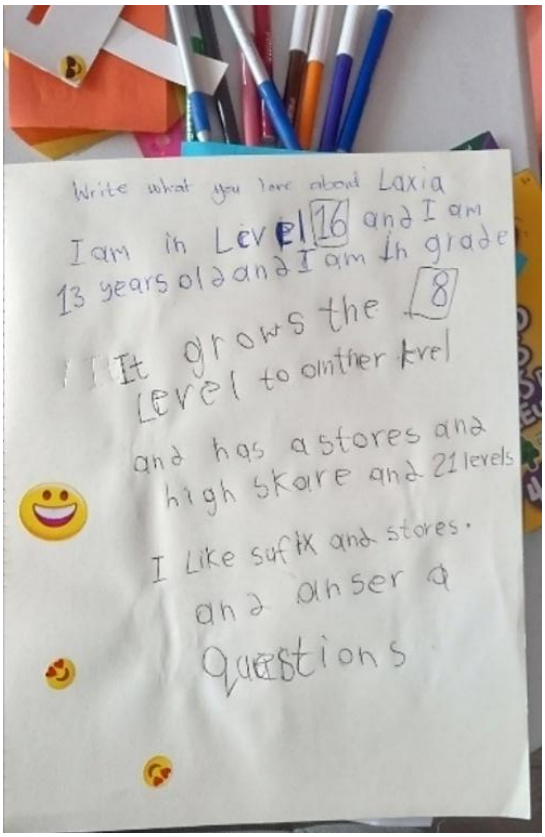


Figure 15 What Primary Co-designer loves about Lexia App

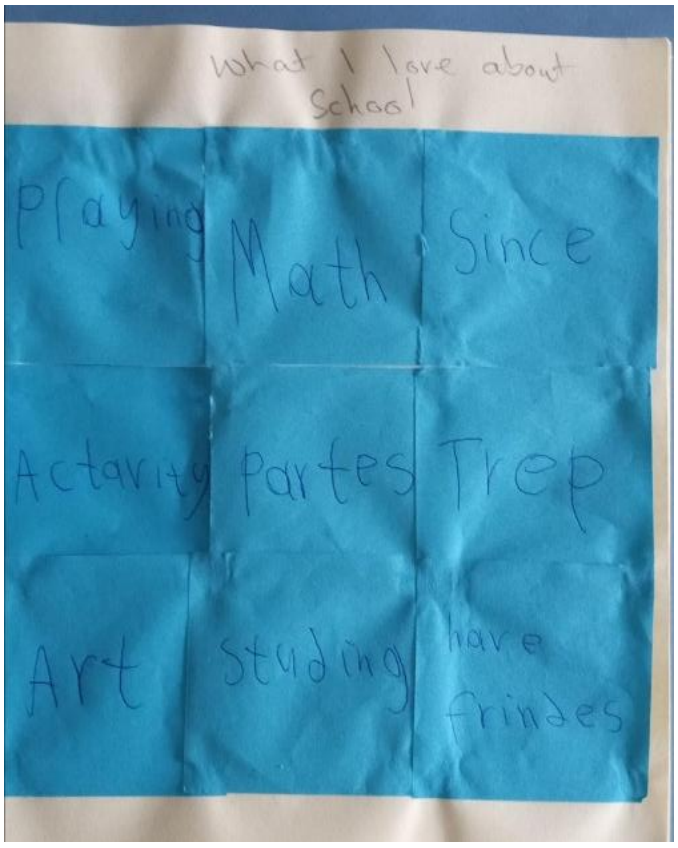


Figure 16 What Primary Co-designer loves about his school

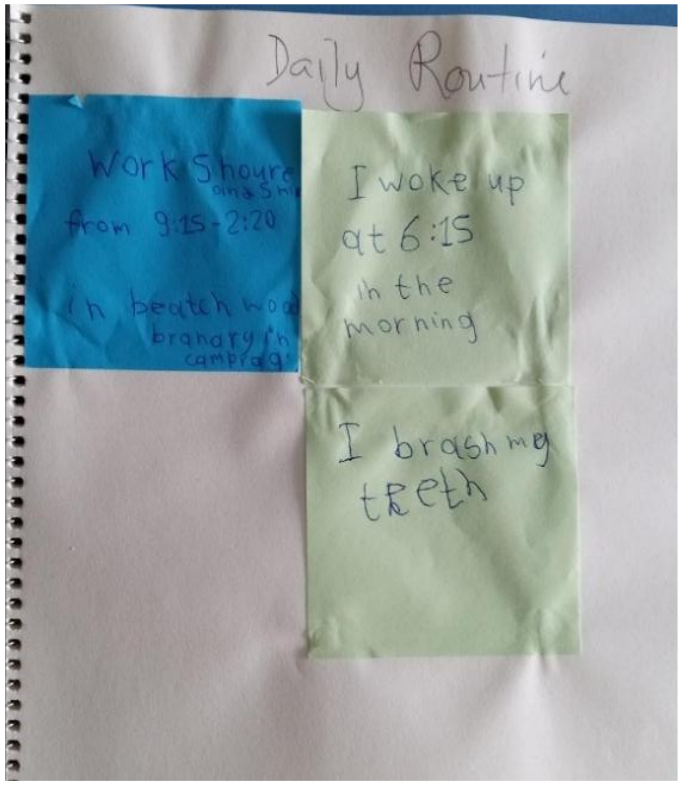


Figure 17 Diagram of daily routine by Primary Co-designer

Transferability of Co-Design Process

The transferable processes captured in this session includes multiple engagement strategies using journal, conversation and activities capture experiences. Established protocols for breaks and communication done together and observing Primary Co-designer's interaction with educational technology (Lexia) to understand needs.

Insight for Next Co-design session

There were limited concrete planning for adaptations and modifications in these initial sessions. More structured exploration of learning preferences would be beneficial in the next session, which was concluded with Secondary Co-designer.

- Increase structured activities that capture Primary Co-designer's attention while gathering information about learning preferences.
- Develop visual supports for maintaining focus on research project topics, given Primary Co-designer's tendency to shift focus easily.
- Create clearer protocols for parent involvement that balance support with allowing Primary Co-designer's independent agency.
- Implement more metacognitive reflection opportunities to help Primary Co-designer articulate learning experiences.

Phase 2: Understanding Experience and Needs

This session explored the needs and experience of Primary Co-designer held in two (2) co-design sessions, it is measured against success indicators, theoretical frameworks, and design principles. Facilitator tried to address the specific objectives outlined in the Success Indicators. Primary Co-designer demonstrates significant difficulty with reading comprehension compared to his comfort with other aspects like prefixes and suffixes. Facilitator consistently offered Primary Co-designer choices and respected his decisions. A co-created learning strategies was used to relate learning to his interests in cooking. Primary Co-designer revealed his perception of comprehension difficulties by saying.

"It's hard because a lot of words, it can hurt me." "It is my choice if I do that one it's my choice." - Primary Co-designer

Effective Approaches

Interest-Based Learning and co-creation strategies were applied by Creating a "recipe" for reading comprehension and connecting challenging content to cooking to make complex concepts easier and more accessible.

> "So, for example, when you are cooking your cheesecake, you have to add key details like for example you need strawberry puree... It is the same thing; stories have things that give more information."-facilitator

Metacognitive Prompting supported me to understand his thoughts about his challenges, questions like "Why didn't you want to go to the comprehension?" ,"Why are you looking there?", "I see you're shaking your leg. Why?" were asked for him to think about what he was doing and why.

Visual prompt like the Tree diagram (See figure 13) for main idea and key details was suggested by Secondary Co-designer and recipe cards for the "ingredients" of comprehension. YouTube videos were used to build background knowledge of aspects of the comprehension that were abstract to him.

Less Effective Approaches

Duration-Based tasks were less effective in this session. Primary-co-designer struggles with sustained attention for more than 5-10 minutes. Also, long reading passages without breaks or support made him shift his attention easily. Abstract concepts without concrete references for terms like "main idea" or "key details" without visual anchors were difficult to grasp. Several verbal prompts had diminishing returns.

Success Indicators Assessment

Student Engagement and Agency

Primary Co-designer engaged more when topics align with his interests in cooking but resistant to challenging areas when asked to read comprehension. He clearly understood self advocacy in this project and clearly states his preferences and negotiates for breaks and activity choices by say "It's my choice. I make my own choices, I'm a big boy, I make my own choices." Also, metacognitive awareness was initiated through prompting when Primary Co-designer was stimming or distracted by looking away from the focus area.

Parent-Student-Facilitator Collaboration

Based on our co-design sessions about understanding and knowing co-designer, all three stakeholders contribute to the session structure, we shared goals on improving comprehension while respecting Primary Co-designer's pace. Open dialogue about challenges and strategies between

Facilitator and Secondary Co-designer gave in-depth information on how she prepares the Primary Co-designer before the start of sessions.

Individualized Learning Plan

The adaptation plans the Primary Co-designer preferred was using recipes as a framework to understand text structure. Additionally, adjusting time, allowing breaks, and following Primary Co-designer's lead when appropriate, I support him with confidence to participate in sessions.

Academic and Social-Emotional Outcomes

Focus was on reading comprehension while building on strength and during the sessions the Primary Co-designer recognized when he needed breaks and articulated this need.

Primary Co-designer's Experience, Challenges and Preferences

The attention patterns observed during the sessions with Primary Co-designer demonstrates characteristic attention challenges that emerge consistently. There were a lot of topic shifting, looking away from the screen, noticing objects in the room, physical restlessness, there was also sustained attention when discussing cooking, pets, or personal topics and there was a lot of tasks avoiding when content is challenging.

Learning Preferences

- **Visual and Experiential Learning**: Engages more when watching videos or relating to concrete experiences
- **Preference for Structure with Autonomy**: Responds to clear boundaries but needs to feel agency within them
- **Reward-Oriented**: Motivated by tangible reinforcement
- **Interest-Driven Learning**: Initiative-taking when topics connect to special interests

According to Universal Design for Learning (UDL) Principles, it is essential to use multiple means of engagement, multiple means of representation and Multiple means of action/expression. This principle was express by relating topics to existing interest, visual aids and structured frameworks like recipe cards, tree diagrams, and allowing choices in how Primary Co-designer demonstrates understanding. Deep Learning Principles came to play as we moved beyond rote comprehension to deeper connections to Tree diagrams and recipes by indicating that every comprehension has a WHO and WHY, WHERE and WHEN. WHEN shows as time in the comprehension. WHERE shows us location or place, WHO shows us the person in the story. WHY shows us the reason. Diverse participation was encouraged in this session, we adapted to the needs of Primary Co-designer, and it was acceptable the process evolved based on his responses.

Artifact co-created by Co-designers

Figure 18 Strawberry cheesecake recipe made by Primary Co-designer which was related to Reading Recipe. (Strategy 1)

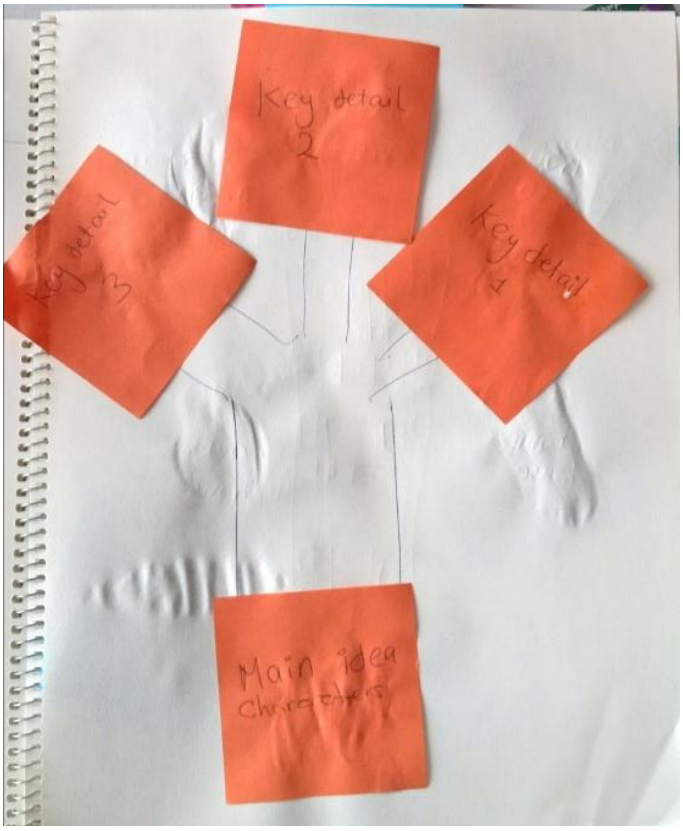


Figure 19 Suggested strategy to relate reading content to parts of a tree. Root is main Character. and branches are key details 1,2 and 3. By Secondary Co-designer (Strategy 2)

Insights for Next Co-Design Sessions

Based on the reflection on the session, several key insights emerge that should guide future co-design sessions:

- **Structured Visual Supports**: Developing reading guides, visual frameworks, and other tools to help focus attention
- **Interest Integration**: Continuing to build connections between reading comprehension and cooking recipe/food preparation/activities/drawing
- **Chunking Content**: Breaking reading passages into smaller segments with built-in breaks
- **Multimodal Learning**: Incorporating videos, drawings, and hands-on activities to support text comprehension
- **Agency-Building Strategies**: Providing structured choices within activities rather than open-ended options
- **Metacognitive Development**: Continuing to ask "why" questions that build self-awareness
- **Topic Expansion Strategy**: Using special interests as entry points while gradually introducing new content areas.

Phase 3: Strategy Exploration

This session explored strategies to ease challenges observed in the Understanding and Need, held in phase two (2) co-design sessions. The co-design process involved three key participants: the Facilitator, the Primary Co-designer (a student with ADHD/ASD), and the Secondary Co-designer (the student's parent). The sessions focus on exploring learning strategies to help the Primary Co-designer overcome reading challenges in an integrated classroom setting and home. Through reading comprehension exercises, structured breaks, and visual learning techniques, the collaborative approach aims to develop personalized learning strategies that leverage the student's strengths and address their specific needs.

Report from BW School

At this stage we received the Primary co-designer's Report Card from BW school. In the Language Art subject, his teachers indicated he is at level 2, which means the student demonstrated the required knowledge and skills with some effectiveness (see Appendix I). Achievement approaches the provincial standard required for grade 8. The report indicated the details below,

> “Primary Co-designer effectively reads a variety of texts (simple stories, charts, posters, tables, graphs, poetry, graphic novels, articles, websites) using a range of strategies. He sometimes seeks clarification of unknown words and their meanings, he is able to effectively use tools such as google to help him understand the meanings of words. Primary Co-designer has shown improvement in his ability to understand and interpret the texts he reads. He has reviewed identifying the main ideas, and supporting details, and answering questions accurately based on the passages. Primary Co-designer understands the different parts of speech like nouns, verbs, adjectives, and more. We have been encouraging Primary Co-designer's independent study in areas that we know he is confident in. He is beginning to build his stamina of effectively working independently, using tools to help himself, and remain focused on the task at hand.
>
> Primary Co-designer has shown dedication and enthusiasm in his studies, particularly in developing his cursive writing skills and expanding his vocabulary. His efforts in mastering cursive writing are commendable, as this skill not only enhances his handwriting but also contributes to improved cognitive development, memory, and fine motor skills. Primary Co-designer's current language arts curriculum is based on third to fourth grade expectations. Primary Co-designer continues to practice reading and comprehension, working to increase is creative writing abilities and expand his vocabulary. For next steps, he will be supported in learning to make complex inferences, first with visual aids, to use context clues to infer meaning in reading.”-BW School

Insights from Previous Co-Design Sessions Explored

Structured Visual Supports and Interest Integration

The Facilitator implemented a reading frame tool to help the Primary Co-designer maintain focus while reading (see Figure 9). The tool was co-created with the Primary Co-designer. This physical tool directs attention to specific text being read at the time. Additionally, the Facilitator introduces a comic strip format to transform reading comprehension into a visual learning. The experience gained here is for the Primary Co-designer to have a hands-on experience in interacting with text being read, an activity he loves to do, which is drawing, to understand the concept.

Structured Time Management and Chunking Content

The sessions incorporate clearly defined work periods and breaks, with the Primary Co-designer actively participating in setting the schedule and writing it down on sticky notes.

"Maybe, we'll maybe after I finish... OK, Oh, I have an idea. If I did it fast, I can take a break." -Primary Co-designer.

This approach gave the student agency in managing their energy and focus while maintaining progress toward session goals. The Facilitator consistently used encouragement, high fives and reward systems (stickers) to acknowledge the Primary Co-designer's achievements. The reading comprehension approach adapts to the Primary Co-designer's needs, allowing him to engage with text in manageable sections with immediate visual reinforcement.

Alignment with Success Indicators

Student Engagement and Agency

The Primary Co-designer demonstrates active participation in the co-design process, particularly in setting session structure and negotiating breaks. The student also shows self-advocacy in expressing needs.

Parent-Student-Facilitator Collaboration Quality

There was balanced input from all stakeholders, with the Secondary Co-designer providing insights into the student's previous educational experiences.

"So, in the school that we were in, like there is the book. It has three stories, those three stories, they read them over and over."- Secondary Co-designer

The Secondary Co-designer also shares observations about effective strategies in the sessions held.

"I notice that his level of focus is a little bit increased... And now I'm focusing on the meaning like the interpretation of the meaning of the message."- Secondary Co-designer

Individualized Learning Plan Co-creation

The sessions applied adaptations and flexibility in responding to emerging needs. There was an interchanging use of pencil or pen and reading frame to guide reading. The reading frame is re-introduced only when the student is losing focus on reading by asking repeated questions(fixation) or looking aside (side glancing). Break times are integrated into the learning process by the Primary Co-designer.

Academic and Social-Emotional Outcomes

The approach targeted specific academic areas (reading comprehension) while supporting self-regulation through structured breaks and clear expectations. Lexia Core5 Reading, level 16, passage comprehension 4 (The Crowded House) (Readkong, n.d.) was used in this session (see figure 14). This

story was used throughout the strategies developed to reinforce learning. This is a transferable process that can be reused.

Alignment with Educational Theories and Principles

The approach embodies experiential learning by connecting abstract concepts to concrete activities. The Comic strip was introduced to the student using the Canva App and a YouTube video for increased understanding. The strategies demonstrate UDL principles by providing multiple means of representation with text and visuals, allowing for multiple means of action and expression with drawing and discussions based on his love for conversation, friendship, and fostering engagement through choice and autonomy. The process also aligns with co-design principles through inclusive participation of the student and parent, working with diverse knowledge, both academic and lived experience, and creating adaptable contexts like flexible timing and breaks.

Artifacts Co-created by Primary Co-designers

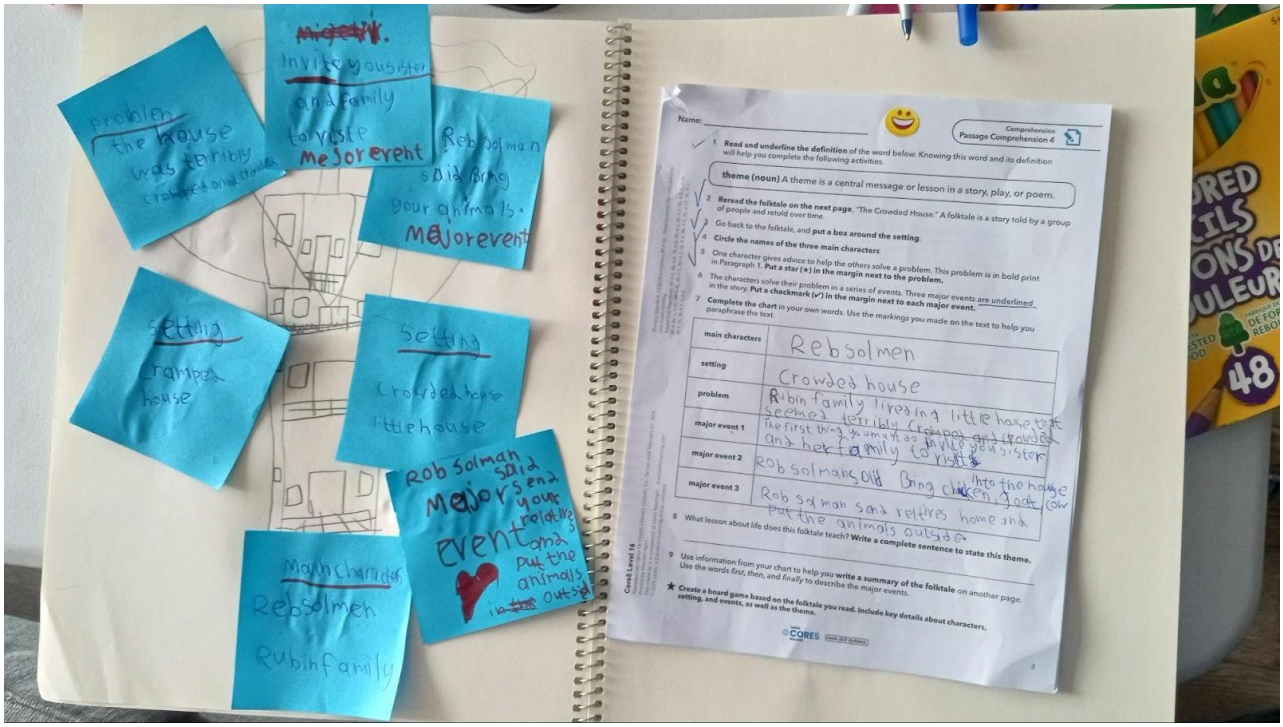


Figure 20 Story content (The Crowded House) related to parts of a tree to comprehend the main Character and key details co-designed by the Primary Co-designer based on the strategy suggested by the Secondary Co-designer (Strategy 2)

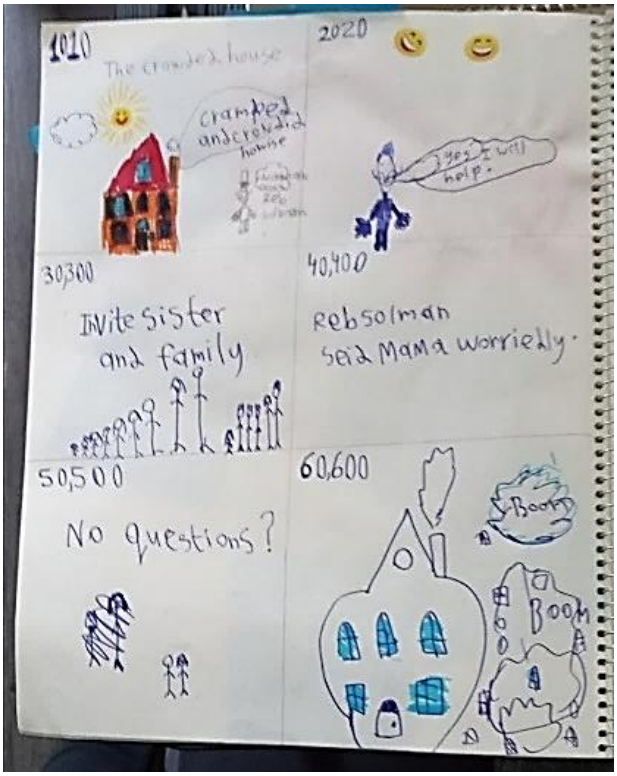


Figure 21 Comprehension (The Crowded House) was transformed into a visual by the Primary Co-designer. Each box represents a paragraph. (Paragraphs 1-6) (Strategy 3)

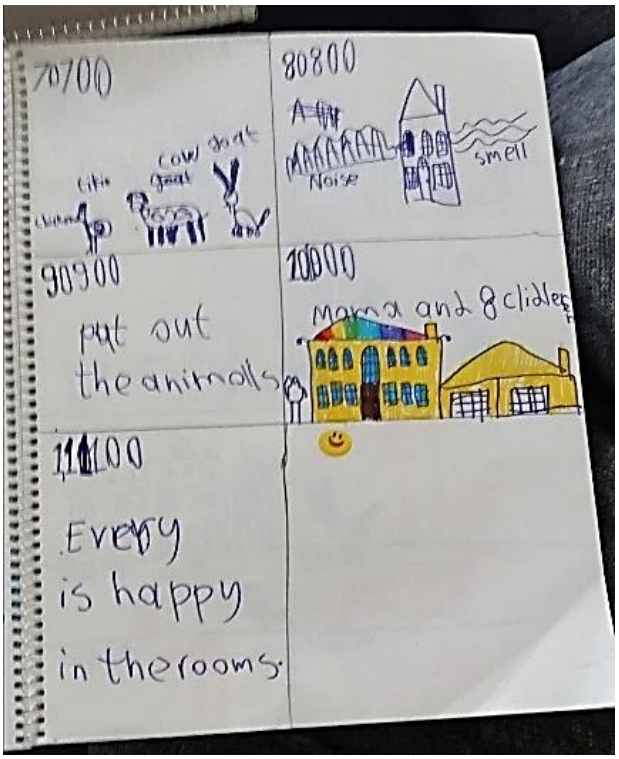


Figure 22 Comprehension (The Crowded House) was transformed into a visual by the Primary Co-designer. Each box represents a paragraph. (Paragraphs 7-11) (Strategy 3)

Phase 4: Strategy Development and Refinement

This section of the project documents a three (3) co-design session held individually with the Primary Co-designer and the Secondary Co-designer. The Primary Co-designer did not want his parent present. The sessions focus on developing and refining a personalized learning strategy that combines reading comprehension with visual representation through drawing. This analysis examines how this strategy was created collaboratively and evaluates its effectiveness against established success indicators, learning theories, and design principles.

Strategy Development and Implementation

The core strategy developed in these sessions integrates reading comprehension with visual representation through a "comic drawing" approach. In this method, the Primary Co-designer reads passages from a story ("A Change of Heart") from the Lexia App, interprets the content, and then transfers this understanding into visual representations in designated boxes on a worksheet in his journal.

The Facilitator explained the approach a concept in which a paragraph is read and drawn paragraph by paragraph to create in depth understanding. This method leverages the Primary Co-designer's interest in drawing while addressing challenges with reading comprehension and sustained attention.

Key components of the strategy include:

1. **Structured Segmentation**: Dividing reading material into manageable paragraphs that correspond to drawing spaces on a worksheet
2. **Guided Reading**: Using a reading pointer or frame to maintain focus on specific text portions
3. **Visual Interpretation**: Transferring textual understanding to visual representations
4. **Student-Led Time Management**: Collaborative establishment of work periods and breaks
5. **Positive Reinforcement**: Using stickers and verbal encouragement to acknowledge accomplishments

Alignment with Success Indicators

Student Engagement and Agency

The Primary Co-designer demonstrates active participation in the process, particularly in determining session structure. This reflects growing agency in managing learning time. The student's metacognitive awareness is evident when differentiating between story characters and real people, which shows an understanding of narrative elements versus reality, suggesting deepening comprehension.

Parent-Student-Facilitator Collaboration Quality

Balanced was achieved through input from all stakeholders, The Primary Co-designer decided when he wanted the Secondary Co-designer to join his sessions or not, and she respected his opinions. The Secondary Co-designer offers insights about effective strategies below.

> "This is very, very effective, by the way... I love this. I love it" - Secondary Co-designer

The Facilitator adapted approaches based on observations, and the student and parent's acknowledgement of improvement, all indicating mutual understanding of goals and progress. This flexibility extended to learning tools, acknowledging the student's preference for certain writing tools, and incorrect spelling was not a problem if the student understood the meaning of the word. Academic progress is evident in the Primary Co-designer's growing ability to understand narrative elements. The Secondary Co-designer noted that he pictured in his mind when reading on the screen in the Lexia App, suggesting improved visualization skills linked to reading comprehension. Subsequently, Self-regulation development is shown through the student's awareness of his own needs, like when he mentioned, "I'm tired because my back hurts", followed by solutions from the Facilitator, "So you want to go…, then push back and sit, or you sit on this chair".

Artifacts Co-created by Primary Co-designer

Figure 23 Comprehension (A Change of Heart) was transformed into a visual by the Primary Co-designer. Each box represents a paragraph. (Paragraphs 1-10) (Strategy 3)

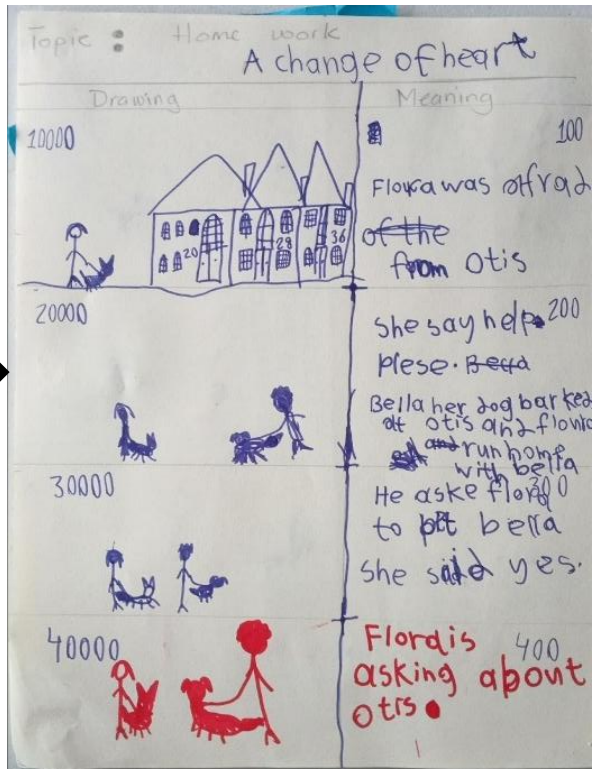


Figure 24 Comprehension (A Change of Heart) was transformed into a visual and meaning by Primary Co-designer. Each box represents a paragraph. (Paragraphs 1-4) (Strategy 4)

Transferability of Co-Design Process

The Secondary Co-designer recognizes the strategy's transferability during the debriefing session indicated below.

"I think let's have this strategy... This is good. Until he gets it, and then we can move…, right?" -Secondary Co-designer

This suggests an understanding of how this approach could be continued and adapted beyond the current sessions. The critical element for continued implementation was the Primary Co-designer's understanding of the concept he is developing. The strategy embodies Kolb's experiential learning cycle by engaging the Primary Co-designer in concrete experience (reading), reflective observation (interpreting content), abstract conceptualization (deciding what to draw), and active experimentation (creating visual representations).

The Secondary Co-designer confirms this connection: "When she responded I know that he pictured in his mind" when working on Lexia App on the computer, indicating the cyclic process of experience, reflection, and application.

Alignment with Educational Theories and Principles

Deep Learning

The approach promotes deep learning by encouraging the Primary Co-designer to move beyond surface-level reading to meaningful interpretation. The Secondary Co-designer also noted she focusing more on the interpretation of the meaning of the message by asking What this? And What does this paragraph want to say? This focus on meaning-making rather than mechanical reading represents a shift toward deeper learning processes.

Universal Design for Learning (UDL) Principles

All information were presented through text and visual representations, drawing activates the student's interest and motivation. The Primary Co-designer can demonstrate understanding through drawing, labeling, written expression, and verbal explanation. The approach leveraged the student's interest in drawing and incorporates choice in time management as indicated in the UDL principles.

Co-Design Principles

This session recognized and accommodated the Primary Co-designer's unique learning profile, keeping in mind the student's expertise about their own learning needs was valuable, Shared decision-making about session structure and implementation, adapting the strategy based on specific contexts (e.g., energy levels, engagement), and designing with actively involving the Primary Co-designer in strategy development. Finally, the approach evolved through practice and reflection at this stage, aiming toward ‘designing by’ in the final session and personal implementation.

> “Maybe after you finish... It. You can say this is a key detail and tell me what is happening here,"-Secondary Co-designer

The above quote shows the Secondary Co-designer actively contributing to strategy refinement, suggesting ways to extend the approach to include key detail identification.

Phase 5: Implementation

The Primary Co-designer in the implementation phase was given the agency to be autonomous in using the strategy and implementing it in his way. He demonstrated the need for encouragement to complete the strategy in the initial sessions to implement the strategy (See Figures 25, 26, 27). This process lasted for 4 weeks, allowing time for personal reflection and input. Some implementations were related to as homework, and the Primary Co-designer had the agency to implement it or not. He always looked forward to collaborating with me (the Facilitator), according to the Secondary Co-designer.

Artifacts Co-created by Co-designers

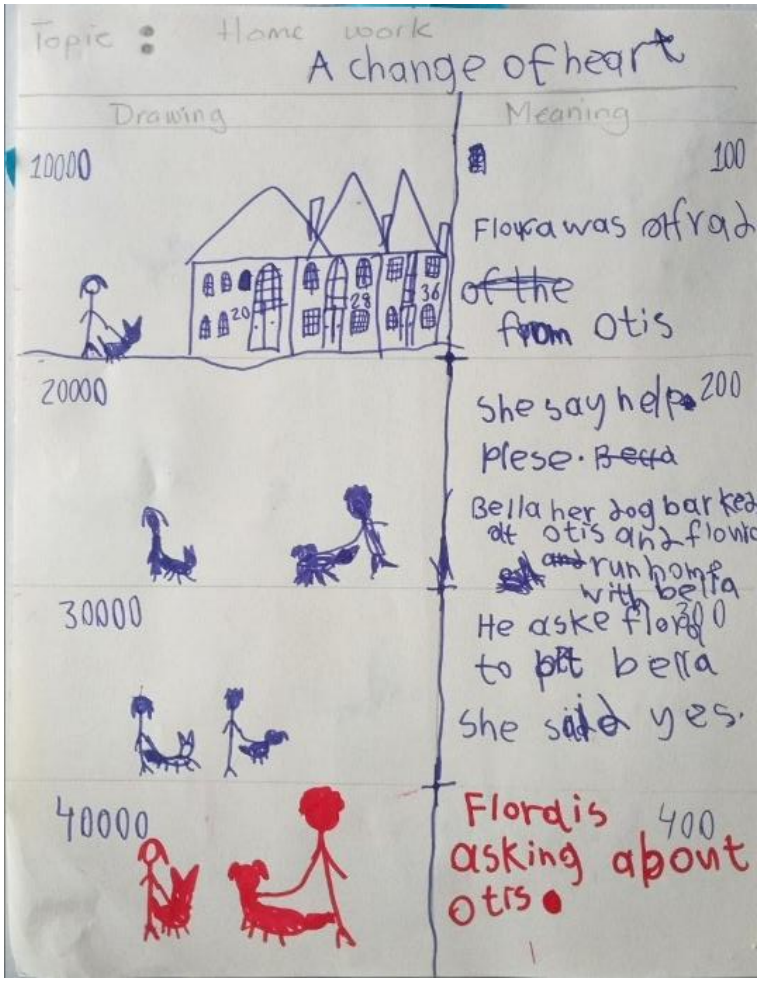


Figure 25 The Read-Draw-Write strategy : Comprehension (A Change of Heart) was transformed into a visual and meaning by the Primary Co-designer. Each box represents a paragraph. (Paragraphs 1-4) (Strategy 4)

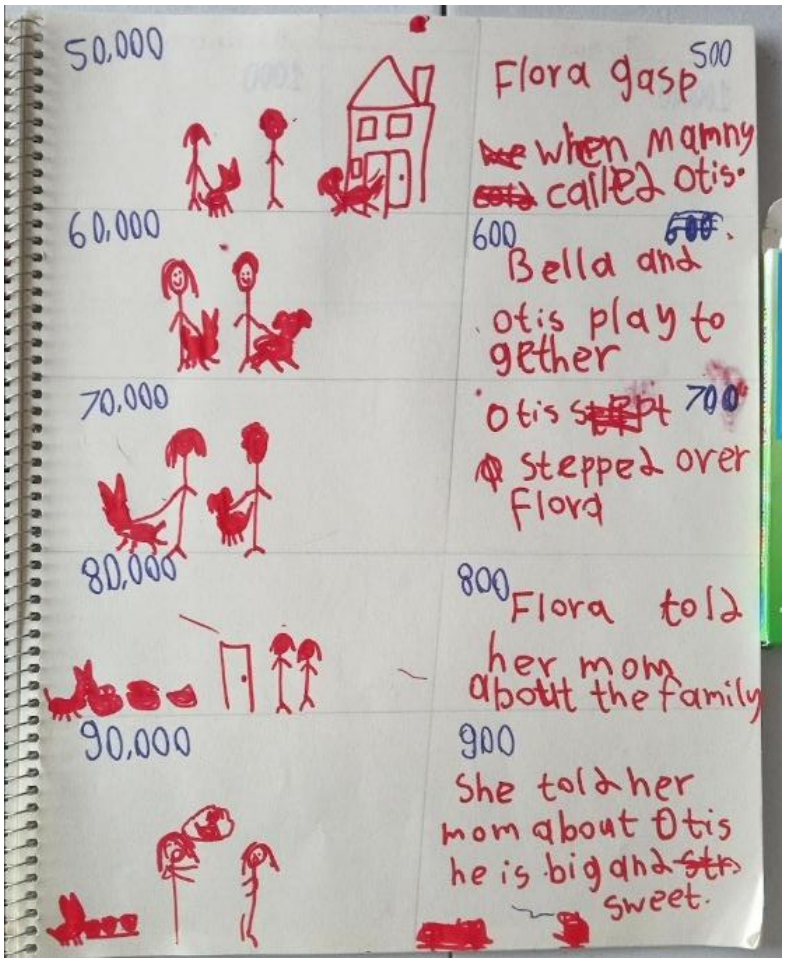


Figure 26 The Read-Draw-Write strategy : Comprehension (A Change of Heart) was transformed into a visual and meaning by the Primary Co-designer. Each box represents a paragraph. (Paragraphs 5-9) (Strategy 4)

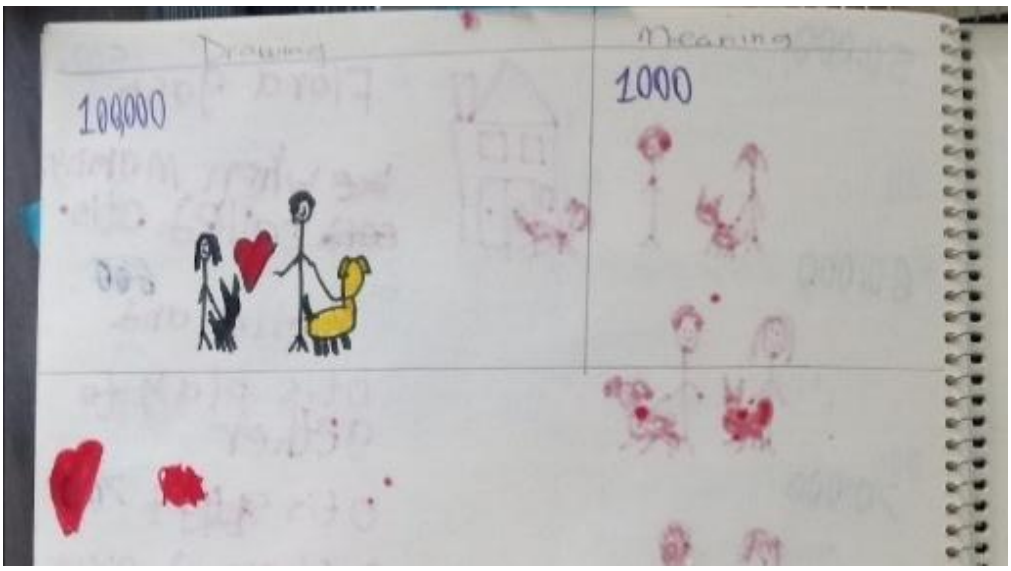


Figure 27 The Read-Draw-Write strategy : Comprehension (A Change of Heart) was transformed into a visual by the Primary Co-designer. Each box represents a paragraph. (Paragraphs 10) (Strategy 4)

Figure 28 Flag of Ghana and Egypt showing collaboration, drawn by the Primary Co-designer

This collaborative approach demonstrated how personalized learning strategies can effectively bridge his reading gaps by providing structured scaffolding that builds independence.

Phase 6: Review and Refinement

This session addresses several of the specific objectives outlined in the project which are,

- **Determining challenges encountered in class**: The project reveals several challenges faced by the Primary Co-designer, including difficulties with reading comprehension, connecting words together while reading, building appropriate friendships, and understanding emotions beyond mere identification.
- **Examining student agency in learning**: In the co-design process the Primary Co-designer was given agency in determining learning strategies. For example, he named the project "Trace writing" and outlined the steps involved in the comprehension strategy.
- **Co-creating learning strategies based on student interest**: The project documented the development of a visual comprehension strategy that incorporates drawing, which aligns with the student's visual learning preference.
- **Determining success criteria and continuity strategy**: The Co-designers established a plan for continuing the strategy beyond the formal project period, with the facilitator agreeing to visit weekly to support ongoing implementation.

Report from BOMA

Boma Learning Centre assessed the Primary co-designer during the strategy development and refinement stage, and it was determined that visual representation is needed for comprehension. The purpose of seeking behavioural services was to continue to build on and increase Primary Co-designer's current skills with a focus on social skills, self-regulation, executive functioning and academic skills, as well as decrease difficult behaviours which are defined in Appendix J: Parts of BOMA Learning Centre Behaviour Service Plan in a clinic/home/community setting using one-to-one/group teaching. Primary Co-designer's current therapy schedule is 8-10 hours a week at his school with program supervision from Boma Learning Centre. This is a complementary resource for improving upon the Primary Coo-designer's challenges.

Strategy Review and Refinement Process

The co-design strategy developed was a comprehension approach that uses visual elements and drawing to help the Primary Co-designer understand text. During the refinement and review Phase, he demonstrated full autonomy of the strategy and created his own variation. This strategy was reviewed by having the Primary Co-designer articulate and reflect on the process. When asked about what he does with difficult comprehension texts, he responded, saying, "By drawing or writing and reading."

The Primary co-designer created a visual about his "Daily School Routine Story" from imagination. He wrote the duration of the Session, he drew five stars and five hearts, and sectioned and numbered his Scrap book page, where each box represents an Activity. The Read-Draw-Write strategy (see Figure 25, 26, 27) was refined to figure 29, which Co-designers named "Trace writing," and it involves several steps:

1. Focus
2. Reading
3. Drawing
4. Understanding
5. Writing the meaning

The Co-designers refined the strategy through ongoing discussion and reflection. The Secondary Co-designer (parent) noted that the strategy aligns with professional recommendations

> "When they told me that this suggestion, I told them I think it will work because when we used it before it worked with him."-Secondary co-designer

Alignment with Success Indicators

Alignment with several success indicators included active participation in the process, expressing his preferences of writing and drawing and establishing his own scoring system for his work. Also, a balanced input from all stakeholders, with the Primary Co-designer making decisions, the Secondary Co-designer providing context, and the facilitator guiding the process. The adaption of visual strategies for comprehension is clearly documented and responsive to the student's needs. even though direct measures are not explored, the Secondary Co-designer reports improvements when using the strategy. The methodology is replicable, with clear documentation of the key components that contributed to success.

Alignment with Educational Theories and Principles

Experiential Learning Theory

The strategy aligns with experiential learning by incorporating the student's direct experience with texts and allowing him to process information through different modalities (reading, drawing, writing).

Deep Learning

The visual comprehension strategy supports deep learning by helping the student move beyond surface-level word recognition to a deeper understanding of text meaning through multiple representations.

Universal Design for Learning (UDL) Principles

The strategy embodies UDL principles by providing multiple means of representation like text and visual drawing, offering multiple means of expression through drawing, or writing and creating multiple means of engagement which is student-selected scoring system that motivates him.

IDRC Co-design Principles

The co-design principles applied here includes diverse perspectives from student, parent, and facilitator, valuing the lived experience of the Primary Co-designer, creating adaptive solutions that address specific needs and ensuring the student has a meaningful and relatable role in the design process.

Artifacts Co-created by Primary Co-designers

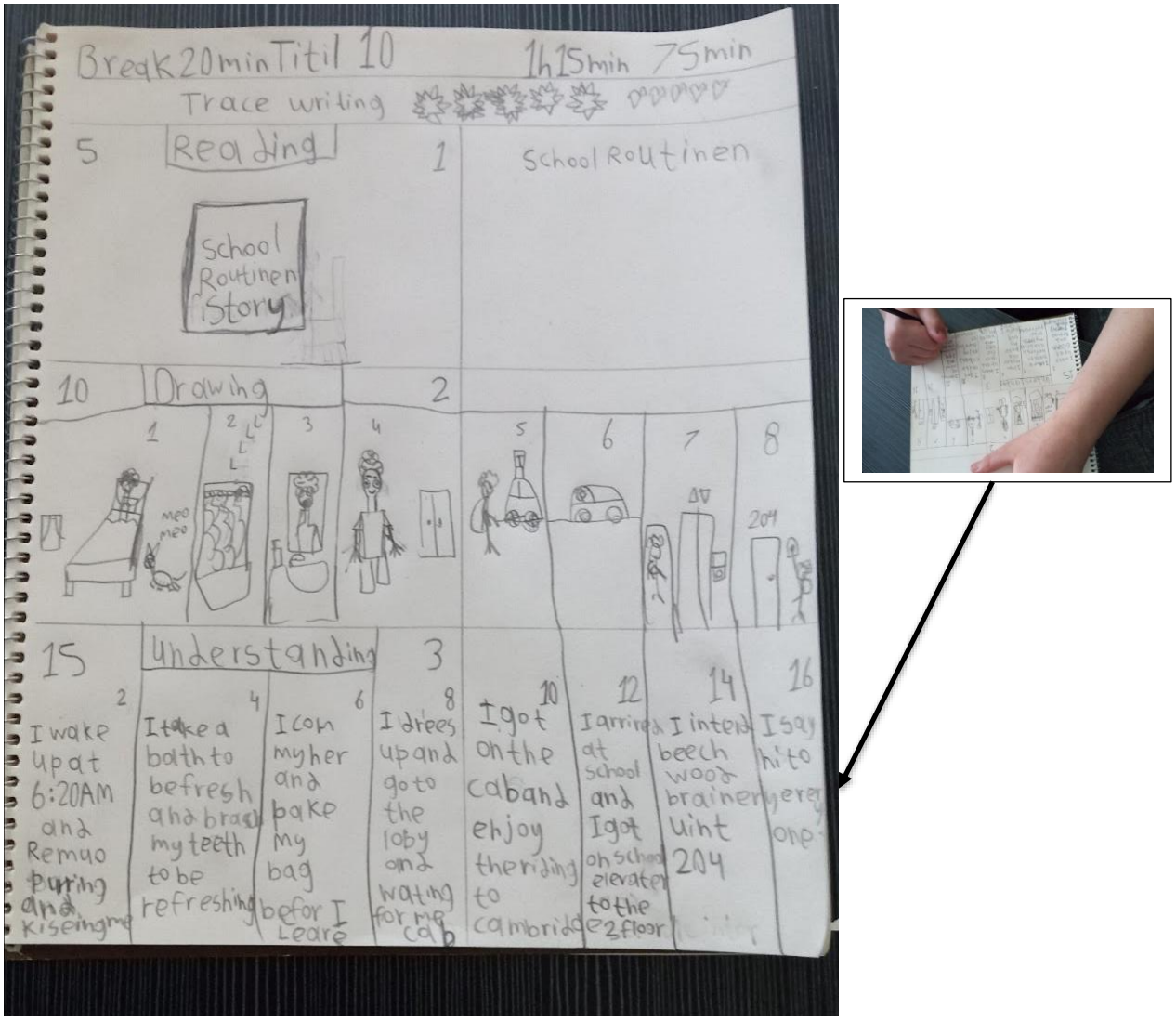


Figure 29 School Routine story was transformed into a visual by Primary Co-designer through recollection and visualization. Each box represents an activity done before school. (Reading, Drawing and Understanding) (Strategy 4 refined by Primary Co-designer)

Discussion

Power Dynamics

Power Redistribution in the Co-Design Process

The facilitator deliberately attempted to redistribute power to the primary co-designer through several strategies, choosing to have parent present in co-design sessions, choice in scheduling sessions and time, agency in activities and naming the project and validating student scoring system by exploring the student's unique scoring system with percentages like "50,000%," allowing him to define success on his own terms.

The primary co-designer demonstrates growing agency throughout the project by negotiating when and what he wants to do, by saying "It's my choice, I can say OK." You can come every Sunday." He also expressed an understanding of boundary setting.

There was tension between the protective power (exercised by the parent) and the Primary co-designer's agency and autonomy. The Primary co-designer is a minor, and this was expected. But negotiation between the student's desire for autonomy and the parent's protective gatekeeping role had to be balanced throughout the process.

Financial burden creates a power dynamic in which access to effective support depends on economic privilege. The Secondary co-designer holds decision-making power about resource allocation and the Primary co-designer's educational outcomes are partially determined by family financial capacity.

There are also professional lived experience power dynamics at play. The project revealed tension between professional expertise and lived experience where, professional authorities like schools and assessment centers hold power to diagnose and make educational recommendations. The Secondary co-designer questions these authorities based on their lived experience, which was clear when they had struggles in the public school system placement prior to this research project engagement. All the schools they went to recommended to place Primary co-designer in the Alternative Continuum of Education (ACE[15]) class, but the parent knew her child could do better in a regular class. This brough about a lot of stress and metal health issues for the whole family. Also, many parents told the Secondary co-designer to fight for her child's rights because he could not advocate for himself.

[15] The Alternative Continuum of Education (ACE) program is a non-credit program leading to a Certificate of Accomplishment. As an alternative to Ontario curriculum, the program does not lead to an Ontario Secondary School Diploma (OSSD).(Grand River Collegiate Institute, n.d.)

"Although that I told them like I can see a lot of potential like they ignored me…" - Secondary co-designer

The Secondary co-designer also mentioned that the public school they started with did not push the kids to do things. Whether the students completed assignments or not, was ok with teachers, even though the Secondary co-designer recognizes that every school may be different, and this was not a general comment.

"In his public school, they do not push him, if he does it is ok, if he doesn't it is ok"- Secondary co-designer

This indicated that the public school gave autonomy to Primary co-designer when doing assignments compared to the secondary co-designer's expectation of completing assignments which are assigned to Primary co-designer to progress. This brings us to cultural power dynamics.

Cultural Power Dynamics

As a newcomer family, additional power dynamics emerged. The newcomer status created language-based power imbalances in navigating systems, cultural resources disadvantages in understanding educational options and potential for discrimination or dismissal based on newcomer status.

"We are very special because we are newcomers. English is not our first language. New system, new school system."

The Parent's Struggle with Institutional Power

The parent actively resisted institutional power through rejecting MC public school's recommendations to move the Primary co-designer into the ACE class because she mentioned she did not trust public school and wanted a school that understands ASD/ADHD, and the Parent is looking for teachers that are good in her view; because she believes the environment and teachers also have an impact on the child. She sought alternative options by looking for people with similar experience to her and alternative schools.

The power dynamics in this co-design process reflect traditional hierarchical structures and intentional efforts to redistribute power more equitably. While institutional and financial power structures create significant barriers, the co-design process creates spaces where the primary co-designer can exercise meaningful agency. The parent's role as both power holder and advocate creates complex dynamics, as she simultaneously wields significant decision-making authority while fighting against systemic barriers.

The facilitator's approach demonstrates conscious attention to power redistribution, though within the constraints of professional boundaries and institutional realities. The outcome reflects a nuanced negotiation of power that honors student agency while recognizing the protective and advocacy roles of the caregiver within challenging systemic contexts.

The project reveals that true inclusive design requires ongoing attention to power dynamics, with deliberate strategies to amplify the voices of those traditionally marginalized while navigating the complex realities of existing power structures.

Success

A collaborative and iterative approach was used to developing personalized learning strategies that address the specific needs of the Primary Co-designer. By combining focused reading tools, visual aids, structured breaks, and positive reinforcement, the Co-designers explore effective ways to enhance learning and engagement. The process aligns with established success indicators and principles of experiential learning, UDL, and IDRC co-design principles, suggesting potential transferability to other educational contexts. The conversation between all Co-designers reflects a commitment to creating sustainable, student-centered approaches that build on strengths and address challenges in integrated inclusive classroom settings. Some main successes include,

- **Student Agency**: The Primary Co-designer demonstrated significant agency throughout the need exploration, strategy development process, naming the strategy and determining continuation plans.
- **Strategy Alignment**: The visual strategy aligns well with professional recommendations, as indicated by the parent's report that BOMA (a professional assessment organization) also suggested visual cues.
- **Collaboration Quality**: All three stakeholders demonstrated active participation and mutual respect throughout the co-design process.
- **Integration with Professional Support**: The strategy complements other professional supports the student is receiving, creating a coordinated approach.

The naming of the project as "Trace writing" and the detailed continuity planning reveal refined co-design practices that prioritize student agency while establishing sustainable support structures. The naming process empowered the primary co-designer to take ownership of the strategy, while the multi-layered continuity plans created pathways for ongoing implementation across contexts and time periods. The case demonstrates how individual planning through understanding student needs and strength-bases activities can enhance the effectiveness of educational interventions, while also revealing the substantial systemic barriers that still exist to ensure truly sustainable support for learners with diverse needs.

Limitation

The duration of co-design sessions was short because The Primary co-design needed breaks due to ADHD/ASD. The Project Initially was to explore both Learning and behaviour, but there was limited time to dive deep into behavioral change through co-created strategy. While the strategy addresses academic comprehension, the Secondary Co-designer and BOMA notes additional behavioral challenges that require attention.

There was no actual cooking activity to relate recipe and comprehension. The primary co-designer actually wanted to cook together, but the timing of the project was conflicted with Ramadan where his religion would not permit us to cook during the day, which we both agreed to respect. Hence the use of other relevant skills like drawing. Also the Primary codesign sometime seen so focused on the cooking part and ignored the comprehension if not well structured.

The continuity of the strategy has financial barriers and uncertainty about adult support; this highlights the need for systemic changes to better support learners with diverse needs. While the co-design process successfully created an effective personalized strategy and continuity plan, its long-term sustainability remains dependent on the Facilitator and the efforts of the secondary co-designer to navigate complex support systems and financial demands.

Recommendation

Recommendations for Co-Designing Personalized Inclusive Learning Strategies

Based on the comprehensive analysis of the co-design sessions, the co-designers recommend key strategies for implementing personalized learning strategies in inclusive educational settings. The sessions reveal critical insights about student agency, facilitation approaches, and the delicate balance between power structure and flexibility in supporting students with diverse learning needs. These recommendations are grounded in the observed interactions between the Primary Co-designer (student), facilitator (Project researcher), and the Secondary Co-designer (parent), demonstrating the effectiveness of co-design principles when applied to personalized learning.

Building Agency Through Choice and Relatability

The most outstanding element from the sessions are the importance of providing genuine choices while maintaining educational objectives. When the Primary Co-designer expressed difficulty with comprehension activities, stating "Because it's hard," the facilitator demonstrated remarkable flexibility by shifting to cooking-related analogies. This approach aligns with Universal Design for Learning (UDL) principles, which emphasize multiple means of engagement.

I recommend that educators implement a "gap bridge-building" approach where challenging academic content is consistently connected to student interests. The facilitator demonstrated this in how the facilitator used cooking recipes to explain reading comprehension, to demonstrate how abstract concepts become accessible when linked to familiar experiences. The structured process below can be used to build agency.

- Students identify their areas of expertise or interest
- Educators create parallel frameworks between these interests and academic concepts
- Regular check-ins ensure the analogies remain meaningful and effective

Structured Flexibility in Learning Design

There is a need for what I term "structured power flexibility". That is maintaining clear educational goals while allowing for dynamic adaptation. When student repeatedly attempted to redirect from

comprehension to other Lexia activities, the facilitator established boundaries while respecting student choice by saying "We don't have to do prefix today, so only the comprehension."

Educational programs should develop protocols that;

- Allow students to express preferences and difficulties openly
- Provide predetermined alternatives that still address learning objectives
- Create transition strategies between preferred and challenging activities
- Establish clear success metrics that students can understand and track

Environment and Self-Awareness Development

A particularly insightful moment occurred when asked, "Why are you looking there?" when Primary co-designer's attention wandered. Instead of reprimanding, Facilitator used this as an opportunity to build self-awareness. This approach transforms potentially negative interactions into metacognitive learning moments.

I recommend implementing systematic self-awareness practices:

- Regular "attention mapping" where students identify their distraction patterns
- Co-created environmental modifications based on student feedback
- Development of personalized focusing strategies
- Integration of movement and sensory breaks as legitimate learning tools

Technology Integration and Multi-Modal Learning

The challenges encountered with the Lexia platform highlight the need for thoughtful technology integration. When navigating became cumbersome, the team adapted by introducing paper-based alternatives. This flexibility demonstrates that technology should enhance, not constrain, learning experiences.

Key recommendations for technology use include:

- Pre-assessment of platform accessibility for individual student needs
- Parallel paper and digital options for all digital content
- Regular evaluation of technology effectiveness with student input

- Training for facilitators on when to pivot from digital to analog methods

Collaborative Planning and Documentation

The success of this project hinged on the collaborative dynamic between all stakeholders. The parent's insight about student listening more to "outsiders" than family members informed the facilitator's approach to reinforcement and encouragement.

To optimize collaborative planning:

- Establish regular communication protocols between all stakeholders
- Create shared documentation systems for strategies that work
- Develop transition plans for when students work with different facilitators
- Include student voice in planning and evaluation processes

Time Management and Session Structure

The 90-minute session structure revealed important insights about pacing and breaks. Primary co-designer’s negotiation for break times demonstrates the need for student participation in time management decisions.

Recommended time management strategies:

- Co-create session schedules with built-in flexibility
- Allow students to earn or negotiate break times
- Use visual timers and clear transition signals
- Balance intensive work with reward activities

Progress Measurement and Success Criteria

The facilitator's approach to progress measurement focused on qualitative improvements rather than just quantitative metrics. This holistic assessment aligns with inclusive education principles that value individual growth paths.

Assessment recommendations include:

- Develop personalized success criteria with student input
- Create visual progress tracking tools that students can understand
- Celebrate incremental improvements in engagement and persistence
- Document strategies that lead to breakthrough moments

Cultural Competence and Relationship Building

Culture enhanced the learning relationship. Student teaching facilitator Arabic phrases created reciprocal learning moments that strengthened bond. Also Arabic was used to enhance meaning of concepts and further understanding.

To enhance cultural competence:

- Encourage reciprocal teaching moments
- Integrate students' cultural backgrounds into learning materials
- Create opportunities for students to be experts in their cultural knowledge
- Use multilingual approaches when beneficial for comprehension

These recommendations collectively form a framework for implementing inclusive, personalized learning strategies. The key insight is that successful co-design requires a delicate balance between structure and flexibility, always guided by student voice and agency. When students are treated as genuine partners in their educational journey, with their interests and challenges respected and incorporated into learning design engagement, progress naturally follow.

The success of this approach depends on educators' willingness to adapt, listen, and co-create with students, viewing challenges not as obstacles but as opportunities for innovative solution-finding. As demonstrated in these co-design sessions, when we honor student agency while maintaining educational rigor, we create learning environments where all students can thrive.

Conclusion

This Masters Research project was a successful co-design and co-creation process that resulted in a personalized Inclusive learning strategy aligned with theoretical best practices in inclusive education. By actively involving the Primary Co-designer in strategy exploration, development through to refinement, the process honoured student agency while addressing specific learning needs. The "read-draw-write" approach emerging from this collaboration demonstrates how personalized learning strategies can effectively bridge reading gaps by providing structured scaffolding that builds independence. The observed outcomes indicate positive progress, though continued refinement and practice will be necessary for sustained growth.

The strategy development and refinement process documented demonstrates a successful co-design approach to addressing reading comprehension challenges, but this process required trust, patience, and dedication from all stakeholders. By combining visual representation with structured reading, the team created a personalized learning method that engages the Primary Co-designer's strengths while supporting areas of difficulty.

The strategy aligns well with established success indicators, particularly in fostering student engagement and agency, facilitating quality collaboration among stakeholders, and creating adaptable learning approaches. It also reflects core principles of experiential learning, deep learning, UDL, interest based learning , problem based learning and co-design.

The evolution of the strategy shows a responsive, iterative process. All participants contributed meaningful insights. The Facilitator provided structure and guided implementation, the Secondary Co-designer offered context and reinforcement, and the Primary Co-designer exercised agency in determining how the strategy was created and applied.

The power dynamics in this co-design process reflected both traditional hierarchical structures and intentional efforts to redistribute power more equitably. While institutional and financial power structures created significant barriers, the co-design process creates spaces where the primary co-designer can exercise meaningful agency. The parent's role as both power holder and advocate created complex dynamics, as she simultaneously wielded significant decision-making authority while fighting against systemic barriers. The outcome reflects a nuanced negotiation of power that honors student agency while recognizing the protective and advocacy roles of the caregiver within challenging systemic contexts. It is important to pay attention to power dynamics, with deliberate strategies to amplify the voices of those traditionally marginalized while navigating the complex realities of existing power structures.

This project suggests that the visualization approach to reading comprehension represents a promising strategy that could be transferable to other educational contexts, particularly for students who benefit from visual thinking approaches and structured segmentation of learning tasks. The documentation of this process aims to provide and share valuable insights for educators and parents seeking to support and collaborate with students with diverse learning needs to develop effective, personalized approaches to learning challenges, particularly in reading comprehension through strength-based approaches.

"Inclusive Designers must recognize the lived experience of outliers to create truly accessible designs or strategies in complex environments."-Elikem Akos Amevordzie

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Appendix

Appendix A: Invitation / Consent / Attribution Forms for Parent

Dear Parent

I am a student writing a Master Research Project (MRP) in the Department of Inclusive Design, OCAD University in Toronto, Ontario, Canada as partial fulfillment of my master's degree. You are invited to participate in a research study in which we will explore collaboratively to gain insight into your child's experiences, behaviours and strategies employed when learning in a regular classroom and co-design learning and behavioural strategies and plan to modify his learning and behaviour in a regular classroom and social settings.

The Purpose

The purpose of this research is to collaboratively understand the challenges faced by your child with ADHD/Autism Spectrum in an integrated classroom setting. The goal is to co-design strategies with you and your child to support your child's journey through decision-making, advocacy and how active participation influences agency and developmental outcomes in the integrated class setting. We will study the impacts of personalized learning and behavioural strategies and plan on his engagement, deep learning, individual growth, and improve behaviour in a regular classroom and social environments.

It is acknowledged that the student researcher will not assist and is not responsible for providing guidance regarding the choice or appropriateness of the school environment or the choice of schools. Nor is the student researcher accountable for providing tutoring or teaching support of particular curricular activities in the class. Your child has the agency to activate the co-created approaches in the classroom.

If you agree to participate, you will be asked to:

- Participate in an in-depth interview to dive into your perspectives, challenges, and strategies that you adapted based on your experience, that your child could adapt to when learning in regular classroom/resource support. This will be done at the beginning of the project. This will be done with you.

- Prompt your child to participate in reflective journaling on his experiences in school. This would provide ongoing insights and capture his thought processes and decision-making process. He will be given Journaling prompts to fill in and write and/or draw reflections on successes and challenges, his thoughts on learning in an integrated classroom setting and Ideas for improvement if needed. This could be done daily, weekly or bi-weekly depending on your child's preference. The journals will be used to co-create strategies during co-design sessions.

- Participate in about 4 sessions of 1.5 hours co-design sessions only if your child consents to have you present in the session. There will be preferred breaks in-between. you will be an observer in the co-design session and your child has the agency to invite you to participate in any activity such as planning collaborative activities, define objectives and co-create iteratively.

- We will analyze journals based on lesson plans and support strategies provided in the classroom and teachers' reports to reveal his learning process and behaviour. We will take into consideration Universal Design for Learning principles, Regular lesson plans, Individualized Education Plans (IEPs) or equivalent, Resource support materials and strategies (if provided by you) and his process of adaptation as a learner and active and respectful participant in the classroom setting with other learners. This will be done once a month. The co-design session will be between your child and the researcher. Your child can choose to allow you to join the co-design session or not. If they choose to not have you present, I will inform you about this.

- Prompt your child to implement the plans by reminding your child about the plan. However, it is up to your child the agency to implement or not.

- In this consent form you have the option to choose between one or more formats to allow me the documentation of research. Options are note taking and/ or, video recording and/ or audio recording or photographing of the co-design sessions. Note that no personal information will be recorded as part of this research. Where personal information may be obvious, the video will be edited and blurred. This will be done during co-design and interview sessions. All information will be kept safe in OCAD University database and deleted by 30th June,2025

- Photo and Video recording consent is optional and voluntary and will not affect your child's or your participation in the project. All audio recordings will be destroyed at the end of the project by 30th June,2025. All data will be anonymized by default unless consented to by you.

Please read this Information Statement and the consent form, be sure you understand its contents before you consent to participate. Participation in this project is entirely your choice. Only those people, who give their informed consent will be included in the project. Whether or not you decide to participate, your decision will not disadvantage you in any way. If you do decide to participate, you may withdraw from the project at any time without giving reason or without penalty.

All information will be stored exclusively in the researchers' access-protected database and will not be shared by or with anyone other than the researchers themselves. Any personal data will be securely kept in an access-protected database throughout the project's duration and will be permanently discarded at its conclusion. Participant names will be changed on any educational or presentation materials created for the project unless they agree to the image and attribution consent (page 6). If you have any concerns or would like to know the outcomes of the project, please contact me at the above address.

Thank you for considering this invitation.

Elikem Amevordzie

Student Investigator, OCAD University.

POTENTIAL BENEFITS

Participation may improve classroom practice and student outcome. The co-design sessions may contribute to the understanding of effective inclusive learning strategies or plans that could significantly increase the likelihood of successful practices for personalizing support in an integrated classroom setting. This may create insights into the challenges students with ADHD/Autism spectrum face in an integrated classroom setting.

POTENTIAL RISKS

participating in the co-design activities, participants will need to use a computer, express their thoughts through drawing or writing. This may lead to participants experiencing fatigue. This risk would not be greater than using these technologies in their day-to-day activities.

CONFIDENTIALITY

No personal details are part of this research. Your names and other personal details will be changed on any educational or presentation materials created for the project unless you choose to provide us with your image and attribute consent (by ticking YES on page 6). Raw data in the form of identifiable images/ videos of participants and artifacts collected during this Project will be stored exclusively in the researchers' access-protected database and will not be shared by or with anyone other than the researchers themselves.

Shortly after the interview and co-design session has been completed, I will send you a copy of the transcript to give you an opportunity to confirm the accuracy of our conversation and to add or clarify any points that you wish. Any personal data will be securely kept in an access-protected database throughout the project's

duration and will be permanently discarded at its conclusion. The raw data will be kept until the 30th of June 2025 after which time the raw data will be deleted. Access to this data will be restricted to participating OCAD U ID student researchers and OCAD U ID faculty supervisor.

INCENTIVES FOR PARTICIPATION

The participant will not be paid to participate in this study.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time, or request withdrawal of your data prior to data analysis and you may do so without any penalty or loss of benefits to which you are entitled. Your choice of whether or not to participate will not influence your future relations with OCAD University or the investigators [Elikem Amevordzie] involved in the research.

To withdraw from this study, let Faculty supervisors know at any point during the study, or you may contact Elikem Amevordzie by email at elikemamevordzie@ocadu.ca

To withdraw your data from the study, please contact Elikem Amevordzie by email at elikemamevordzie@ocadu.ca no later than 21/03/2025. Any data flagged for removal will be removed from our databases and will not be included in the final report.

PUBLICATION OF RESULTS

The final MRP report may be presented as part of conferences or lectures and communicated in form of publications (online/print). It will be an open-source document in the OCAD University Library and will be made available to participants per request through email. In any publication, data will be presented in aggregate forms. Quotations from Co-design sessions will not be attributed to you without your permission.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact the Student Investigator Elikem Amevordzie, the Faculty Supervisors Jutta Treviranus or Angelika Seeschaaf-Veres using the contact information provided below. This study has been reviewed and received ethics clearance through the Research Ethics Board at OCAD University [file # 102656]. If you have any comments or concerns, please contact the Research Ethics Office through research@ocadu.ca.

For further information please contact the

Student Investigator:

Student Investigator:
Elikem Amevordzie
MDes Inclusive Design
OCAD University
[phone number]
[email address]

Participation Consent Form for Parent

I, …… hereby agree to voluntarily participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time. I understand that the project will be conducted in accordance with the Information/Consent Form, a copy of which I have retained.

I understand that I can withdraw from the project at any time, without penalty, and do not have to provide any reason for withdrawing.

- The audio recording and/or photographing of my participation in and contribution during the research.
- My name and other personal details changed on any educational or presentation materials created for the project.
- The secure storage of all information.
- My contributions and opinions being accurately represented.

I agree to the procedures listed above and would like to participate in this research project.

☐ Yes

☐ No

Print Name:……

Signature…….

Date: …….

Thank you for your assistance in this project. Please keep a copy of this form for your records.

This project will be conducted in compliance with the Research Ethics Code of OCAD University [file # **102656**].

For further information please contact the

Student Investigator:

Student Investigator:
Elikem Amevordzie
MDes Inclusive Design
OCAD University
[phone number]
[email address]

Image and Attribute Consent Form for Parent

Please note that this consent form is optional and has no impact on the participation in this research study.

I, (please print) ……have read the information on **A Collaboration with a student to co-design learning strategy and classroom behaviour** and all queries have been answered to my satisfaction. I have made this decision based on the information I have read in the Information/Consent Form. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future.

- You may use my name alongside statements and/or quotations/ images or movies that you have collected from me/ I am part of.

- The use of this footage and any still images in which I can be clearly identified may be used in presentations, conferences and publications both online and in the print media.

☐ No. I do not wish to provide attribution and image consent.

☐ Yes, I wish to be attributed and consent to the use of identifiable images.

Print Name:……..

Signature…….

Date: ……..

Thank you for your assistance in this project. Please keep a copy of this form for your records.

This project will be conducted in compliance with the Research Ethics Code of OCAD University [file # 102656]

Appendix B: Invitation / Consent / Attribution Forms for Parent to consent to Child's/Youth Participation

Student Investigator:
Elikem Amevordzie,
MDes Inclusive Design
OCAD University
[phone number]
[email address]

Faculty Supervisor:
Jutta Treviranus
Faculty of Design
OCAD University
[phone number]
[email address]

Faculty Supervisor:
Angelika Seeschaaf-Veres
Faculty of Design
OCAD University
[phone number]
[email address]

Dear Parent

I am a student writing a Master Research Project (MRP) in the Department of Inclusive Design, OCAD University in Toronto, Ontario, Canada as partial fulfillment of my master's degree. Your child is invited to participate in a research study in which we will explore collaboratively to gain insight into your child's experiences, behaviours and strategies employed when learning in a regular classroom and co-design learning and behavioural strategies and plan to modify his learning and behaviour in a regular classroom and social settings.

The Purpose

The purpose of this research is to collaboratively understand the challenges faced by your child with ADHD/Autism Spectrum in an integrated classroom setting. The goal is to co-design strategies with your child and to support your child's journey through decision-making, advocacy and how active participation influences agency and developmental outcomes in the integrated class setting. We will study the impacts of personalized learning and behavioural strategies and plan on his engagement, deep learning, individual growth, and improve behaviour in a regular classroom and social environments.

It is acknowledged that the student researcher will not assist and is not responsible for providing guidance regarding the choice or appropriateness of the school environment or the choice of schools. Nor is the student researcher accountable for providing tutoring or teaching support of curricular activities in the class. Your child has the agency to activate the co-created approaches in the classroom.

If you agree to participate, you will be asked to:

Allow your child to participate in an in-depth interview to dive into his perspectives, challenges, and strategies adapted when learning in regular classroom/resource support. This will be done at the beginning of the project. He can choose to allow you to join the interview session.

+-

Allow your child to participate in reflective journaling on your experiences to provide ongoing insights and capture your thought processes and decision-making. He will be given Journaling prompts to fill in and write reflections on successes and challenges, his thoughts on learning in an integrated classroom setting and Ideas for improvement if needed. This could be done daily, weekly or bi-weekly depending on the participant. The journals will be used to co-create strategies during co-design sessions.

Allow your child to participate in about 4 sessions of 1.5 hours co-design sessions with his preferred breaks in-between, plan collaborative activities, define objectives and co-create iteratively. We will analyze journals based on lesson plans and support strategies provided in the classroom and teachers' reports to reveal his learning process and behaviour. We will take into consideration Universal Design for Learning principles, Regular lesson plans, Individualized Education Plans (IEPs) or equivalent, Resource support materials and strategies and his process of adaptation as a learner and active and respectful participant in the classroom setting with other learners. This will be done once a month. The co-design session will be between your child and the researcher. He can choose to allow you to join the co-design session.

In this consent form you have the option to choose between one or more formats to allow me the documentation of research. Options are note taking and/ or, video recording and/ or audio recording or photographing of the co-design sessions. Note that no personal information will be recorded as part of this research. Where personal information may be obvious, the video will be edited and blurred. This will be done during co-design and interview sessions. All information will be kept safe in OCAD University database and deleted by 30th June,2025

Photo and Video recording consent is optional and voluntary and will not affect your child's or your participation in the project. All audio recordings will be destroyed at the end of the project by 30th June,2025. All data will be anonymized by default unless consented to by you.

Please read this Information Statement and the consent form, be sure you understand its contents before you consent to participate. Participation in this project is entirely your choice. Only those people, who give their informed consent will be included in the project. Whether or not you decide to participate, your decision will not disadvantage you in any way. If you do decide to participate, you may withdraw from the project at any time without giving reason or without penalty.

All information will be stored exclusively in the researchers' access-protected database and will not be shared by or with anyone other than the researchers themselves. Any personal data will be securely kept in an access-protected database throughout the project's duration and will be permanently discarded at its conclusion. Participant names will be changed on any educational or presentation materials created for the project unless they agree to the image and attribution consent (page 7). If you have any concerns or would like to know the outcomes of the project, please contact me at the above address.

Thank you for considering this invitation.

Elikem Amevordzie

Student Investigator, OCAD University.

POTENTIAL BENEFITS

Participation may improve classroom practice and student outcome. The co-design sessions may contribute to the understanding of effective inclusive learning strategies or plans that could significantly increase the likelihood of successful practices for personalizing support in an integrated classroom setting. This may create insights into the challenges students with ADHD/Autism spectrum face in an integrated classroom setting.

POTENTIAL RISKS

participating in the co-design activities, participants will need to use a computer, express their thoughts through drawing or writing. This may lead to participants experiencing fatigue. This risk would not be greater than using these technologies in their day-to-day activities.

CONFIDENTIALITY

No personal details are part of this research. Your names and other personal details will be changed on any educational or presentation materials created for the project unless you choose to provide us with your image and attribute consent (by ticking YES on page 6). Raw data in the form of identifiable images/ videos of participants and artifacts collected during this Project will be stored exclusively in the researchers' access-protected database and will not be shared by or with anyone other than the researchers themselves.

Shortly after the interview and co-design session has been completed, I will send you a copy of the transcript to give you an opportunity to confirm the accuracy of our conversation and to add or clarify any points that you wish. Any personal data will be securely kept in an access-protected database throughout the project's duration and will be permanently discarded at its conclusion. The raw data will be kept until the 30th of June 2025 after which time the raw data will be deleted. Access to this data will be restricted to participating OCAD U ID student researchers and OCAD U ID faculty supervisor.

INCENTIVES FOR PARTICIPATION

The participant will not be paid to participate in this study.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time, or request withdrawal of your data prior to data analysis and you may do so without any penalty or loss of benefits to which you are entitled. Your choice of whether or not to participate will not influence your future relations with OCAD University or the investigators [Elikem Amevordzie] involved in the research.

To withdraw from this study, let Faculty supervisors know at any point during the study, or you may contact Elikem Amevordzie by email at elikemamevordzie@ocadu.ca

To withdraw your data from the study, please contact Elikem Amevordzie by email at elikemamevordzie@ocadu.ca no later than 21/03/2025. Any data flagged for removal will be removed from our databases and will not be included in the final report.

PUBLICATION OF RESULTS

The final MRP report may be presented as part of conferences or lectures and communicated in form of publications (online/print). It will be an open-source document in the OCAD University Library and will be made available to participants per request through email. In any publication, data will be presented in aggregate forms. Quotations from Co-design sessions will not be attributed to you without your permission.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact the Student Investigator Elikem Amevordzie, the Faculty Supervisors Jutta Treviranus or Angelika Seeschaaf-Veres using the contact information provided below. This study has been reviewed and received ethics clearance through the Research Ethics Board at OCAD University [file # 102656]. If you have any comments or concerns, please contact the Research Ethics Office through research@ocadu.ca.

For further information please contact the

Student Investigator:

Student Investigator:
Elikem Amevordzie
MDes Inclusive Design
OCAD University
519 242 9059
elikemamevordzie@ocadu.ca

Participation Consent Form

I, the parents/guardian of …… hereby agree and give my permission to my child to voluntarily participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time. I understand that the project will be conducted in accordance with the Information/Consent Form, a copy of which I have retained.

I understand that:

The participation is voluntary, and I can withdraw from the project at any time, without penalty, and do not have to provide any reason for withdrawing.

The secure storage of all information.

My contributions and opinions being accurately represented.

All data will be anonymized by default unless consented to by you.

I agree to the audio recording of my participation in and contribution in the research project.

☐ Yes

☐ No

I agree to the video recording of my participation in and contribution in the research project.

☐ Yes

☐ No

I agree to the photographing of my participation in and contribution in the research project.

☐ Yes

☐ No

I agree to the procedures listed above and would like my child to participate in this research project.

☐ Yes

☐ No

Print Name:……

Signature…….

Date: ……..

Thank you for your assistance in this project. Please keep a copy of this form for your records.

This project will be conducted in compliance with the Research Ethics Code of OCAD University [file # 102656].

For further information please contact the

Student Investigator:

Student Investigator:
Elikem Amevordzie
MDes Inclusive Design
OCAD University
[phone number]
[email address]

Parental/Guardian Image and Attribute Consent Form child(dren) for Research Dissemination and Publication

Please note that this consent form is optional and has no impact on the participation in this research study.

I, (please print) ……have read the information on **A Collaboration with a student to co-design learning strategy and classroom behaviour** and all queries have been answered to my satisfaction. I have made this decision based on the information I have read in the Information/Consent Form. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future.

You may use my name alongside statements and/or quotations/ images or movies that you have collected from me/ I am part of.

The use of this footage and any still images in which I can be clearly identified may be used in presentations, conferences and publications both online and in the print media.

☐ No. I do not wish to provide attribution and image consent.

☐ Yes, I wish to be attributed and consent to the use of identifiable images.

Print Name:……..

Signature……..

Date: ……..

Thank you for your assistance in this project. Please keep a copy of this form for your records.

This project will be conducted in compliance with the Research Ethics Code of OCAD University [file # 102656].

Appendix C: Invitation and Assent Form for Youth

Dear Potential Co-designer

I am a student writing a Master Research Project (MRP) in the Department of Inclusive Design, OCAD University in Toronto, Ontario, Canada as partial fulfillment of my master's degree. With your parent's permission, I will learn about your classroom experiences and strategies. Together, we will co-design a plan to improve your behaviour in the integrated class setting.

You, parent, and I talking about school

Who am I?

My name is Elikem Amevordzie and you can call me Eli. I am a Master student in the Department of Inclusive Design, OCAD University in Toronto, Ontario, Canada. I am a parent of 2 girls, and I supported my child who was struggling to read and now she is reading lovely. I was a teacher and love to support kids with learning difficulty.

Why am I co-designing with you?

I really want to learn how to make Classroom experience better you and kids like you.

You and I talking about school

YOU would be my partner in this project.

What we would do together:

1. Talk about school – what is easy, what is hard, and what helps you learn best

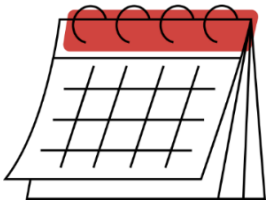
Classroom

2. You will get your own special journal (like a detective's notebook!) where you can:

   - Draw or write about your school day
   - Share what makes good days good and tough days tough
   - Write down your ideas about what could make classroom experience better

3. We will meet once a month for about 1.5 hours (we can take lots of breaks!). During our time together:

1.5



1 or 2 times a month

15-20min Break time

- We will look at your journal together.
- Create plans together that work just for you.
- Try out the plans if you want to.

- You can choose if you want your parent to join us or not

You, Parent, and I talking about school

Do you want parent to join us?

☐ No

☐ yes

The most important things to know:

- You can say no anytime
- You can take breaks whenever you need them
- This is voluntary, you can withdraw before 21/03/2025
- You can tell me if something does not feel right
- There are no wrong answers
- You don't have to answer questions you don't want to
- If you feel tired or overwhelmed, we can stop

Meaning of colours

STOP / NO

REST / BREAK

KEEP GOING / YES

Would you like me to explain any part of this again?

You can ask me questions anytime - even if you think of them later. Here is the telephone number and email address that you can reach me at: [phone number] or elikemamevordzie@ocadu.ca

or 

Email

Call

Is it okay if I record our sessions?

Audio recording and picture will support me to study project. Video recording is optional. I will make sure to blur your face in any videos so nobody will know it is you. You can opt out at anytime. Co-design can continue without video recording.

- Some pictures will be part of the project report after you agree to it.
- All Video and Audio will be destroyed after the research is completed.

Can I take pictures of activities?

photograph activities

☐ No

☐ Yes

Can I audio record?

Voice record activities

☐ No

☐ Yes

Can I video record activities?

video record activities

☐ No

☐ Yes

Remember:

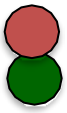
You are the expert. I am here to learn from you and work with you to make classroom experience better.

Thank you for reading this and your interest

Youth Assent Form

Youth's name, printed: _____

Do you want to participate in this co-design?



☐ No

☐ Yes, I wish to participate in the study and the process that you explained in the letter.

Youth Signature: _____ Date: _____

Thank you for your participation in this project. Please keep a copy of this form for your records. This project will be conducted in compliance with the Research Ethics Code of OCAD University [file # 102656].

For further information please contact the student Investigator or Faculty Supervisor:

Student Investigator:
Elikem Amevordzie
MDes Inclusive Design
OCAD University
[phone number]
[email address]

Faculty Supervisor:
Jutta Treviranus
Faculty of Design
OCAD University
[phone number]
[email address]

Faculty Supervisor:
Angelika Seeschaaf-Veres
Faculty of Design
OCAD University
[phone number]
[email address]

Appendix D: Key Questions Asked to understand and Know Co-designers

About School Experience

What do you like about your school?

Do you like the teachers? For example, do you like how they teach you?

What subject do you love best?

What do you like about grade eight?

What don't you like about your school in Canada?

You do not have any problem with your new school? What are some of the things you do not like?

What didn't you like about that school? (referring to previous school)

About Learning Preferences

How do you like to learn? Do you like reading?

How do you understand things? Do you have to watch things more to understand or you have to write it down to understand?

Which parts do you love about reading?

Do you like answering the questions? You know after you read the story.

About Daily Routines

How do you prepare in the morning, you get up in the morning, what time do you wake up?

What time you leave the house? Do you take the bus?

About Lexia Program

What are the things you like about it?

The Lexia certificates, what do they write on the certificates?

Show me how Lexia works on your computer?

Appendix E: Key Questions Asked to understand experience and needs Co-designers

Key Questions Asked by Facilitator

Understanding Challenges:

Why didn't you want to go to the comprehension?

What is hard about it?

Why are you looking there?

Building Metacognition:

When shows us what?

Tell me, what is a fact?

What is the main idea?

Exploring Agency:

What do you want us to do?

Which one do you want?

How would you make it easy for you?

Scaffolding Learning:

Who encounters the changing climate?

How high is the mountain?

What happens at 16,000 feet?

Appendix F: Key Questions Asked to explore strategy with co-designer

Main Questions Asked by the Facilitator

Comprehension-focused questions:

What is the setting in the story?

What was the problem in the story?

What did you learn about the story?

Agency-promoting questions:

Which sticker do you want for this?

When do you want to cook?

Where will we put the last?

Strategy development questions:

Do you think that is the problem?

What do you think we should write with this House?

Appendix G: Key Questions Asked to refine strategy created by Co-designers

Comprehension-checking questions:

What was the problem in the store?

So where is the Rottweiler walking towards them?

Who is in the story?

Process-oriented questions:

So do you want to schedule it 10 minute work, 5 minute break like that?

You want me to use the pointer or you are using the reading guide. Which one?

What do you have to draw in five? Let us go.

Metacognitive questions:

Why do you think she ran home?

What meaning do you get from...?

What is the Rottweiler doing?

How is it transferring there? - Exploring generalization of strategies across contexts

What are the options? Does the public school have for people who are migrating in the middle of the term or in the middle of the school years? - Examining systemic challenges

So how do you balance that in the school to make sure that everybody is...in the classroom, right? - Addressing inclusive education principles

Is there any thing you want to add to the strategy we have so far? - Inviting co-designer input

Is he able to do that easily? - Assessing strategy efficacy

Changes you want to make? - Encouraging refinement and agency

Appendix H: Key Questions Asked to review the project and refinements done by Co-designers

In the comprehension project, what did we do? (eliciting reflection on the strategy)

How did we break it down? (promoting metacognitive awareness)

What type of activities will you do to make the comprehension easy for you? (encouraging self-advocacy)

Do you prefer to draw or to write? (determining preferences)

How do you feel about that because you are looking away? (exploring emotional responses)

What makes you happy when it comes to grading? (understanding motivation)

Are you going to continue like using the strategy we developed? (planning for continuity)

I want us to name the project we did. (creating ownership)

Appendix I: Level indicates and meaning By BW school

Level 4 - The student has demonstrated the required knowledge and skills with a high degree of effectiveness. Achievement surpasses the provincial standard.

Level 3 - The student has demonstrated the required knowledge and skills with considerable effectiveness. Achievement meets the provincial standard.

Level 2 - The student has demonstrated the required knowledge and skills with some effectiveness. Achievement approaches the provincial standard.

Level 1 - The student has demonstrated the required knowledge and skills with limited effectiveness. Achievement falls much below the provincial standard.

Appendix J: Parts of BOMA Learning Centre Behaviour Service Plan

Strengths: According to the Socially Savvy, Executive Functioning, and PM Benchmark assessments, Primary Co-designer shows strength in his joint attending, social language, self-awareness, and attention skills. He also demonstrated great strength in his word-to-word reading and retelling skills. School Readiness, Play and Leisure, Social/Interpersonal, Self-Regulation we areas documented, which was divided into current, future and behaviours that needed change. An Emotions and Responses Skill Acquisition Program was put in place for Primary co-designer.

Domain	**Goal**	**Current Description of Skill**	**Format**
School Readiness	Increase reading comprehension	Currently, Primary Co-designer demonstrates emerging skills in reading and recognizing words but has difficulty understanding and answering questions about what he has read. Developing reading comprehension is essential for academic success, communication, and overall language development. Through a reading comprehension program, Primary Co-designer will improve his ability to understand, recall, and respond to questions about written text. Initially, he will work on answering wh-questions (who, what, where) about simple, short passages with visual supports. As he progresses, the complexity of the text and the types of questions will increase to include why and how questions, sequencing events, making inferences, and identifying main ideas. Mastery criteria will be determined following baseline.	School Natural Environment Teaching (NET) Discrete Trial Training (DTT) One-to-one
School Readiness	Increase attentive listening	According to parent reporting, and throughout the assessment, it was noted that Primary Co-designer may struggle to listen to others attentively. Developing attentive listening skills is essential for effective communication,	School NET DTT

		academic success, and positive social interactions. Through an attentive listening program, Primary Co-designer will increase his ability to actively listen, attend to verbal information, and respond appropriately. Initially, he will work on maintaining eye contact, orienting his body toward the speaker, and demonstrating active engagement through gestures or verbal responses. As he progresses, he will practice following multi-step directions, summarizing key points, and asking questions to confirm comprehension. Mastery criteria will be determined following baseline.	One-to-one Group Session
Social/Interpersonal	Increase ability to recognize and label emotional state of self and others	Currently, Primary Co-designer is developing foundational social-emotional skills but requires support in recognizing, expressing, and regulating emotions appropriately in various situations. Strengthening these skills is essential for fostering positive relationships, problem-solving, and overall emotional well-being. Through a social-emotional program, Primary Co-designer will improve his ability to identify emotions in himself and others. Initially, he will work on identifying basic emotions (e.g., happy, sad, angry) using visual supports and BST (role-playing activities). Then, he will learn to recognize emotions in different contexts and respond appropriately to social cues. Mastery criteria will be determined following baseline.	
Social/Interpersonal	Increase ability to recognize and respond to nonverbal communication from others	Currently, Primary Co-designer is developing awareness of nonverbal communication but requires support in recognizing and appropriately responding to body language, facial expressions, and gestures in social interactions. Strengthening these skills is	

		essential for effective communication, building relationships, and understanding social cues. Through a nonverbal communication program, Primary Co-designer will improve his ability to recognize, interpret, and respond appropriately to nonverbal body language in social situations. Initially, he will work on identifying common gestures and facial expressions using visual supports and modeling. As he progresses, he will	

Future

Domain	Goal	Description of Skill	Format
Self-Regulation	Increase ability to self-manage behaviour within the classroom	At the time of his assessment, Primary Co-designer struggled to be self-aware of his own behaviours, and the consequences of those behaviours within the classroom and his peer interactions. Through a self-awareness program, Primary Co-designer will develop the ability to recognize and reflect on his actions, identify his strengths and areas for improvement, and understand how his behaviour impacts himself and others. Initially, he will work on labeling and describing his own behaviours, using structured discussions, visual supports, and BST (role-playing). As he progresses, he will learn to identify behaviours he would like to increase or decrease, recognize the outcomes of his choices, and begin to use self-monitoring strategies to adjust his behaviour in real time.	School NET DTT One-to-one

Behaviours for Decrease

Behaviour	**Operational Definition**	**Intervention**
Repetitive Questions	This is defined as the repeated asking of the same or similar question within a short time frame, despite having received an answer or when the answer is readily available. This behaviour includes verbal or written questioning directed toward others. It	An intervention will be determined following

	includes asking the same or similar question multiple times, repeating questions after receiving a response, and asking about information that is already accessible (e.g., written on a schedule). It excludes asking for clarification when a response was unclear, seeking new or related information, inquiring about changing information, and socially appropriate questioning within a conversation.	collection of baseline data.
Crying	Crying is defined as the production of tears, often accompanied by vocalizations such as whimpering, sobbing, or wailing, and facial expressions like frowning or a scrunched face. It includes audible or silent crying with visible tears, crying with vocalizations, and episodes that occur in response to frustration, discomfort, or social interactions. It excludes tearing due to medical or environmental factors (e.g., allergies, eye irritation), isolated whining without tears, and socially appropriate emotional expression.	An intervention will be determined following collection of baseline data.
Protesting	Protesting is defined as any verbal or non-verbal behaviour used to express refusal, disagreement, or opposition to a demand, request, or situation. It includes vocal objections such as saying "no," whining, complaining, or arguing, as well as non-verbal actions like crossing arms, turning away, pushing away objects, or physically resisting a task. It excludes appropriate self-advocacy (e.g., respectfully expressing a preference or requesting a break), quiet noncompliance without active resistance, and behaviours that escalate into aggression or property destruction.	An intervention will be determined following collection of baseline data.
Eloping	Eloping is defined as leaving a designated area or moving away from a supervised setting without permission or awareness from a responsible adult. It includes leaving the table during a work period, exiting a classroom, playground, or building without approval, running, or walking away from a staff member, and attempting to flee an assigned area. It excludes appropriate transitions between locations, movement within an area while remaining in sight and under supervision, and leaving with permission or after appropriately requesting a break.	An intervention will be determined following collection of baseline data.

Appendix k: Empirical Literature Review

There are several empirical studies in inclusive education. One of such is (Walton et al., 2022). The authors investigated the efficacy of professional learning communities in improving inclusive

teaching competencies in rural Australia and peri-urban South Africa, focusing on the obstacles to implementing inclusive education. Walton & Kimani, (2022) used a multi-case study design to analyze three different learning communities, utilizing complexity theory to understand factors influencing teacher learning.

The authors discovered that inclusive pedagogical methods within communities necessitate contextual understanding, specialized knowledge, and robust support networks. Also discovered that, the interchange of local knowledge and collaboration are essential for efficient implementation, recognizing the importance of both local expertise and foreign contributions.

Walton & Kimani, (2022) concluded that inclusive pedagogy via learning communities addresses local difficulties, leverages expert knowledge, and fosters collaborative networks; but it does not ensure consistent outcomes across diverse contexts. Consequently, Walton & Kimani, (2022) recommended the exploration of inclusive education themes, development of adaptable professional learning strategies, and establishment collaborative frameworks for sustained practice of inclusive education.

The study of Walton & Kimani, (2022) highlights the significance of professional learning communities in fostering collaboration among educators, highlighting the necessity for shared knowledge and contextual adaptability in inclusive education. However, the study was not including Canada as it focused on Australia and South Africa. More so, the study methodology did not exploit co-design approach with students with disabilities, to develop appropriate strategies to deepen inclusive education. Further, the benefits of implementing personalized instructional strategies in inclusive classrooms, the challenges faced by teachers and special education consultants in modifying content and teaching methods from the viewpoint of parents and children were not dealt with by Walton & Kimani, (2022).

Unlike Walton & Kimani, (2022) who focused on South Africa and Australia, McCrimmon, (2015) addressed the Canadian gap by focusing on Canada. McCrimmon, (2015) did not use a multi-case design but employed a review methodology to evaluate the efficacy of training in Inclusive Education (IE) and childhood impairment. McCrimmon, (2015) was motivated to undertake the study, given that undergraduate university courses in Canada, were not apt in addressing the needs of IE, thusly, making many graduates not prepared to handle issues of IE.

McCrimmon, (2015) found out that most universities in Canada do not have curricula that addresses the preparation of graduates to deepen the practices of IE in Canadian schools. In addition, the scholar found out that the lack of courses in Canadian universities has resulted in the lack of confidence by graduates to deal with IE practices effectively in Canada. McCrimmon, (2015) concluded that educators without specific training in developmental disorders and inclusive methodologies are ill-equipped to successfully execute Inclusive Education, resulting in heightened stress and burnout.

To this end, McCrimmon, (2015) recommended the integration of specialized coursework on childhood disabilities into undergraduate teacher preparation programs, development of postgraduate certificate programs, and enhanced collaboration between universities and educational systems. The importance of the study of McCrimmon, (2015) is that it focused on realities of IE in

Canadian society. More so, the study pertains directly to inclusive education by examining systemic challenges in teacher preparation programs that impede the effective execution of inclusive practices.

The outcome of the study of McCrimmon, (2015) indicate that, by promoting specialized training tailored for prospective teachers, IE practices could be enhanced to the effect of overcoming some of the challenges that impede the effective practices of IE in Canada. What McCrimmon, (2015) was unable to do in the study was that, the answers to how teachers can personalize teaching and learning to cater for children with various disabilities in IE practice, how processes, learning and teaching methods, as well as teaching aids can be tailored to personal challenges in IE were not provided from the perspective of the Student and their parents. Also, McCrimmon, (2015) failed to address the challenges that emerge when teachers attempt to tailor processes, methods and products in regular classrooms from the perspective of student and parents.

Bota (2023) also conducted a study on IE in Canada, thusly, focusing on the country of interest per this work. The author examined Canada's inclusive education system for kids with special educational needs, emphasizing inconsistent implementation of IE across the country. Bota (2023) employed qualitative methodologies, particularly thematic analysis, to examine data from 31 individuals, comprising researchers, advocates, and educators, regarding their experiences with inclusive education in Canada.

Per the findings of Bota (2023) families are key in promoting inclusive education, and Positive beliefs and values are essential. However, a lack of consensus on its definition and diverse policies across provinces hinder its implementation and student experiences. The study of Bota (2023) concluded that even though Canada is one of the frontrunners in inclusive education, the country encounters obstacles in attaining uniform and effective inclusion throughout its educational systems.

The recommendations of Bota (2023) include improving communication, advocating for consistent policies, prioritizing education training, and encouraging collaboration among stakeholders to promote inclusive education strategies and resources. The study by Bota (2023) pertains to inclusive education as it defines the existing framework of inclusive practices in Canada, highlights areas necessitating enhancement, and offers insights into the experiences and viewpoints of diverse stakeholders engaged in inclusive education. This comprehension is essential for promoting the inclusive education movement and guaranteeing that all pupils obtain equitable educational opportunities.

There are, however, certain specifics of interest that are missing from the work of Bota (2023) that need to be addressed. The author has not been able to explore, how co-designing involving parents and students as a research methodology can address, the challenges associated with personalization of lessons, methods, processes, learning and teaching aids, to advance inclusive education in Canada.

Walton & Kimani, (2022), McCrimmon, (2015) and Bota (2023) converged that collaboration is crucial for successful implementation of IE practices in Canada. Given the criticality of collaboration in the successful implementation of IE in Canada, (Loreman et al., 2015) explored the roles of collaboration on fostering successful implementation of IE in Canada.

The study by Loreman et al., (2015) utilized a qualitative methodology, concentrating on the perspectives and experiences of university researchers and school district administrators involved in collaborative projects during a six-year period. An inquiry session was held to describe lessons learned on inclusiveness and collaboration, offering a thorough assessment of the partnership's dynamics and results.

Loreman et al., (2015) found out that Collaboration is essential for attaining inclusiveness in education and fostering effective collaborations between universities and school districts. Participants underscored the need for transparent communication, collective objectives, mutual respect, and varied viewpoints. According to the authors, explicit definitions of inclusion enhanced commitment while risk-taking and adaptability positively influenced attitudes and practices.

The study concluded that while challenges remain in achieving systemic inclusion, collaborative research initiatives can significantly advance inclusive practices in educational settings. Also stated by Loreman et al., (2015) was that the partnerships formed during the research contributed to a better understanding of inclusion, highlighting the importance of continuous collaboration among stakeholders. Loreman et al., (2015) recommended continuous collaboration between universities and school districts, effective communication among stakeholders, uniform execution of inclusive education policy, and professional development for instructors.

(Gallagher et al., 2024)aimed to tackle the persistent issues associated with the inclusion of students with Developmental Disabilities (DD) in educational environments, specifically in Ontario, Canada. Gallagher et al., (2024) utilized a qualitative design, employing interviews as the principal technique of data gathering. A total of 31 individuals were involved, comprising 10 administrators and 21 instructors from a single Ontario school system that has adopted full inclusive education. The interviews sought to obtain insights into the attitudes and experiences of various stakeholders concerning the transition to inclusiveness.

The findings of Gallagher et al., (2024) were that a gap exists between the planned inclusive practices and the actual conditions in the classroom, with numerous stakeholders recognizing beneficial effects such as enhanced social skills, while simultaneously emphasizing obstacles such inadequate resources.

The conclusion from the study was that the study shows the potential for inclusive education for individuals with developmental disabilities, while recognizing substantial obstacles and stressing the necessity for continuous support, resources, and professional development. Gallagher et al., (2024) recommended the improvement of educator training, the allocation of resources, the encouragement of collaboration, and the formulation of explicit policies to advance inclusive teaching methodologies and practices.

The currency of the work of Gallagher et al., (2024), indicates the pressing challenges of IE and how to resolve them. This research of the authors is pertinent to the subject of inclusive education as it examined the situation of students with Developmental Disabilities (DD) in Ontario. Gallagher et al., (2024) provided significant insights into educators' experiences during the transition to inclusion and emphasizes practical advice for other school systems with comparable issues. Despite the valuable

contributions of the authors, the advantages and obstacles left behind Individually tailored educational practices in inclusive classrooms, emphasizing adaptation in content, procedure, and product while preserving classroom cohesion. Nevertheless, the focus was not on parents and students and co-designing as method was not used to address the challenges of IE in Canada.

(Sider et al., 2023) empirically addressed the necessity for efficient professional development resources for school administrators, especially regarding inclusive education for students with special educational needs (SEN), in Ontario, Canada. The study of Sider et al., (2023) developed five online case studies for 109 principals in Ontario, Canada, employing an iterative methodology and tested such within a professional development program.

Sider et al. (2023) discovered that the online case studies were considered genuine, relevant, and encompassed several viewpoints for an enhanced comprehension of decision-making in different circumstances, while the branching scenario style was both accessible and effective. The conclusion of the study was that Web-based case studies serve as a significant resource for augmenting principals' professional development about inclusive practices. Also, Sider et al. (2023) found out that the genuine quality of the situations, together with the diverse decision-making alternatives, fosters an effective learning experience that meets the requirements of school leaders.

Sider et al. (2023) recommended Web-based case studies should be explored for their adaptability and accessibility as professional development tools in implementing and aiding IE in Canadian schools. Sider et al. (2023)'s study indicates the effectiveness of innovative online resources in promoting inclusive education and professional development for school leaders, underscoring the importance of continuous learning. Nevertheless, the study did not address personalization of deficiencies in pedagogical practices within the context of IE in Canadian schools using both parents and children with co-design methodology.

Synthesizing the work of the authors, they made considerable contributions to the understanding of inclusive education (IE) across various contexts, particularly in Canada. Walton & Kimani (2022) provided valuable insights into collaborative learning communities aimed at enhancing inclusive teaching competencies in Australia and South Africa. The authors outlined contextual factors for effective inclusion, but lacks specific questions about personalized instructional strategies, methods, and challenges in inclusive classrooms, despite highlighting the importance of local knowledge and support networks.

On the contrary, McCrimmon (2015) focuses on deficiencies in Canadian teacher preparation programs concerning inclusive practices, highlighting the lack of training related to developmental disorders and inclusive strategies. While McCrimmon's findings enhanced those of Walton & Kimani by identifying critical areas within educator training that require attention, they also left unexamined how personalized instructional strategies can be effectively implemented within Canadian classrooms to cater to diverse learners.

Bota (2023) also in the Canadian context, evaluates the inconsistencies in inclusive practices across provincial lines. While Bota echoed McCrimmon's emphasis on the role of families and the

demand for coherent policies, there remained a gap in understanding the practical benefits and challenges associated with personalized instruction for diverse learners in Ontario and beyond.

Tiffany et al. (2024) provided a focused analysis on the inclusion of students with Developmental Disabilities (DD) in Ontario, emphasizing the disparity between inclusive policies and classroom realities. Their findings reinforced the prior studies' calls for collaboration and professional development but do not directly address the nuanced questions related to personalized instructional strategies or the methods used by educators to engage with individual student needs while maintaining cohesion within the classroom.

Sider et al. (2023) contributed by examining the development of web-based case studies for principals, enhancing the discussion on professional learning initiated by McCrimmon and Bota. While their findings emphasized the importance of continuous training in inclusive practices, they, too, do not explore the specific benefits, challenges, and strategies related to personalizing instruction for diverse learners in satisfying ways.

Collectively, these authors provide a robust yet incomplete narrative regarding inclusive education. While they highlight the importance of collaboration, teacher training, and the need for systemic change, there remains a pressing need to explore fundamental questions specific to the Canadian context focusing on parents and children while using co-design methodology. Addressing these questions is essential to advance effective inclusive education practices in Canada.

Appendix L: The Background to the Concept of Inclusive Education

Inclusive education originated from societal movements promoting equality and human rights according to (Singh & Bhatia, 2023). According to the authors, the civil rights movement in the United States during the 20th century acted as a catalyst for change, resulting in the implementation of laws that guarantee children with disabilities same educational opportunities as their classmates.

(Oad, 2023) noted that historical documents like the Universal Declaration of Human Rights and the Declaration of the Rights of the Child both in 1948 and 1959 laid the foundation for equal educational opportunities. Consequently, there was enactment of the Individuals with Disabilities Education Act (IDEA) in 1975, which required public schools to offer free and suitable education in the least restrictive environment (Singh & Bhatia, 2023).

This legislation, that is the IDEA marked a shift from prior policies that frequently confined students with disabilities to separate environments, thus fostering their integration into regular schools(Armstrong et al., 2009). The authors established that the concepts established by this act significantly impacted global inclusion practices and laid the groundwork for advancements in inclusive education.

In 1994, the World Conference on Special Needs Education initiated global campaigning for inclusive education, resulting in the Salamanca Statement and Framework for Action[16], which underscored the significance of quality education for all students (Lindsay, 2003). From this point on, inclusive education, integrates students from varied origins, fostering social justice and equity (Slee & Tait, 2022). The report of (UNESCO, 2021) highlights the importance of acknowledging and addressing the varied needs and capabilities of all learners, while maintaining ideals of acceptance and inclusion. The report asserted that coordination, cooperation and collaboration are required to ensure inclusive early childhood education. It further indicates that it is not the sole responsibility of educational policy makers to safeguard equity in education but also the responsibility for those at risk of exclusion.

It is essential to recognize that inclusive education transcends a mere pedagogical framework; it embodies a philosophical dedication to educational equity and social justice (Shaeffer, 2019). Effective inclusion entails more than merely integrating students with special educational needs (SEN) into general education classrooms; it demands both structural and attitudinal transformations within the educational system to foster a conducive learning environment.

Inferenced is that the development of inclusive education in Canada is founded on societal movements promoting equality and human rights. To this end, both the Civil Rights

[16] The Salamanca Statement and Framework for Action is a landmark international agreement on inclusive education that was adopted at the UNESCO World Conference on Special Needs Education in Salamanca, Spain in 1994.

Movement in the United States and the Individuals with Disabilities Education Act (IDEA) of 1975 guaranteed free and appropriate education in the least restrictive environment, marking a transition from segregated educational settings. The Salamanca Statement and Framework for Action also underscore the importance of quality education for all, promoting social justice and accommodating the diverse needs and talents of every learner. Such equality though, has not been primarily found within the role of both the parent and the student in shaping educational processes with regards to inclusivity.

Consequently, UNESCO's position, which discussions the significance of fostering acceptance and inclusivity for successful integration is contradicted given the exclusion of both parents and students in planning and executing inclusivity in the classroom instructions. In the framework of the topic under study, educators must adopt an inclusive perspective that fosters collaborative practices, ensuring that all students, including those with varied abilities, succeed in mainstream classroom environments. It is in this context that this project seeks to explain the challenges and achievements in attaining practical inclusion in Canadian public school, so contributing to the current dialogue on equity and social justice in education focusing on a student with ADHD/ASD and their caregivers/parent.

The Concept of Integrated, Inclusive Education (IE)

The concept of IE is evolutionary over time (Arthur-Kelly & Foreman, 2020) The author held the position that previously, IE is about every child gaining access to education thus ensuring social justice and equity. The concept then evolved to mean focusing on children with different forms of disabilities.

The concept of IE at a point in time, meant that children with disabilities, are to be given special education, in a separated educational facility with different methods and different teachers who are specialized to deal with the challenges of disabilities and impairments among children (Deku & Vanderpuye, 2017). To this end, Masi et al., (2022) wrote that there is special educational training for teachers, to equip them with the skills that can deal with special aspects of children with disabilities.

According to Foreman (2020), with the concept IE, it means that children with disabilities and different forms of impairments should not be separated from other children that are Regular. In effect, both children with disabilities, and those without such, ought to be in the mainstream. In mainstreaming, a child with disabilities is also put in conventional school with peers, when the same facility is used to undertake learning and teaching activities (Bailey, 2020)

Under this section of the literature review, IE is not a stagnant concept. There was the call for justice through increased access to equity, the need to pay special attention to children with impairment and there is now the call to ensure that there is no differentiation between the regular child and the one with impairments with regards to pedagogical practices.

The deductions are that the evolving nature of IE will not stop, and going into the future, changes will be made to the concept. At this point, IE means three things: Ensuring equal access to education, making sure that children with impairments are treated equally just as regular

students, and mainstream education. Nevertheless, dealing with IE as a concept must be situated within the context of the era. This study, therefore, deals with the concept of IE within the current era, where there is the need to combine diverse learners in regular teaching environment, while aiming to overcome associated challenges from the viewpoint of parent and student.

The Past, the Present and the Future of Inclusive Education in Canada

In Canada, inclusive education has transitioned from exclusion and segregation to acceptance and integration, grounded in societal movements advocating for equality and human rights (Wong, 2023). (Bunch, 1994) stated that educational inclusion in Canada commenced in the early twentieth century, coinciding with the exclusion of individuals with disabilities from educational institutions. The author suggested that there were some transformations with regard to IE in Canada, and one such is the emergence of the Intelligence Test and the choice of placement in regular classroom, which resulted in enhanced educational rights for children with disabilities(INCLUSION, n.d.). Between 1970 to 1985.

The One Million Children report in Canada is a crucial framework aimed at meeting the varied needs of around one million children in need of different types of assistance. According to (Laycock, 1970), the One Million Children report urged Canadian society to cease the isolation and segregation of children with disabilities from their peers and families. The report was a crucial milestone in the advancement of inclusive education in Canada, emphasizing the necessity for enhanced inclusive practices throughout educational systems. In spite of the report, (Bunch, 1994)noted that certain Canadian provinces provided the least restrictive environment for students to thrive in their learning.

Presently in Canada, the right to education is protected by international treaties but lacks guidance in implementing policies (Wong, 2023). Per the view of the author, education is under provincial jurisdiction, and inclusive education has made progress but still needs improvement. Wong (2023) Asserted that provinces use different languages and names for disabilities, leading to confusion and neither Canada nor individual provinces protect the right to inclusion in childcare settings. However, the childcare sector has led the way in early years' inclusion, often without provincial funding. Also, the implementation of inclusion is determined by where child lives and whether the teachers, schools, and childcare programs welcome students with disabilities (Inclusive Education Canada, 2023).

Currently, educators in Canada advocate for inclusivity but are overwhelmed with diverse viewpoints indicating the absence of a cohesive framework in early childhood environments which is problematic (Wong, 2023). Wong (2023) authored integration focuses on the child with a disability, while inclusion aims for all children to learn in the same school. The author noted that inclusion requires equal participation. Inclusive learning environment can identify learning and developmental disabilities early, promoting children's full potential. To

this end, the author pointed to the SpeciaLink Early Childhood Inclusion Quality Scale[17], which outlines principles for quality inclusion.

Concerning the future, the question is what remains. From history, inclusive education in Canada has evolved from a system marked by exclusion and segregation to one that embraces acceptance and integration. What is clear is that there is a lack of understanding and guidance in implementing inclusive policies. The decentralization of education in Canada has resulted in creating confusion therefore separate application of inclusive practices in each province. Notable in the literature of the IE in the past, the present and in the future of Canada is the absence of how students with disabilities are involved in the creation and implementation of educational practices.

The Benefits of Inclusive Education in Canada

(Bunch, 2015; CAST Inc, n.d.) discussed that inclusive education guarantees equitable access to high-quality educational opportunities for all students, cultivating a sense of belonging and acknowledgment, enhancing academic achievement, and creating social cohesion. Bunch, (2015) explained that inclusive education in Canada promotes social relationships by uniting students with and without disabilities in a shared classroom, cultivating empathy and respect for difference. This promotes a culture of acceptance, allowing children to understand and value individual diversity from a young age.

Further Bunch, (2015) outlined the advantage of inclusive education as one that enhances academic performance for students with disabilities, resulting in enhanced reading and mathematics proficiency, increased attendance rates, and more success in secondary school graduation. The author also noted IE trains students for real-world interactions, providing them with vital life skills for navigating a complex culture.

(Volker et al., 2022) held the view that IE inclusive education equips students for real-world interactions by facilitating engagement with various classmates, hence imparting vital life skills. The authors stated, inclusive education cultivates robust collaborations across schools, families, and communities, addressing the distinct needs of children with disabilities and

[17] The SpeciaLink Early Childhood Inclusion Quality Scale (sometimes referred to as the SpeciaLink Inclusion Scale) is a Canadian assessment tool designed to measure the quality of inclusion practices in early childhood settings. Developed by Dr. Sharon Hope Irwin and published through the SpeciaLink organization (The National Centre for Early Childhood Inclusion), this scale helps evaluate how effectively early childhood programs include and support children with diverse abilities and needs. The principles used to measured are

1. Zero Reject
2. Naturally Occurring Proportions
3. Same Hours of Attendance Available to All Children
4. Full Participation
5. Maximum Feasible Parent Participation
6. Pro-Active Strategies and Advocacy for High Quality, *Inclusive* Child Care

establishing supportive settings that honor and promote diversity. With the benefits of IE, it is imperative, that Canadian public schools implement IE practices, to exploit the advantages it offers. This study holds the view that, doing this inclusively will require the input of both parent and the student with disability giving the student the agency in planning and implementing personalize lessons instructions within the context of IE in Canada.

The Challenges of Inclusive Education in Canada

Inclusive education in Canada encounters numerous obstacles, such as the conflation of integration and inclusion, variability in provincial regulations, inadequate preparation for educators, and issues with budget distribution (Bunch, 2015) The author explained that the conflation of integration and inclusion may result in activities that inadequately represent

the concepts of inclusion.

Bunch (2015) also mentioned that provincial policies generate unequal access to schooling for students with impairments and significant number of educator's graduates lacking the requisite knowledge or skills to assist kids with impairments. The author also pointed out that resource distribution differs among provinces, resulting in schools being inadequately prepared to address the varied requirements of their students. In explaining this point, Bunch, (2015) stated ongoing attitudinal obstacles and systemic inequities hinder the implementation of inclusive education, further marginalizing children with disabilities.

Bota (2023) also mentioned insufficient resources, inadequate teacher training, inflexible curricula, and societal attitudes hinder the implementation of inclusive policies in Canada's school system. Although the authors have listed the challenges facing IE in Canada, they fail to focus attention on how excluding the student with disability impact the personalization of pedagogical practices of IE in Canada. The authors also did not mention how co-designing methodologies involving a parent and child could enhance the strategies of IE practices in Canada