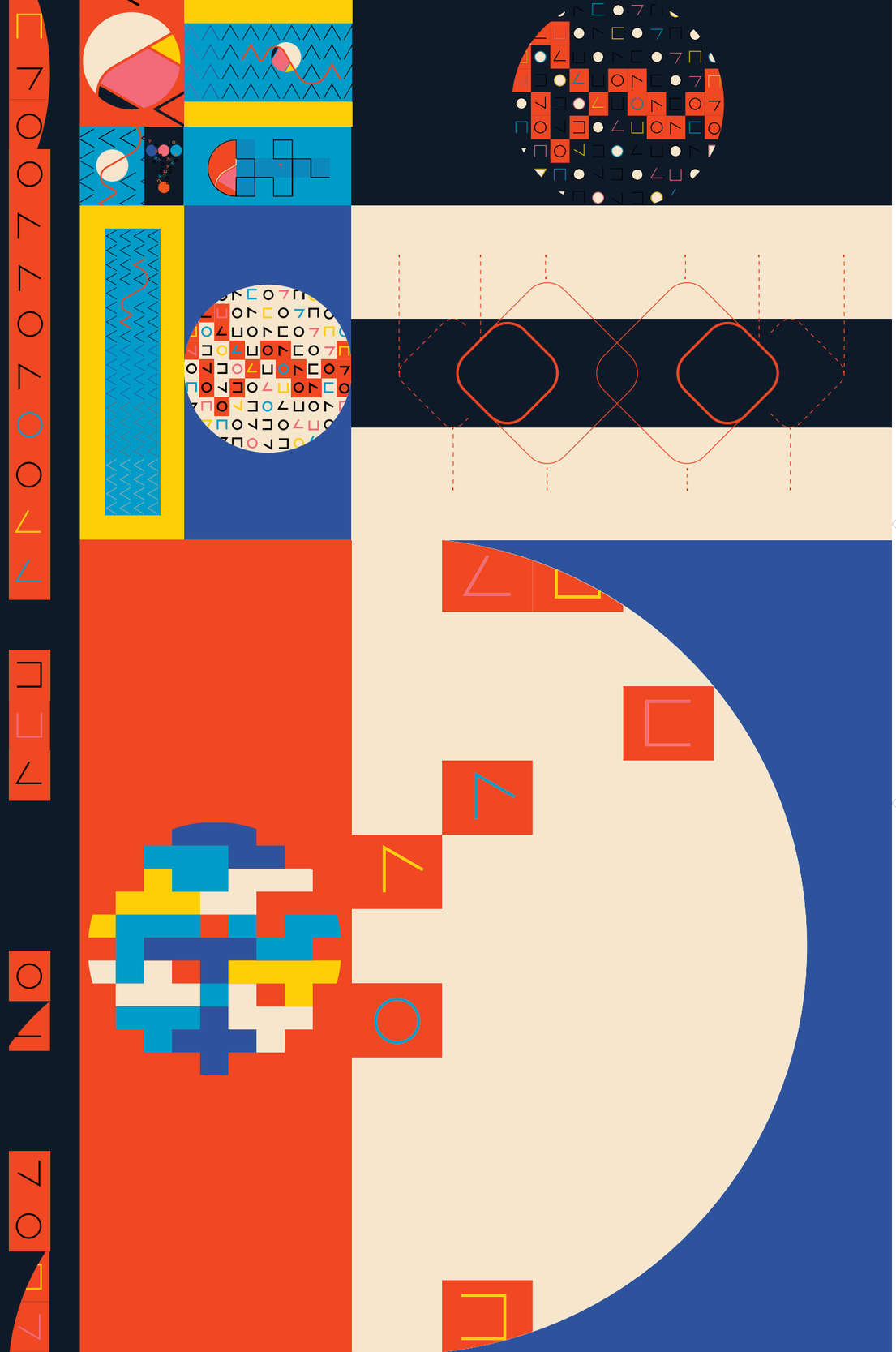

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Design Education for Agency Development in children aged 10-11

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To my beautiful daughter

> *In the middle of a life transition we are looking for a place to meet, sometimes feeling lost and distant but never giving up on each other and always believing in our ability to find ourselves in the journey. I will always keep you close to my heart, I love you.*

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To my supervisor Professor Daria Hernandez, who guided this process, always accessible to assist me when necessary.

I also would like to thank the school community for their time and effort in letting me apply this thesis in the PYP section. To the grade four staff members for attending in the participatory workshops and for being open minded about the new co-constructed ideas that emerged during the development of this thesis.

Abstract

Design Education for Agency Development in Children Aged 10-11

This research is about how design education and design thinking can support the development of agency in children aged 10 and 11 in primary education. As part of the theoretical background, the literature review first provides information about design, design skills, design thinking, design as a human activity, and key elements within design education. Secondly, it explains information about agency, how it is developed, and the different dimensions and components.

This is a research through design, which means that the design is both the subject and object of the research, where the design itself, in this case an educational service, is the instrument of research. In terms of methodological and scientific rigor, action research is used. The aim of this type of research is to improve the design practice starting from the educational context of the research itself, primary.

As a design teacher, in this case in primary school, I have seen the benefits of design education in an early stage of human development, and the ways students make sense of our artificial world while acquiring lifelong design skills. Nevertheless, the benefits of this approach within a curriculum are not offered, nor documented, as often as one would prefer. Therefore, my interest is to open this door to discussion, development and improvement of our practice as designers and design educators.

This research was conducted in the primary section of a Colombian international school with fourth grade students and teachers. Through participatory methods and co-design, we developed toolkits to guide the students on the development of the **PYPx (Primary Years Programme Exhibition: Student led final project of the primary program)**. By the inclusion of design thinking and design education methods, we focused on the agency development of the students throughout all stages of their project.

Keywords: Agency, design, design thinking, design skills.

Resumen

Educación en Diseño para el desarrollo de Agencia en Niñas y Niños de 10-11 años

Esta investigación trata de cómo la educación en diseño puede apoyar el desarrollo de la agencia en niños de 10 y 11 años en la educación primaria. Como parte de los antecedentes teóricos, la revisión de la literatura proporciona, en primer lugar, información sobre el diseño, las habilidades de diseño, el pensamiento de diseño y el diseño como actividad humana, elementos clave dentro de la educación del diseño; en segundo lugar, información sobre la agencia, cómo se desarrolla, las diferentes dimensiones y componentes de la agencia humana.

Se trata de una investigación a través del diseño, lo que significa que el diseño es sujeto y objeto de la investigación, donde el propio diseño, en este caso un servicio educativo, es el instrumento de investigación. En cuanto al rigor metodológico y científico, se utiliza la investigación-acción. El objetivo de este tipo de investigación es mejorar la práctica del diseño.

Como profesora de diseño, en este caso en la escuela primaria, he visto los beneficios de la enseñanza del diseño en una etapa temprana del desarrollo humano, la forma en que los estudiantes dan sentido a nuestro mundo artificial mientras adquieren habilidades de diseño para toda la vida. Sin embargo, los beneficios de este enfoque dentro de un plan de estudios no se ofrecen ni se documentan con la frecuencia que uno preferiría. Por lo tanto, mi interés es abrir esta puerta a la discusión, el desarrollo y la mejora de nuestra práctica como diseñadores y educadores de diseño.

Esta investigación se llevó a cabo en un colegio internacional colombiano, en la sección de primaria con estudiantes y profesores de cuarto grado. A través de métodos participativos y de co-diseño se desarrollaron kits de herramientas para guiar a los estudiantes en el desarrollo del **PYPx (Exhibición del Programa de Escuela Primaria: Proyecto final del programa de primaria dirigido por los estudiantes)**. Mediante la inclusión de métodos de diseño y educación del diseño centrados en el desarrollo de la agencia de los estudiantes a lo largo de las etapas del proyecto.

Palabras clave: Agencia, diseño, pensamiento de diseño, habilidades de diseño.

Contents

Introduction

Design and education can empower one's self and social growth. The evolution of design towards a value-based process (Santillán, n.d., p.1-10) has allowed the transition of the way design was conceived from a "product maker discipline" to one that enhances complex social solutions, stimulating a positive change in different sectors like education, health, politics, etc. With this evolution, people have found designing and improving our world to be more accessible as everyone has the ability to contribute and problem solve.

It is essential to acknowledge how design can help people make sense of the world and the influence that comes with it in terms of improving people's lives and creating a positive impact in the world. That is why this project has, as its starting point, two of my great passions: design and education.

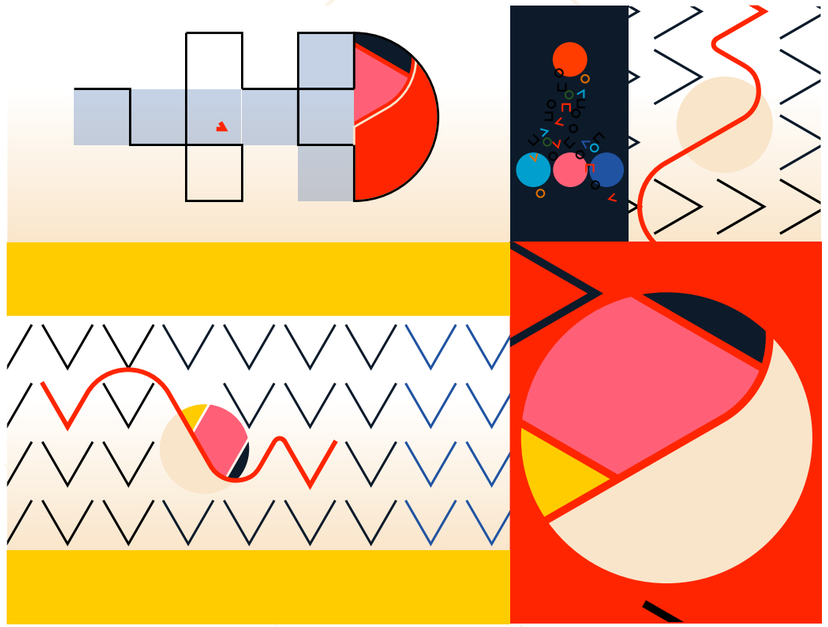
Currently I am working as a design teacher at a private international school in Bogota, Colombia. This school implements the International Baccalaureate (IB) curriculum framework.

It was after teaching the subject Design & Technology in the grades 1-4, where my interest started shaping. Here I have scaffolded the Middle Years Programme (MYP) design framework to implement it in the Primary Years Programme (PYP). After having taught all three sections (PYP, MYP & DP) my motivation to understand how Design can be a vehicle of knowledge for the development of human beings became more and more intriguing. And how, through Design education from an early stage, children's agency development could be supported. Agency is a skill essential for the construction of personal values related to one's own development and growth.

Throughout these years and several processes many questions have arisen related to my own personal experience and practice. The initial inquiries that led to this Masters in Design also led the way to a more concrete drivers of this research: through this research how can I give meaning to the work I do every day? How can I improve my teaching practice to make an incremental contribution to the development of my students? What contributions can I make to the design discipline through this research? How is the support of the educational community going to impact my research? Which type of barriers I will come across with? And which ones would severely benefit or interfere with my research or my work?

In the following thesis the reader will find seven chapters, starting with chapter 1 the initial research approach focused on framing the problem situation, aims and objectives. Chapter two, the state of the art in design education and a glimpse of the International Baccalaureate (**IB**) curriculum. Chapter three, the research methodology , the wok plan and the content of the different stages within the work plan, the methodological tools and the ethical considerations. Chapter four, the reference framework, where the main theoretical and conceptual background about Design and Agency can be found. Chapter five, the proposal, goes throughout all the design stages from discover to apply, where tool has its own description, process and insights. Chapter six, results and analysis, focuses on the results compared among the experimental and the control group, concluding with the analysis of the agency developed during the project. Chapter seven, in this final chapter both conclusions and recommendations are given in relation to the aims and objectives of the study.

Chapter 1



1. Research Approach

The focus of this chapter is the framing of the problem in the school context where the study has been made, and their relation to the identifies gaps that can be solved with design, along with the aim and objectives of the study.

1.1. Framing the problem - Current Stage of PYPx at the School

At the school this research took place, although teachers have been applying the PYP framework in the primary school for 15+ years, PYPx (Primary Years Programme Exhibition) has not developed to be a fully student-led process. The trans disciplinary theme that provides context for students to explore has changed from a more global context to a personal one,"Who We Are." This means instead of encouraging students to showcase their ability to be global citizens, they are given a central idea that encourages them to focus on their "passions."

The central idea used in previous years was, "*Passion leads to further inquiry, stimulates creativity and empowers the learner.*" From here, the student is to decide on a topic they are "passionate" about and create inquiry questions to guide their entire process. Although this central idea has the potential to inspire students to choose global issues and take action, what has happened in the past is teachers and students choose a topic they "like" or enjoy, which often is a topic they are already knowledgeable about, and create surface level inquiry questions that don't require students to think deeper about their topic. This results in minimal action and agency, and showcases a superficial amount of knowledge on their topic.

In addition, since the PYPx process is still more teacher-led, there is more scaffolding that happens along their entire journey. For instance, students are assigned a mentor, an additional teacher that supports them, instead of seeking out their own. They are provided tools to organize their research, links or videos to support them in finding answers to their inquiry questions, occasional moments of reflection on their learning or progress, and all with very little emphasis on taking action.

How students present their findings was also very structured, where every student was given one board with strict requirements for how the information must be displayed. The entire process resulted in limited student voice, choice and ownership, and a cookie-cutter approach with little diversity among presentations or depth. In order to give the learners choice and ownership it is necessary to share control with them (Thibodeaux, 2019) otherwise motivation and autonomy will not take place.

Part of the reason why the process of fully embracing the IB philosophy has taken so long is due to teacher training, lack of alignment and application of skills students need to acquire prior to entering PYPx, and the over structuring and scaffolding provided for students which limits their opportunity to fully take the reins on their learning.

Regardless of the school's current stage in fully applying the IB framework, PYPx is still an opportunity for students to show some level of agency in using their voice to express their interests, and taking ownership of what they accomplish. Although taking action has not been a main focus in previous years, students and teachers are gradually becoming more confident in this area, opening the door to new possibilities and the recognition that there is a room for improvement towards the agency development of the students.

Unlike other schools in the country, this school offers the Design and Technology subject in the PYP programme, where the focus in a problem-solving and inquiry-based approach, challenges the students to develop creative and divergent thinking while exploring the different topics of their units of inquiry through a designer's lens. Nevertheless the students will only study this subject in the first semester of the academic year and the PYPx always happens in the second semester, which means that Design was never linked to this project in the past. Due to the nature of Design as a cognitive multifaceted skill(s) (Cross, 2011) and the problem situation identified in the school the question takes shape.

1.2. Research question

In what way does the implementation of participatory design dynamics with the educational community IB and the inclusion of design education within the PYPx contribute to the development of agency in the grade four students?

1.3. Aims of the study

Explore how the implementation of participatory design dynamics with the educational community IB and the inclusion of design education within the PYPx contribute to the development of agency in the grade four students.

1.4. Objectives

Identify opportunities and practices that promote agency development in the PYPx and how teachers, teaching materials and curricula support it.

Methodological objectives

- Review the current state of the project, the stages, didactic materials and teachers' perspectives related to the development of agency.
- Measure the level of agency of the students using the tools ESAGE

Define which opportunities, practices and difficulties the students and teachers have throughout the PYPx and how they can be improved by design education.

Methodological objectives

- Define which aspects of agency and which aspects of the PYPx development are not being supported.
- Identify the difficulties students and teachers face throughout the project.
- Adapt, design and apply instruments for data collection
- Triangulation of data, discover the relationship between the results of the ESAGE, the design skills and the project timeline to select the elements that require intervention.
- Collectively construct the learning experiences and tools that promote the development of agency.

Measure the impact of including design education in the PYPX in the development of agency compared to the traditional way of developing this project.

Methodological objectives

- Analyze the data collection during the research
- Compare the data collected, the impact of including design education in relation to the development of agency.

1.5. Justification

Despite the extended experience of the school implementing the PYP, as seen in the problem framed before, due to the way the PYPx is proposed, the opportunities for students to develop their agency are limited. Many of us educators share the dream of helping our students develop a lifelong growth mindset. This shared aspiration has been described by many of my colleagues throughout the years. Having a growth mindset requires, as Dweck (2016) says, a person's belief that their talents can be developed through hard work, the adoption of good strategies and constructive feedback from others. But in order for teacher to support students in developing a growth mindset, it is necessary to have cooperative development (Schuler & Namioka, 1993, p.79). In this way the early involvement of teachers in the adjustments made in the PYPx will increase the acceptance and appropriation.

In addition, teacher acknowledgment of expanding knowledge beyond the core literacies has become more evident as the challenges in the world become more and more complex. The importance of agency development for the school has been increasing, for several reasons. The teachers acknowledgment of agency and it's benefits, it's importance for the students' personal and social development and the clear pathway the IB curriculum has been setting, updating and aligning it as a key component that the whole framework should embrace.

Furthermore, Design thinking can be the support system that guides the development of a diverse range of skills required for the future. The design competency in the terms of knowledge, skills, attitudes and values. But also, ways of thinking, ways of working, tools for working and living in the world. These are the four categories of 21st century skills that Wong, B., Koh, J. H. L., Hong, H.-Y., & Chai, C. S. (2015) mentioned when they propose a framework for assessment.

The first category, ways of thinking, covers critical thinking, creativity, innovation, problem solving, decision making, learning to learn and metacognition. Almost all of these skills can be fostered by the practice of design favoring divergent thinking, reasoned judgment and reflective thinking, all necessary for the development of agency.

According to the learning compass categorization of values (OECD,2020) personal, social, societal and human values are related to the sense of agency. The OECD (2020) defines this as the ability to believe in our positive control and ability to change our life and the world around us. The OECD with the learning compass 2030, refers to agency as the personal value related to one's own development, being agency the regulator of cognitive abilities like autonomy, intentionality, anticipation, auto-regulation, empowerment, self efficacy and control, among others.

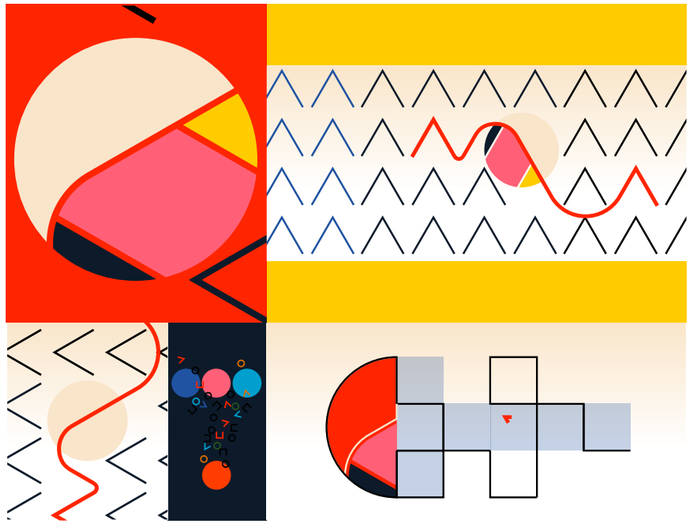
It is natural that the creation of new value is essential. This means innovating to shape better lives in a wider spectrum.

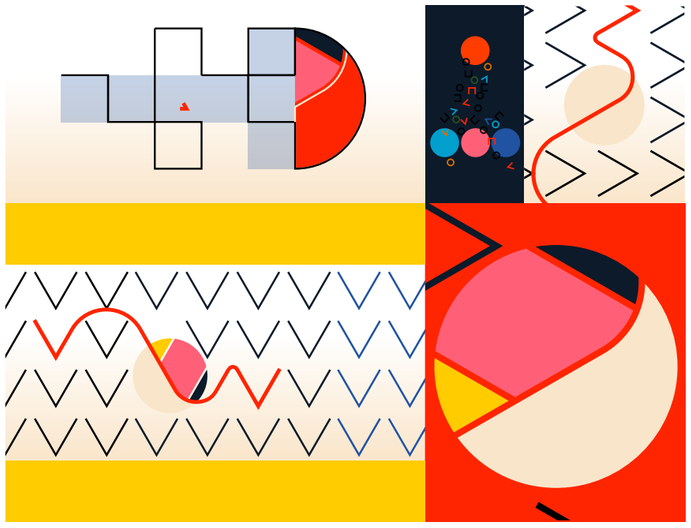
> *"Creating new jobs, businesses and services, and developing new knowledge, insights, ideas, techniques, strategies and solutions, and applying them to problems both old and new. When learners create new values, they question the status quo, collaborate with others and try to think "outside the box".*
>
> **(OECD, 2020)**

The complex problem solving and reflection found in design can foster 21st century learning when exposing it to students. The ill-defined or wicked nature of design problems are characterized by being ill-structured, ambiguous specification, no determined solution path, no goals and require the integration of multiple knowledge domains. This requires a completely different set of skills and high order thinking that integrates different knowledge domains where there is no clear or determined solution path. The type of thinking needed requires critical and creative thinking that can support students in the development of different attributes related to agency. In this case. This path of thinking takes us not only to 21st century skills but to different dimensions needed in a class, adding the value of design education and how it can support this process.

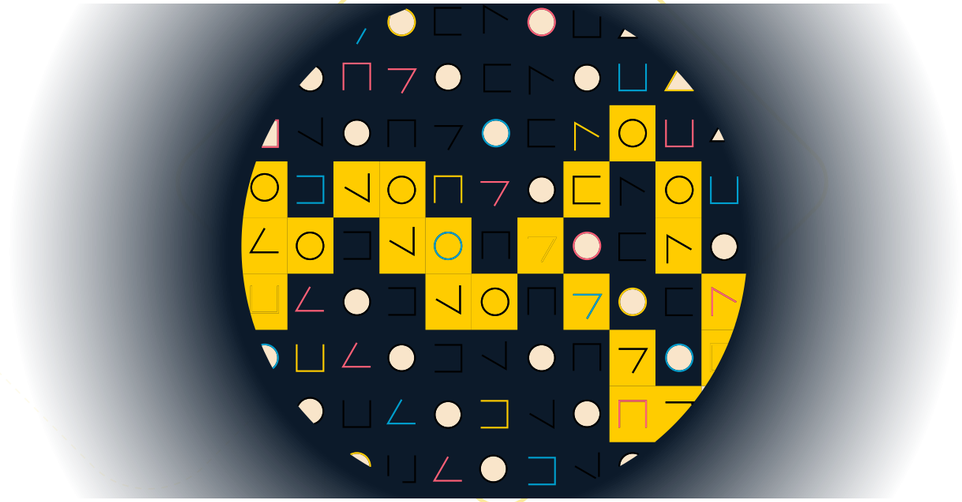
The different types of thinking that provoke, engage, develop, and allow a person to design and have agency are part of their own cognitive development. Therefore, we can start with the statement that "the boundaries of cognitive growth are established by societal influences" (Sivasubramanian, 2013). Setting or expanding these barriers according to the needs of a learning environment can play a key role in terms of student growth.

At the age of 7-11 intelligence is both symbolic and logical where concrete operations are developed (Mettas, 2011). This responds to the child's understanding of the reversible character of taken actions. From 11-16 children start developing formal operations, meaning that they are capable of deductive reasoning, abstract thinking, prospective thinking in terms of possible outcomes and testing these against real scenarios. (Mettas, 2011) Being this two stages key to the nurturing and development of both design thinking and agency.





Chapter 2



2. State of the art

This chapter focuses on the review of the different design curricula and a glimpse of the shift needed in education caused by the growing complexity of the world. It also reviews the general aspects of the Internationale Baccalaureate and how the Design subject is incorporated in this curriculum.

2.1. Design education

Some of the design curricula, in school, undergraduate and graduate programmes, have been developed from different theories, methodologies and authors, the following is a review of the most recent and relative ones, taken into account, for this study.

Design education can build the student's predilection for complex problem solving, and how design thinking can support interdisciplinary learning. (Wong and collages, 2015) The set of knowledge and skills within design has a completely different range of content. Through design problems the students are challenged within the social, technological and metacognitive skills that most times go beyond what a lesson requirements and context can offer, being this a key component that can help students prepare for tomorrow's workplaces.

Wong and collages (2015) introduce the term design-based learning to the learning experiences that foster and engage students in the development of creative, critical thinking, collaborative work, students' self efficacy towards their own knowledge and the meaningful use of ICT.

On the other hand, Tellez (2017) explains three main elements that should be present within design pedagogy. First, the importance of embedding the forms of teaching and learning that are particular to design and are already used and developed in the different design programmes around the world. Second, the importance of knowledge construction formulated around situated problems, where the students take ownership of their learning and within the design process they manipulate a wide range of artifacts. Here it is important to acknowledge that by exposing students to real-situated problems, the application of knowledge is a driver for agency if there is student engagement. Third, the learning process is collaborative, and it includes an extensive range of the learning community. Here, design educators familiarize the students with the different design practices to start giving them a glimpse of the culture and values design embeds.

2.1.1. Design Education in schools (Internationally)

There is a great extension of school curricula around the world. In fact, each country has variations in their educational systems, which makes it very complex to make structural, curricular, performance or goal achievement comparisons. Therefore, the criteria when choosing which curriculum should be analyzed for this research was ensuring it is applied internationally and had design as part of their disciplinary areas. As a result, the curriculum to explore are the Australian curriculum, Cambridge Assessment Curriculum and the IB (International Baccalaureate). The following will be dissecting the pedagogical design methodology each curriculum implements.

2.1.1.1. Australian Curriculum

The Australian curriculum is designed to help its students become successful, confident, creative, active and informed citizens. It is broken down in detail to establish what the academic community should teach and the quality of learning expected of students as they progress from grade to grade.

Its curriculum has been based on the importance of disciplinary knowledge, skills and understanding, along with general abilities and interdisciplinary priorities. This is developed through the eight learning areas of the Australian curriculum: English, Mathematics, Science, Health and Physical Education, Humanities and Social Sciences, Arts, Technology and Languages. In each learning area or subject, content descriptions specify what young people will learn, and performance standards describe the depth of understanding and sophistication of knowledge and skills expected of students at the end of each level or year group.

2.1.1.1.1. Design in the Australian Curriculum

Design Technologies and Technologies is the name given to this subject, which specifically aims to develop the knowledge, understanding and skills to ensure that, individually and collaboratively, students can develop confidence as critical users of technologies, and designers and producers of designed solutions.

This curriculum seeks to enable its students to investigate, generate and critique ethical and innovative design solutions for sustainable futures. They use design and systems thinking to generate design ideas and communicate them to a variety of audiences. Together, students must produce designed solutions suitable for a variety of technological contexts by selecting and manipulating a variety of materials, systems, components, tools, and equipment in a creative, competent, and safe manner; and by managing processes, evaluating processes, designing solutions, and transferring knowledge and skills to new situations. It also seeks for students to understand the roles and responsibilities of people in design and technology occupations and how they contribute to society. (Australian Curriculum, n.d.)

2.1.1.2. Cambridge Assessment Curriculum

Cambridge syllabuses and qualifications aim to set the global standard for international education. They are created by subject experts, and are based on academic rigor and reflect the latest educational research. (Cambridge Assessment, n.d.)

The Cambridge curriculum focuses on developing learners who are confident, responsible, reflective, innovative and engaged, equipped for success in the modern world, developing an informed curiosity and an enduring passion for learning. They describe their curriculum as flexible, challenging and inspiring, culturally sensitive, but with an international focus.

2.1.1.2.1. Design in the Cambridge Assessment International Education curriculum

Art and design give students a platform to express themselves, sparking imagination, creativity and transferable skills development. Students explore and push boundaries to become reflective, critical and decisive thinkers. They learn how to articulate personal responses to their experiences and think about how their artistic development will support them in all areas of their education.

2.2. International Baccalaureate (IB) Curriculum

The four programs develop inquisitive, informed and caring young people who are motivated to succeed. The IB offers students distinct advantages by developing their critical thinking skills, fostering their curiosity and their ability to solve complex problems. (International Baccalaureate Organization (UK) Ltd, 2019)

2.2.1. PYP

The Primary Years Program is aimed at children ages 3 to 12 that nurtures and develops young learners as active and caring participants in a lifelong learning journey through a learner-centered educational approach.

2.2.2. MYP

The Middle-Year Program offers a challenging framework that encourages students to make practical connections between their studies and the real world; it is inclusive by design; students of all academic interests and abilities can benefit from participating.

2.2.3. DP

In the Diploma Program, research suggests many benefits. It aims to develop students who have excellent breadth and depth of knowledge, who thrive physically, intellectually, emotionally and ethically.

2.2.4. Career-related program

The Career-Related Program provides an international education framework that addresses the needs of students involved in career-related education. It leads to higher or further education, apprenticeships or employment.

2.3. Design in the IB curriculum

The IB continuum provides a progression of learning in which the Primary Years Programme (PYP), focuses on the construction of meaning and their understanding by sparking students' curiosity exploring and interacting with the environment physically, socially and intellectually. In this program, there is no design component in the PYP, the use of structured inquiry is a precursor to the problem-solving and inquiry-based approach of MYP design.

MYP design aims to build on what students learn and do in the PYP and other student-centered programmes of primary education. There are no prior formal learning requirements.

MYP design courses help specifically to prepare students for the study of computer science, design technology and information technology in a global society (ITGS) in the Diploma Programme (DP).

- Design focuses on a holistic process rather than final products and solutions, which, challenges all students to:
- Apply practical and creative thinking skills to solve design problems.
- Explore the role of design in historical and contemporary contexts.
- Invite students to consider their responsibilities in making design decisions and taking action.

2.4. Design education in primary

Design education in primary education seeks to engage students in challenging activities that spark their interest to solve a problem. It is an introductory stage of the students' learning process in design, making sense of the artificial world and how human beings manipulate both natural and artificial environments to solve problems.

The development of critical, prospective, creative and systemic thinking, by encouraging students to solve problems, seeks to help students gain a deeper understanding of local and global contexts. Explorations and learning experiences give the opportunity to create connections between different disciplines, collaborate and cooperate with peers, and explore the use and transformation of different materials to develop different ways of verbal and non-verbal communication.

Projects are developed by following different adaptations of the design thinking method, following a certain amount of steps that help students identify needs within a specific audience. They use different tools for idea generation. They create plans of action which include material selection and construction steps. They test their solutions, make improvements and adjustments. And finally, they reflect on their process and personal growth. Iteration can be found all throughout the project development process, where students jump to and from different stages according to the project's needs.

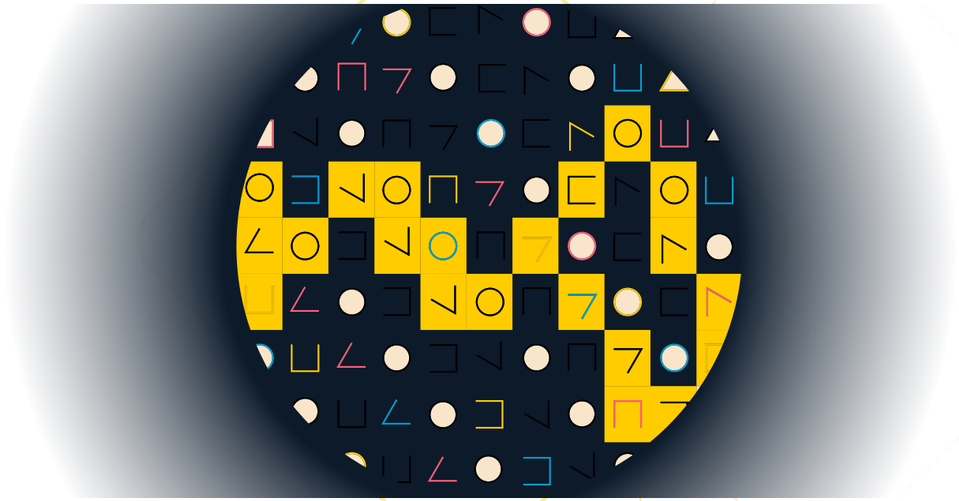
The design curriculum of the school has been developed by adapting and scaffolding the one found in MYP programme, maintaining the core of what this programme seeks. This process has been done, not only in terms of the scope and sequence, but also, the design cycle used. The range of materials and tool usage was also adapted to make it appropriate for students within the age range of the students in the PYP programme, but only offered to the primary section, not the preschool section.

2.5. The educational shift

The ongoing and growing complexity of today's global challenges, mentioned before, like the UN global goals, require a prospective view on what students need to be prepared for in the future. The current proposal of the OECD's learning compass (OECD, 2019) aims for a route to evolve the current educational framework towards future needs. Nevertheless, it is common to find within education that the skills, concepts or theories taught are chosen according to the current challenges our world is facing. And yes, students need to know about our past and present achievements and struggles, but these would become more meaningful if they were to be used as a projection for future scenarios embedded in today's curricula.

The exercise of situating students in the context they will live in whether it is in five, ten or twenty years, can be complex and can require a vision of the future and a prospective exercise some teachers may not be familiar with on a daily basis. Despite the complexity or newness that this may represent, the possibilities of looking at the education field as future driven, constantly changing and evolving, can lead us to an incremental innovation.

If we analyze the tasks needed for today's global challenges that deal with complex social systems, these would be similar to the ones associated with contextual challenges seen in design. For instance, tasks like interpreting vast quantities of information to define a problem, ensuring that root causes are addressed, monitoring or adjusting implementations, and developing strategic modifications would all be connected. (Meyer & Norman 2020) Having an emphasis on the design scenario where we can transition for skills that are community driven, would be bottoms-up and co-creation.



Chapter 3

3. Research methodology

This chapter describes the methodology developed for this project. The use of the Double Diamond and participatory action research permeated the development of this thesis. The components and insights of the implementation during each stage are described, also the tools and methods for data collection and the ideas for data analysis, and the adjustments needed along the way.

The selection of stakeholders was according to the availability of the school and the opportunities identified in the characteristics of the PYPx. In an initial stage the experimental group was six grade four classes (the whole grade level) having as a control group last year's grade four students (2020-2021). Nevertheless, further on in the process the leadership decided to reduce the experimental group to one class and therefore the control group were the five grade four classes of 2021-2022.

The methods and tools to explore this research favor participation and co-design since the interest of this project is in promoting the participation of the educational community, in addition to making use of methodologies that privilege not only verbal, but also non-verbal competencies, as the representation within design knowledge makes a connection between design, visual and material language. Despite being a research through design, as the context in which the research field is conducted and characterized by a diversity of people (non-designers), a participatory action research approach was also embedded during the process. Thus, the methods and tools should enable the community to have the capacity to make "things" that describe future objects, concerns or opportunities. They can also provide feedback on future experiences and future courses of action. As Manzini (2015) says, the production of knowledge of this research should be discussable, transferable, accumulative, and also should be explicit. Privileging participatory design means that there will be various methods that will be used in an iterative way which will construct the emerging design and therefore the research results. (Spinuzzi, 2005)

As a designer, a permanent goal is to improve aspects and areas of my life, in this case, through this project towards my work environment. When analyzing what could be improved or redesigned in the school I work in, and what could be related to design and possible to tackle, I started reflecting about the personal experiences in previous years of the different projects of the PYP (Primary Years Programme) curriculum. I then contrasted this with the possibility of potential improvement and the opportunity for connections with design that each of those could have. The PYPx (Primary Years Programme Exhibition) had potential, opportunity, connections and it represented such an interesting challenge that made me eager to encounter it.

3.1. Research approach

Design research aims to focus on the design phenomenon. Whether it is to construct a solid theoretical framework or to understand and explain what design is through intellectual, experiential and experimental activities. The objects of study within design research have corresponding sectors driving the research. These are, the design discipline driven by the academy, the design user driven by sociology or philosophy and the design product driven by industry (Herrera, 2010). There are three main types of research in design, research about design, research for design and research through design, being this last one selected for the development of this thesis.

3.1.1. Research through design

The following is a general explanation of research through design selected for this thesis, necessary to understand the methodology and tools adjusted and designed during its development.

The production of vision and proposals along with research by using methods proper to design characterizes the research through design (Manzini, 2015). This type of research, also called, RtD focuses on research of the future. It encourages to have as an intentional outcome what the preferred state might be allowing the research community to participate in the discourse. (Zimmerman & Stolterman, 2010, p.310). In RtD the design itself is the subject and object of research, which means that the artifact, no matter what it turns out to be (product, service, system, etc.), is a type of implicit, theoretical contribution. (Zimmerman & Stolterman, 2010, p.314). In other words, the artifact resulting from the design activity, is the instrument of the research.

According to Herrera (2010), Findeli (2008) states that the research through design should encompass both research about design and research for design. The aim of RtD is to improve the design practice, a characteristic taken from research for design. Which is the type of research made for professional practice while developing a design project. Practice which is not focused on knowledge production nor scientific acknowledgment, being design, the object of research. Scientific rigor is adopted from research about design, where design is the subject of study and it is conducted by other disciplines. RtD also adopts action research which adds to the scientific systematic and strict procedures as is equally rigorous as research about design (Frayling, 1993). For this study, not only action research but participatory action research will be adopted.

3.1.2. Participatory Action research

As stated before, action research is embedded within research through design. The difference between action research and participatory action research is the importance of the participation component. Participatory action research is a method that combines theory and practice through a collaborative process with the participants that leads to action and change. The exploration of the agency development through design allowing the research to be conducted within the school environment, monitoring the students' development of the PYPx project during regular lessons with their teachers will enable the skills in practice to be seen. It is within the participatory action research that the skill development can be explored.

The techniques in this type of research allow for a mix of activities where participants are involved from an early stage of the development process. They engage in reflecting, flexibility and the social nature of each activity. (Panke, 2019) This approach is characterized not only by participatory but also co-designed processes, being highly dynamic (Manzini, 2015). Co-design process includes consensus creation of methodologies that are interconnected to agency development, design skills and the PYPx requirements. Both of these were integrated with the collective teacher workshops and the co-design process was developed with the volunteer group director of the experimental group.

During the workshops, the role of the design expert is to trigger the social conversation that leads and feeds to considering new ideas. Meaning that the designer serves as both mediator and facilitator.

Children participation was limited to the tools adjustments and reflections about their use according to the stage of the project. Parents were not able to participate in the process nevertheless they were informed about the research.

3.1.3. Double diamond

Since this is a research through design the double diamond methodology allows to The double diamond methodology to be designed when service design was emerging as a clearer practice, developed from product design and graphic/UX design. The Design Council team reviewed the methodologies and tools of many organizations that use design well, seeing patterns in them.

From this review, the design council developed four phases: discover, define, develop, deliver. These form the double diamond methodology and enable design to solve more complex and multifaceted challenges. Based on this design methodology there were adjustments according to the needs of my research project, present below the methodology of this project.

>>>
FIGURE 3.1
DOUBLE DIAMOND
METHODOLOGY

Primary Leadership Team (PTL)

Level Leader Grade 4
Group Directors
Psychologists

Students 4A
Group director

Primary Leadership Team (PTL)

Methodology

PYPx: Primary Years Programme

Current state of the project

Skills
Problems
Opportunities
Differentiation
Disciplines
Concepts
Tools

Participatory
Workshops
Prototypes
Probes

ESAGE:Agency Measurement Instrument (previous)

PYPx Brief: Agency Development through Design

IDEATION
Participatory workshops
Prototypes
Probes

PYPx Implementation

Participatory workshops
Prototypes
Iterations
Toolkit

Data Collection & Analysis
Comparative Analysis

ESAGE:Agency Measurement Instrument (after)

Iterations PYPx

How do we develop fourth graders' agency through PYPx when design is included?

Diagnosis of the PYPx Systemic project mapping

PYPx system findings

IDEAS

Conclusions Contributions Socialization Sessions

Proposal Solution

Work Plan

Discover

Define

Develop

Apply

1 Socialization session of the research project. General summary, methodology and work-plan.	2 Project mapping: Systemic mapping work-shops of the current PYPx.	3 Prototyping: initial selection of design elements to be implemented, intervention / modification of PYPx documentation tools (physical-digital)	4 ESAGE application of the tool (Personal Agency and Empowerment Scale).	5 Work-shop on the journey map: initial definition of the phases, characteristics of the tools, didactic material, classroom sessions, transdisciplinary connections with design	6 Probes: Triangulate and uncover relationships between ESAGE - Design skills and competencies - PYPx Map	7 Prototyping work-shop - toolkit: class sessions, didactic material (physical-digital), tool development.	8 Adjustment and implementation of PYPx agency development through design - data collection. Semi-structured interviews students	9 ESAGE application of the tool Semi-structured interviews teachers	10 Data analysis, comparative analysis (PYPx control/ experimental), iterations of the project	11 Socialization of results
Primary Leadership Team Academic Coordinator PYP Coordinator G4 Level Leader Designer/Researcher	G4 Level Leader G4 Group Directors G4 Class Assistants Designer/Researcher	Group Director 4A Designer/researcher	Psychologists Group Director 4A Designer/ researcher	Directora de Grupo 4A Diseñadora/investigadora		G4 students Group Director 4A Designer/researcher		G4 students and group Directors Designer/ researcher	Designer/resea rcher	Primary Leadership Team Designer/ Researcher
Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

>>>
FIGURE 3.2
WORK PLAN

3.2. Stages of the work plan

The selection and application of tools on each of the stages of the work plan responds to the methodological objectives as follows:

<<<
TABLE 3.1
METHODOLOGICAL OBJECTIVES IN THE WORK PLAN

Methodological Objectives in the Stages of the Work Plan				
Methodological objective	**Discover**	**Define**	**Develop**	**Apply**
Review the current state of the project, the stages, didactic materials and teachers' perspectives related to the development of agency.	X	X		
Measure the level of agency of the students using the tools ESAGE	X			X
Define which aspects of agency and which aspects of the PYPx development are not being supported.	X	X		
Identify the difficulties students and teachers face throughout the project.	X	X	X	X
Adapt, design and apply instruments for data collection	X	X	X	X
Triangulation of data, discover the relationship between the results of the ESAGE, the design skills and the project timeline to select the elements that require intervention.		X	X	
Collectively construct the learning experiences and tools that promote the development of agency.		X	X	X
Analyze the data collection during the research	X	X	X	X
Compare the data collected, the impact of including design education in relation to the development of agency.				X

3.2.1. Discover

- Socialization session of the research project: General summary, methodology and work plan.
- Project mapping: Systemic mapping workshop of the current PYPx.
- ESAGE application of the tool (Personal Agency and Empowerment Scale).

3.2.2. Define

- Prototyping: initial selection of design elements to be implemented; intervention / modification of PYPx documentation tools (physical-digital)
- Workshop on the journey map: Initial definition of the phases, characteristics of the tools, didactic material, class sessions, transdisciplinary connections and semi-structured interviews.
- The systemic design tools used in the workshops during this stage, were chosen due to the participatory nature of the project and the information needed to redesign it.
- The importance of introducing systemic thinking to the teachers by using design tools that promote this type of thinking can potentially lead to its transferability to students.

3.2.3. Develop

- Prototyping - toolkit: class sessions, didactic material (physical-digital).
- Adjustment and implementation of the PYPx - data collection.
- Probes: Triangulate and uncover relationships between ESAGE - Design skills and competencies - PYPx Map

3.2.4. Apply

- Learning experiences and class sessions
- Website for documenting
- Agency tracker
- PYPx presentation
- Semi-structured interviews to teachers / students

3.3. Methodological tools

The development of tools mentioned above, responded to the perceived needs of the students, teachers and project, the agency survey results, the design skills, design cognition or thinking patterns within design knowledge that could support the development of agency of the students but also helped them setting them up for success. The word success is related to what the school

expects for all teachers, which is to develop the learning experiences, activities and engagements with students, where they are set up for a successful outcome.

<<<
TABLE 3.2
METHODOLOGICAL TOOLS

Methodological tools		
Tool	**Stakeholders**	**Objective**
Agency measurement tool: ESAGE	Adjusted by the researcher, the school's psychology team and the group director.	This tool was used to measure the agency of the students previous and post PYPx.
Participatory workshops and probes	Adjusted, developed and facilitated by the researcher. The participants were the level leader, group directors, level psychologists and teacher assistants	Provoke and elicit a response to help define the starting point of the PYPx. Also to find inspiration for the stakeholders to raise awareness and create opportunities and practices that promote agency development in the PYPx, identifying how teachers, teaching materials and curricula support it.
Prototypes	Co-designed by the researcher and the group director of the experimental group	Visual organizers to trigger systemic, prospective and reflective thinking in students. Agency tracker, action canvas and presentation planner.
Toolkits	Co-designed by the researcher and the group director of the experimental group	Variety of components including learning experiences, support resources and students' websites. To help and support teachers and students in the development of the PYPx.
Semi-Structured interviews	Developed by the researcher and applied to the grade four level leader, group directors and students	Identify which opportunities, practices and difficulties the students and teachers have throughout the PYPx. The school's community knowledge about agency and the practices that support its development.

3.4. Data collection

The data collected during this research was the results of the workshops with teachers, the learning experiences with students, the websites, the journals, the surveys and the measurements of the level of agency in the students.

During this study, observations were recorded as far as is possible on the day of the fieldwork, in different forms. Photos, work during teachers' workshops, voice recordings and students' samples were comprise as follows:

- Primary observations including: Date: Time of day, Location, Actors present, Sequence of events, and any interruptions.
- Secondary observations in the form of any statements by others about what the researcher observed. Experiential data relating to the researcher's own state of mind, emotions and any reflections. Also, circumstantial and background data about the organization, key roles etc.

3.4.1. Forming Research Groups

The intention in creating these research groups was to experiment with the organization of PYPx and with the amount of opportunities for student agency (voice, choice and ownership) throughout the entire PYPx journey. The hope was that this would result in a more student-led PYPx, which is the expectation of the IB.

The PYPx happens in Grade 4 (ages 10-11), which in this school, consisted of 6 classrooms. Of those classrooms, 1 was the experimental classroom and 5 were the control. The teachers of all 6 classrooms did participate in a workshop outlining the timeline for the PYPx and reflected on how they could improve based on previous years, which could alter the results slightly as teachers were already focusing on finding ways to improve across the grade level.

3.4.2. Triangulation of data

The triangulation of data informed the development of the prototypes and toolkits. Its objective was to find the relationships between the ESAGE tool (Agency measurement), the design skills that could potentially support the development of agency and the current state of the PYPx. The aim of these correlations was to recognize which practices were already supporting agency development, where are the knowledge gaps and also framing the room for improvement.

The space where design skills, agency development and gaps in the PYPx allow the design of the preferred state of the project.

3.5. Ethical considerations

As a researcher, I am responsible for protecting the rights and welfare of the subjects who will be part of the research, in this case, the community that makes up the educational institution where the research will take place, who have placed their trust in me for the implementation of the research.

Consequently, the ethical considerations in research with human beings proposed by the UCLA Center for Health Policy Research (Centro de investigación en pólizas de salud de UCLA Health DATA, n.d.) will be taken as a reference. Therefore, the following considerations were taken from this report, with some particular adjustments to my research.

- Value: the research should seek to improve the knowledge of the educational community of the institution.
- Scientific validity: the research should be methodologically sound, so that research participants do not waste their time with research that must be repeated.
- Selection of human beings or subjects should be fair: research participants should be selected fairly and equitably and without personal bias or preference.
- Favorable risk/benefit ratio: the risks to research participants should be minimal and the potential benefits should be increased, the potential benefits to individuals and the knowledge gained for society should outweigh the risks.
- Informed consent: the educational community should be informed about the research and give their voluntary consent before becoming research participants.
- Respect for human participants: Research participants should have their privacy protected, have the option to leave the research, and have their well-being monitored.

3.5.1. Anonymity of the institution

In terms of protection of the educational institution and the "Child protection program" implemented at the school, it is of utmost importance to maintain the anonymity of both the community and the educational institution. In this section, the following considerations will be taken into account:

- Privacy: the rights of a participant to limit access to his or her personal information to others.

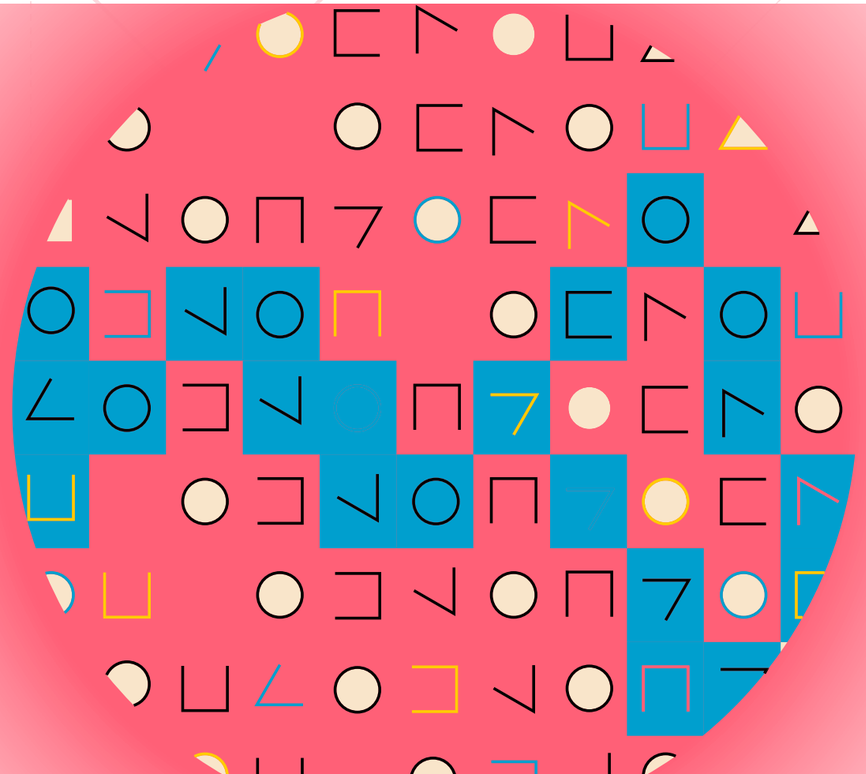
- Confidential data: is personal or identifiable information about the person participating, given with the understanding that it will not be disclosed to others without consent.
- Confidentiality: this is the researcher's obligation to limit access to personal or identifiable information about research participants.
- Anonymized data: this is data collected without any personal or identifiable information. Ethical and legal concerns about confidentiality can easily be resolved by collecting only anonymous data from research participants.

About the informed consent

- Information: It should include information about the research procedures, its purpose, risks, anticipated benefits, and a statement offering the individual the opportunity to ask questions and to withdraw from the research at any time.
- Comprehension: Researchers are responsible for ensuring that potential research participants have understood the information before giving consent; that they have been given time to consider it or ask questions; that they have been offered the information in their preferred language; and that a high level of literacy skills is not required to understand it.
- Voluntary consent: Consent to participate in research is valid only if it is given voluntarily, without coercion, undue influence or pressure.

Note: Parents at the school sign an informed consent, at the beginning of each academic year, that covered the requirements of the ethical considerations. Since this study will not publish personal information about the students nor the school it was not necessary to sign a new informed consent. In addition, the faces of the students and logos of the school will be blurred in the photos. Finally, it is important to clarify that the parents were informed about the research and they were all in agreement of its development.

Chapter 4



4. Reference framework

The following chapter is presenting the reference framework related to the education system, international education organizations, the PYPx, design, design thinking and agency. The researcher's understanding of the concepts and the consideration of the different perspectives of thinkers in both fields showed clear linkages, relationships and connections found between the different concepts and how they are related to this research study. The present chapter displays how the different topics and concepts come together facilitating the understanding of results.

For the initial research framework, a starting point will be to explore the understanding of education in Colombia, and the policies and organizations that impact the current curriculum of the school, such as the international accreditations. Each curriculum and accreditation will be analyzed looking for the characteristics, approaches, differences and similarities between them in order to build a solid foundation for what design is in education and possible connections with agency. Through this process, will begin the discovery of o path of knowledge in terms of depth, interactions and iterations.

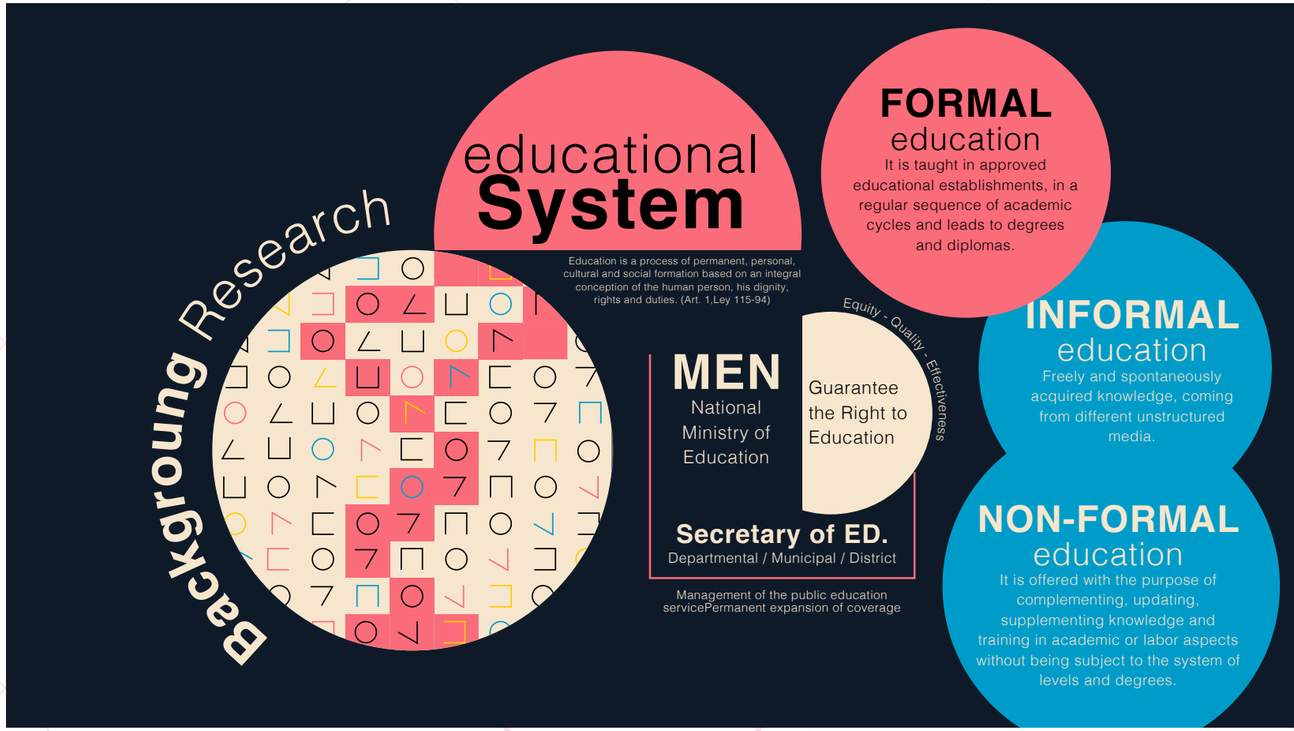
4.1. A Glance at Education - The Education System in Colombia

Education in Colombia is defined by the Ministry of Education as "a process of permanent, personal, cultural and social formation based on an integral conception of the human person, his dignity, rights and duties". (Ley 115 congreso de la República de Colombia, 1994)

From this definition, there are many keywords to explore. Despite the fact that the word "formation" refers to the acquisition and transformation of knowledge, looking at it from the most basic meaning, it means shaping. It could then be said that, by means of a process, a person and their knowledge is continuously shaped. It's impossible not to wonder how many formations have been combined within education and the combinations yet to connect.

The personal sphere is related to the dimensions of the human being. For instance, this would include a person's physical, socio-emotional, mental and spiritual dimensions. These are also connected to skills such as self-knowledge, self-esteem, resilience, self-control, perseverance, adaptability, empathy, conflict management, assertive communication, among others, which permeate the development of the individual.

>>>
FIGURE 4.1
CONCEPT MAP
EDUCATIONAL
SYSTEM



To explore "personal sphere" further, consider the term "Ubiquitous education'' (Krokfors and colleagues, 2015), which highlights the importance of children having the confidence and competence to design their own tools as future citizens. Learning transcends the barriers between the formal and the informal education, the local and the global contexts and between the physical and the virtual scenario. It is a place where actors such as the society, the school and the world of each child should develop activities that cross the boundaries between them and, in consequence, build a pedagogical continuum between different practices.

This boundary crossing requires a participatory pedagogy (Krokfors and colleagues, 20015) where the barriers between grades/school courses are blurred, creating the opportunity for collaborative work between them and taking into account the interests, and the personal and social competencies of the students.

Even though in Colombia, the Ministry of Education is working to move forward to the compliance of the Sustainable Development Goals (UN) linked to The Future of Education and Skills for 2030 (OECD), in our country, it is still mandatory to teach only the core literacies (Congreso de Colombia 1992). But this transition requires curriculum changes to make it happen. Consider the possibility of creating different

learning environments that foster the development of different types of agency such as learning-by-doing or learning-by-playing. Creating practices where students are responsible for small projects leads them to being authors of their learning process and having responsibility and initiative to make decisions. This calls for the learning process to be participatory to the extent that they are given the opportunity to participate in the design of the curriculum(Krokfors and colleagues, 20015), and the definition of achievements for their own learning (Bandura, 1997). This lead the necessity to create opportunities for agency development within the students.

According to the OECD (2005), the curriculum defines the knowledge and competencies needed for the future, so schools can create learning environments that support those competences and have a clear cross boundary between different practices, disciplines and institutions. It requires creating and enabling links between institutions and communities to which they belong. Implementing this type of curriculum requires changes in learning materials and approaches to learning. These types of changes in education make it necessary to provide teachers with professional development opportunities that support the implementation of such grand challenges.

4.2. International Education Organizations

There are three main organizations that are aligned with the need to recognize education systems. They notice the need for curricular changes and respond accordingly while considering the present and future challenges of the world's diverse population. These organizations are OECD, the United Nations and UNESCO. Below are their main functions and their particular projects in this section.

Organizations, that propose educational frameworks that encourage the development of agency will found below.

4.2.1. OECD - The Organization for Economic Co-operation and Development

The OECD (OECD, n.d.)is an international organization whose main mission is to design policies that promote prosperity, equality, opportunity and well-being for all people. In collaboration with governments, policy makers and citizens, they work to set international standards and propose solutions to today's challenges. It is an organization that helps develop international curriculum.

One of the OECD's initiatives is "The Future of Education and Skills for 2030." This initiative was created as the recognition for a global understanding of teaching and learning rose among the international community. It hopes to provide tools to support students in preparing for jobs that will exist in the future, i.e. jobs that have not yet been created. This, bearing in mind the social challenges they will face and the type of technologies that could be used in the future.

Likewise, the concern was to equip students to thrive in the interconnected world in which they will find themselves. Therefore, they will need to understand and appreciate different perspectives and worldviews in order to be able to interact respectfully and take responsible action towards collective well-being and sustainability.

This project recognizes that current curriculums are linear in nature and do not foster the development of competencies in terms of knowledge, skills, values and attitudes for all students. They rarely take into account that students come from different backgrounds and contexts, and therefore require non-linear learning paths that are flexible and personalized. In other words, the OECD proposal points towards the transition from linear curriculum to the development of dynamic curriculum that allows for the recognition of the differences of all members of the community. This would form a responsive educational system that allows its students to adapt, shape and thrive in the future that awaits them. The role of the student, therefore, must change to become an active participant in his or her own learning process. Consequently, the project highlights the importance of agency development as central to the development of identity and sense of belonging, which is directly related to students' motivation, hope, self-efficacy and growth mindset.

4.2.2. UN - United Nations

Sustainable Development Goals (SDGs)

The "2030 Agenda for Sustainable Development," (Transforming Our World: The 2030 Agenda for Sustainable Development | Department of Economic and Social Affairs) created by the United Nations, provides a shared blueprint for peace and prosperity for people and the planet, now and in the future. At its core are the 17 Sustainable Development Goals (SDGs), which are an urgent call to action by all countries, developed and developing, in a global partnership. They recognize that ending poverty and other deprivations must go hand in hand with strategies that improve health and education, reduce inequality and stimulate economic growth, all while addressing climate change and working to preserve our oceans and forests. (United Nations, 2015)

Target number 4 of the Sustainable Goals refers to the quality of education. Its main objective is to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. It also talks about the importance of keeping children in school and ensuring that they complete their education. Making statistical comparisons on the global completion rate of elementary school, secondary education and how these figures show large disparities between different groups of the world's population.

4.2.3. UNESCO - United Nations Educational, Scientific and Cultural Organization

Seeks to build peace through international cooperation in education, science and culture. UNESCO's (UNESCO, n.d.) Programs contribute to the achievement of the Sustainable Development Goals defined in the 2030 Agenda. Particularly, UNESCO has five major objectives as its mission:

- Develop educational tools that help people live as citizens of the world.
- To work to ensure access to quality education for the world's population.
- Promote science programs and policies as platforms for development and cooperation.
- Defends freedom of expression as a fundamental right and a key condition for democracy and development.
- Assists countries in adopting international standards and manages programs that encourage the free flow of ideas and the exchange of knowledge.

4.2.3.1. ISCED - International Standard Classification of Education

This classification (UNESCO Institute for Statistics, 2012, 1-88), developed by UNESCO, serves as an instrument for compiling and presenting education statistics at both national and international levels. It also includes the introduction of educational qualifications as a statistical unit related to education programs and includes coding schemes for levels of educational programs and achievement. This helps the development and organization of educational programs around the world and to establish the educational qualifications (levels and field) that will be adopted to ensure compliance with world educational standards.

4.2.3.2. Application

One way schools apply these organizations and the benchmarks they provide is to ensure the quality of education across the globe is similar. As these organizations are mainly focused on ensuring equality and sustainability, they express the importance of making education accessible to all and that the same level of knowledge is shared, regardless of the country, their economy or society.

In addition, schools use these organizations as a tool in applying international mindedness within their curriculum. The resources they provide help schools and teachers create more awareness of local and global issues worldwide, and support schools in providing an opportunity for student-led initiatives where students identify social problems and design solutions. Collectively, they create a movement across the globe that results in community and agency at all levels, personal to governmental.

4.3. Accreditations

As any other education institution, the school where the study was performed holds three different accreditations recognizing the international standards this school embodies. Therefore a brief description of each one will be needed.

4.3.1. International Baccalaureate (IB)

The International Baccalaureate (IB) provides schools with a framework which is flexible, aiming to empower students, teachers and schools to adjust the curriculum according to their cultural needs and interests. The main goal of IB schools is to develop the best in every child, having a solid academic foundation and building global citizenship. IB students are best characterized for having transferable future-ready skills. The focus of the curriculum in the early years is to provide opportunities for students to guide their own learning through authentic inquiry. Teachers support students in developing their skills in approaches to learning (research, communication, thinking, social and self-management skills), while students have more voice in the actual content of their learning. As students progress, they are encouraged and expected to take their knowledge and apply it to the world around them, finding ways to improve their community organically. Ultimately, the curriculum framework prepares the students to be creative, proactive, critical thinkers who make a contribution to their world.

IB schools can have one or more of the following curriculum frameworks offered based on age. A school with all programs is considered an "IB World School."

- Primary Years Programme (PYP, for students aged 3–12 years)
- Middle Years Programme (MYP, for students aged 11–16 years)
- Diploma Programme (DP, for students aged 16–19 years)
- Career-related Programme (CP, for students aged 16–19 years).
- The school in question possesses 3 IB accreditations: Primary Years Programme, Middle Years Programme and Diploma Programme.

4.3.2. Council of British International Schools (COBIS)

Schools accredited by the Council of British International Schools must follow a curriculum that is focused on British educational ethos and values (COBIS, 2020). COBIS does not necessarily provide a specific curriculum, but insteads allows the school to choose a curriculum that best meets the needs of their community, and uses COBIS as a source of values and direction. The 10 standards it provides help schools determine how they want to function and assists schools in creating systems, such as ensuring elements of safeguarding are in place or having clear expectations on teaching and learning.

- **Foresight studies**
- **Knowledge transfer**
- **Normative actions**
- **Experience in technical cooperation**
- **Exchange of specialized information**

UNESCO
United Nations Educational, Scientific and Cultural Organization

ISCED
International Standard Classification of Education

Organizing educational programs

Educational Qualifications (Levels & Fields)

PUBLIC
National

PRIVATE
National-**International**

FORMAL
education
It is taught in approved educational establishments, in a regular sequence of academic cycles and leads to degrees and diplomas.

UN
United Nations

SDGs
Sustainable Development Goals

GOAL 4
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

OECD
Organization for Economic Co-operation and Development

Identity
Sense of Belonging

Agency
"The ability to positively influence their own lives and the world around them, as well as their ability to set a goal, reflect and act responsibly to effect change."

Motivation
Hopefulness
Self-efficacy
Growth Mindset

ACTIVE Participant

students' ROLE

COMPETENCIES
Knowledge
Skills
Values
Attitudes

KIDS

≠
Background
Context

Non-linear learning pathways

Dynamic curriculum

Future

Adapt
Thrive
Form

Receptive ED system

Flexible
Personalized

OECD Future of Education and **Skills 2030** project background

interconnected WORLD

≠
Perspectives
World views

Understand Appreciate

Taking responsible action

Sustainability
Common welfare

>>>
FIGURE 4.2
CONCEPT MAP FORMAL EDUCATION

FORMAL
education

It is taught in approved educational establishments, in a regular sequence of academic cycles and leads to degrees and diplomas.

PUBLIC
National

PRIVATE
National-Internacional

INTERNATIONAL curruculums

- Adapted or School-Developed Curriculum at Middle School Level
- Advanced Placement (AP)
- A Levels Used In Conjunction With an Adapted Curriculum
- A-Levels
- Adapted or School-Developed Curriculum
- Adapted or School-Developed Curriculum at the Primary Level
- Bahrain Elementary (or Primary) Curriculum
- Bahrain High School Diploma (College Preparatory)
- Barbados National Curriculum
- Based on curriculum of Canton Zug
- Brazilian ENEM Entrance Exam (Exame Nacional do Ensino Médio)
- Brazilian High School Diploma
- Cambridge International Advanced Programme
- Cambridge International Primary Programme (CPP)
- Cambridge International Secondary 1 Programme
- Cambridge International Secondary 2 Programme
- Common Entrance Exam
- Curriculum Canton Zurich
- Dutch National Curriculum
- French Bac
- French Diplôme National du Brevet
- French National Curriculum
- GCSE (General Certificate of Secondary Education)
- German International Abitur Exam (DIAP)
- German State Curriculum
- IGCSE (International General Certificate of Secondary Education)
- IGCSE used in conjunction with adapted curriculum
- Indian National Curriculum
- International Baccalaureate (IB) Career-related Programme (CP)
- International Baccalaureate (Diploma)
- International Baccalaureate Middle Years Programme (MYP)
- International Baccalaureate Primary Years Programme (PYP)
- International Baccalaureate- Diploma (candidate)
- International Baccalaureate- MYP (candidate)
- International Baccalaureate- PYP (candidate)
- International Middle Years Curriculum (MYC)
- International Primary Curriculum
- Italian Curriculum (Italian Ministry of Education Diploma - Licenza Media)
- La Maturit
- Montessori
- National Curriculum for England
- New South Wales/High School Certificate (HSC)
- OIB (Option Internationale du Bac)
- Ontario Secondary School Diploma (OSSD)
- Quebec Provincial/Canadian
- Reggio Emilia
- Rudolf Steiner
- SABIS School Network: International Schools of Choueifat
- Spanish State Curriculum
- Sports, Skills, Study & Career Technology
- The European Baccalaureate: The European Schools
- UWCSEA - designed Middle School Programme
- Victoria Certificate of Education (VCE)
- Western Australian Certificate of Education (WACE)
- BTEC (Business and Technology Education Council) Level 3 Extended Diploma
- Higher National Diploma (HND)
- Common Core (US)
- UWCSEA - designed Primary School Programme
- Bilingual Abitur
- National Curriculum for England Used In Conjunction With an Adapted Curriculum
- Harkness Method
- School-Adapted American curriculum
- Mittlerer Schulabschluss (MSA) (German middle-school certificate)
- SABIS School Network
- Irish Primary Curriculum
- Junior Certificate Examination (Ireland)
- Leaving Certificate (Ireland)
- Canadian Academic High School Graduation Diploma
- International A Levels (IAL)
- New South Wales
- American middle school curriculum
- British Columbia Certificate of Graduation (Dogwood Diploma)
- Diplôme de fin d'études secondaires en Colombie-Britannique
- British Columbia Curriculum
- Early Years Foundation Stage (EYFS)

SECONDARY
6º, 7º ,8º ,9º

PRIMARY
1º, 2º, 3º, 4º, 5º

BASIC
It will be structured around a common curriculum, made up of the fundamental areas of knowledge and human activity.

INTRINSIC

PRESCHOOL
Integral development in the biological, cognitive, psychomotor, socio-affective and spiritual aspects, through pedagogical and recreational socialization experiences.

MIDDLE
Understanding universal ideas and values and preparing the learner for entry into higher education and work.

Disciplinary

DP
Diploma Programme

Interdisciplinary

MYP
Middle Years Programme

Transdisciplinary

PYP
Primary Years Programme

It prepares students to be **active participants** in their lifelong learning journey.

IB
International Baccalaureate

Aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect.

BSF
British Schools Foundation

Produces people who don't just know things but are also able to think for themselves and it draws from long-standing institutions, traditions and values.

Transdisciplinary learning

It addresses that which is present both within disciplines, between disciplines and beyond all disciplines."
(Nicolescu, 2014)

Key concepts

Knowledge
Conceptual understanding
Skills
Action

PYP Exhibition
Culminating, collaborative learning experience in the final year of the PYP.

transdisciplinary THEMES

Who we are
Where we are in time and space
How we express ourselves
How the world works
How we are organized
How we share the planet

Capabilities

physical
social
intellectual
aesthetic
cultural

>>>
FIGURE 4.3
CONCEPT MAP
FORMAL IB
CURRICULUM

This accreditation has the following 10 standards:

- Safeguarding and Safer Recruitment
- Student Welfare
- Facilities
- Governance
- Ethos and Values
- Boarding
- Learning and Teaching
- Leadership in the School
- Communication
- Extra-Curricular, Enrichment and Engagement

4.3.3. Council of International Schools (CIS)

This accreditation focuses on a school's commitment to high quality education, and continuous improvement according to the leading international education standards. Its core is the students' learning and global citizenship. Recently CIS has begun collaborating with the IB, as they share the same values and many international schools have both accreditations. A CIS member school has to comply with the following processes:

- Rigorous evaluation against internationally-agreed standards
- Blend of support and challenge focused on a school's development
- Peer-based model that brings together international educators from across the world of CIS-accredited schools.

4.4. Primary Years Programme Exhibition PYPx

The following is the IB's definition of what PYPx is:

> *"The exhibition is the culmination of the students' learning from Preschool through Primary and is a celebration of the knowledge, concepts, AtLs (Approaches to learning) and Learner Profile Attributes that they have developed over this time. It is a unit of inquiry where students initiate their own learning, choosing an issue that they are passionate about. Students must use the IB concepts and key questions to connect what they already know with new knowledge. This new knowledge leads all students towards a meaningful action related to their passion and topic of research. Teachers, peers and mentors play an essential role in making the experience truly collaborative, providing guidance and scaffolding to make it a successful experience.*
>
> *The Primary Years Programme (PYP) exhibition represents a significant event in the life of a PYP school and student, synthesizing the essential elements of the PYP and sharing them with the whole school community.*
>
> *As a culminating experience it is an opportunity for students to exhibit the attributes of the International Baccalaureate (IB) learner profile that have been developing throughout their engagement with the PYP. "*
>
> **PYP Exhibition Guidelines**
> **(International Baccalaureate, n.d.)**

The timeline and degrees of which the PYPx is student-led depends on the school. One aspect of being an IB school is that becoming full IB in philosophy and organization is a gradual process. It can take several years of hard work, going from a very structured curriculum to a more inquiry based curriculum. It requires professional development for teachers and exposure for students to develop critical thinking skills, research skills, independence, confidence, global awareness, etc. Traditionally, students are not often given a voice in their educational journey, and often don't know where to begin when they are finally given it, such as in the IB. To better support schools in this evolution to fully apply the philosophy behind the framework, the IB allows time and support.

Taking this evolution into account, this also means that each IB school is at a different stage in their PYPx expectations and organization. When schools are just starting the IB framework, PYPx tends to be more teacher driven. Eventually, as students and teachers become more confident in this type of thinking, students lead the entire process, from developing a central idea, inquiry questions, actively researching, creating student-led action, etc.

Most IB schools provide students with 8-10 weeks to work through the entire PYPx process. Students work independently or collaboratively on a global issue they care about and are curious to explore further. They gather information through online research, field trips, conducting surveys or interviews, and have their teachers, mentors and parents to support their process. As PYPx is a culminating experience, students are required to have one element of the Arts in their presentation.

4.4.1. Agency in the IB

The IB's understanding of agency is inspired by Bandura's social cognitive theory, stating agency "enable[s] people to play a part in their self-development, adaptation, and self-renewal with changing times" (Bandura 2001)." In IB schools, students take responsibility for their learning, have a strong sense of identity, and are open-minded to the needs, opinions and values of others.

In the IB's document called "The Learner," it describes how students and teachers create a partnership and support agency in different ways. For instance, teachers support student agency by differentiating content and lessons to reflect the students'

individual needs, value and actively listen to the student's perspectives or ideas, and offer moments for students to do open-ended tasks and creative thinking.

Finally, "The Learner" also describes different ways teachers can support and create more opportunities for agency, such as allowing students to set up the learning environment to reflect their needs, or to be collaborative where they have a voice in how routines are organized and creating clear classroom expectations.

One of the main goals of increasing student agency in the IB is to build student's own self-efficacy. According to Bandura, the stronger students feel they are capable of accomplishing their goals and actions, the higher possibility they will have agency (Bandura, 1997).

4.5. Design and design thinking

One of the most interesting theoretical approaches that one can come across throughout a research, are those that change or expand the perspective and/or understanding of a topic. During this process, the clarification of a personal and complex question was answered. Specially, in reference to why design is not a fundamental area of knowledge formally recognized, located and established in basic and secondary education. The approach of Nigel Cross (2006) in his book "Designerly ways of knowing"deals with design as a third area of knowledge, different from the sciences and humanities, and the importance of including this discipline in general education (elementary and middle school) since it develops knowledge, competencies and skills different, but equivalent in importance, to those commonly developed in the sciences and humanities. Cross also talks about the differences in the phenomena of study, the methods of inquiry and the belief systems or values of each of these areas of knowledge.

> *"The transmission of knowledge in design about a study phenomenon is the artificial world, not the natural world as it is in science, or human experience in the humanities.*
>
> *The appropriate methods of inquiry that pertain to design are modeling, pattern formation, and synthesis. Unlike the sciences which focus on methods of controlled experimentation, classification and analysis, or the humanities which focus on analogies, metaphors and evaluation.*
>
> *The approach to a system of beliefs and cultural values in design comes from practicality, ingenuity, empathy and concern for appropriation. In the sciences they are more concerned with truth, objectivity, rationality and neutrality. And in the humanities the concern revolves around justice, subjectivity, imagination and commitment."*
>
> **Cross, 2006**

As seen in Cross, design encompasses the domain of the artificial or human made world.

4.5.1. Design

Seeking for a rounded definition of design, one can find a universe of approaches that somehow connect with one another. It is important to recognize that leaning towards one approach over the other, acknowledging the differences between them, derives from one's personal history and belief system.

Aligned with this statement, the start will be Manzini (2015). He talks about design as a sense of making a field concerned with the creation of meaning, regardless of the shape that it withholds. And going beyond, when the construction of meaning is embedded in the social sphere having an active and proactive role, assigning collective understandings of values, quality and beauty.

For Cross (2006), design is coherent, tackles ill-defined problems, and is solution-focused, but also does not belong in the humanities nor in the sciences. Schön introduces the reflection-in-action approach, stating that problem solving in the design process is constantly framing, acting and adjusting. Cross (2006) and Dorst (2010) studied the abductive reasoning of the design activity that takes place when solving ill-defined problems. For Buchanan (1992), the indetermination and complexity of design problems, makes them wicked. The artifacts that come from design are signs, things, actions and thoughts, and the distinct way designers look and approach problems.

Whereas Bonsiepe aims to establish the field of action and knowledge of design. The following are the 7 columns of design, proposed by Bonsiepe (1992), that can serve to reinterpret the discipline of design.

1. Design is a domain that can manifest itself in any area of human knowledge or human action.
2. Design is oriented towards the future (prospective).
3. Design is related to innovation.
4. Design is connected with the body and space, especially with the retinal space.
5. Design is oriented to efficient action.
6. Design is linguistically rooted in the field of judgments.
7. Design focuses on the interaction between user and artifact. The domain of design is the domain of the interface.

Theoretical & conceptual **framework**

Human activity

- Evolutionary
- Cultural
- Practical
- Development
- Prefiguration
- Projection

Future events / Consequences

Prospective thinking
(McKiernan, 2017)

Create simulations

Human Agency
(Emirbayer & Mische, 1998)
(Bandura 2001)

- Projection — Future
- Iteration — Past
- Practical Evaluation — Present
- Ownership
- Choice
- Voice

- **Self-efficacy**
- **Autonomy**
- **Self-determination**
- **Control**
- **Self-regulation**
- **Empowerment**

>>> FIGURE 4.4 CONCEPT MAP DESIGN

"Everyone designs who devises courses of action aimed at changing existing situations into preferred ones."
(Simon, 1996)

Concrete — Abstract

SYNTHESIS

Cross, 1990 / Simons, 1996 / Manzini, 2015 / Dorst 2015

DESIGN
Skills
Knowledge

Regulation of cognitive activities

"Thinking about thinking"

Cognitive goal

Metacognition
(Livingston 2003)

Flexibility of thinking — Freedom from rigidity — Adaptive Flexibility

Creativity
(Guilford, 1958)

Divergent

Intuitive

Disorder Uncertainty

Complex Systemic

Abductive reasoning
(Dorst 2015)

Design **THINKING**

Generative — Creative

dimensions of **diversity**
(Morin, 1999)

Knowledge - growing organism

EPISTEMOLOGY
(Liares, 1988)

conceptual boundaries
constitutive data

different disciplines

DESIGN
Epistemology
(Mahdjoubi, 2003)

Personal & Social Development

LINKS & RELATIONSHIPS

Socio-emotional **process**

Service learning
(Simons, L., 2011)

senses

critical attitude
coherent & orderly

GIVING MEANING
adaptation of thinking to **REALITY**
(Manzini, 2015)

COGNITIVE
multifaceted skill
(Cross, 2011)

DESIGN

Breaking down the understanding of design with each of the columns in the same order listed above. This is to extend the explanation of what each of the columns means.

1. Design can adopt one or more domains from other disciplines (knowledge) and can be applied to any area of human experience (action). Therefore, it is inter and transdisciplinary that its field of action has a universal character. This seems to be closely related to the ill-defined nature of Buchanan's (1992) "Wicked Problems".
2. This column can be reinterpreted in relation to Simon's (1996) postulate where he understands design as the conception and planning of the artificial, of what does not yet exist. That is to say, design is permeated by a projective dimension.
3. It is important to refer to two types of innovation proposed by Norman & Verganti (2014): radical innovation, where we find innovations with major changes, new domains and paradigms, which are the product of technology or a change of meaning; and incremental innovation, which is the dominant form of innovation and can be taken as a continuous improvement of a radical idea that is established in a system.
4. It seems that Bonsiepe (1992) refers to ergonomics, however, this reference has a systemic character by being connected not only to the body, but to the space or context.
5. This column can be related to Aristotle's Efficient Cause (Arranz, 2013), where 3 depends on a change agent to acquire determination, it is extrinsic. It is related to being used, and therefore, the agent of change must know beforehand the form that it is going to induce in the formal cause in order to fulfill the efficient cause. That is, the designer is the one who plans and makes possible the result of the efficient and final cause.
6. Here, it seems that it refers to the action of design in culture. As a manifestation of the multiple perceptions of the world.
7. The interface, here the system that makes possible the connection between the tangible or intangible response of the design action, with the purpose and the stakeholders.

According to this re-interpretation, it can be said that design is a discipline that has a projective approach. It is characterized by the creation of innovative, aesthetic and ergonomic solutions that confer meaning. In addition, it responds and is established within a given context or system belonging to any dimension of the human experience. It is developed in an inter-transdisciplinary and sometimes participatory and/or collaborative way.

4.5.2. Design skills

The following is a review of the authors who talk about design thinking, competencies and skills specific to the discipline. Their positions break down in a clear and detailed way the characteristics of us designers.

There are two publications by Kees Dorst that catch our attention and they are "The levels of expertise in design education" (2004) and "The nature of design thinking" (2010). Here he explains how the objective of design education is to reach a certain level of design skills, and agrees with Nigel Cross (2006) in identifying the competencies that characterize designers, defining the following main characteristics:
- Produce novel and unexpected solutions.

- Tolerate uncertainty, working with incomplete information
- Applying imagination and constructive foresight to practical problems
- Use drawings and other modeling media as a means to solve problems.
- Solve ill-defined problems
- Adopt solution-focused strategies
- Employ abductive / productive / appositional thinking (Gestalt relationship perception)
- Use non-verbal, graphical / spatial modeling means.

Dorst (2015) studies the constant iteration, synthesis and evaluation between the problem and the solution space (conceptual design spaces), the role of reformulating problems, the abstraction, and how design is future oriented.

Lawson (2006) explains how the design process is a negotiation between the problem and the solution where reciprocity of reflection feeds one another with an iterative quality. The core activities in this process are first, analysis which is related to identifying patterns, relationships and classification in order to structure a problem and formulate objectives. Second is synthesis, involving the creation of a solution in response to the problem. And the third, is the appraisal which is the critical evaluation of the solution in contrast to the objectives.

Cross (1992 & 2006) identifies the main aspects of the ways of knowing and design ability. Designers tackle "ill-defined" problems. Their problem-solving mode is "solution-focused" or problem structuring by exploring potential solutions. Their way of thinking is "constructive". The definition and redefinition of goals and constraints throughout the process gives room to a constructive evolution of solutions maintaining a main solution concept. They think by drawing and transforming the abstract into concrete. Their solutions use codes transferable to object languages.

4.5.3. Design thinking

Every train designer develops a way of seeing the world with design eyes. It is a common practice for designers to extend their subject matters (reference of the term) to every level of one's own human experience. From cooking breakfast to planning a date night, design seems to permeate our daily experiences transcending the way we designers make sense of the world. With the constant practice of design, adopting a design thinking mindset permeates every aspect of our human lives. This multifaceted cognitive activity (reference of the term) allows us to synthesize what seems abstract to a concrete understanding of reality, where there is a mix of rational, analytical, systemic, creative and social thinking (problem solving, creativity and empathy).

Design thinking as a cognitive style and as a way of making sense of the world around us. Throughout the training and practice of design, the development of skills that involve the core activities of the design practice allow the practitioner to develop a different set of lenses to view the world. A set of lenses that does not need to be taken off and that can be used in any area and situation of the practitioner's life.

Cross studies how common aspects and strategies across designers would be seeing the bigger picture by taking a systems approach of the problem, making sense of the problem by framing it in their own particular way, and taking into account the first design insights or first principles they devise from the start.

Aiming to foster the development of design thinking as a way of seeing the world and not only seeing design thinking as a method or process to develop a project, but as a cognitive skill, as a strategy of knowledge construction, which requires the transition of design methods to different fields of application in and outside design education in the educational context of this research.

Nevertheless, the starting point to nurture design thinking skills cannot be separated from the design methods commonly associated with design thinking. Whereas through the recurrent and persistent practice of these methods, students can start making sense of the world through design. Of course it is necessary to leave aside the generalized design thinking methods that have migrated to different fields and concentrate on the use, adjustment and design methods that foster the core design skills related to agency development scaffolded for the age range of the stakeholders of this study.

It is important to acknowledge that design thinking combines with the abductive thinking (Dorst, 0000; Lages 2020) and swings between analysis and creation. It is by nature multidisciplinary and human-centered (Liedtka, 2015; Martin, 2009). It is also driven by innovation matching human needs, local resources and viability (Brown, 2009).

Design thinking mindset mentioned by Tellez (2017), first developed by Carrol and colleagues (2010), is an approach that focuses on the importance of empathy as a key component that guides the design process. Whereas Verganti (2017) proposes that the evolution of cognition theories can be developed by design thinking if it is conceived as cognitive style with a clear set of processes and methods. He highlights the following process steps:

- Double diamonds
- Brainstorming
- Quick ethnography
- Empathy maps
- Customer journeys
- Blueprints

Friedman's (2017) description of design thinking is concise, stating that it is a term for iterative problem-solving process. Panke (2019) talks about the different areas of application span of design thinking in education, stating how it goes from K12 to post graduate and informal education too. It is characterized by its versatility to tackle complex ideas and common goals with a shared vision while fostering empathy. In addition, Hillner (2018) states the importance of the early stage discovery process in design thinking, and the iteration process that brings understanding to the problem-solving process.

Irbīte, A., & Strode, A. (2016) mention the adaptability and adjustability of design thinking and how its methodology should be tailored to the context relationships and interactions, challenge scale, opening the discussion about how design is transitioning to more complex and situated problems like:

1. Serving the needs of the global poor.
2. Designing new approaches to health, including aging and the end of life.
3. Designing healthy and profitable food systems that can serve the needs of all.
4. Designing citizen-centered government services.
5. Designing the future of our urban communities.
6. Anticipating the opportunities and challenges of over-the-horizon technologies.
7. Designing the future of work and the corporation itself.

For Kimbell (2012) design thinking has a dualism between thinking and doing that requires designers to be empathic. She acknowledges the importance of the design practice on constituting the world of today and tomorrow: . " Design thinking is meant to encompass everything good about designerly practices." Kimbell (2012).

As Luka (2014) states, the inclusion of design thinking in pedagogy promotes an iterative problem-based approach that contains analytic and synthetic elements. This process encourages the development of social skills to work in a multidisciplinary team. Which in a school environment, like the one in this research, would be equivalent to being able to team up with any classmate when challenging them to solve everyday problems. Luka (2014) studies the different discourses where design thinking is seen as:

- Creation of artifacts
- Reflexive practice
- Problem solving activity
- Way of reasoning
- Making sense of things
- Creation of meaning
- Process and mindset

At some level, all of these discourses meet, combine, interact, and some of them are a constant that cannot be taken away from the practice of design. We will always find problem solving, reflexive reasoning and diverse processes that allow the practitioner to design. Within its practice, the designer develops different types of thinking (Dorst, 2015) and therefore the way of reasoning starts to evolve, resulting in the designer mindset that makes sense of the world and creates meaning in the process. Some characteristic of design thinking from Owen (2005) and reviewed by Luka (2014) are:

- The main feature of design thinking is creativity
- It is human centered focused considering the stakeholders' perspective
- Its concerned with sustainability, therefore its environment-center
- It accepts adaptive solutions and tries to evolve stakeholders' needs, meaning bias for adaptability
- It seeks for multi-functionality driven aiming to solve multiple challenges with in a system
- Has a "view of the generalist" widening the knowledge base in contrast to specialization enabling creative connections across different fields.
- It has a systemic vision
- It favors teamwork and multidisciplinarity

Manzini (2015) reviews Brown's design thinking definition as a concept that responds to the innovation challenges and complex public issues the organizations and societies face. Where Brown (2009) implies that a successful design lies within the intersection of what is desirable, feasible and viable. Manzini, highlights the contribution of Brown's (2009) view by introducing this key paradox. Seeing designers as the ones who understand people's perspectives and situated actions by interpreting their needs through ethnography.

4.5.4. Design as a human activity

As Herbert Simon said in The Sciences of the Artificial (1996): "Everyone designs who devises courses of action aimed at changing existing situations into preferred ones." Problem solving, decision making, prospective thinking, taking action, iterate, reflect and improve are all descriptions of many human experiences involved in professional fields and real life situations. Therefore Simon (1996) implies that design, at different levels of development, is a human activity. Whereas the level of development is determined by the context, which means that, as any other human skill, depending on the training the level of expertise will vary.

Simon (1996)explains how design as many other disciples belong to the sciences of the artificial, as they are connected, as mentioned before, to various fields of human experience. Implying the many design activities are embraced across many professional fields and can be universal (Dorst, 2009). "Design of human action in the realm of the artificial." Simon (1996)

Knowledge and reflection-in-action (Schön, 2008) within design, "what can be taught is the development of one's knowing in action habits" (Dorst, 2015, p.184). Explaining how once a problem has been set to be solved, a designer "seeks both to understand the situation and to change it"(Schon, 2008, p.159) by experiencing new situations his understanding evolves through an iterative process of appreciation, action and re-appreciation.

All human beings have the ability to develop critical sense, creativity and practical sense which allows them to create something that is not already there (Manzini, 2015). These abilities, as any others, require training, learning and refinement. Consequently, the personal values, the context, the exposure to the design practice, will foster or block the development of these abilities. Given that design can be applied to any field of human experience it means that it is connected to the real world and its complexities.

Manzini (2015) has a simple and clear explanation of how design is a human ability and how there are different levels of expertise. He says: "Everybody can run, but not everybody takes part in the marathon and few become professional athletes; everybody can tap out the beat with a tambourine, but not everybody plays in a group and few make a living playing it professionally."

Equivalently, everybody can design, not everybody is a proficient designer and a few make a living out of the professional design activity. Manzini (2015) proposes

the terms, diffuse and expert design to describe the different levels of expertise. Being the novice stage of the development, or natural design capability related to diffuse design. Whereas expert design is related to the trained people who exercise design professionally.

4.6. Agency

Agency is when human beings are able to act as a product of self awareness and reflection not only of the particular situation but acknowledging one's role in it. (Bandura, 2001)It requires ownership and the ability to assess one's behaviors and actions within a context, to be self driven and to act upon any constraint one finds along the way.

The words that encompass this concept to make sense of what agency is would be initiative, intentionality, freedom and awareness. (Bandura, 2001) Which connects to how we, human beings take action, how we control our own thinking process, how we communicate with ourselves and with others, the way we make our decisions, how we develop as independent individuals and how we make ourselves accountable for our actions within a context.

4.6.1. The concept of agency

Human agency is characterized by a number of core features that operate through phenomenal and functional consciousness. These include the temporal extension of agency through intentionality and forethought, self regulation by self-reactive influence, and self-reflectiveness about one's capabilities, quality of functioning, and the meaning and purpose of one's life pursuits. Personal agency operates within a broad network of social structural influences. (Bandura, 2001)

As Bandura(2001) implies, depending on the scope from which it is viewed, the concept of agency has several variations in relation to the action, motivation, intentionality and purpose that individuals or communities imprint on their activities. In short, one can refer to personal agency or collective agency, however for the purpose of this research I will focus on personal agency and its dimension of empowerment has an impact at the societal level. With this in mind, we can say that "Agency implies the predictive capacity and control that a person has over the choices, decisions, and actions for which he or she is responsible."(Sirkin and colleagues, 2007) This definition encompasses several concepts that must be included in order to construct a scale of agency:

- Self-efficacy: Refers to an individual's own system that allows him/her to exercise control over his/her thoughts, feelings and actions.
- Autonomy: Refers to being an agent, but, acting in parallel with self-will without a sense of cohesion, self-government.
- Self-determination: Refers to extrinsic and intrinsic motivation that generate connectivity and autonomy for personal and integral growth.
- Control: Reflects the generalized expectations of an individual in relation to the rewards he/she obtains or not, throughout his/her life.
- Self-regulation: It is the capacity of an individual to refrain from engaging in behaviors that have costs or repercussions for him/her.
- Empowerment: This is related to the social implications of the development of agency. That is, the impact of an individual's valued and meaningful agency choices within his or her own social context.

4.6.2. Agency as a human activity

People's beliefs in their capability of controlling their own functioning and contextual events (Bandura, 1997) are the core of the mechanisms of the development of personal agency. As Bandura (2001) says: "Efficacy believes are the foundation of human agency."

The importance of this belief system, helps in a person's daily decision making, intrinsic motivation and self-regulation. (Bandura, 2002). Human's self actualization needs are rooted in this value system that allows goal setting and aspirations to provide stimuli for people to take action. Consequently, people's life courses vary according to the expected outcomes and the efforts they make to achieve them, giving way to one's positive and negative self-appraisal.

Social systems are composed of human values and meaning, intellectual perspectives and civic commitments are fostered within communities (Bandura, 2002), these are collective constructions where education should take part, as people are both creators and products of social interactions. The idea of human agency cannot be disconnected to the concept of collective agency (Bandura, 2001). As however a person takes action to shape their personal life, those actions will always create an impact in the social and economic sphere. "People's shared belief in their combined power to achieve desired results is a key ingredient of collective agency." (Bandura, 1997, 2001)

Different forms of action are connected to different temporal orientation (Mustafa & Mische, 1998). Whether it refers to having a glimpse of past learnings when making a choice or to critically assess present courses of action and their impact on our life. Depending on how challenging the situation is, people will make temporal iterations to better approach the specific situation. This process allows people to build up not only their deliberative but also their inventive responses, meaning that this will foster their creative and critical thinking skills used in the different social interactions.

Bandura (2001) proposes that agency is an important part of what it means to be human, he describes the core features of personal agency as follows:

- Intentionality: refers to the intentional actions humans choose to take in every situation. This requires a prospective view of the potential outcome, planning and being proactive to carry out the plan.
- Forethought: This feature is characterized for the use of prospective thinking. The action of setting goals overseeing the possible consequences and outcomes. It requires anticipation and evaluation of future events. Forethought is connected to how humans give meaning to their life, by bringing connection and direction when long term plans are set. The recurrent practice of this exercise, goals and plans setting, including the setting of new goals depending on what we have already achieved, fosters foresightful behavior. (Bandura, 2001)
- Self-reactiveness: Self- regulation and motivation characterize this feature. The ability to create action plans to set oneself for success, where one can keep being motivated by achievable goals, where one can also regulate their execution. This is connected to the linkage of thought and action. In other terms, when people are able to self direct, self regulate and self monitor. It is important to mention that moral agency takes place within this feature. It is described by Bandura (2001) as the capacity for self sanctions according to personal and social moral standards.
- Self reflectiveness: Is when people examine their own functions and behavior means they have self reflectiveness. It is described as the capacity to reflect upon oneself and is connected to the use of metacognitive skills. This feature is what humans use to appraise different life goals and it is linked to people's efficacy beliefs about overcoming goal challenges and setting outcome expectations.

4.6.3. Mustafa and Mische's chordal triad of agency

Iterational element (past): It is associated with how a person can willingly activate past patterns of thought and action selecting them according to their needs. Followed by the ability to incorporate them into daily practical activities. This element is related to the way we maintain our identities and our social interactions.

Projective Element (future): Is related to the capacity, which the individual possesses, to imagine possible future trajectories of action, where one can creatively reconfigure structures of thought and action in relation to his future hopes, fears, and desires. There are three main characteristics of projectivity, the construction of narratives, the symbolic recomposition and the hypothetical resolution.

Practical evaluative element (present): is the capacity of an individual to make practical and normative judgments, evaluating possible alternative trajectories of action, in response to the demands, dilemmas and ambiguities emerging from present situations. This is evident when a person identifies a problem, characterizes it, deliberates new patterns of action to make decisions that allow them to execute their plan of action.

4.6.4. Children's agency development

The global study "Measuring Agency as a Dimension of Empowerment" (Sirkin and colleagues, 2007), among Young Adolescents Globally, demonstrated that agency is measurable and that it can be evidenced in children and adolescents aged 10-14. As a product of this study, there were five basic elements identified as fundamental to the development of agency and empowerment. The following are those elements:

- The context to which the subjects belong
- Access to resources
- Family dynamics
- Community
- Cultural norms

Taking into account the findings of the ESAGE study, the research performed at the school was adapted according to the specific characteristics of the students and their context, their age range and their cultural norms and values.

<<<
FIGURE 4.5
CONCEPT MAP
DESIGN-AGENCY

4.7. Correlations between design and agency

The enrichment of our experiences in design provides gestalt modes of understanding which allows us to create patterns of ideas that can be projected to decide on courses of action. Finding and analyzing past and present gaps, constraints, problems or opportunities are part of the design road map. It can allocate functions, purposes, roles, interactions, causes or situations helping the practitioner to make sense of the world by understanding how systems work, its parts, connections or variables from the stakeholder's perspective. In addition to this, by practicing design, it is common that understanding takes place by problem solving, by changing situations into preferred ones or by creating and imagining solutions.

These design activities can contribute to our own understanding of ours and others' contexts. By embedding the development of social empathy, it helps us to make sense of the world around us to the point where we are able to imagine how it can be better. During this process, we develop our own self and our own view of the world, adopting a design thinking mindset. This is an example of Friedman's (2017) theory about knowledge creation and the linkage of the activities that enable it. One can imagine this as a place where design and agency meet. In this case, it is in the eyes of children.

Seeking connectedness in both scopes, it is inevitable to bring forward the ideologies of two of the most important theorists and thinkers of each field. Simon (1996) "Everyone designs who devises courses of action aimed at changing existing situations into preferred ones."

Bandura (1997) "Self-efficacy, the central mechanism for personal agency, refers to beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations. Efficacy beliefs influence how people think, feel, motivate themselves, and act."

Both of these theories are referring to the human's capability of devising and managing courses of action for prospective situations. Bandura (1997) explicitly refers to one's own intrinsic capability of self development when dealing with a situation. Simon (1996) focuses on the human's extrinsic capability to make the action preferable and states that everyone has the skills to do so. Both design and self-efficacy within agency, are working towards a preferred situation, whether it is self development or solving a problem on the outside. Design's ability to look into the future is lined with the prospective vision needed to develop agency.

When teaching design skills to children, in order to make it meaningful, purposeful and age related, the design situations must first connect with themselves as a starting point of the development of design skills. It is in these situations, children are developing their design skills from personal experiences and prior knowledge while

increasing their own agency. Thus the question emerges, how are the different dimensions of agency related to design cognition, and can agency potentially be developed with design thinking? Below we can find the connections, relations and potential development.

4.7.1. Voice dimension (Agency) = Communication (Design)

Voice, according to Bandura (2002), is when people make their voices heard, seeking to have an active role in creating meaningful changes in their lives. It is related to the development of self or collective agency because it connects to one's ability to be self aware and advocate for your own wellbeing. In design, communication can be seen all throughout its exercises, through sharing ideas in both verbal and nonverbal ways. For instance, the importance of visualizing ideas through brainstorming, mind mapping, sketching, modeling, prototyping is an instrumental ability that allows opportunities to reflect-in-action about potential solutions (Schon, 1983) aiming to transform ideas into a future-oriented reality. These verbal and nonverbal ways of communication can expand the way people use their voices and make themselves be heard.

4.7.2. Choice dimension (Agency) = Decision making (Design)

Through choices, people determine their life courses while developing several competencies, interests, and social networks (Bandura, 1995). Intrinsic and extrinsic factors can determine and affect one's choice making when deciding on different courses of action, or whether to take action at all. In addition, our perceived personal efficacy, or our own mentality of what we are capable of achieving (Bandura, 1995), can influence the resilience or fragility to the commitment of the goals we choose to pursue. In design this is transferable to decision making. The process requires critical thinking and the ability to look into the future and prejudge situations (Dorst,2015) aiming to project where the solutions will be heading. It is related to the way we understand the essence, functions and needs of a context, situation or problem which allows this understanding to inform our decisions. The connection between choice and decision making lies in the critical thinking they both require to assess a future course of action and the repercussions of the selected pathway.

4.7.3. Ownership dimension (Agency) = Problem solving (Design)

Ownership is related to the belief system that allows humans to trust in their own capabilities so they can regulate their learning. This process does not only include self evaluation but also to challenge oneself with situations that can bring success. The development of ownership aims for self-improvement, identity, accountability, responsibility and belonging. For these aims to be fulfilled this

dimension transcends from the personal to the social sphere, where we have control of the space and the pace in which these skills can flourish.

In design, problem solving requires the development of a set of skills that are unique for each designer and their way they make sense of a problematic situation. We talk about the uniqueness of these skills because they depend on the designer's mindset, belief system, culture and context. By framing the problem first, a designer can selectively manage large amounts of information (Schön, 2008) in order to select the required baseline information for inference, ideation and invention to happen.

This aligns with the capacity of considering several variables at once without deviating from the route and leading the designer to the discovery of the consequences and implications of the proposed solutions. Here, the connection between ownership and problem solving is the ability to control and re-frame a situation that considers multiple variables that help us develop our sense of responsibility and accountability within a social context. "Problem solving is often described as a search through a vast maze of possibilities, a maze that describes the environment. Successful problem solving involves searching the maze selectively and reducing it to manageable proportions." (Simon, 1996)

4.7.4. Iteration element (Agency) = Iteration nature (Design)

The iteration element is related to the way we intentionally activate and remember past experiences which correlates to the habits we construct. It is activating past patterns of action (Mustafa & Mische, 1998) that gives us a sense of continuously building our personal and collective identity. In design, there are different cycles of iteration (Simon, 1996) that take place all throughout the design process. It is a learning pathway in which the practitioner is led to re-appraise, re-invent, re-plan, re-appreciate and re-visit any point of development. This is what Dorst (2015) calls co-evolution. The constant iteration of analysis and synthesis a designer needs to walk through to frame problems, and accordingly, create solutions.

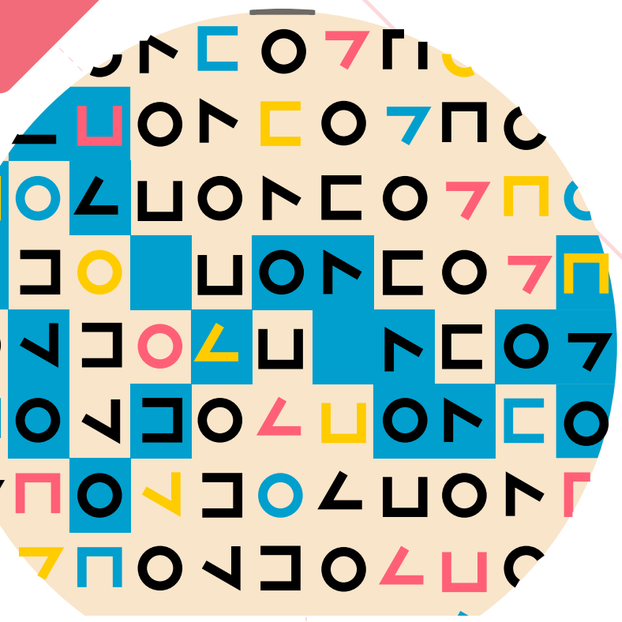
4.7.5. Prospective element (Agency) = Projective nature (Design)

In agency, the prospective element is associated with the foresight to apply practical knowledge. It is related to the culturally established views, in which we have the capacity to imagine distant experiences related to one's personal evolution. It is our human ability to pursue freedom by altering existing structures seeking for future possibilities (Mustafa & Mische, 1998). Thinking about the future has an emotional attachment to the different possibilities of what we will become, which means caring about our future. As Dewey(1917) says: "Part of human intelligence is the capacity to read future results in present ongoings".

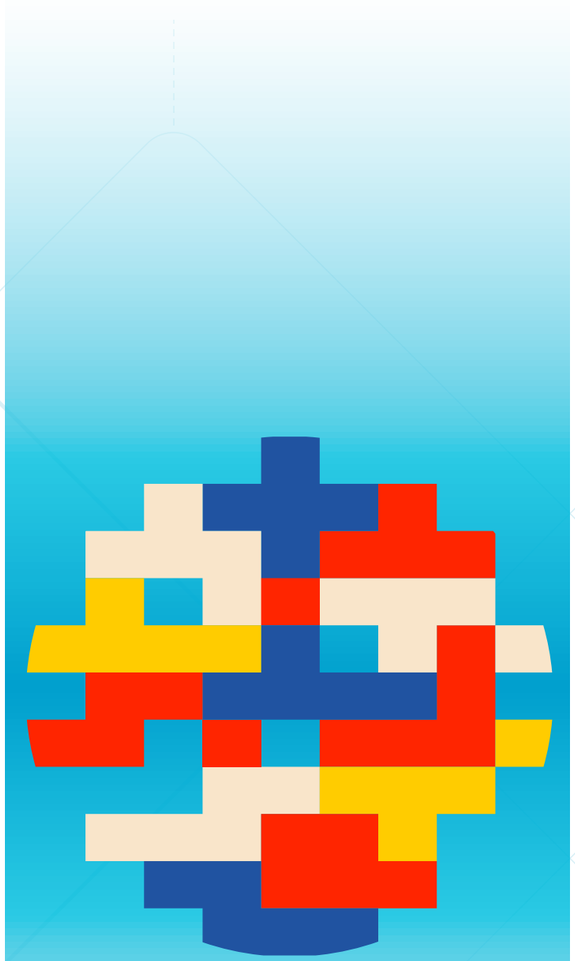
The nature of design is future-driven. Every time designers plan, they need to play out a prediction of the route and the expected outcome. It is necessary to discard factors in order to reduce problems of choice to a manageable size according to our capabilities, always ensuring that the integral outcomes will be covered (Simon, 1996).

4.7.6. Practical evaluation element (agency) = Critical thinking nature (Design)

This area of agency responds to the decision making process of a present situation. It involves the different ways in which one can judge and the consequences of the direction we take. Involves the use of practical knowledge and how we apply it within the current context. In addition, it relates to the use of common sense where one, as part of a collective, deliberative judges seeking a collective good (Mustafa & Mische, 1998) In design, critical thinking is based on the judgment exercise, practitioners perform, according to the analysis of the context, stakeholders and their particular interactions and situations. It is a constructive attitude (Manzini, 2015) that allows for values and visions to be appraised, to be changed, or to be conformed. The distinction of elements, patterns of relationships and outcomes (Dorst, 2015) integrates the conceptual tools needed for problem-solving.



Chapter 5



5. The proposal

This chapter contains the description of all the tools designed, adjusted and applied during the development of the PYPx. The tools will be presented following the four stages established on the double diamond methodology. Each tool contains the description, the process and the insights found along the way.

The proposal of this thesis is to redesign the PYPx. This is based on the inclusion of design education, participatory and co-design methodologies to support the development of agency in the fourth grade students during the PYPx. The use of design of clear design stages guided the actions taken along the process. Also, the connections between agency and design allowed the creation of a diverse range of tools for agency development that responded to the perceived needs in the different stages of the project and of the school.

The inclusion of design education is related to the fact that the design subject, supported and embedded within its curriculum, in the form of a unit of inquiry (UOI), learning experiences and tools of the PYPx development. This allowed teachers and students to strengthen and acknowledge the transdisciplinary connections between the PYPx and design. During the development of the PYPx, part of the tools for students were applied during design classes and the other part during the regular UOI lessons. And all the learning experiences and tools for students were co-designed with the group director.

5.1. Design tools

The selection of tools was driven by the connections between agency, design thinking and the PYPx current state. The tools developed or adjusted for this project had a common denominator, they all derived from design. According to the stakeholders they were projected for, on one side the tools for teachers favored collaborative interactions. On the other hand, the tools for students, allowed them to develop and practice their agency using design's own tools aimed to guide students while developing design skills too.

5.2. Discover

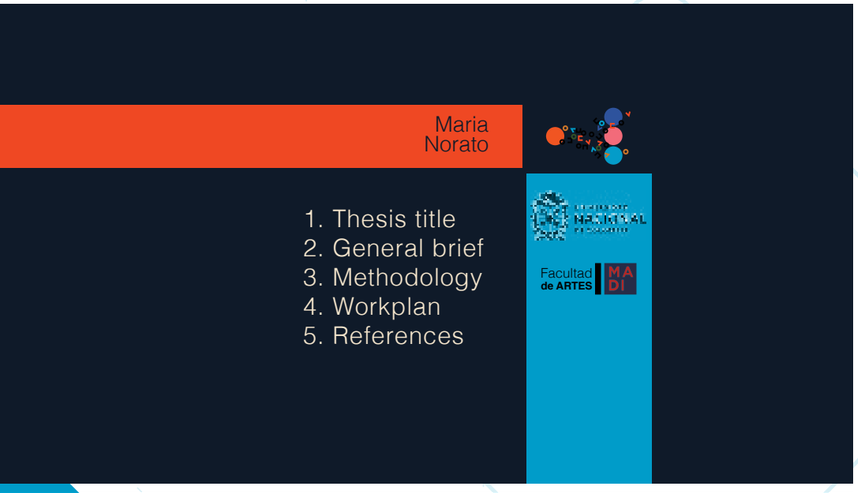
The first diamond is focused on building empathy so people understand, rather than simply assume, what the problem is. (Design council, 2019) The purpose of this stage is to collaboratively discover the current state of the PYPx, to make a diagnosis using system mapping workshops to have a starting point of the PYPx system and its components. For these and all the research projects to happen, it was imperative to have the necessary approvals and permissions from the academic

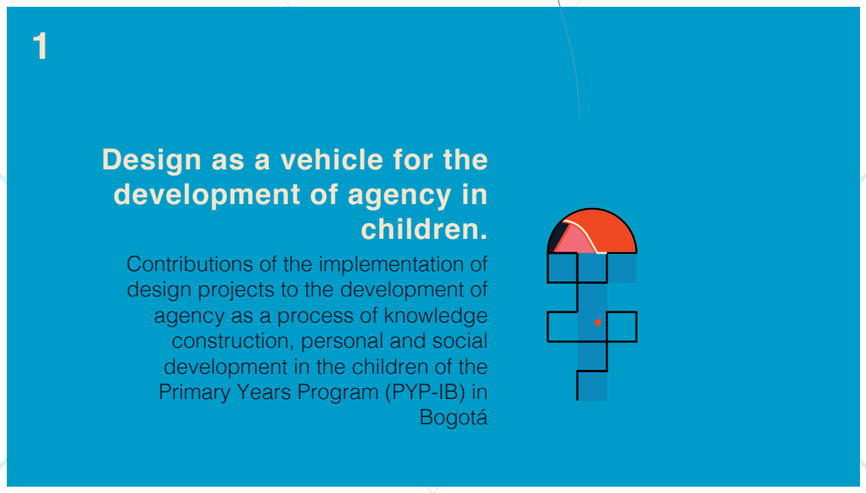
institution. Therefore, the process started by presenting the aim, the objectives of the study and the work plan to the Primary Years Program Leadership Team (PLT). After the approval the initial agreement about implementation of the project in a certain amount of classes changed, lowered, which made evident that these types of changes can keep happening along the process and that the study should be able to adjust depending on the emerging requests.

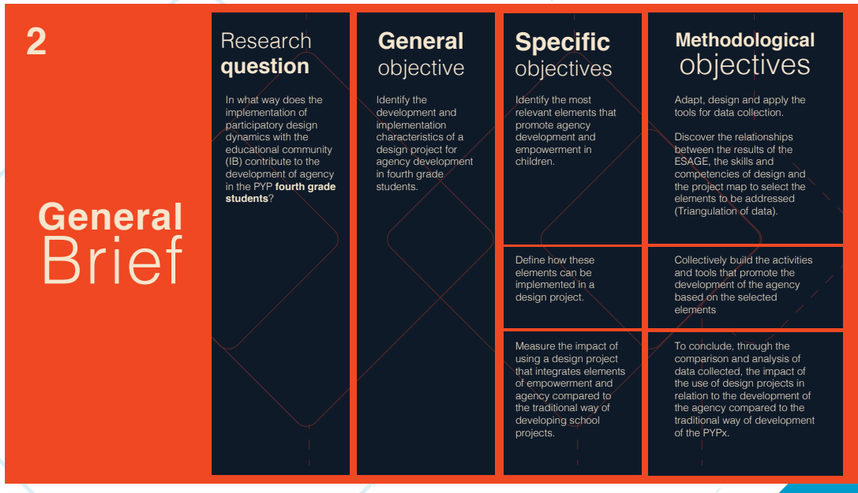
5.2.1. Socialization session of the research project

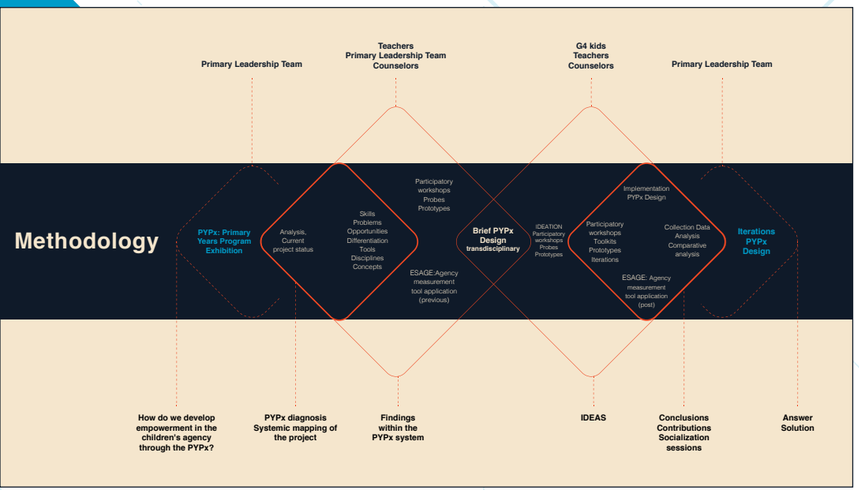
The project was presented to the PLT (Primary Leadership Team) several times in both individual and collective presentations. The first approval was the head of the section followed by individual meetings with the pastoral and academic deputies. All of whom were interested in the project and approved its development. A presentation containing the title of the thesis, a general brief, the methodology and the work plan was used to explain the aim and requirements of the project. There was an initial agreement that the project was going to be developed with all the four grade levels composed of six classes of 24 students, six GD's (Group Directors) and three TA's (teacher assistants), nevertheless in the last of the collective presentations that initial agreement changed from six to one class.

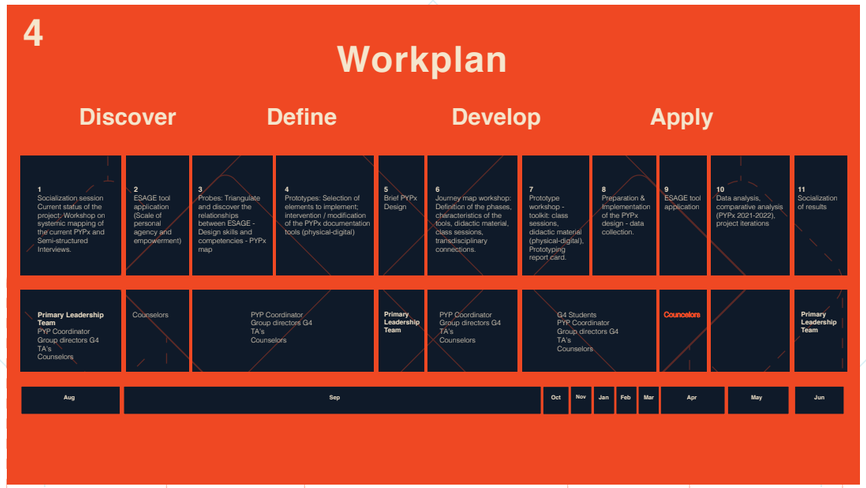
FIGURE 5.1
PRESENTATION
RESEARCH
PROJECT











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5.2.2. Workshops

The workshops developed with the Group directors and teacher assistants were adapted from the systemic design toolkit. Using only some of the tools adjusted to analyze the system, it was necessary to combine some of the suggested tools within the toolkit because the time frame for the workshops was 30min per session and there were only 3 sessions with the whole group and were focused on finding information about the PYPx, from the teachers' perspectives. The first workshop was the project mapping.

5.2.2.1. Framing the PYPx

<<< FIGURE 5.2 FRAMING THE PYPx WORKSHOP

Description

The first workshop, "Framing the PYPx", is about identifying the parts and relationships within the system. In this case the adjustments were made taking into account the educational context and particular requirements of the G4 project. Therefore several items that needed to be identified were changed or added to the original workshop. For example it was not needed to add reflection about the economic structures, so instead, it was replaced for tools and materials, and Culture was changed for Stakeholders and Roles. Also it is important to mention that the focus

>>> FIGURE 5.3 FRAMING THE PYPx RESULT

of each of the big areas/topics to reflect on was also adjusted to match the type of information required to discover or reveal the current system. So the focus on each category are as follows: for Institutional Structures: Curriculum requirements, rules, regulations, power structures; Tools and Materials: Didactic materials, physical and digital resources currently used in learning experiences; Practices: Learning experiences, activities, routines, behaviors; and for Stakeholders and Roles: Actants, roles, norms, values, relationships, connections, expectations.

Process

The timing given for the development of this workshop and all the future ones was thirty minutes. There participants for this first one were six group directors, three teacher assistants, and one counselor. After explaining the reason and purpose of the activity, the dynamic of the workshop was communicated to the stakeholders. Depending on the variable the teachers needed to paste their ideas about the different variables related to the PYPx using post-its.

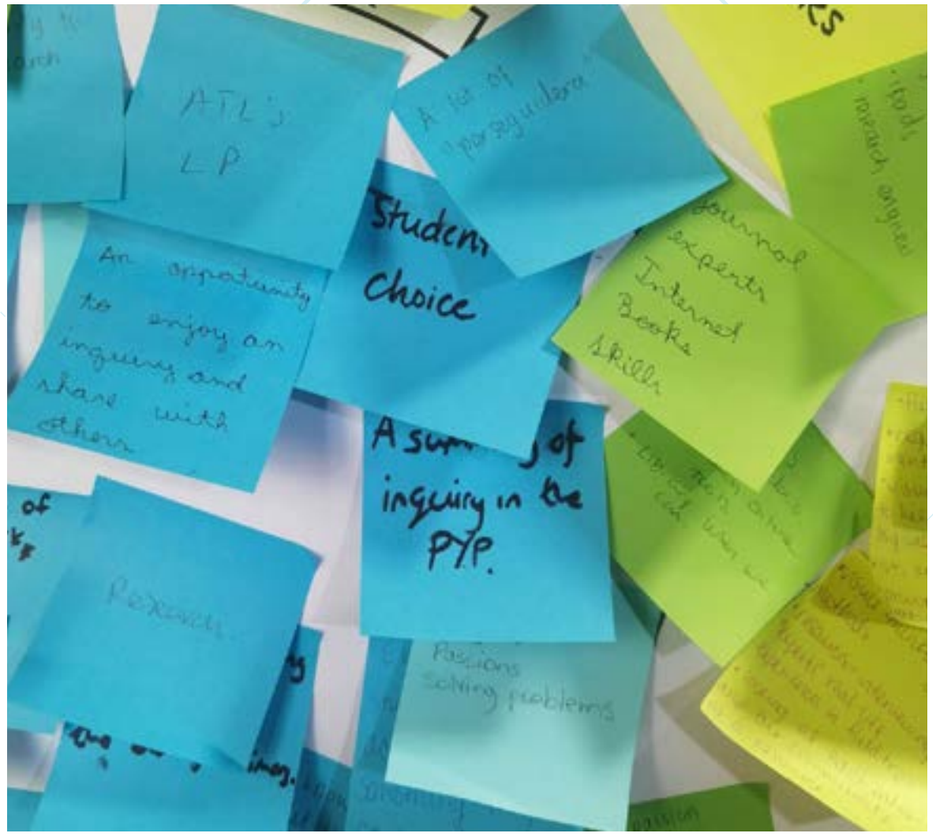

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FIGURE 5.4
ZOOM FRAMING THE PYPx RESULT

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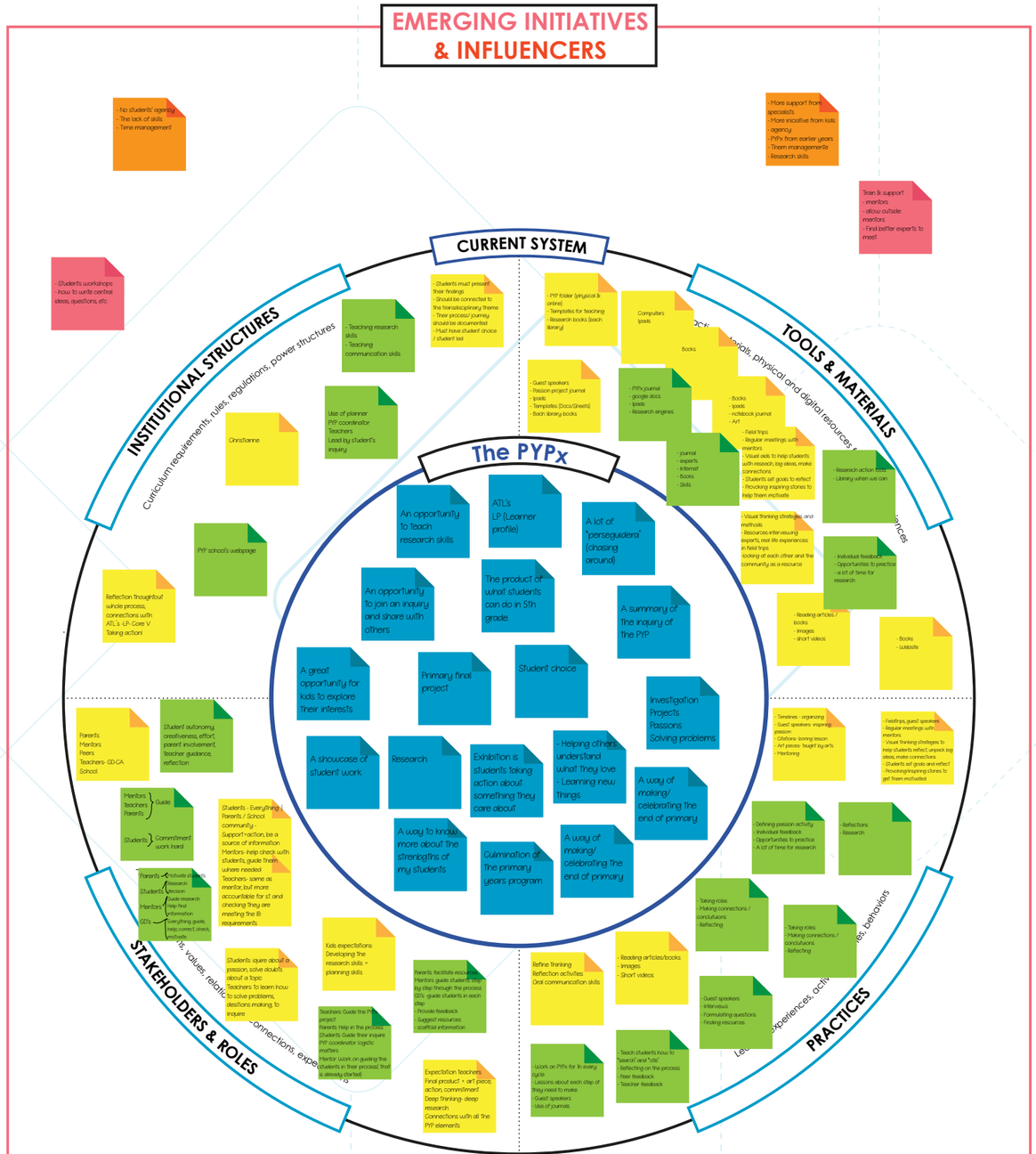
FIGURE 5.5
DIGITALIZED RESULT FRAMING THE PYPx

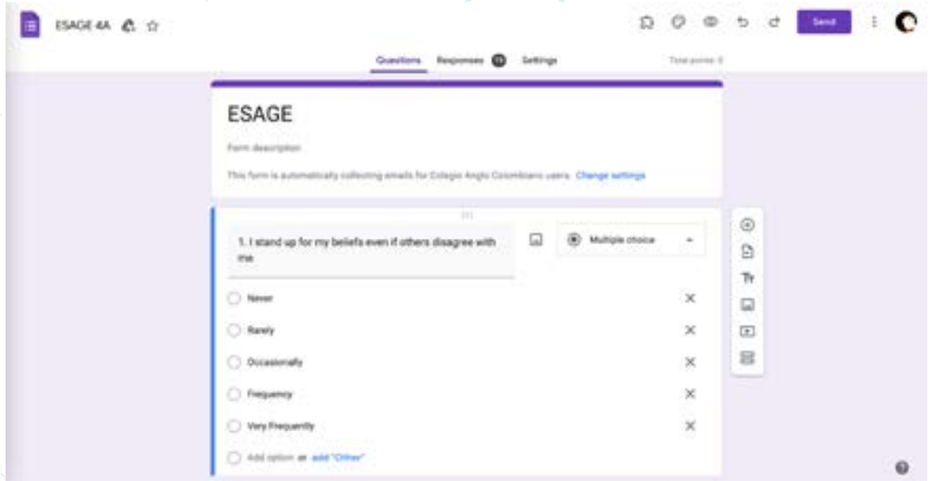
Framing the PYPx



Insights

This workshop allowed the mapping of the different stakeholders that are involved in the process, the curriculum needs and with it the lack of knowledge of some teachers, the involvement from other teachers, and low teacher participation in the curriculum construction. This is not by choice, it was clear that it is not a common practice to revise and adjust the curriculum that the teachers are actually teaching. Also this workshop allows the teachers to anonymously express their main/true conceptions about what the PYPx is.

5.2.2.2. ESAGE (Personal Agency and Empowerment Scale)



<<< FIGURE 5.6 ESAGE GOOGLE FORMS SURVEY

Description

The agency survey was adapted from the ESAGE (scale for the measure of personal agency and empowerment) which was design grouping the following variables:

- Auto Efficacy
- Auto-determination
- Control over my behaviors
- Independent thinking
- Identifying the need for change
- Fear of success
- Recognition of my learning
- Perception of my context
- Control of my environment

The frequency Likter scale was used as a multiple choice answer giving the student five options, never, rarely, occasionally, frequently, very frequently. Since this tool was designed for an older Spanish speaking audience all the questions need to be adapted and translated to match the age range of our students, also, some of the questions of the empowerment component were not relevant or appropriate for the current context. That initial adaptation was recommended by the counselors, which means that some of the questions of the original survey were not used. On the other hand, since the questions needed to be translated to English. At this point, the group director, who is a native English speaker, helped revising and making suggestions about the wording and adjustment of each question. Finally the length of the survey needed to be adjusted as well, reducing it from 42 to 26 questions, the original one was too long for the attention span of our students.

>>> FIGURE 5.7 ESAGE TRANSLATION SURVEY QUESTIONS

Dimensions of Agency 18	ESAGE questionnaire Spanish	ESAGE questionnaire English
Voice	Exijo mis derechos aunque otros no esten de acuerdo	I stand up for my rights even if others disagree with me
	Me quejo con las autoridades cuando hay un abuso	I inform the authorities when I see someone breaking the rules.
	Le doy demasiada importancia a las opiniones de los demás	I give too much importance to the opinions of others.
	Me es difícil expresar mi opinión públicamente	I find it difficult to express my opinion publicly
	Me da pena equivocarme	I am embarrassed to be wrong
	Me da pena hablar en público	I am embarrassed to speak in public
	Me da miedo que me elogien	I am afraid of being praised
Choice & Ownership	Busco la solución a un problema, aunque otros me digan que no hay	I look for the solution to a problem, even if others tell me there is no solution.
	Me gusta planear mis actividades	I like to plan my activities
	Es mejor tomar decisiones que esperar a ver lo que pasa	It is better to make decisions than to wait and see what happens.
	Me es fácil tomar decisiones	I find it easy to make decisions
	Tengo iniciativa para hacer las cosas	I have initiative to get things done
	Encuentro soluciones novedosas a problemas difíciles	I find novel solutions to difficult problems
	Me gusta tener responsabilidades	I like to take responsibility
	Me gustaría ser el primero en hacer cosas nuevas	I like to be the first to do new things
	Hago lo que creo que es mejor para mí sin importar lo que otros crean	I do what I think is best for me regardless of what others think.
	Se por qué me pasan las cosas	I know why things happen to me
	Dejo las cosas a medias	I leave things half done
	Cumplir con mis planes está fuera de mi control	Fulfilling my plans is out of my control
	Siento que tengo poco control sobre lo que me pasa	I feel I have little control over what happens to me.
	Solo le echo ganas a lo que es fácil	I only focus on doing what is easy
	Me siento inseguro de mis decisiones	I feel insecure about my decisions
	Me cuesta trabajo terminar los que estoy haciendo	I find it hard to finish what I am doing
	Cuando tengo un problema, sé lo que necesito para solucionarlo	When I have a problem, I know what I need to do to solve it.
	Tapo mis errores para que nadie se de cuenta	I cover up my mistakes so that no one notices them.
	Me desespero en situaciones difíciles	I get desperate in difficult situations

Process

The tool was applied almost at the end of the December break, initially using a private school software exclusive for data analysis. Nevertheless the access was not shared only the results and there was no form of sorting the information due to the nature of the file type. Once the responses were checked and reviewed with the group director, she recognized inconsistencies in the answers of her students, and as a result she suggested that we repeat the survey one more time. At this point, the survey was passed to Google forms where there was more control over the data

visualization. The survey was applied again previous to the start of the project, this time completed with constant teacher support. After its completion, the results were analyzed and the selection of tools was done according to the students agency needs. Once the project was completed the tool was applied one more time.

<<<
FIGURE 5.8
ESAGE
FIRST RESULTS
FINDINGS

English	ESAGE questionnaire English				
	Never	Rarely	Occasionally	Frequently	Very frequently
I inform the authorities when I see someone breaking the rules.	3	11	6		
I stand up for my rights even if others disagree with me		3	12	4	1
I give too much importance to the opinions of others.	1	6	5	5	3
I find it difficult to express my opinion publicly	0	6	7	7	
I am embarrassed to be wrong	0	6	8	3	3
I am embarrassed to speak in public	6	5	5	2	2
I am afraid of being praised	7	8	4	1	
I look for the solution to a problem, even if others tell me there is no solution.	1	1	9	7	2
I like to plan my activities	1	3	5	7	4
It is better to make decisions than to wait and see what happens.	0	4	10	5	1
I find it easy to make decisions	2	2	10	4	2
I have initiative to get things done	0	1	13	5	1
I find novel solutions to difficult problems	0	3	9	8	0
I like to take responsibility	2	4	6	7	1
I like to be the first to do new things	0	9	7	1	3
I do what I think is best for me regardless of what others think.	0	3	2	10	5
I know why things happen to me	1	5	6	6	2
I leave things half done	1	9	7	3	
Fulfilling my plans is out of my control	3	6	9	1	1
I feel I have little control over what happens to me.	3	9	3	3	2
I only focus on doing what is easy	0	12	7	1	0
I feel insecure about my decisions	4	6	4	5	1
I find it hard to finish what I am doing	2	6	10	1	1
When I have a problem, I know what I need to do to solve it.	0	2	9	8	1
I cover up my mistakes so that no one notices them.	0	5	8	6	1
I get desperate in difficult situations	1	4	11	2	2

Insights

Even so these adjustments were made, the survey is still significantly long for the students. It was meaningful that the teacher explained each question, but not all teachers wanted to support students with this particular tool, therefore in some classes they were only told to answer the survey. The timing when this tool was applied for all the grade levels (the six grade four classes) prior and after the PYPx was in both cases close to the holidays of December and June, therefore a significant percentage of the students were not at school.

5.3 Define

This stage is related to the information, insights and other variables found during the Discover stage used to help build the guidelines, requirements and frame the problem, challenge or opportunity of improvement.

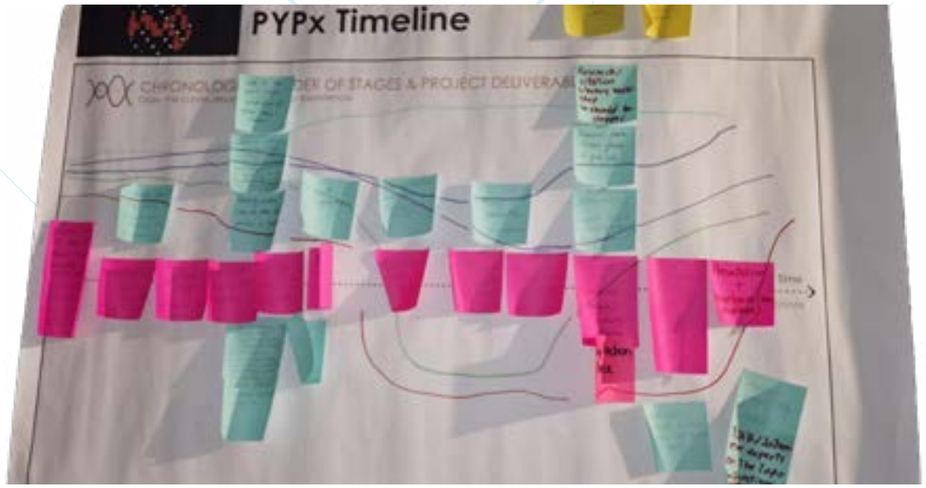
5.3.1. PYPx timeline - Workshop on the journey map

>>>
FIGURE 5.9
JOURNEY MAP
WORKSHOP

Description

The second workshop, "PYPx Timeline", is about identifying the different stages of the project. Trying to discover variables within the project system, the activities and the learning experiences teachers use in each stage. As well as the previous one, this workshop was adapted from one of the design toolkit called the "Actants".

>>>
FIGURE 5.10
JOURNEY MAP
WORKSHOP
RESULT



>>>
FIGURE 5.11
DIGITALIZED
RESULT JOURNEY
MAP

PYPx Timeline

Stages

Learning experiences

Additional insights

CHRONOLOGICAL ORDER OF STAGES & PROJECT DELIVERABLES

Draw the curves depending on your experience

Previous years: Preparing students for research and summarize

Mentors prepared for helping on research

Look at last year's passion spreadsheet for passion ideas and mentors

Class in which we encourage students to think of a mentor and they write them an email to possible mentors telling them about the theme and lines of inquiry

Research/ citation library workshop (should go deeper)

Research/ citation practice IN PRIOR UNIT

Inspiring videos
Videos about passions
Questions related to passions

Teach children how to pitch their passion to mentors

Guest speakers

Categorize / sort questions
Thin & Thick questions

Key concepts
Connections

Research skills
-Paraphrasing
-What to put in research engines
- How to pick reliable sources

+

−

Time

Emotions

Teacher modeling step of the passion project. Modeling how it should look

Provocations
Begin identifying ideas

Choose a passion
Define a Topic

Connect Topic and action

Research on issues

Creating questions related to Topic

Identify questions that can be used for inquiry lines

Connect inquiry lines and key concepts

Research
Summaries
Analysis
Evaluating

Students begin to prepare action, art, presentations
Conferencing mentors + Group directors with students

Presentations + feedback from audience

Focus on research skills in other units

Get students to write what they know and what they don't know. From what they don't, they identify what they want to know and what that issue connects to.

Class on selecting mentors

Reflection piece

Research skills
-Paraphrasing
-What to put in research engines
- How to pick reliable sources

Continuously reflect on their progress, set goals, revise goals

Introduce graphic organizers + citations

Talk/interview experts on the topics (questions created before)

Actually there was only one particular element that was kept, the concept of showing the positive and negative emotions in retaliation to the timeline. This workshop was interesting not only because it brought clarity of what the flow of the whole project should be but also because the teachers started making adjustments, moving or adding, different stages throughout the session.

Process

Using color post it notes, one for each variable) teachers wrote the different stages and organized them in a timeline, after finishing, they proceed to think about each stage and to write the different learning experiences or activities they normally develop. Once they were organized in their respective states, the teachers added some opinions and insights from previous experiences that denote learning gaps and skills that should have been filled or developed in previous years and that are needed for the development of the project.

Insights

Actually fulfilling these gaps takes time that should be used for the development of other skills and knowledge during the project. There was also an identified concern from the teachers and is the teacher accountability, up to what point does the teacher roll go in terms of the outcome of the students?

So our starting point should be the agreement of the Grade 4 group directors.

5.3.2. Creating a learning experience

Description

The third workshop with teachers was adapted from the Systemic Design toolkit - Intervention strategy. The adaptation took in consideration the expansion of the variables that are taken into account when planning learning experiences so teachers could create them using a systemic approach. The adaptations from the original workshop were in the different variables to match the academic context, are the following: Scope and sequence, Goals-Ican statement, time, rules and parameters, delays and constraints, feedback loops, evidence, agency, digital resources, physical resources, transdisciplinary connections, differentiation. This workshop aimed to allow them to create a learning experience for the stages with gaps or fewer learning experiences. Therefore in the center of the canvas, teachers needed to write the learning experience for the chosen timeline gap and the paradox they were going to use. On the side there was space for them to place ideas for the learning experience.

>>> FIGURE 5.12 CREATING A LEARNING EXPERIENCE WORKSHOP

Process

The workshop started by dividing the group of teachers in three, we talked about the results of the last workshop and if they would add any stage to the timeline, which they did.

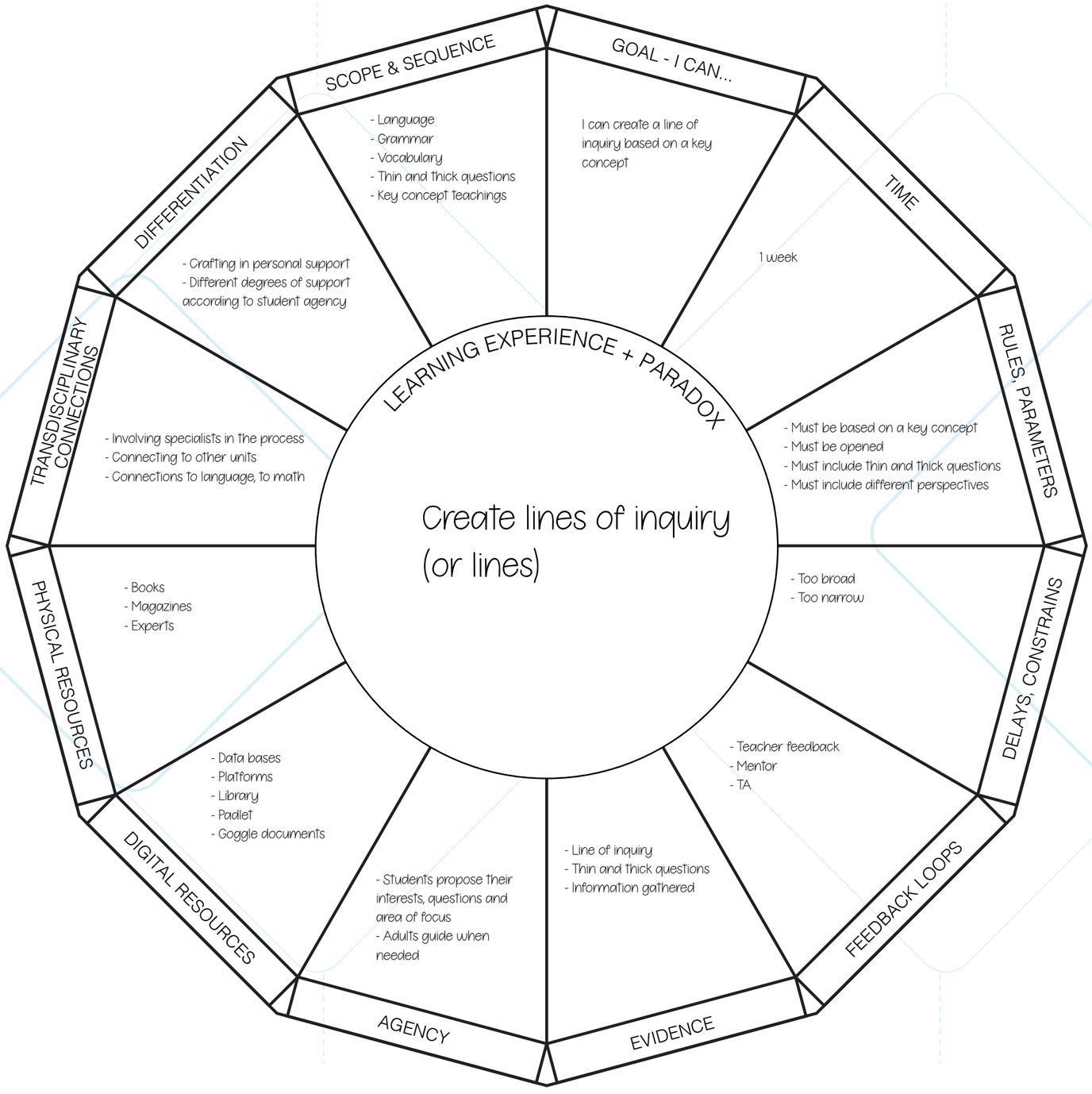
The learning experience canvas, that was already on the tables, was explained, almost every variable was familiar to them, which made it easy to understand. When explaining the paradox cards and how they are used to provoke divergent and paradoxical thinking, it was difficult for the group to understand why it is important that we teachers try new strategies to design creative learning experiences. There was even rejection from some of the members to use this different set of tools. Once the explanation was finished each group started creating the learning experiences.

Insights

None of the groups completed the canvas on all the variables. Only one group used the paradox cards. As an observation, teachers want their students to develop divergent thinking, to think out of the box, but my perception was that they were not keen to try techniques that provoke this type of thinking.

Group 1

>>>
FIGURE 5.13
DIGITALIZED RESULT CREATING LEARNING EXPERIENCE 1



learning experience
IDEAS

Group 2

>>>
FIGURE 5.14
DIGITALIZED RESULT CREATING LEARNING EXPERIENCE 2

learning experience

IDEAS

L2-1: Question box with questions from students(with no name). Teacher model thinking through to identify if it is thin or thick questions.

L1-2: Give sentence/ question strips that model good sentence structure for a question(thick questions). Students have to pair them together. Could be a question cut in half or a question/ answer.

L1-3: Sort premade thick and thin questions
L1-4: Sorting their own questions into thick and thin (show questions matrix)

L2-5: Show a video (pixar short?) Students write questions during with no teacher molding

L1-6: What makes a good question rubric? Rubric- self - teacher - peer assessment

L2-7: Create questions about their topic

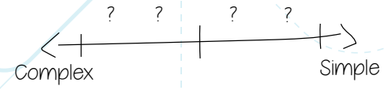
Group 3

>>>
FIGURE 5.15
DIGITALIZED RESULT CREATING LEARNING EXPERIENCE 3

learning experience
IDEAS

- Reflection a topic: using the question matrix, create as many questions as possible
- Students use their questions to try to come up with the criteria of simple and complex: give general definition of simple and complex - ask students to sort their questions, ask them why they put their questions there, and their reasons will help create the criteria for simple and complex.

Using their complex questions, the diamond ranking, or..

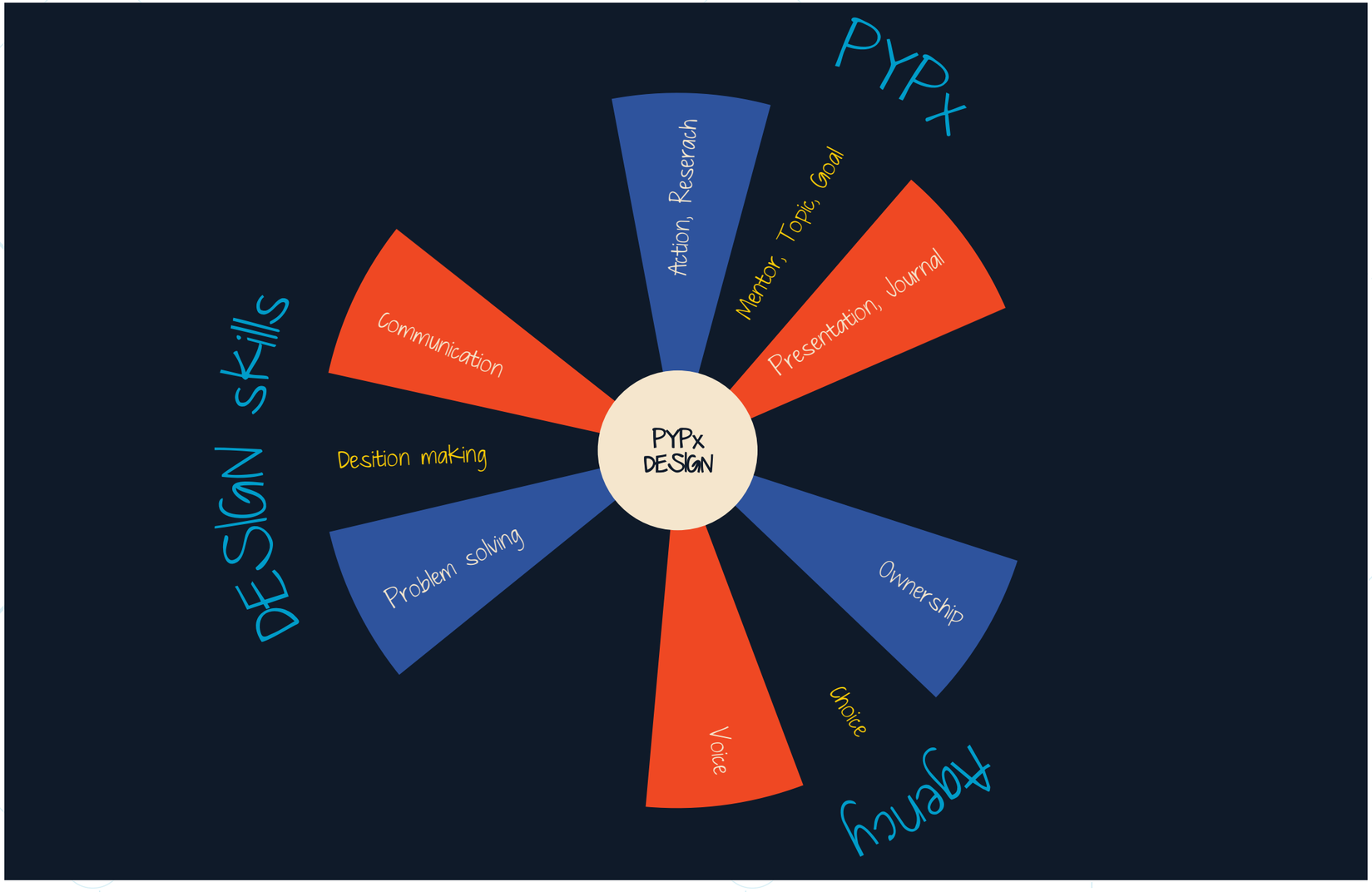


5.3.3. Triangulation of data

The triangulation of data was used to inform the development of tools and prototypes in the remaining stages of the research. The fist component, the ESAGE tool (Agency measurement), showed that the three dimensions of agency, voice, choice and ownership, needed development.

The design skills that could potentially support the development of agency are the following: Communication, decision making, problem solving, iteration projection and critical thinking.

In the current state of the PYPx the practices were already supporting agency development, where the following: conducting the research, although the tools are provided by the teachers, selection of topic, regardless of the depth. According to these and to the data collected to this point, the room for improvement needs to permeate the majority of the project stages therefore the PYPx flow gave us a road map of what was needed according to the project timeline.



>>>
FIGURE 5.16
TRIANGULATION
OF DATA

5.3.4. PYPx flow - Prototyping

Modelling the steps of Exhibition- how it should look, step by step, to help them understand the goal of exhibition

- Create a success criteria for exhibition and a whole class 'Big Idea' of what exhibition is all about

Provocations–

- Present different ideas and show examples
- Brainstorm topics that are relevant and meet the success criteria listed above
- Global goal– then topic? Or topic, then global goal?

Journal-

- Include a timeline with key dates and document their progress.. Set weekly goals and reflect on what they have accomplished
- Students use this as a place to reflect and create to-do lists for each of their exhibition lessons
- The cover of the journal will consist of small pictures that they complete throughout the stages of exhibition to show their feelings, how their project has developed, to then be able to see an overall reflection of their experience
- This could be an additional art piece to share in their presentation– show how they have evolved in a personal way, how they have grown throughout the process

Choose a topic and write inquiry questions–

- Students research their topic before determining their inquiry questions to help them build a foundation in their topic before determining which inquiry lines they want to focus on
    - Parts, Purposes and Complexities (visual thinking routine)
    - Simply going through the WH questions
- Students use thinking routines to help them build questions
    - Thinking Hats
    - Question Wheel
- Determine their finally inquiry questions and connect it to global goals
- Turn inquiry questions into inquiry lines with Key Concepts and decide on Learner Profile
- Students determine their Exhibition's Big Idea– what is the main message they want to share with the world.
- **Ongoing– introduce website and have students input information as they have it**

Introduce ideas for action– (break away from just collecting money)

- Look at different examples from previous exhibitions
- **Create an action resource with examples based on the types of action in PYP, and helpful resources**
    - Refer to the World's Largest Lesson website to see ideas for each specific global goal
    - https://worldstodolist.org/
    - Globalgoals.org
- **Ongoing– have students input information as they have it**

Personal goal

- What do they want to accomplish? How do they want to grow during this experience?
- Create regular opportunities to reflect on their goal, and the entire process
- **Ongoing– have students input information as they have it**

Connect with a mentor

- Elevator pitch
- Identify the mentor's role and the student role
- Create an easy way to communicate between teacher, mentor and student
- Students prepare for their meetings prior with questions, keep track of what happens in each mentor meeting, and tasks they need to finish before the next meeting.

<<<
FIGURE 5.17
PYPx FLOW
DOCUMENT

Description

The group director developed this document, with my support, after the workshops with all the teachers. The goal of this exercise was to model the steps of the PYPx, how it should look, step by step, to help students understand the goal of the PYPx. We took into account the changes made during the workshops, the teacher's know-how of the PYPx and the additional adjustments that we both thought benefit the development of the project from the students point of view.

Process

This was a one-on-one meeting with the teacher, where we took decisions on:
Success criteria for the PYPx: was going to be constructed with the students, which made it more meaningful for them to participate on what the big goal of the project would be.

Provocations: Related to the different ideas or examples shown. The decision to include global goals as a requirement to guide the focus of the project in real life issues that are taking place around the world. Also to connect the chosen goal to a personal interest/topic that would frame what the research and project should look like.

Journal: Including a timeline with key dates and process documentation. Setting daily and weekly goals that include a reflection on what they have accomplished. Decoration of the journal with small pictures/drawings that reflect how they felt or what happened on each of the stages of the PYPx so that at the end there is a visual map of how they felt along the process. This could be an additional ART piece that they could show in the presentation.

For next year: Analysis and synthesis of the research. Space to write their big ideas of the research, their takeaways, and analysis of the new knowledge they have acquired during the research stage.

Choose a topic and write inquiry questions: Students research their Topic & Global goal to build a foundation for determining the inquiry lines of their research. Parts, purposes and complexities thinking routine (visual thinking) To help them unpack all the parts, subparts and interactions of their topic. Also using the WH questions to shape the bigger picture of their research. Thinking routines to help them build questions: Thinking hats was an overall look of the PYPx, that helped some framing their project but in general there was a lack of research that was needed for this tool to aid students in a deeper understanding of what the whole picture looked like. The Question Wheel to build scenarios with the information gathered/researched so far. Having the students use creative thinking to imagine the different possibilities their topics can evolve to. Next would be determining the inquiry questions connected

to the global goals. Here there was an exercise on identifying thin and thick questions, with a given criteria. so that students could recognize the difference, and could break a thick question into thin ones. Afterwards, we needed to turn inquiry questions into lines of inquiry that include key concepts and Learner profile attributes. Next, determining their PYPx Big Idea: What is the message they want to pass to the world? Finally, introducing the website to the students, a place where they can include all the details of their process of the PYPx and all the evidence of the steps they have taken for their teachers, mentors and parents to see.

Introduce Ideas for action: First is to look at examples of previous exhibitions. Next is to create an action resource example bank, framed or divided into the different types of action within the PYP including any helpful resource that could complement the understanding of the types of action. The world's to-do list is a base point to start for students to have perspective of what real actions look like.

Personal Goal: First, students should establish what they want to accomplish with the PYPx and how are they going to grow during the process, for this it is necessary to give them a clear growth pathway(this will translate in the agency tracker). Create regular opportunities to reflect on their goal and the entire process (also linked to the agency tracker)

Connect with mentor: This was discussed in all the workshops with teachers, and the only advance this year was to establish that the students were the ones in charge of contacting their potential mentors. To accomplish this, next year, because this one was not synchronized with the timing of the PYPx UOI(unit of inquiry), there is a tool that can be used in Design call the elevator pitch, that will help the students approach a potential mentor by preparing a 2-3min pitch about their PYPx. Ater this, they needed to identify the mentor's role and the students role so they can proceed to decide who they are going to send this information to, for this we created the Choosing my mentor slides to give the students an easy way to find their mentor depending on the topic or interests they need. This was done using a survey sent to all the staff, this information was later organized in the google slides. We also thought it was necessary to create an easy way to communicate with the mentors -teachers-students, therefore to help students prepare for their meeting, set goals, write prior questions, keep track of what happens during the meetings, set tasks for next meeting and have a space for the mentor to make comments about student's progress, the tool Mentor notes was created.

Research: One of the ideas was to have guest speakers come to the classroom and talk about the different topics or skills nevertheless we had only one guest speaker during the process. Also there were some "mini lessons" in the library about: writing key words in search engines, organizing information, skim and scan, paraphrasing,

finding reliable sources, analyzing and synthesizing information. From these lessons only skim and scan did not happen due to lack of time.

Revisit Ideas for action: Thinking about their research, determine what their actions would look like, review the different types of actions. We created an empathy tool and an Action planner to help them frame what their action would be. Students used the design cycle to plan their action with the help of graphic organizers for empathy (to think deeper about their audience for action), for the action planner we adapted the canvas business model to have a systemic view of what was needed for their action to become a reality.

Prepare presentation: Discuss the success criteria, define the purpose of their presentation so that they have a clear understanding of what they want to express, what message they want their audience to understand and what actions they want their audience to take to support their message or ideas. We created the presentation planner to help them define all the elements of the success criteria and help them decide what should be part of their speech and what needed a display. The creation of interactive displays, as a creative way to engage and include their audience during the presentation, thinking of different ways to deliver the message. Finally it is needed that all teachers have the necessary information that needs to be included in all the presentations.

Insights

This was a document which we went back several times, not only to check that we were aligned to what we planned but to add or adjust variables along the way. It was useful to provoke ideas about the different tools that haven't been used so far and that could help the students, mentors and teachers keep track of the students' progress.

- The PYPx main idea: For next year this should be the first display for the presentation, something they can go back to if they get lost along the process. The main takeaway of the presentation itself.
- In the Journal: for next year it would be more effective for the depth of the reflections towards the development of agency to include the agency tracker (developed in a further stage along the research project)
- For next year, it was proposed that Design and technology(the subject) be changed to the second semester so that it would support the development of the PYPx, therefore, students won't have Art class where they used to develop the art piece for the PYPx. To replace this process and subsequent evidence, the proposal is that they show how they have evolved and grown throughout the process by creating a visual 2D or model 3D of each stage during the whole process.

- About the thinking hats: It is an extremely powerful tool for divergent and systemic thinking, although, it was performed on an early stage of the project where the topics were still being chosen and there was a limited knowledge about them, there wasn't any research yet, therefore for some of the students the tool, even though it showed different points of view and approaches to the project development, wasn't as effective because some of them changed their topic. Definitely a tool that should be applied in an advanced stage of the project.
- Question wheel: Also a tool that would be more productive in a further stage of the PYPx, where the research is completed and maybe should be focused or aligned towards the action.
- Creation of inquiry lines: for next year adding a graphic organizer could help the students follow a decision making path towards the creation of the inquiry that includes key concepts and learner profile attributes.
- Website: is an ongoing task, that should contain all the evidence of the students' progress, it allows students to attach, link or upload any work they have been developing so that the adults supporting can have a common place to access this information and give feedback to it.This tool should be presented at the beginning of the project, it is the place where all the research, details, the depth, bibliography, process, action, reflections, mentor meetings and in general all the stages and process are documented and available for the different support stakeholders from the school community to review and give feedback.
- About the action: Further along the PYPx, we realized it was necessary to introduce more design thinking concepts that help students decide what the action could be, therefore the Empathy tool and the Action planner were created to help them frame what they needed to create as an action from their project.
- Personal goal: Reflecting on the goal of the Master's research itself, agency has been present along the way but even though it was clear for most teachers, the students did not know what agency actually is. This led us to the development of an agency lesson and tracker that could help students establish a clear understanding and goal of what growth within the PYP meant, including the pending tasks, the relation of the tasks and the ATL's (approaches to learning) and the agency area that students need/want to work on (refer to agency in the PYP).
- Choosing my mentor slides: was an effective and helpful tool but it was time consuming, next year each teacher can create their own slide later to be organized and linked by one person. Elevator pitch: for next year this could be a short video 2-3min long to send it to their potential mentors and this tool might be better developed after choosing their mentor. Sending a video is also ICT literacy that can be embedded within the curriculum.
- Related to the research: the idea about the guest speakers could be a powerful tool to help students engage and get deeper understanding of their topics or skills, students could prepare questions (thin questions) for their guest speakers and count it as a first hand reliable resource and also to build community by involving the different staff members and to recognize their specialties, passions or skills.
- Regarding the presentation: the design area would be also helpful supporting the design and creation of the displays of the students. Also after this year's project it was evident that the students need to start creating displays from the start and not leave them for the last week or two. Having a clear checklist from the start can also help the students keep track of their progress and produce the required evidence with time.

5.4. Develop

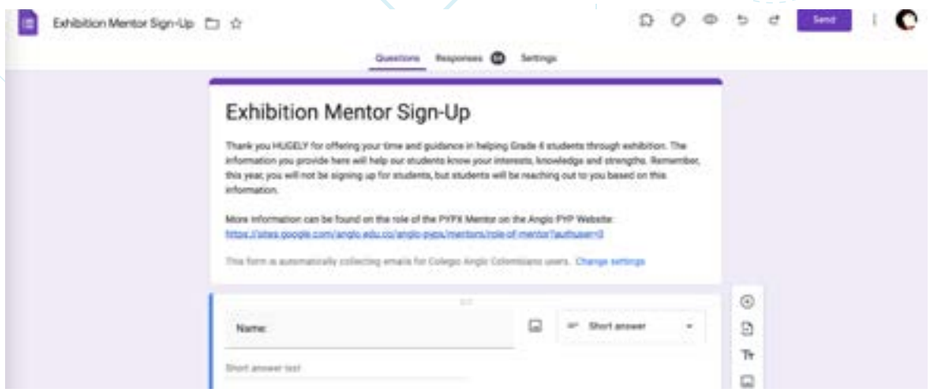
Once the problems had been identified and framed, this Develop stage focuses on the co-designing activity with the group director. This allowed the exploration of different ideas and the creation of tools. The iteration to and from this stage lasted up to the final stage of the project.

5.4.1. Prototyping - Toolkit

The following are part of the tools developed and applied during the study. Two of them will be found here, the rest will be found in "**Apply**". The ones found here were developed in the initial stage of the study. There were a considerable amount of tools in different stages of the design process and all happening simultaneously, resulting in tools being developed and applied at in multiplicity of timings. It is important to clarify that this two sections were the ones that required more iteration processes, therefore the tools were divided in both sections, it is important to clarify that all the tools were developed and applied without sharing a specific stage in the design process.

5.4.1.1. Exhibition Mentor sign up

>>> FIGURE 5.18 GOOGLE FORM MENTOR SIGN-UP



Description

This is an Online survey sent to the school staff with the objective of having them sign up to be mentors. They needed to choose the areas of expertise or interests depending on the topics chosen by the students so the teachers met to list the different topics of their classes. The rest of the questions were related to the section they are from, their contact information, and if they were willing to be guest speakers about a topic of expertise or teaching a skill or strategy that could help the students during the exhibition.

The original idea was to include questions related to different skills they can support/help the students with. Nevertheless there wasn't enough time to get to an agreement on this idea therefore it was not applied.

Process

The survey was sent to the whole staff and students' parents via email. We received answers from 64 staff members, from which 52.4% are allocated in primary. (Need to make a comparison of the number of students and the number of possible mentors registered to withdraw a conclusion/recommendation about it) 29.7% responded Yes to be a guest speaker and 42.2% responded Maybe. Looking at the individual answers of the Next question for those two groups (If yes, please explain). This was an excellent resource that was not used and that could have helped support the skill development of the students; for example:

> *"I would be really happy to deliver a session on public speaking and strategies for being calm and confident."*

Insights

The question related to the skills was valid for the ones who know what the exhibition is about and what is required from the students to develop it. I think it might have been useful to inform the staff members about the exhibition, what it requires and what is expected from students and what the role of mentor includes.

Also there were no guest speakers from the survey due to a lack of timing for the development of the project itself. Next year the survey should also include the skills that the project seeks to reinforce and develop in the students so there is a bigger support system and perspectives and techniques to teach them. Also since this information was used to create the next tool "Choosing my mentor" at the end of the survey there should be a link to the slide presentation for the future mentors to complete, this could be an automatic message sent via email after completing the survey.

In general within the amount of available people in the school community, there would be no need for a teacher to have more than one student as a mentee, nevertheless there were teachers with 4 or more students and even some students without a proper mentor.

On the other hand, some mentors did not fulfill their aspects of their role. This could have been caused by different facts. For example the lack of clarity of the mentor role and expectations from the start. Miscommunication between the mentor and/or the mentee. Lack of time or schedule availability.

5.4.1.2. Choosing your mentor

>>>
FIGURE 5.19
SLIDES
CHOOSING MY
MENTOR

Description

The idea for this tool was conceived because we needed a way for students to select and contact their mentors on their own. Therefore the google slides presentation was designed so that the students could find information about the teachers or staff members that responded to the survey organized per topic. The slides were linked so that students could easily navigate through the presentation only in the topics of interest making the process of accessing specific information faster and self managed. This tool was applied during Group director classes.

Process

The slides were shared in the google classroom, the students accessed them with their Ipads. They had 1 session of 45 min to choose the possible mentors and contact them via email.

Insights

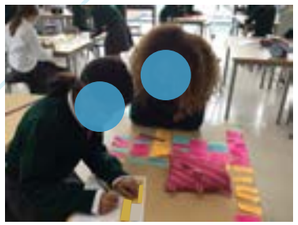
The process of creating this tool was time consuming in comparison to the time students used it, for next year the slides can be shared with the teachers and staff

interested in being a mentor so they can complete one slide with their mane, contact information and the areas of knowledge or expertise.

5.5. Apply

Applying involves testing out different solutions. Despite the fact that the tools below are past of the toolkit, they are placed in this section because they were the ones that passed through a constant iterative process. The tools found here, needed several adjustment during the study. This allow to improve the extend and effectiveness of those tool for the students and teachers. The following are the learning experiences, class sessions and the rest of the tools.

5.5.1. Brainstorm


<<< FIGURE 5.20 G4 STUDENTS BRAINSTORM SESSION

>>> FIGURE 5.21 SLIDES BRAINSTORM

Description

Brainstorming tool was used to help students select the topic for their project. First the think, pair, share routine helped the students question what the main goal of the exhibition was. From a student's point of view, the aim was to construct a goal common to all. With this as a starting point, the students chose a global goal. The brainstorm about their topics followed the sequence select, generate, sort, connect elaborate. Once the brainstorm finished we used that information as a starting point for the thinking hats. This tool was applied during Design class.

Process

The class was divided into groups of three or four to develop a thinking routine called "think, pair, share". They were asked to think about what is the goal for them of the PYPx, discuss it with their peers and then share it with the classroom. As a group we made a mind map (on the white board) of the goal of the PYPx. Once we set the goal for the PYPx. We started brainstorming. Students began using thought provoking questions for them to write as many possible answers in a limited period of time (one minute per question). With all this information, students were then given time to sort the words in different groups forming different groups/categories, they needed to name each group thinking of a main idea of the combination of these words. Consequently, they needed to underline or highlight the most interesting words for them, then try to find connections between the groups and selected words and elaborate an idea to explain the connection. Finally, they were asked to select the idea they like the most and write a possible PYPx topic statement as a starting point, connect ideas and elaborate by complementing those ideas that interest them the most by adding new ideas that expand, extend, or add to your initial ideas and elaborate

After constructing the main goal, the students were asked to think about what makes a good PYPx topic, the slides used had words to guide them and help them think on meaningful topics.

Insights

In the brainstorm exercise, the slide where it says passion can be changed for curiosity. Also when revising the questions with the group director there were some adjustments in the questions that were used during the brainstorming to allow better understanding and deeper connections. Even though a big percentage of the topics changed, this is a great tool to explore the possibilities for choosing a topic connecting different areas of interest and seeking for uncommon relations and areas not explored before. Would have been efficient and productive to work on the PYPx simultaneously with the group directors and have a common agreement on what is the exhibition, its goal and expectations throughout the grade four level.

The decision to include the selection of a global goal was to start with a topic that would ground the students to a real life problem that they look forward to, where the students can either connect it to an area of interest or can discover a new interest.

Part of the main goals of the PYP curriculum and the whole IB program is to help students develop international mindedness and the exhibition would be an important part where this process can be embodied.

Most of the classes that decided not to have their students choose a global goal which made a difference in the topics selected by the students. While in these classes the students choose for example the topic sports in the class where students selected a global goal there were topics like inequality in sports.

5.5.2. The thinking hats

<<<
FIGURE 5.22
SLIDES THINKING HATS

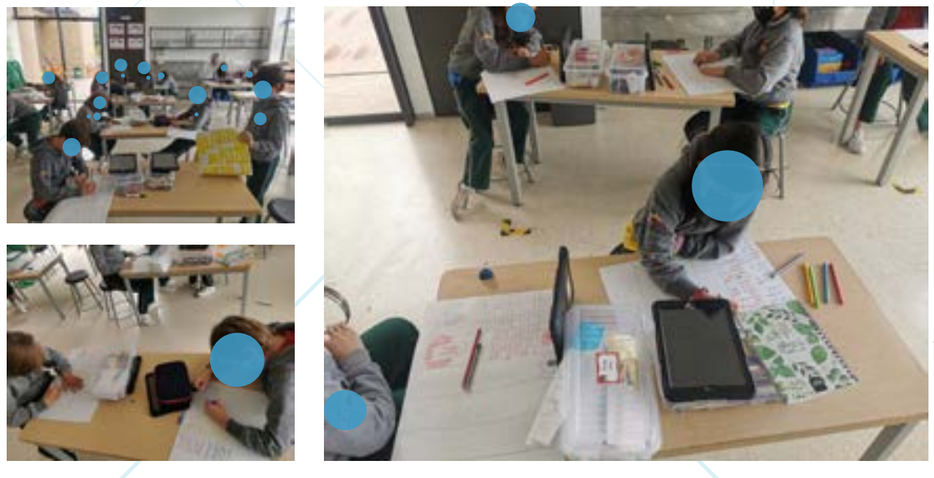
Description

It is a methodology created by Edward De Bono, based on lateral thinking which seeks to create a new idea regarding a problem posed. In this case there wasn't any specific problem but the project itself. At this stage the selection of the topic was barely explored and the students did not have a clear topic chosen, therefore the activity was proposed with their initial idea of the topic discussed with their group directors and the result from the previous brainstorming. This tool was applied during Design class.

The aim of the 6 hats is to help simplify / scaffold thinking resulting in a wide range of approaches for their exhibition. Here each thinking hat has a purpose and focus. Like thinking about the known and needed facts for conducting their research; the students' feelings in relation to the project, their process, the result; the positive and negative situations or outcomes; the creativity to think in uncommon connections,

considerations and alternatives to develop the project and how through the analysis of the other hats they can create a plan with the necessary steps to start developing their project. To do this they were given an example of a graphic organizer to present the information.

>>>
FIGURE 5.23
G4 STUDENTS THINKING HATS SESSION



Process

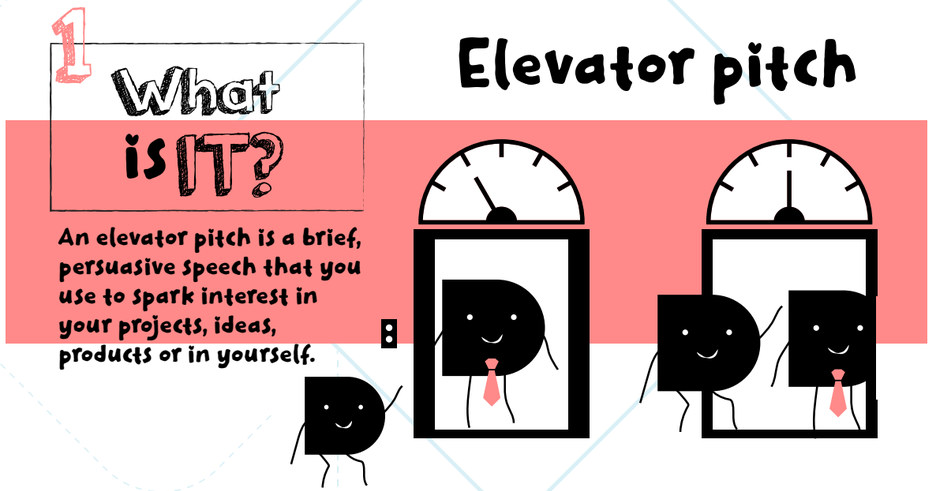
During this lesson the students had access to the brainstorm completed in the previous session. The methodology of the thinking hats was explained along with the

uses and steps. With the help of a slides presentation, the was an example of how the graphic organizers should be presented along with guiding questions and possible example answers.

Insights

Used in an early stage where there wasn't enough information about the topic to really explore the potential of this tool. This can be an iterative tool that can be used to come back to and be adapted throughout the project. Next year give more options to graphic organizers and develop this exercise in a more advanced stage of the research so they have enough information to maximize the potential of these tools.

5.5.3. Elevator pitch



<<<
FIGURE 5.24
SLIDES
ELEVATOR PITCH

Description

This type of presentation is used to communicate a unique idea proposition, UIP, in a limited amount of time. It should be brief and persuasive enough to spark the interest of the audience. This tool was selected to help students produce the required content to contact their mentors. This tool was applied during Design class.

Process

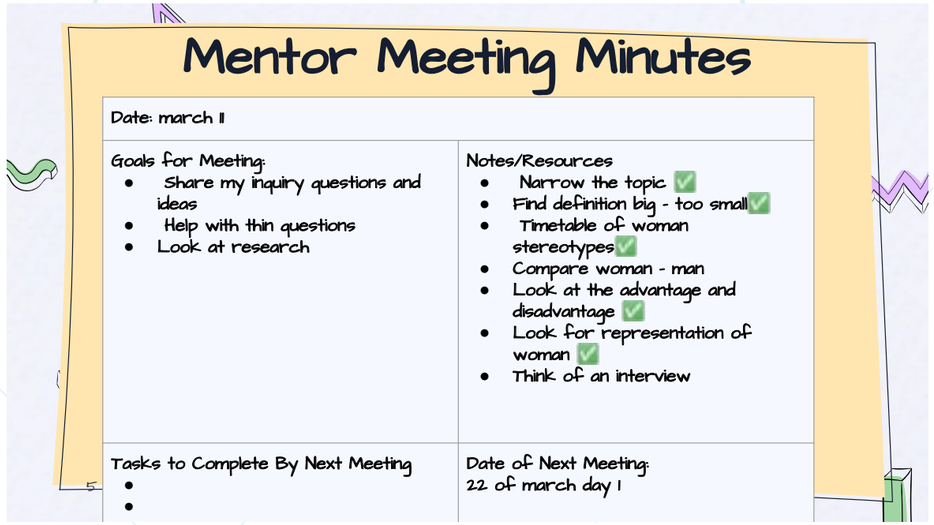
During this lesson the students had access to their previous work related to the PYPx. With a slide presentation it was explained to the students what an elevator pitch is and how it would help them communicate their project idea to their future mentors.

Then a series of steps were shown and explained and developed with student led examples. Last, the students needed to find a peer who did not have extensive knowledge on their topic to practice the pitch with them, they were given a maximum of five minutes for each pitch.

Insights

This was the first year the students were required to autonomously contact their future mentors. This decision was taken in the first collaborative workshop of this project, being the first step towards the development of agency. In terms of the tools itself, it was applied in an early stage of the project and only some students actually used it to contact their mentors. Following the steps made it easier for the students to truly synthesize the information they wanted to communicate. As a design tool it helps the students' decision making by selecting the relevant information to achieve synthesis. For future usage of this tool, it can be connected to the dimension of voice within agency. Finally, giving students the choice to present the elevator pitch in different formats can be better accepted by students, for example as a 90 seconds video via email, or written information.

5.5.4. Mentor notes



>>>
FIGURE 5.25
SLIDES MENTOR NOTES

Description

This is a Google slides presentation to keep record of the students' progress. It is where the students plan what the meeting with their mentors will focus on and when they are going to meet with them. Allowing the students to develop agency

through acknowledging their needs, organizing their thinking prior to the meetings by planning the meetings in advance, setting goals and tasks and reflecting and recording their process. This tool allows the student to insert different types of files and record information in different ways (drawing, voice notes, videos, photos), giving a broader selection of tools to record their process and therefore adding a differentiation component to benefit students. Within the tool the mentors also have a section to record information related to the students' progress and recommendations. This tool was applied during Group director classes.

Process

Most of the students found the tool helpful to organize what they needed from their mentors, nevertheless most of them recorded the process of the initial meetings but left the tool aside further along in the development of the project. Also, not all mentors were checking the mentor notes nor required the students to fill them up prior to the meetings.

Insights

There needs to be a more consistent use and requirement of mentor notes file to be updated. The compliance to this process should not only be a responsibility of the group director but also mentors. It would be meaningful if parents also got involved.

5.5.5. Research document

Description

This document had minimal changes. The layout was simplified to make it easier to read and understand how to fill it in. The main goal was to improve how students were able to visualize, complete and document their research information. This tool was applied during Group director classes.

Process

The document was found on the website, it was a place for them to write their findings of the research according to their lines of inquiry.

Insights

This document has more improvement to be done nevertheless there were other stages and tools that required more attention. The next step will be to make it kid-friendly in both usability and interface.

>>> FIGURE 5.26 RESEARCH DOCUMENT LAYOUT

Defining My Passion

Theme:
- How We Express Ourselves

Central Idea:
- Passion leads to further inquiry, stimulates creativity and empowers the learner

Thin Inquiry Questions
- How stereotypes change through time
- How people take advantage of stereotypes
- What is the impact of stereotypes on people
- What is the definition of impact
- What are some synonyms of impact
- What are important people who stopped stereotypes
- What is the definition of stereotypes
- What are some synonyms of stereotypes
- Which is the definition of stereotypes
- Which are some synonyms of purpose

Thick Inquiry Questions:
- What is the purpose of stereotypes
- How can stereotypes impact your daily life
- How can stereotypes be prevented

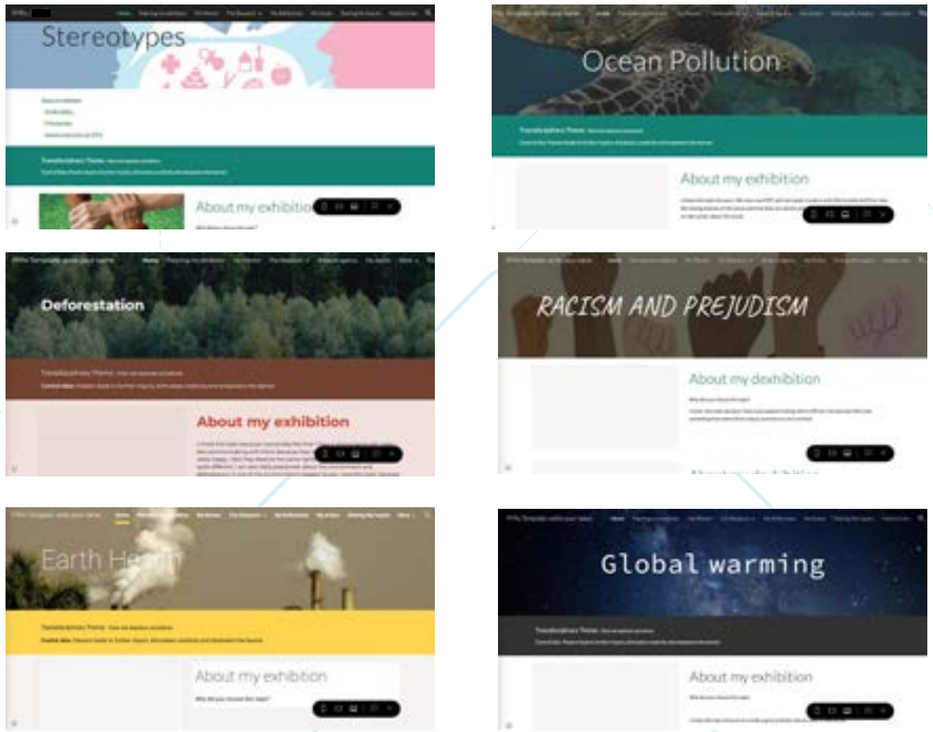
Concepts:
- Form
- Perspective
- Change

Learner Profiles:
- Risk taker
- Reflective
- Open minded

Research

THICK Inquiry Question #1	Research (in your own words)	Resource (Author. Title. Website. Date)
Question: How can stereotypes impact your daily life	• Gender roles change through time • Many years ago women had problems to be free • Now in almost all countries women are free to make choices	Title: A life history account of gender roles in gender inequality Website: frontiersin.org I
	• stereotypes can be good and even protect us • Age is involved in stereotypes • All stereotypes are of perspective	Title: The impact of stereotypes on self and others Website: ncbi.nlm.nih.gov
	• women is getting harassed • Organizations around the world are trying to talk with governments and getting laws about it • Many women is making protest to help women been harassed • Women is been harassed by men using stereotypes of gender	Title: How stereotypes affect us and what we can do Website: Facinghistory.org
THIN Inquiry Question	Research (in your own words)	Resource (Author. Title. Website. Date)
How stereotypes change through time	• Gender roles change through time • Many years ago women had problems to be free • Now in almost all countries women are free to make choices	Title: A life history account of gender roles in gender inequality Website: frontiersin.org
	• gender equality paradox is stereotypes with math-related • Women and girls have proof math is for both gender and not only for man • Now girls have no stereotypes at all (in math)	Title: Gender stereotypes can explain the gender equality paradox Website: pnas.org
THIN Inquiry Question	Research (in your own words)	Resource (Author. Title. Website. Date)
What is the impact of stereotypes in people	• stereotypes can be good and even protect us • Age is involved in stereotypes • All stereotypes are of perspective	Title: The impact of stereotypes on self and others Website: ncbi.nlm.nih.gov
	• In an experiment there was a woman and a man in the first part the man was aggressive, in the second part the woman was aggressive, in the comments they only tell the man he has been aggressive and the woman nothing	Title: What are the consequences of stereotypes Website: blogs.hope.edu
THIN Inquiry Question	Research (in your own words)	Resource (Author. Title. Website. Date)
	• stereotypes in gender are a huge problem that we need to stop. Although positive or negative stereotypes affect some way	Title: stereotypes Website: simplypsychology.org

5.5.6. Website



<<<
FIGURE 5.27
HOMEPAGE
STUDENTS'
WEBSITES

Description

In previous years, some teachers used a folder in google drive with 10-12 different files about different stages of the project. Other teachers used the journal to record all the evidence of the process and outcomes of the project, and other teachers used both. The aim of this tool was to have a common place for students to record all the evidence of their process in an interactive, organized and flexible way that could be available to teachers and mentors to check their progress. When thinking about this tool, we wanted something that allowed the students to update the content, to design it depending on their topics and that they could develop it by themselves.

A template was created, using google sites, which already included the header, navigation bar, pages and sub-pages which contained titles with their respective space for content for both text and images depending on the type of content expected, links to the following: documents research (google doc), mentor notes (PowerPoint presentation), different PowerPoint resources about some of the stages of the project, inspiring links to different websites and some empty pages for them to complete.

From this point on, all the tools were applied during Group director's classes because G4 no longer had the Design subject in the 2nd semester of the academic year. Therefore the researcher was sometimes supporting, co-teaching or leading PYPx related lessons in the Group director's class.

Process

The students used the tool and their information was actually consolidated in one place; it was, as predicted, easier to allocate and track their process and information. Nevertheless most of the students completed only some of the pages focusing on the stage of the process that they were more engaged with and leaving empty or barely filled the rest of the pages. Also the amount of time given to update their websites was not enough due to timing constraints encountered in the last three weeks of the project.

Insights

Next year there are some adjustments, sub-pages, training and designated timing to have a more efficient use of the website. IT integration where lessons can be used to teach them how to construct a website using Google site, as this is the available tool for the school. Also there needs to be a conversation with teachers to decide which sections to maintain and which to include.

Add sub pages like:

- My display design
- My presentation(including a video of their actual presentation, the tools used to plan it, their actual speech, a reflection post exhibition about this stage)
- My agency journey (including their agency tracker and their reflection at the end of the process-maybe an option of having a digital tracker should also be available)

Next year all of the pages and sub-pages should have links to documents, videos or presentations that the students can refer to if needed. This year, students shared the edition version of their website while the page was being constructed. Nevertheless next year students can publish it before sharing to enhance the viewer experience and maybe increase the people they share it with by looking for feedback in specific areas.

Finally next year the Design subject would be more beneficial for the development of the exhibition during the second semester of the academic year.

5.5.7. The Agency specific component

The following are the tools dedicated exclusively to build up agency knowledge and its awareness to both students and teachers.

5.5.7.1. Agency survey

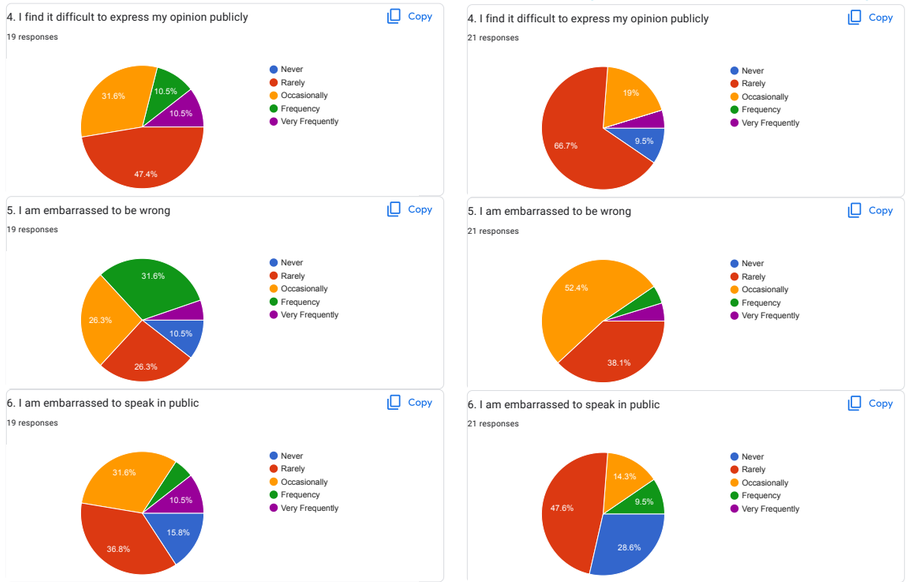


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FIGURE 5.28
RIGHT: PREVIOUS PYPX
LEFT: POST PYPX

Even though this survey was explained in a previous section, the following is a description of how the measurement of the agency tool informed the decision making towards what was needed and the importance of socializing that information with the students.

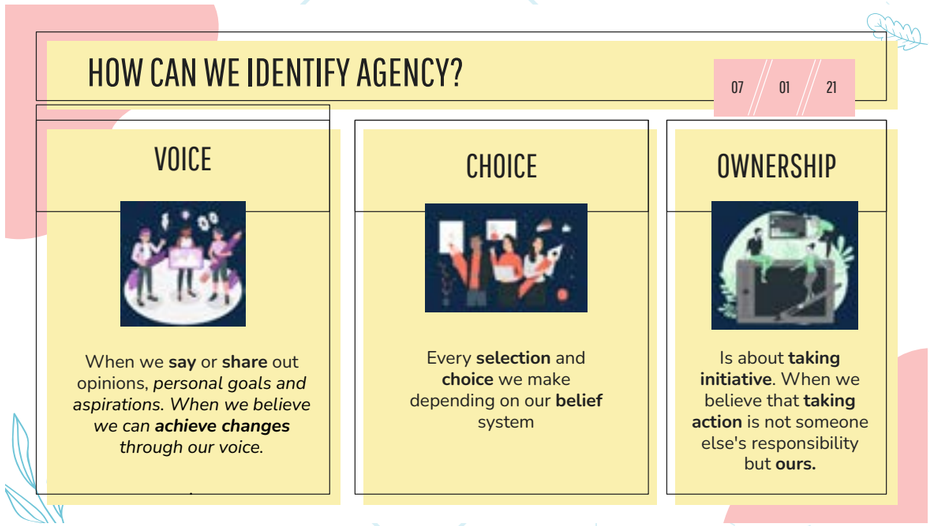
With this survey we were able to measure the agency prior and after the development of the project. We found after the first time the tool was applied that there were inconsistencies in the answers, in consequence the tool needed to be adjusted for a second time to ensure student understanding and the group director supported the completion of the survey explaining every question so that the students consciously answered it.

This tool informed the needs related to agency within the class. It revealed that in general all the students had at least one area of agency they needed to work on and in most cases more than one. Therefore it was decided that the students should be presented with tools that allowed them to work on any area of agency according to their personal interest and need. As a result all the tools designed encouraged students to be agents working on different areas, sometimes simultaneously.

During the analysis and decision making process there was an important insight, the students had never been taught what agency is. In consequence it was necessary to plan a lesson to teach them about agency. One can not assume that students will learn and develop a skill that they have no knowledge of but that is expected for them to develop. While designing the agency lesson it made sense that the students should be able to see their own results of the survey not only for them to feel identified but also to make them agents in search of their own agency. In other terms, one cannot be an agent without acknowledging what agency is.

5.5.7.2. Agency lesson

>>>
FIGURE 5.29
SLIDES AGENCY LESSON



Description

This lesson was created to teach students about agency. The purpose of this tool was to help students have a general understanding of what agency and how it is related to the PYPx, to share the results of their survey and to teach them how to use the agency tracker.

Process

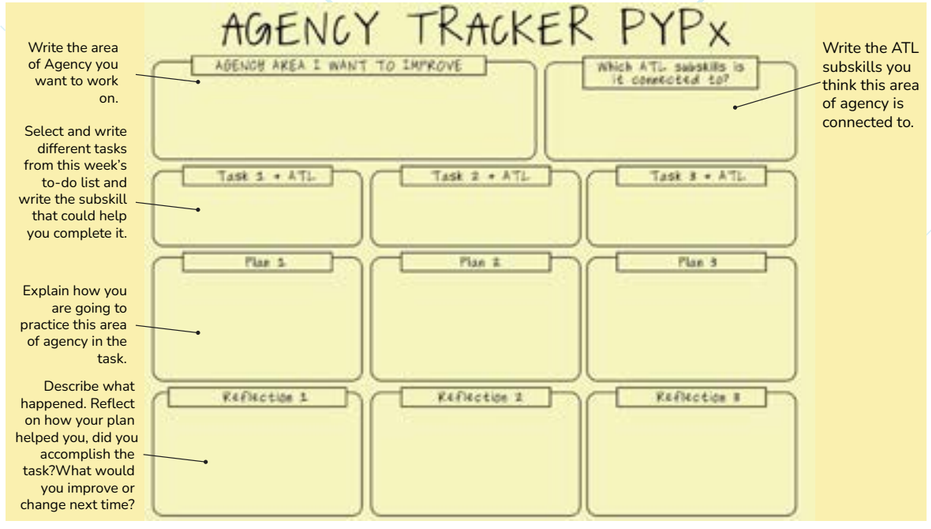
The lesson started with a discussion about students' previous knowledge of agency. After clarifying the term, we proceeded to explain the different areas of agency by explaining how to identify when one is having agency. We also talked about how

agency looks like and the students and us teachers gave different examples. To create a linkage for deeper understanding we talked about where agency comes from, once again with student participation sharing personal experiences. Then we asked the students about how agency was related to the PYPx and why the development of agency is related to the success of the project. Before presenting the results of the survey, the goal of the session was presented as follows: I can identify the areas of agency that I need to improve on for PYPx. They were asked to think about the survey and their answers to the questions. The results of each area of agency were presented asking them to raise their hands if they felt that was an area they needed to work on, they also wanted to share examples of their personal experiences. The agency tracker was handed over to the students and explained using the slides. Section by section was zoomed in to show a filled example of how to use the tool. After all the questions were answered the students were given time to start their agency tracker.

Insights

It was interesting that the students in grade four had no previous knowledge about agency, they related to advertising agency companies or travel agencies but not to the regulation of cognitive activities which is what was expected from them. What was equally interesting was that most of the students raised their hands in all the areas of agency while sharing the results with them, implying their acknowledgment of their own needs, a sign of ownership within agency.

5.5.7.3. Agency tracker



<<<
FIGURE 5.30
SLIDES AGENCY LESSON EXPLANATION AGENCY TRACKER

Description

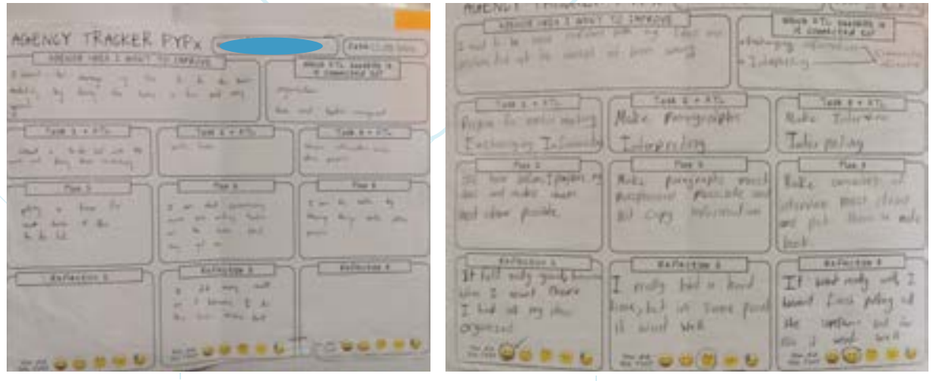
The focus of this tool was to help students organize their thinking by making connections with the area of agency they wanted to work on (voice, choice, ownership), the skills that could help develop the chosen area of agency and the daily tasks for the project development. Students needed to analyze which tasks were related to the area of agency they wanted to work on, then, they needed to create an action plan to complete the chosen task using a specific skill and having always as a goal the agency development. Finally once their plan was carried out, the students needed to reflect on their outcome and decide if they needed a new action plan or if they could advance to a different task.

Process

Students were presented with the tool, having a detailed explanation on how to fill in each of the boxes, this was done by using examples the group director extracted from daily behaviors in the classroom so the students could relate from personal experience and better make sense on how to use the tool. The following steps were displayed for student guidance:

- Select the agency area(s) that you want to improve on.
- Select an activity of your TO-DO list and connect it to the agency area you chose before.
- Choose a technique to help you work in this area of agency.
- After using the tool, write a sentence about your experience.
- How did you feel? Select an emoji that best describes it.
- At the end of the week, reflect about how this tool helped you or not. Also select which area of agency you will try next.

>>>
FIGURE 5.31
SLIDES AGENCY LESSON EXPLANATION AGENCY TRACKER



Insights

It was impressive to see how most of the students embrace the use of this tool and how their awareness, attitudes and thinking reflect on their actions. The level of the

reflection that evidenced meta-cognition was both unexpected and amusing for the age range of the students. The constraints were the time limit to use this tool on a daily basis and the lack of consistency and lingering of the students behavior once the project finished. For this tool to have a lifelong impact it would need to be applied before and after the project, transitioning it to different educational scenarios and even embedding it in all the units of inquiry throughout the year to see a real lasting change in the students, even so its implementation could even start in previous years.

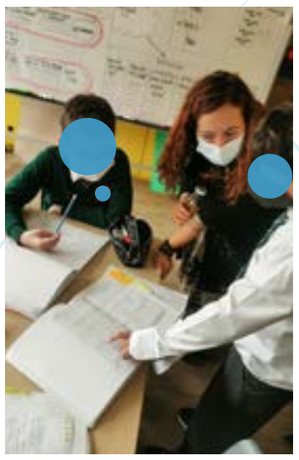


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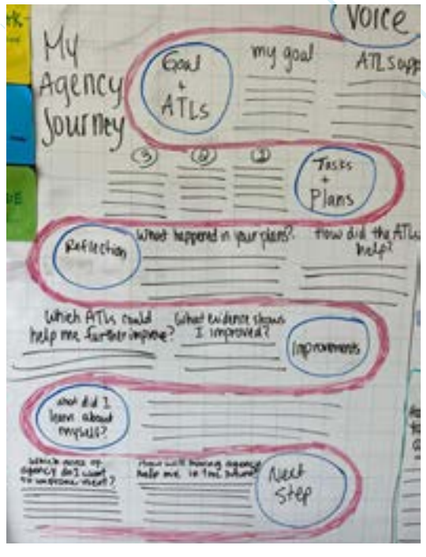
FIGURE 5.32
STUDENTS COMPLETING THE AGENCY TRACKER

5.5.7.4. Agency display



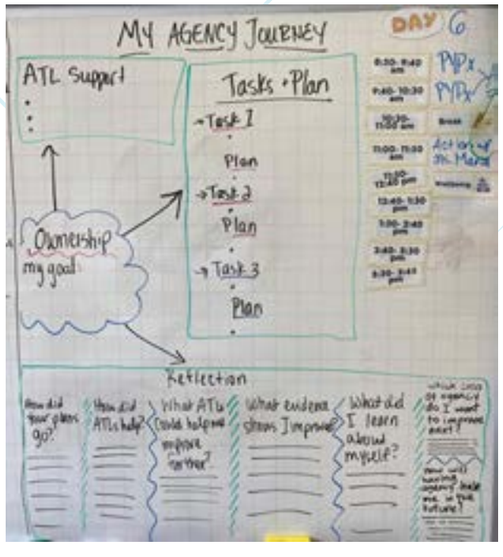


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FIGURE 5.33
GRAPHIC ORGANIZER OPTIONS FOR THE AGENCY DISPLAY

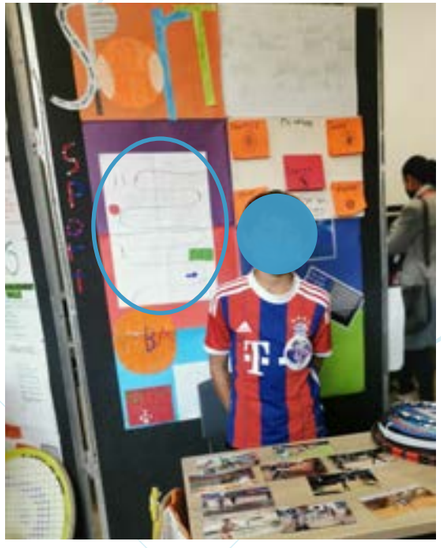
Description

The advances regarding agency needed to be showcased the day of the exhibition, not only to reinforce the importance of agency for the students but also for the school community to become aware of these efforts. As a result, for the culmination of the journey and the presentation of the results on the day of the exhibition, to all primary and parents, the students were asked to create an agency display.

Process

The students were presented with two different options to create their agency displays. This process required them to analyze the outcome of their agency development during the past weeks having as a guide the agency tracker. The display was called My agency journey and its content was the following:

- How did ATL's help?
- What ATL's could help me improve further?
- What evidence shows I improved?
- What did I learn about myself?
- Which area of agency do I want to improve next?
- How will having agency help me in the future?



>>>
FIGURE 5.34
AGENCY JOURNEY (EXHIBITION DAY)

Insights

The capacity of the students to analyze their own process, showing awareness of their strengths and weaknesses was empowering. The school community's response was positive and curious about the project's process. For future applications, it would

be more meaningful to include the agency explanation within the presentation speech and not only if the students are asked particularly about the tool. This insight should apply to the majority if not all the visual aids (displays, models, brochures) used in the stands.

5.5.8. Action component

The following are the tools dedicated exclusively to the planning of the action following the design cycle where each stage is linked to a Learner Profile Attribute (Skills developed along the IB curriculum). They aim to reinforce acknowledgment of the role of design supports the development of the exhibition.

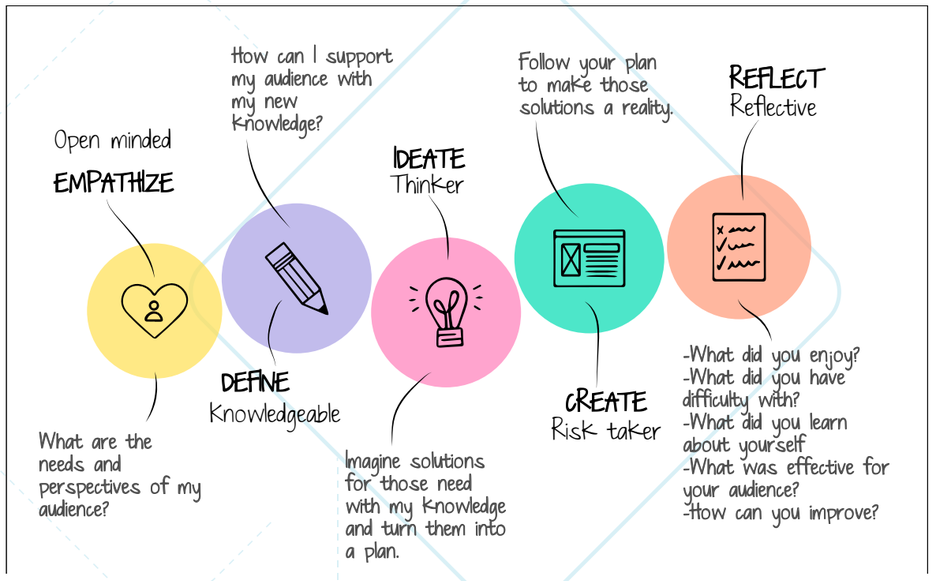


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FIGURE 5.35
DESIGN CYCLE LINKED TO LEARNER PROFILE ATTRIBUTES (ACTION DISPLAY GUIDE)

5.5.8.1. Empathy (Action audience)

Description

This tool was used as a starting point for the students to start thinking in their action. The development of the action was done using the stages in the design cycle to support the organization of their thinking.

The selection of the audience they were going to create their action for was the key first step that guided what their action was going to look like. For this tool it was necessary to clarify the students previous knowledge of the students about empathy. For this within the action lesson slides there was a section for this stage of the design cycle.

>>>
FIGURE 5.36
SLIDES EMPATHY

Process

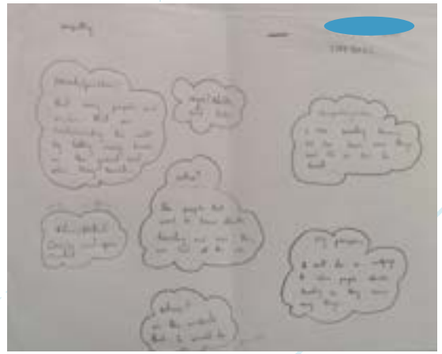
We start the section about empathy by asking the students if they had heard the word "EMPATHY" before and if they know about its meaning. After several group discussions, going through the slides and clarifying what empathy is, the students started to give their own examples of personal experiences related to empathy. We discussed the importance of choosing their audience for the action and how through empathy they could understand easier what the needs of their audience were. After this, the students were presented with the different options of graphic organizers, which were explained in detail.

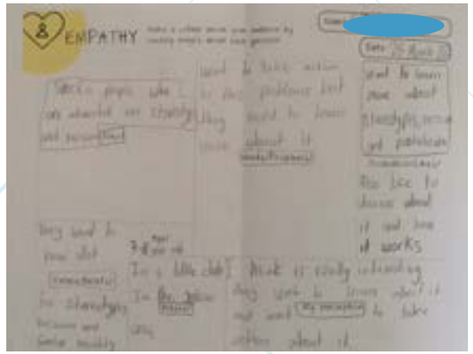
- What is empathy
- How is it connected to action
- How to empathize with their audience
- Guiding question and steps to start their empathy journey
- Three options of graphic organizers to research and complete the basic information related to their audience

Insights

Within the graphic organizers options there were no materials to complete the collage. Most of the students did not have time to carry out a proper research about their audience due to the lack of time to complete this activity (twenty minutes), in

one hand and their project, in general. For next year it might be pertinent to have the students choose their type of action as a starting point of the process, in this way the empathy stage can be better focused and directed to match the type of action with enough time to conduct a proper audience research in order to identify real needs and real opportunities.





>>>
FIGURE 5.37
EMPATHY GRAPHIC ORGANIZER

5.5.8.2. Action canvas

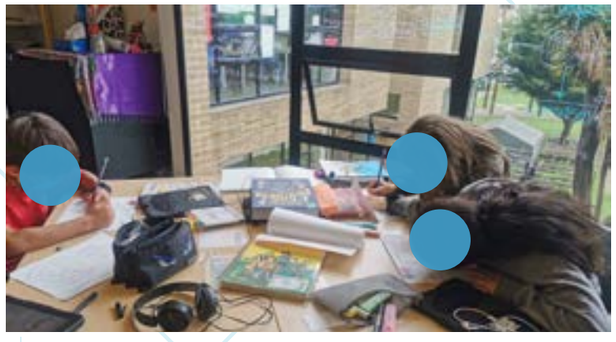


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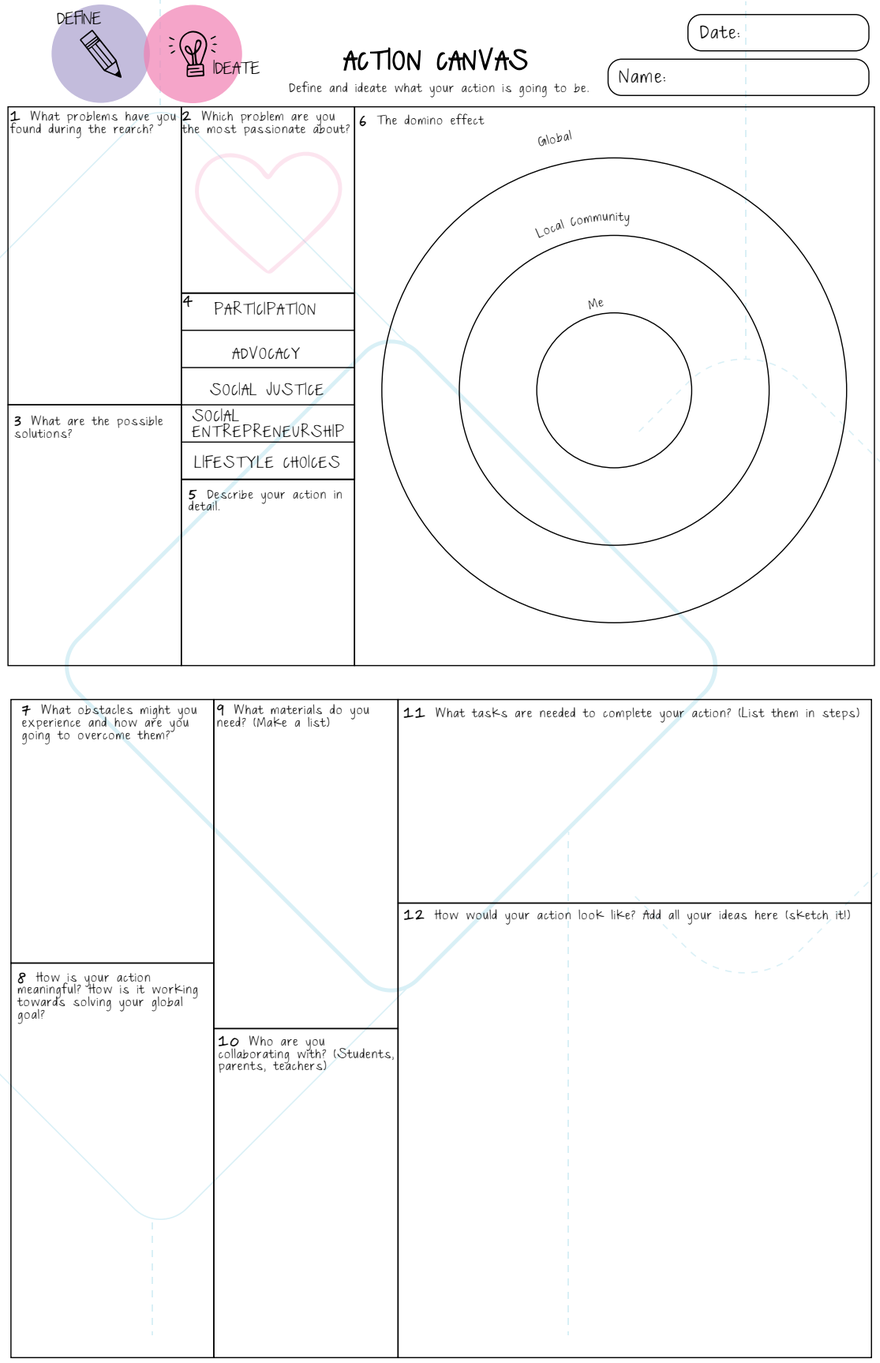
FIGURE 5.38
STUDENTS WORKING IN THEIR ACTION CANVAS

Description

This tool was designed inspired on the business canvas model which is a tool that considers the system where an organization will create and deliver value using different strategies. By adapting this tool, the students were able to have a systemic view on action they are going to develop, helping them think and define the different stakeholders, resources, partners, activities, costs and other requirements. The building blocks of this model were adapted to the needs of the PYPx and the types of thinking and reflection the students need to demonstrate by completing the action. This tool was designed for the stages Define and Ideate.

>>>
FIGURE 5.39
ACTION CANVAS

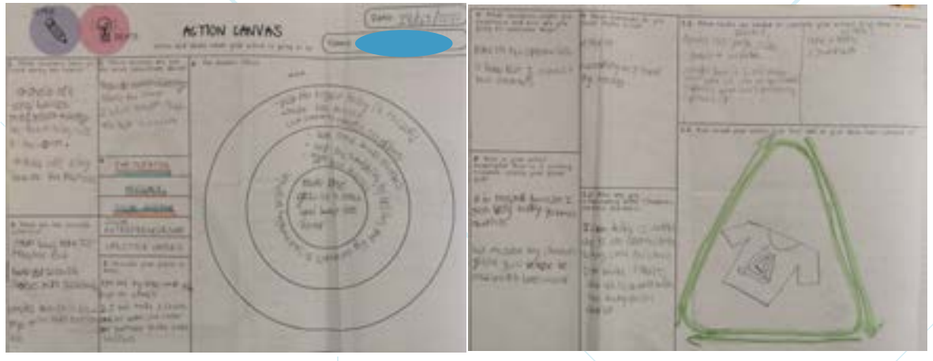


Process

The action canvas was presented and handled to the students. We explained the purpose of this tool and gave a detailed explanation of each of the parts. The initial questions were connected to their research and to their interest or passion within their topic. Which led them to the selection of their type of action according to the chosen problem. Then they need to think on the domino effect and imagine how their action would impact them, the local community and the global community. Then they needed to think about the constraints or obstacles that they could face during their action stating how they can overcome them. They needed to explain why their action was meaningful and how it was working to solve a global goal (OECD, 2019). They also needed to make a list of resources, who they would collaborate with. In addition, make a clear list of steps to complete their action. And finally, make a sketch of how their action would look like.

Insights

This tool helped the students have a better understanding of what carrying out their action requirements. It supported them to organize their ideas but most importantly it allowed them to have a higher level of independence while planning their action. This tool favors the development of systemic thinking by giving the students a systemic perspective of all the parts that action should have and how they are connected together.



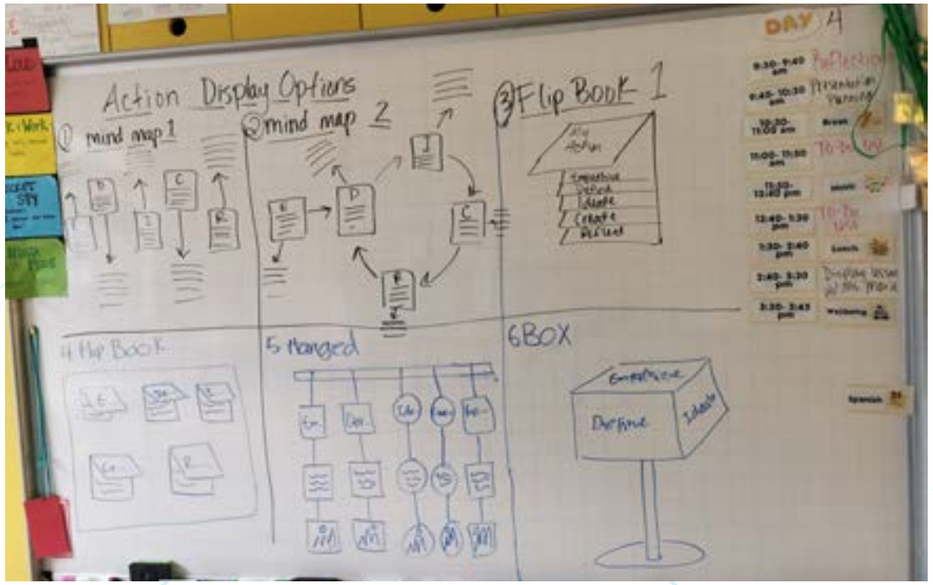
<<<
FIGURE 5.40
ACTION CANVAS COMPLETED

5.5.8.3. Action Display

Description

The action display was a tool meant to communicate the stage of the action at the time of the exhibition. Each of the stages of the design cycle were connected to an IB learner profile attribute and had a guiding question they needed to answer.

>>>
FIGURE 5.41
ACTION DISPLAY OPTIONS



They were given six different options of displays to select from. Here the stages of the action were shown through the design cycle. They were show guiding questions for each stage and they needed to have as a reference the Empathy tool and the action planner.

Process

Using a slide presentation we explained the requirements of the action displays, the students needed to include the learner profile attributes, the stages of the design cycle and the description of what happened on each stage, they were given guiding questions to support them in the completion of the content. Once they defined what information they were going to include, they selected the material they wanted to use for creating their displays. Finally they were given time to build them.

Insight

This type of way to summarize their action was truly engaging for the students. They enjoyed creating interactive displays and it was easier for them to connect what information should go on each stage of the design cycle. For next year the use of interactive displays tends to be more engaging, hands-on and by extension more attractive for the students, therefore it would be interesting to transition it to other stages of the PYPx.

<<<
FIGURE 5.42
STUDENTS CREATING THEIR ACTION DISPLAY

5.5.9. PYPx Presentation Component

The following are the tools dedicated exclusively to the planning and developing the presentations. These also followed the design cycle. They aim to reinforce acknowledgment of the role of design supports the development of the exhibition.

5.5.9.1. Planning my presentation (initial ideas)

<<<
FIGURE 5.43
PRESENTATION SLIDES

Description

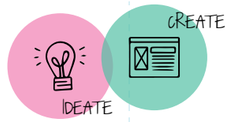
This tool was developed to encourage the students to have a big idea of what their presentations would be. The design cycle was used for this stage too, connected to all the other components of the PYPx but as a single component that required the students to complete the design cycle once again. This tool focuses on empathize, define and ideate. The purpose of this tool was to make the students think about the different components their presentation should have, so when they got to the detailed design of the presentation they would have a clear idea to start with.

Process

During the first lesson about the presentation, the students were asked to create the success criteria for the content and displays of the presentation as a goal for the session. In order to complete this they needed to use brainstorming in the formats for planning my presentation that were handled at the beginning of the session. In those they were asked to write their presentation criteria and sketch their stand and displays. They were asked to think about what information should be displayed and which one should be part of their speech using a thinking routine called "think, pair, share". After which they were shown some videos of presentations of the PYPx around the world and they were asked to gather ideas that could help them with their own. Once they shared their ideas, they were shown suggestions of components that could go on each one to help them complement their initial ideas. After this, they watched the videos again, this time to spot the unique way of creating displays seen on the videos and once again they needed to try to come up with ideas for their own. They were asked to start brainstorming again, but this time they were reminded who the audience was but they needed to think about how they were going to capture their attention and what would be exciting, clear and interactive for them. Also, after completing the criteria for both displays and speech, in the back of the page, they were asked to imagine how their presentation would look like and they needed to sketch it including all of their ideas.

Insights

This tool helped the students have a better understanding of what the presentation requires and a general view of the different activities they need to complete for their presentation to be ready. It was interesting that some of the students didn't create a detailed sketch, but they sketched different objects and displays separate from each other that they were going to put together in the stand. This tool works best when applied at the middle of the project allowing student to iterate their initial ideas and keep track of their own growth, reflection and creative process.



Presentation Planner

Empathize with your audience:
The Anglo Community

Date:

Name:

Thinking about my audience	How do I engage my audience	Take aways	Call to action
1 What could the Anglo community know about your topic?	3 How can you present your topic so that it is engaging for your entire audience?	5 What is the big idea you want them to learn after your presentation?	What actions do you hope your audience will take after your presentation? (List 3 to 4 ideas)
2 What information could be difficult for them to understand about your topic?	4 What information about your topic could be difficult for you to explain?	6 What are 3 to 4 key points that will help them understand that message?	

Speech: Write the information that you will speak about in order.	**Both**	**Display:** Write the information that you will create displays for (posters, drawings, models, comics)

Materials and resources: List all the materials you need for your presentation

Home	School

<<<
FIGURE 5.44
PRESENTATION
PLANNER

5.5.9.2. Presentation Planner

Description

This planner included the detailed design of the presentation. It was also inspired by the canvas business model and responded to the stages Ideate and Create of the design cycle. Here they needed to make deeper cognitive connections and explain in detail why, how and what they were going to do while presenting. The questions in the planner prompt them to have a systemic view of the showcase of their project, considering different variables, requirements and possibilities. Helping them make sense of how they communicate and how others understand their ideas. Also this tool aimed to help them synthesize their presentation and all that it undertakes.

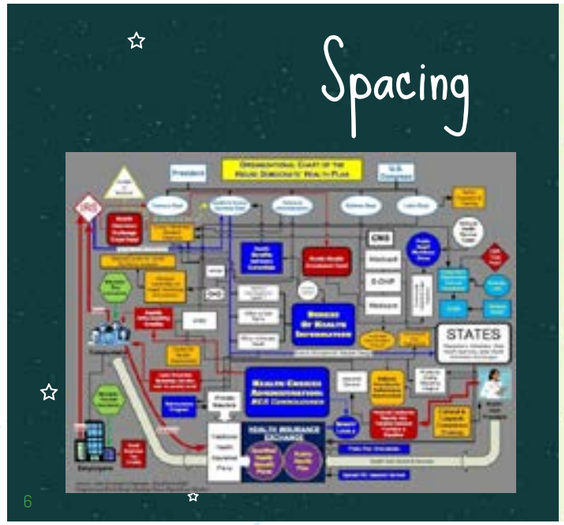
Process

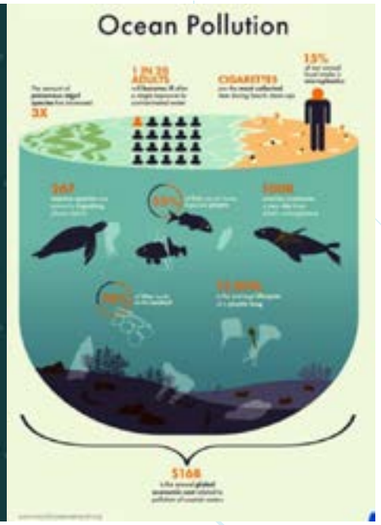
Once the basic planning was completed we introduced them to the presentation planner. We explained and gave detailed examples of each of the sections and questions, like the importance of defining and describing their audience, how to engage with them, what are the takeaways they are going to have, and what will be their call to action. Also they needed to describe the possible obstacles they could have, how their presentation was going to be meaningful. They needed to make a list of materials. They needed to define who was going to collaborate with them. They needed to make a list of the actions they needed to do to complete their presentation. And finally they needed to make a sketch of what their presentation would look like in detail.

Insights

Students felt they were quite organized and that they covered what was needed for them to have a successful presentation. An interesting fact was that they visited the other grade presentations and they were able to make additional adjustments not only to their speech but also to the displays and models they were going to use. This tool works best in an advanced stage of the development of the project allowing students to apply all they knowledge gain in the process which is where they have a clearer idea of what they want their exhibition to look like, being able to assess which requirements are needed to showcase the outcome of their personal journey.

5.5.10. Displays lesson





<<<
FIGURE 5.45
DISPLAY LESSON SLIDES

>>>
FIGURE 5.46
PYPX PRESENTATION DAY

Description

This learning experience was designed to give the students the basic communication, visual and construction criteria for the different types of displays they were going to create. The following were the fundamental elements taught to the students: Text and Visual Balance, Clear Handwriting, Spacing, Color palette, Visual hierarchy, Sizing the elements. As part of the communication skills they develop in design classes this tool is also to the development of voice within agency.

Process

Using the presentation planner, the students revise the displays they need to build. Each criteria of the displays was explained using visual examples and asking the students to recognize the main characteristics and elements they could identify. With this information they started to build their displays according to the information they defined in the previous state and deciding which type of display would be more appropriate for the type of information.

Insights

Most of the students created clear displays following the success criteria. They applied most of the elements taught in class nevertheless the amount of time to create quality and detailed work was limited. For next year it would be recommended to start the displays at an earlier stage of the process.

5.5.11. Semi-structured interviews to teachers/students

Description

The semi-structured interviews were applied to both teachers and students. The interviews for students were made on the day of their presentation to the school community. For teachers the interviews were made approximately between one and two weeks after.

Semi Structured interview students:

1. What was the most interesting part of your project?
2. What was the hardest part of the project?
3. How did you grow as a person?
4. Did the agency tool help? Why?
5. What advice would you give to the next year's fourth graders?

Semi Structured interview teachers:

1. What is the purpose of the exhibition?
2. What is agency?
3. What does agency look like for your class?
4. What would a proficient student in agency look like?
5. What is action and what is its importance?

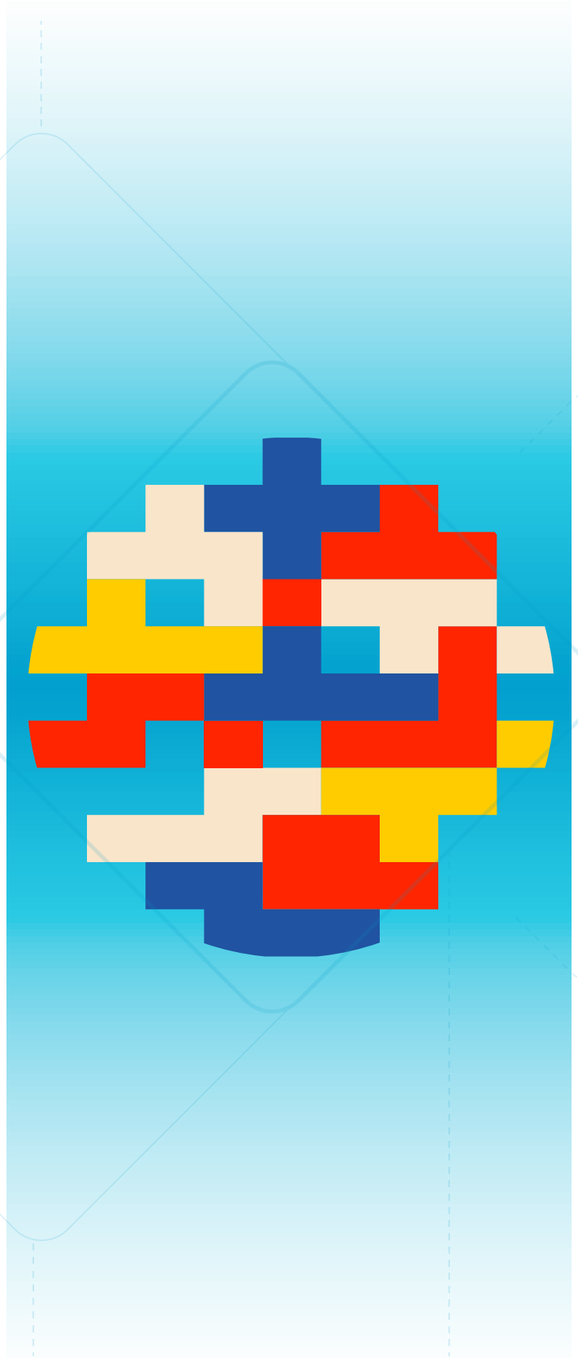
6. Do you think that action is related to agency? How?
7. What was the most useful tool you used with your students?
8. What went well and what went wrong?
9. What is the biggest area of improvement needed?

Process

For the students, interviews were composed of five questions. Most of them lasted about 5-7 min, and the students first would present their project and then make the interview. For teachers the interview lasted between 7-16 min, depending on the extension of the answers. They responded to nine questions and the interviews were performed in their classrooms.

Insights

Both interviews needed to be short due the time crunch of the stakeholders and the amount of questions for each group. For next year it is important that the teachers share this type of understanding about the project and about agency, so if any gaps or misconceptions are spotted they can be fielded or corrected. This will allow teachers to transfer this knowledge to the students.



Chapter 6

6. Study results and analysis

This chapter focuses in the analysis of the qualitative results found during the development of the research. The study results will be presented as follows:

- Control and experimental groups
- Results for the students
- Results for the teachers
- Results for the agency
- Results for design education

To further extend the information found in this chapter please refer to the Annexes

6.1. Control and experimental groups

6.1.1. Control Group

This group consisted of 5 classrooms, approximately 110 students. Teachers led most of the process, meaning students had limited choice in how they can organize their information. For instance, students were forced to use a teacher-made template that showed their PYPx process. Students were not required to apply a Global Goal to their topic, but instead, they could pick a topic they were passionate about and write one thick question to guide their inquiry. In regards to agency, students did not take the agency assessment or use the agency tracker to identify how they can improve. For their display material, students were given one display board they were required to use. To prepare for their presentation, students needed to write a detailed speech explaining their passion, inquiry question, concepts and learner profiles. They were not required to take action or provide their audience with a call to action.

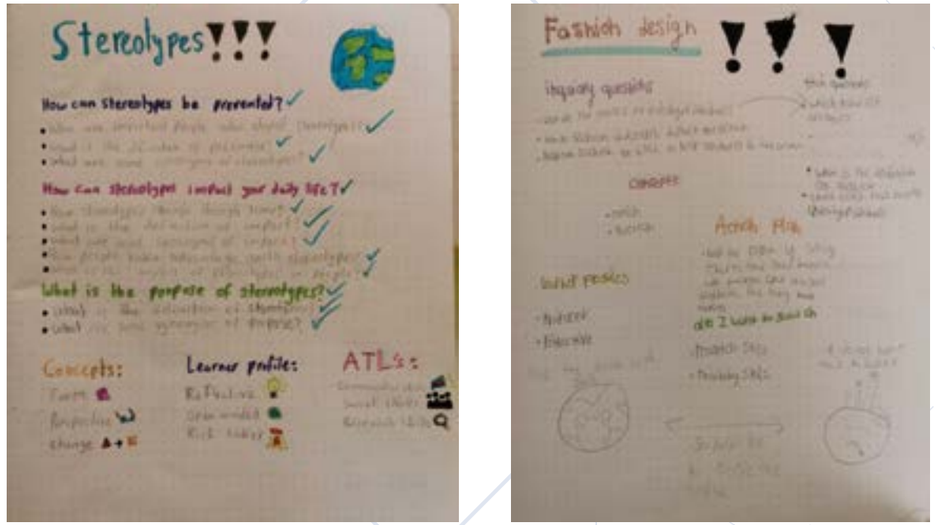
6.1.2. Experimental Group

This group consisted of 1 classroom with 21 students. Students were given choice in their topic and how they wanted to organize their information. For instance, all students used a journal, but instead of organizing their ideas in a teacher-made template, students created their own website which allowed them flexibility in how they visually documented their process. Students were required to connect their topic or passion with a Global Goal of their choice, which allowed them to look at their topic through a global lens and identify social problems they could potentially design solutions for. Adding a global goal also made it challenging for students to choose questions they were already familiar with, but instead, forced them to see

their passion in a whole new light. For instance, instead of inquiring into soccer, students explored why sports are not accessible to all children in Bogota. In addition, students took the agency assessment in the beginning, analyzed their results and determined specific points in their assessment that they wanted to focus on and improve. They used the agency tracker to help reflect on their progress along the way. For their display, students were given basic display requirements, but were allowed to create and organize on their own using any material they would like. In their presentation, students had to think about the key message they wanted their audience to have and provide a call to action.

6.2. Results for the students

>>> FIGURE 6.1 STUDENTS' PYPx JOURNAL



The inclusion of design education along the PYPx fostered the development on agency in the experimental group in several ways. The following are the different areas and stages of the project were this was evidenced for the students.

6.2.1. Inquiry questions chosen by students

All the students in the experimental group had more than one inquiry question and all of them were related to a Global Goal. Choosing a Global Goal enabled students to widen their perspective and view by addressing global issues and making connections with topics they were passionate about. This connection required critical thinking and the students assessing the impact that their own passions have and becoming aware of the realities of what that looks like in the real world. Which

lead to encouraging them to create and take actions that enable change and raise awareness of global issues within their local community. These are clear examples of how design and agency were embedded in the research stage.

The fact that the students in the experimental group selected inquiry questions out of their comfort zone that aimed for the wellbeing of the local or global communities or addressed real-world problems, shows the growth mindset triggered during the development of the project. Their search for facing new challenges believing in their ability to change the world is evidence that the students developed ownership.

For further extension, please check the examples found in the annexes related to the topics and inquiry questions of both control and experimental groups.

<<< FIGURE 6.2 STUDENTS' PYPX JOURNAL COVER, WHERE THEY MADE A DRAWING REFLECTING ABOUT THE STAGE THEY WERE AT

6.2.2. Comparison of the journals and presentations

The following is a comparison of the additional content found in the experimental group in both the journals and the presentations.

6.2.2.1. Journals' content

The journals are used to document the process of the exhibition. The questions, reflections, actions, planning and in general recording their process and project journey. With this tool, students, teachers, mentors and parents can revise the progress, goal setting, feedback, rubrics and success criteria throughout the process. The journal is owned by the student which also means that it is completely customizable to the students needs and preferences. It is, most of the time, used in their presentation being shared with the learning community.

>>> TABLE 6.1 JOURNAL CONTENT COMPARISON

Student's Journal Content	
Commonalities among the journals in both Control and Experimental groups	**New content found in the Experimental group**
Guide of the approaches to learning and sub-skills with their explanation	Research flow checklist
Having a complete and in depth research regardless the topic	Research criteria checklist
Reflections about students' process	Checklist of requirements for all the project development divided per week
Lines of inquiry	To-do lists for every week
Key concepts	Agency tracker
Related concepts	Customized version of agency tracker
Learner profile attributes focus	Empathy tool related to action
Approaches to learning worked during the project	Action canvas
Central idea	Presentation criteria
Survey planning	Presentation planner
Customized journal cover	Display criteria
	Presentation sketches
	Iterations of surveys
	Iterations of presentation sketches and proposals
	Speech planning
	Iterations of presentation speeches
	Reflection illustration in the cover done every week

According to the findings, the tools and learning experiences used with the experimental group resulted in the production of new content, all of which promotes an extensive contribution to the development of agency in the terms of self efficacy, anticipation, autonomy and intentionality. These were shown with the different success criteria used by students to guide their process, the weekly checklists and planners to help them project and organize their thinking prompting them to consider a systemic perspective. Self regulation within agency, and critical thinking within design in the reflections of the agency tracker, as well as decision making and problem solving when coming up with a plan to complete their to-do list, assists in developing a dimension of agency. Another example is seen in the iteration processes in the sketches, speeches, proposals and surveys. Then finally, students using other forms of communication like sketching and taking ownership by creating action plans is yet another example of students developing agency with their design skills.

6.2.2.2. Presentations' content

<<< FIGURE 6.3 STUDENTS' IN THEIR PYPX

>>> FIGURE 6.3 STUDENTS' IN THEIR PYPX

The final product of the PYPx is expected to be a presentation where the students exhibit the journey of their learning process. Despite the fact that there are many accepted formats for sharing student's knowledge, it is common for schools to choose a sharing event for all the learning community.

>>> TABLE 6.2 PRESENTATION CONTENT COMPARISON

Student's Presentation Content	
Commonalities among the presentations in both Control and Experimental groups	**New content in the presentations found in the Experimental group**
Explanatory texts	Action displays according to the design cycle
Approaches to learning	Interactive displays
Displays with research findings	Interactive activities
Key concepts	Global Goal(s)
Related concepts	Agency journey
Inquiry question(s)	PYPx process display

Student's Presentation Content	
Commonalities among the presentations in both Control and Experimental groups	**New content in the presentations found in the Experimental group**
Learner profile attributes	Stands build by the students
Action description	Clear message (take away for the audience)
Art piece	Call to action
Journals	Question walls
Models	

<<<
TABLE 6.2
PRESENTATION CONTENT COMPARISON

The design and agency components permeated the findings in the experimental group. A clear design cycle component not only clear in the action displays but the general use of design display criteria conferring a visual hierarchy to the whole stand composition. The use of building techniques to construct the stands students sketched, were not only a challenging process for the students, but an empowering exercise that contributed to their self efficacy. Students were required to make several iterations, problem solve and engage in collaborative work in some cases given the magnitude and ambition of some structures. Self regulation and self determination were a constant throughout this process.

Intentionality, anticipation, projection and decision making were evident in the takeaways of the audience as well as the call to action. This was also evident in the interactive displays and activities that also stimulated critical thinking in the audience. The presentation in general showed the development of control, empowerment and communication skills of the students, exhibiting a clear presentation flow.

6.2.3. Students' Semi-structured Interviews

As mention in previous chapter, the interviews for students could no be longer that 7 min. They were performed the day el the presentation and were only conducted to the experimental group. The analysis of the findings, found below, was done according to the students' answers. It not only evidenced that the initial identification and definition of the opportunities, practices and difficulties the students have throughout the PYPx were addressed, but it also gave a glimpse of the role of design education during this process. Finally, it was possible to identify an additional difficulty for the students, related to the complexity of the research.

>>>
TABLE 6.3
FINDINGS SEMI-STRUCTURED INTERVIEWS STUDENTS

Semi-Structured Interview Students	
Question	**Analysis**
1. What was the hardest part of the project?	In general, what presented the biggest challenge for the students was the research, finding reliable sources of information and transforming that information into an essay that connected and answered their inquiry questions. Finding resources that are child friendly, was the most difficult part also for the teachers, who are the ones guiding the students along this process. Another difficulty evidenced was the stands' building process. Having timed classes for construction techniques of the presentation stands with the Design and technology subject can allow the students to further explore their creative abilities and shape their ideas to showcase their projects.
2. What was the most interesting part of your project?	The new knowledge gained during the research stage was the most interesting and relevant part of the project for the student. This prompted them to grow, take action and raise their awareness on how they could take action and contribute to their local and global communities as world citizens. Which leads to the development of critical thinking and changes in their daily behavior.
3. How did you grow as a person? The most interesting thing you learned about you during your process?	Personal growth was present during the whole PYPx process, nevertheless, the meta-cognitive skills the students developed to recognize their goal setting, failure and achievement lead them to be proud of themselves and realizing that their efforts and hard work helped them to grow. This is a true example of the students' growth mindset.
4. Did the agency tool help? Why?	The agency tracker worked as a tool that promoted grounded thinking among students where they were encouraged to constantly self-reflect on whether or not they were progressing, to then adjust their planning accordingly. It helped them organize their thinking and have a prospective view by creating action plans. Also, it helped them with their decision making process by selecting and connecting the skills that could help them complete tasks while developing their agency. For some, this tool empowered them to work on their inner growth, accomplish their goal and push boundaries that otherwise wouldn't have been crossed, and at the same time reflect about their personal process.
5. What advice would you give to the next year's fourth graders?	The students evidenced ownership of their learning journey, being confident about their struggles and achievements, acknowledging the hard work it takes to complete this project. Their positive messages call for self confidence and one's own ability to believe in oneself despite the odds.

6.3. Results for teachers

Raising the awareness of agency development and its importance altered the regular course of the PYPx and the stakeholders involved. In addition doing so by including design education raised curiosities as well as rejections. Fortunately, the results of the development of agency in the experimental group open mindedness in the teachers' perspectives. The following is the analysis of the teachers' perspectives in the semi-structures interviews linked to different areas and stages of the project.

6.3.1. Teachers' Semi-structured Interviews

As mention in previous chapter, the interviews for teachers were from 10-16 min long. They were performed at the end of the school year, and were conducted to the teachers in both control and experimental group. The analysis of the findings, found below, was done according to the teachers' answers.

There was a noticeable difference related to the understanding of the purpose of the PYPx, the role and importance of agency development, and the impact and contributions of design education for the development of agency during the project.

Regarding teacher's knowledge about agency, there was a perceived need teachers have in relation the meaning of agency and how to foster it. This is evidence of a difficulty and also an opportunity to take action towards supporting teachers.

The importance of having clear understanding about what agency, is directly related to how teachers can identify within their learning experiences where there is room for agency, and how they can create better opportunities for students to develop it. Having in mind that within the PYP, agency should be related to personal growth despite the impact and action selected for the project.

The fact that the teacher of the experimental group improved her understanding about agency through the participatory design dynamics, in this case the co-designing activities that, from design methods, purposely aimed for agency development in different stages of the project. This exercise, resulted in her seeking the personal growth of her students, creating opportunities for them to be agents, even after the project was finished. This is considered evidence that the development of agency was supported with participatory design dynamics.

It was interesting the teachers in the control group identified as agency proficiency, design skills like critical thinking, problem solving and creating solutions. In General, when teachers are thinking about agency proficiency, they relate it the diverse set of skills that are part of agency, which evidences that there is an excellent foundation to better extend the understanding of the agency components and the different ways we can apply it in the classroom.

Teachers know about the different types of action, and that the impact does not mean that, it needs to be extrinsic, to be meaningful. This is evidence of the acknowledgment, from the teachers side, that the main stakeholders that the actions benefit, can vary in diverse ways. Also they all connect this to agency, and they seem to be aware of the connections between agency and ownership, in both personal sphere, and empowerment, in the social sphere. Once again, a great foundation for growth.

All the teachers found a clear connection with agency and action. Stating that in order to successfully develop an action, it is necessary to have agency. It is important to note that the learning community's support is needed to successfully support students' actions.

Having one to one feedback, the Cornel chart and the agency tracker were the tools that helped teachers the most. It is important to acknowledge the importance for agency development, the self reflecting exercise guided by the agency tracker. As well as the possibilities of applying it to a wider range of learning experiences.

> *"The agency tracker itself was allowing them to have choice, the tool itself had choice, voice and ownership in the way it was designed. In addition to that the kids were able to document their process."*
>
> **Rachel Holtketter**

Regarding the positive and negative aspects of the project development, the level of achievement and furthermore the student's engagement, was a breaking point for the teacher's perspectives when reflecting about what went well and what went wrong. It was clear that teachers had a time crunch to complete the project, but also the lack of skills and preparation that the students required for the development of this project was evident too. The teachers' approach to confront these constraints was more connected to their teaching style. Nevertheless, there is still room for improvement and agreements allowing adaptation to the unique way each teacher teaches, by agreeing on a common understanding on what teachers want the students to achieve.

The identification of the need for this type of agreements to happen among teachers, is one of the practices and opportunities that also will benefit the development of agency and the expected extent of its development. The other practice and opportunity is the criteria unification. Which is a basic need to ensure all students are receiving the same growth opportunities within the development of the project

despite the teachers' teaching style. Maybe opening the conversation of the non-negotiables, the expectations, stages of the project and levels of achievement despite the teaching style could build up a co-designed understanding of what the project is.

<<<

TABLE 6.4
FINDINGS SEMI-STRUCTURED INTERVIEWS TEACHERS

Teachers' Semi-Structured Interviews		
	Analysis	
Question	Control Group	Experimental Group
1. What is the purpose of the exhibition?	The teachers concur that the PYPx is a project where the students demonstrate proficiency in the different types of skills acquired along the PYP. It is passion led and it is related to their academic achievements.	The teacher thinks that the PYPx is the evidence of the personal growth process where the students apply the approaches to learning, to develop agency, which are the skills they have acquired along the PYP. It is a project where the students have the freedom to choose a topic and build their own pathway of development.
2. What is agency?	The concept of agency for the teachers is related to a person's ability to make decisions and their ability to take action upon those decisions.	The teacher that volunteered for the experimental group had a well rounded understanding of the concept of agency.
3. What does agency look like for your class?	Teachers relate agency to student participation or follow through with their action in order to make an impact.	The teacher has a deeper understanding of how agency should look like in a classroom. She acknowledges the need for improvement and related agency to give the students opportunities to develop it by building up confidence in themselves, their independence, and constantly encouraging them to self-reflect and take action.
4. What would a proficient student in agency look like?	Teachers identified that critical thinking, problem solving and creating solutions are found in proficient students with agency. Also decision making and reflection are desirable.	The teacher associates agency proficiency to self reflection and taking ownership. Also an agent student should be independent and confident in themselves. But above all she thinks it is a personal skill.
5. What is action and what is its importance?	Teachers relate action to engaging in real situations, and that if can have different types of impact. It involves transferring knowledge and using the information from their research.	For the teacher taking is related to solving problems were one can choose the magnitude of the impact. For her, it is important because through action students build confidence and self-value.
6. Do you think that action is related to agency? How?	Teachers relate action with being agents of change, and that it is based on a type of agency.	The teacher connects them stating the development of agency is what helps students follow through their action.

>>>

TABLE 6.4
FINDINGS SEMI-STRUCTURED INTERVIEWS TEACHERS

Teachers' Semi-Structured Interviews		
	Analysis	
Question	Control Group	Experimental Group
7. What is the most important tool you used during the exhibition?	Whereas one teacher one teacher recognizes that having one-one conversations with the students is the most useful tool, because all the projects are different. The other, selected the use of Cornell notes in the research to help student organize their research.	The teacher selected the agency tracker as the most useful tool, because it allowed students to be more conscious of their agency development process, raising awareness about their own growth and what they need to do to achieve their goals.
8. What went well and what went wrong?	The completion of the project, student efforts ad students feeling proud of themselves was what teachers identified as what went well. And what went wrong was the lack of quality on some student work and the lack of consistency in the use of tools among the teachers.	For the teacher the answer is the same, the selection of challenging topics, driving or slowing down students progress. But she highlights the hard work on student growth.
9. What is the biggest area of improvement of the PYPx?	Teachers selected the unification of criteria, starting to use tools and develop skills required for the PYPx, earlier in the year, and the implementation of the tools designed during this study.	The teacher selected consistency among the grade level not only for the teachers but for the students.

6.4. Results for Agency

After applying all the different design tools to support the develop of agency, the results of the measurement of agency evidenced the an increase in the children's agency level. The following is the analysis of the three areas of improvement that were evidenced.

6.4.1. Agency level results analysis before and after the project

The following graphs support the general analysis of the results showing a portion of the total results of the survey. The analysis under each graph explains the areas of development and growth of student agency prior to the start of the project contrasted with the results once the project is completed.

<<<
TABLE 6.5
FINDINGS AGENCY
LEVEL RESULTS

ESAGE Agency Level Results Analysis

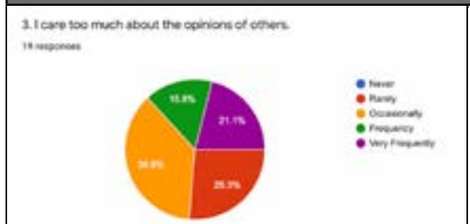
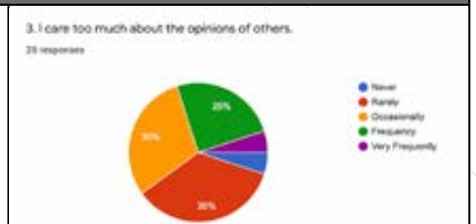
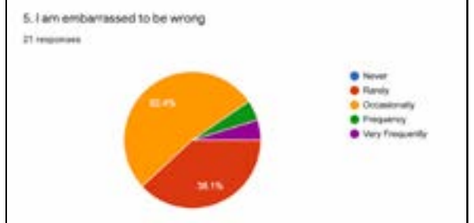
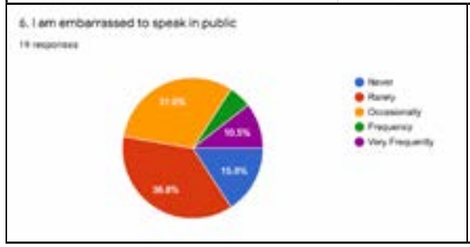
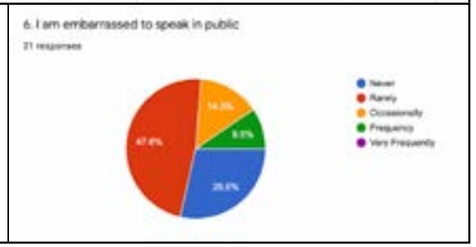
Previous PYPx	Post PYPx
VOICE	
	
Q3: Caring about the opinions of others The comparison between both measurements indicates there is an increase in the percentage of "rarely" of almost 9%, plus an additional 5% of never that wasn't in the first measurement. This shows that: • Students believe in themselves • Gained confidence about their self-image • Students improved their critical thinking skills	
	
Q5: Being embarrassed to be wrong The percentage of "frequently" lowered to 30.6% whereas "rarely" increased to approximately 8%, and "occasionally" 16%. During the PYPx students needed to make several iterations of many of the different tasks they needed to complete. This indicated that: • Students were constantly making practical evaluations of the outcomes and achievements • They getting used to iteration process that leads to continuous improvement • They started to recognize that being wrong is an important part of their learning journey	
	

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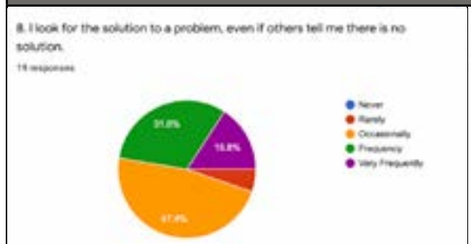
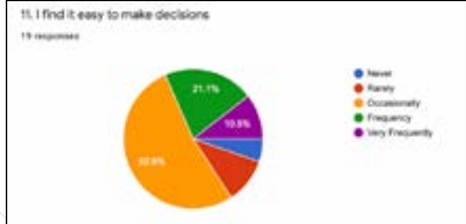
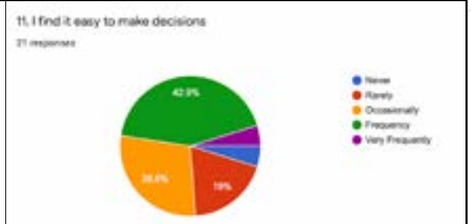
TABLE 6.5
FINDINGS AGENCY
LEVEL RESULTS

ESAGE Agency Level Results Analysis

Previous PYPx	Post PYPx
Q6: I am embarrassed to speak in public In the beginning, almost 50% of the students felt embarrassed to speak in public occasionally to very frequently. Afterwards, approximately 75% of students rarely or never felt embarrassed to speak in public, this displays: • Students increased in their communication skills • The voice dimension of agency improved as they feel more confident expressing themselves in public • Students felt more confident in their ideas and were not afraid to make mistakes.	
CHOICE	
	
Q8: I look for solutions to a problem, even if others tell me there is no solution. Throughout their PYPx journey, the amount of students who very frequently or frequently look for solutions increased by approximately 20%. This demonstrates students are: • Becoming more proactive to problem solving • Establishing a growth-mindset • Willing to strengthen their critical thinking and creative skills	
	

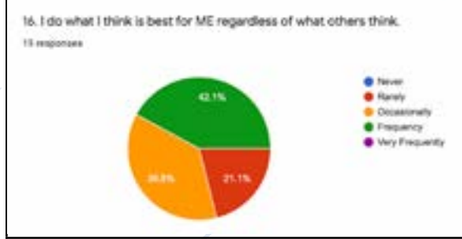
ESAGE Agency Level Results Analysis

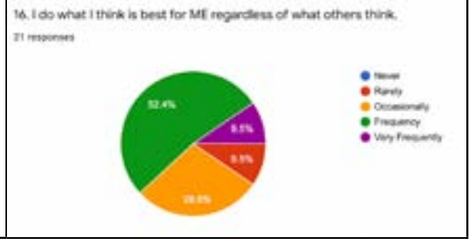
Previous PYPx	Post PYPx

Q11: I find it easy to make decisions.

Reflecting on the differences between "occasionally" and "frequently," students went from 52.6% to 28.6% "occasionally," and 21.1% to 42.9% "frequently" showing that the 20% decrease in "occasionally'' was later added to "frequently." This demonstrates that students:

- Felt more confident in their ideas and their understanding of the PYPx process and expectations.
- Became more independent in their thinking, and didn't rely on the validation from teachers or mentors.
- Are becoming more comfortable understanding their own needs as a student and choosing how they learn best.



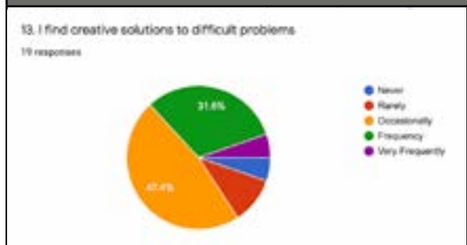


Q16: I do what is best for me regardless of what others think

The results in the percentage of "frequently" increased approximately 10% and the percentage "very frequently" started to appear adding 9.5% more. Being a self directed project the students were in charge of selecting their pathway in every aspect. This demonstrates the students are:

- Responsible for their learning and taking ownership of it.
- Have a projective vision of what they want to accomplish in the near future
- Made conscious choices of the outcomes they wanted to achieve

OWNERSHIP



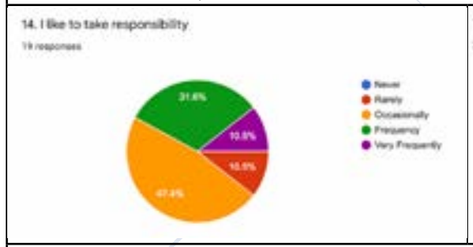
ESAGE Agency Level Results Analysis

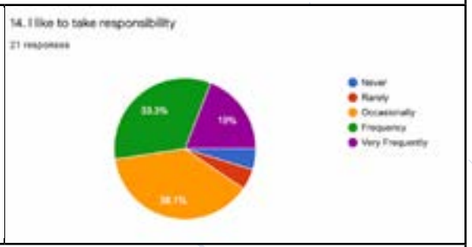
Previous PYPx	Post PYPx

Q13: Find creative solutions to difficult problems

The percentage of "very frequently" increased by approximately 12% resulting in both "frequently and very frequently" adding up to 57% of the students. Also the "never" percentage disappears. The PYPx presents a challenge for all the students where they need to display critical and creative thinking skills all throughout the development of the project. The students evidenced that:

- They were exposed to challenging situations where they push through successfully
- They used problem solving skill to face difficult tasks
- The made systemic connections that lead them to creative solutions

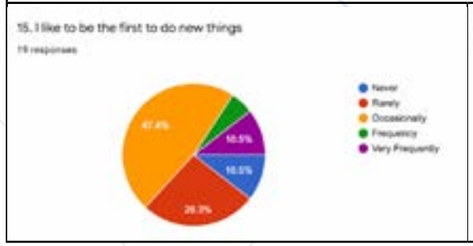


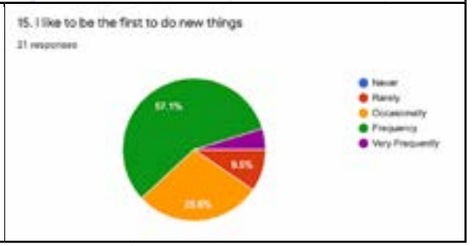


Q14- I like to take responsibility.

As PYPx is meant to be a student-led culminating project, students were given plenty of opportunity to be responsible for their own learning and progress. Looking at the data and focusing on "very frequently" and "never," it can be seen that "never" was not chosen in the beginning, but was in the end for 6% of students. In addition, "very frequently" went from 10.9% to 19%. Although there were students who were more enthused about taking responsibility, there were also students who were not. This displays:

- Some students enjoyed having a voice and choice in their learning. That they potentially felt valued and proud of what they accomplished.
- Other students did not enjoy having more independence in their learning, and possibly felt they needed more support throughout the PYPx process.





ESAGE Agency Level Results Analysis	
Previous PYPx	**Post PYPx**
Q15- I like to be the first to do new things. This question relates to taking risks and coming up with original ideas. In the beginning, "occasionally" and "rarely" combined was approximately 75% of the students. By the end of PYPx, "occasionally" and "frequently" combined was approximately 86%, most of which was in "frequently." In addition, no students chose "never" in the post PYPx assessment. This shows: • Students are more willing to take risks and make mistakes • Students' level of growth-mindset has improved because they are willing to find new solutions or apply new ideas, even when mistakes are possible. • Students' self-esteem and individuality has increased because they are willing to create their own path, instead of following others.	

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TABLE 6.5
FINDINGS AGENCY
LEVEL RESULTS

6.5. Results for Design

The inclusion of design education along the PYPx encourage the students to fostered design thinking. This lead to the development on agency in the experimental group as shown in the previous analysis. Both teachers and the school acknowledged the importance of including design education in projects like the PYPx, up to the point to make the official request to include the design subject during the development of the PYPx.

6.5.1. Design Thinking throughout the development of the project

The variables between design and agency were determined according to the connections found on the reference framework. Awareness of those variables allowed them to be visible throughout the project. It was also clear that there were multiple connections and contributions of design education that supported the development of agency for the students, as shown in the study results. The following are those connections, as stated in Chapter 4.

Connections between Design and Agency	
Agency	**Design**
Voice dimension	Communication
Choice dimension	Decision making
Ownership dimension	Problem solving

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TABLE 6.6
DESIGN
AND AGENCY
CONNECTIONS

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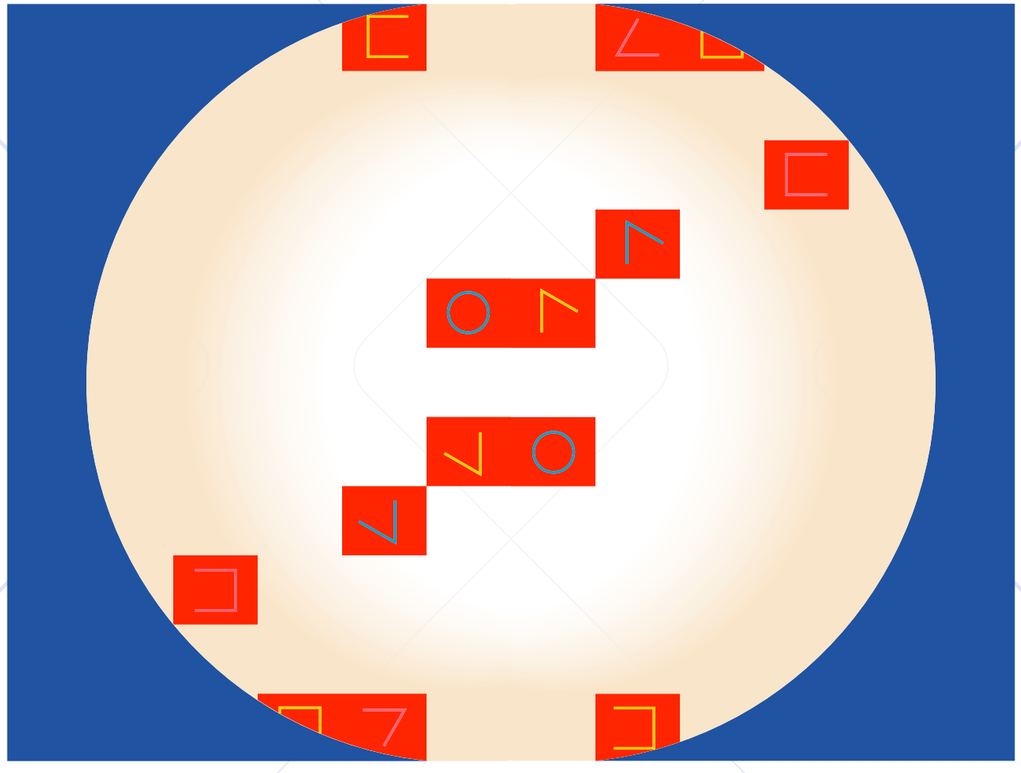
TABLE 6.6
DESIGN
AND AGENCY
CONNECTIONS

Connections between Design and Agency	
Agency	**Design**
Iteration element	Iteration nature
Prospective element	Projective nature
Practical evaluation element	Critical thinking nature

In addition to how strong the connection was between the variables above and the reference framework, it was incredibly interesting that all of the variables worked iteratively and, sometimes simultaneously, to support each other. Not by breaking the initial connections, but by creating interconnectedness among them, almost like creating a web frame with multiple linkages.



Chapter 7

7. Conclusions and Recommendations

The following conclusions are presented according to the research question, the aim of the study and the objectives.

7.1. Conclusions

Explore how the implementation of participatory design dynamics with the educational community IB and the inclusion of design education within the PYPx, contribute to the development of agency in the grade four students.

> Identify opportunities and practices that promote agency development in the PYPx and how teachers, teaching materials and curricula support it.

This study was able to identify different opportunities and practices that promoted agency development in the PYPx. The practices that are currently in use, were not designed thinking about the development of agency but they respond to the set of requirements the project has. This is why, currently more that practices is more grounded to talk about opportunities that can promote agency not only in students but also in teachers. Along the project there are plenty of opportunities to develop agency, for example: choosing a topic, choosing a mentor, planning an action, teachers agreements, curriculum consistency. In the control group the development of agency was a sub-product of the regular activities the teachers do with the students, nevertheless there is no acknowledgment nor reflection, in relation to agency, upon those activities. Therefore it can be concluded that there are no intentional practices for agency development, but there are plenty of opportunities along the PYPx.

> Define which opportunities, practices and difficulties the students and teachers have throughout the PYPx and how they can be improved by design education.

On one hand, the biggest room for improvement found was the lack of common knowledge about agency among teachers and students. Therefore a starting point for both teachers and students can be teaching and learning about agency in a concrete manner. Developing activities exclusively planned for agency development. And having into account the results, all the connections and the support provided by design education it is wise to conclude that the inclusion of design education during the project will support the development of agency of the students. Of course, there will need to be several adjustments for the proposal to be fully implemented the next academic year but the expectation built up upon the teacher is currently making those changes to be addressed.

Finally all the tools, used with the experimental group, were co-designed exclusively for the development of agency in the students, and they were applied throughout the majority of the project and they were coming from design.

> Measure the impact of including design education in the PYPX in the development of agency compared to the traditional way of developing this project.

There was evidence of the development of agency and the impact of the inclusion of design education in the PYPx in the experimental group in comparison to the control group. The depth, reflections and actions taken during the project in the experimental group not only allowed students to understand the reasons, the aim and the benefits of developing this project, but also, sparked them to be self-driven about their own process. The impact was not only reflected on the students but also on the teachers, by building their awareness and interest about the importance of agency development.

> In what way does the implementation of participatory design dynamics with the educational community IB and the inclusion of design education within the PYPx contribute to the development of agency in the grade four students?

The participatory design dynamics were necessary for two main reasons, one, the stakeholders who actually know how the PYPx "system" works and can identify any opportunities and failures are the teachers. Two, through participation the awareness towards agency was arisen and expectation and curiosity about the connection between design and agency was created. Three, the co-design activities not only allowed to build appropriation of the tools, but the input from the teacher, allowed the tools to be more meaningful for the students and keep being aliened to the project requirements.

In this study the design education methods were used to foster design thinking in the students, focusing on the connection elements between agency and design to intentionally contribute to the development of agency. By using the tools and repeating the design cycle several times, the students were able to experience the systemic view commonly used in design, but in this case applied throughout all the stages of the project in and out of the design classroom.

The students experienced a wider range of the iterating process throughout the stages of the project, specially how different variables are addressed and connected when solving the different problems the students faced. It is important to say that the students had design classes that supported the project development, where

part of the content was taught in the units of inquiry with their group director and the other part in the design class, and in addition, the product of the design classes was shared with the teacher added to the requirements of the project.

In other words, by exposing the students to projects, like the PYPx proposed in this research, that embed design focused on agency, besides contributing to it's development also expanded and erased barriers that allow room for cognitive and social growth of the participants.

7.2 Contributions to new knowledge

How design skills are transferred to other activities

From an early stage we started to realize how design can benefit and complement the agency development of the students, these improvements were evident in the students' attitudes, actions and work. The design framework and design thinking can be used for optimal decision making as a method that allows to consider and assess multiple criteria within the students' context and therefore allowing them to come up with multiple solution ideas and select the best one among them. These skills have the potential to be applied to any area of the human experience.

7.3. Recommendations

For future projects or extension of the current one, students participation would expand the possibilities for improvement. It is important to acknowledge that teachers have an important influence and role on how students embrace the process. It is within the teachers to share the control over the process and allow motivation and autonomy to take place.

7.3.1. For the school

At the moment, the central idea, of the unit of inquiry, for all students is the same, "Passion leads to further inquiry, stimulates learning and empowers the learner." Using the word "Passion" gives the impression that students only need to choose a topic they like or are passionate about, but not necessarily curious about. This limits the topics they select and limits the depth of the inquiry, as most of the time, students are choosing topics they already have knowledge about, instead of topics that lead to more growth and depth about themselves and the world around them. In the experimental group, students created their own Big Idea and it was a requirement to connect with a Global Goal, which required students to go beyond the surface and into more real-world related inquiries within their topic.

The suggestion for the next PYPx would be to allow students to create their own central idea within the transdisciplinary theme. Students can unpack the description of the theme and find personal and global connections to add depth to their inquiry.

One of the biggest struggles was completing the research. Therefore, it is recommended to create tools to help both students and teachers in the research process to help them navigate through this stage. For instance, finding resources that are child friendly and organize notes using clear graphic organizers could prevent stress both teachers and students tend to undertake.

In general the use of tools would have a more positive and meaningful impact, especially if they were not only shared and used by other grade levels, with their respective scaffolding process, but also if they were used since the beginning of the year. This would allow the students to gradually build the required skills to successfully develop PYPx throughout their entire schooling if there were more vertical and horizontal alignment throughout the curriculum, and more explicit opportunities for students to develop agency.

7.3.2. Embedding Agency within Curriculum

Eventually, the intention would be for students to discuss agency from Grade 1-3, and scaffold the agency tracker according to the grade level and with proper vocabulary.

From the beginning of the academic year, students should participate in the agency assessment to determine where they stand in terms of voice, choice and ownership. Teachers should introduce the agency tracker as a tool for students to set goals and begin working on developing their agency. This will allow students to build vocabulary and understanding that is part of the process when developing as a learner, and an objective throughout their schooling. Eventually, constant reflection and conversation about personal growth will become a way of being and strengthen their PYPx journey, and lifelong learning in general.

How can agency be embedded within Design in the other grade levels?

Design can be embedded using the same linkages discovered before, but, as all the design skills developed during the design curriculum, they need to be scaffolded and it would be required to teach the students about agency for those connections, not only to be visible, but meaningful. As seen before, all throughout the design process, students have a clear connection and many opportunities to develop agency, and they do. Nevertheless, if there is not a clear understanding of the purpose and connections, despite the fact the students develop agency, they are not conscious of it. Therefore the metacognitive component of agency may not be present. As

explained before in the reference framework, in order to have control and self-efficacy of one's actions is to recognize them.

7.3.3. Professional Development for Teachers

According to the research, teachers have a general idea of what agency is, but struggle with how to apply it in their classroom or find authentic ways to create opportunities for students to develop their own agency. If students are to improve their own agency skills, a community of educators who are knowledgeable about agency and confident within their own agency must be created. This can be done through agency workshops and collaborative meetings to support teachers and their teams in identifying realistic approaches to connect it to curriculum, and differentiating it based on the way each classroom and grade level is organized and the learning needs of their students.

Currently, there are many moments of agency being developed throughout classrooms as it is a normal human ability, however, those moments are not consciously done so students are not aware they are building their agency at all. One of the first steps of professional development, after ensuring all teachers understand the meaning and types of agency, is encouraging teachers to reflect on their classroom routines and organization to find moments of agency already happening, and discussing how they can make those moments more conscious. From there, teachers can then begin brainstorming additional ways to build agency in their classrooms. Having common vocabulary and understanding among teachers will help build consistency within students and make the skills they are developing in one grade level transferable to the next. In addition, it will also create a growth mindset among students as they will realize they are continuously developing agency and growing as a learner, which will eventually assist students in building social agency to apply to a more complex scenario.

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9. Annexes

In this section of the study can be found information to extend and complement depth and details of the study. It is be divided according to the chapter that belongs to.

9.1. Chapter 6

9.1.1. Inquiry questions chosen by students

The depth and global mindedness that guided the research and project of the students guides them in potentially taking action and developing social agency, demonstrating their way of thinking and acting. This is the aim of all IB programmes for students to demonstrate and develop international-mindedness. Consequently, this is part of the main goal of the PYPx. As mentioned in a previous section, this project is where the students exhibit their acquired attributes of the International Baccalaureate (IB) learner profile. To understand how there is evidence of depth and global mindedness in the students' inquiries, it is necessary to include the IB's definition of the learner profile attributes in the following analysis as they are used as a source of measurement.

- Knowledgeable: We develop and use conceptual understanding, exploring knowledge across a range of disciplines. We engage with issues and ideas that have local and global significance.
- Principled: We act with integrity and honesty, with a strong sense of fairness and justice, and with respect for the integrity and rights of people everywhere. We take responsibility for our actions and their consequences.
- Open-minded: We critically appreciate our own cultures and personal histories, as well as the values and traditions of others. We seek and evaluate a range of points of view, and we are willing to grow from the experience.
- Caring: We show empathy, compassion and respect. We have a commitment to service, and we act to make a positive difference in the lives of others and in the world around us.
- Risk-takers: We approach uncertainty with forethought and determination; we work independently and cooperatively to explore new ideas and innovative strategies. We are resourceful and resilient in the face of challenges and change.
- Balanced: We understand the importance of balancing different aspects of our lives (intellectual, physical and emotional) to achieve well-being for ourselves

and others. We recognize our interdependence with other people and with the world in which we live.

- Reflective: We thoughtfully consider the world and our own ideas and experience. We work to understand our strengths and weaknesses in order to support our learning and personal development.
- Communicators: We express ourselves confidently and creatively in more than one language and in many ways. We collaborate effectively, listen carefully to the perspectives of other individuals and groups.
- Thinkers: We use critical and creative thinking skills to analyze and take responsible action on complex problems. We exercise initiative in making reasoned, ethical decisions.
- Inquirers: We nurture our curiosity, developing skills for inquiry and research. We know how to learn independently and with others. We learn with enthusiasm and sustain love of learning throughout life.

The following are 11 examples of similar topics and their inquiries from the experimental and the control groups. There are some additional examples of both groups that did not have similar topics for comparison but that can expand the understanding of the difference between both groups.

Topics and Inquiry Questions				
Control		Experimental Group		
Topic	Inquiry Question	Topic	Global goal	Inquiry Question
Cats	How do cats affect our social, emotional and physical health?	Pets (Caring for them and Animal Rights)	Quality Education	How can an owner understand their pets social and emotional needs? What are pet rights and why should we care?
Soccer	How does exercise influence your health?	Sports	Reduce Inequalities	Why don't poor communities have access to sports? Who is responsible? How can wealthier communities better support poorer communities in accessing sports?

Topics and Inquiry Questions				
Control		Experimental Group		
Topic	Inquiry Question	Topic	Global goal	Inquiry Question
Soccer	How has soccer evolved through history?	Soccer	Gender Equality	How did gender inequality start? How has gender equality improved in soccer? How can we create true gender equality in sports?
Football	Will money change football, and if so, how will it change it?	Sports	No Poverty	How have drugs impacted sports? How can all communities have more safe access to sports?
Golf	How can golf help you control your emotions?	Golf	Reduce Inequalities	How do people with disabilities play golf? How can golf improve so it is equal? How has golf changed the world?
Sports / Horse Riding	How has horseback riding evolved through history? How does horseback riding impact emotional and physical health?	Sports	Good healthy and wellbeing	How do sports affect your social, emotional and physical wellbeing? How can everyone find a sport that is right for them?
Scouts	How are scouts similar and different around the world?	Scouts	Life on Land	What does it mean to be a Scout? What are the benefits of being a scout? What would happen if everyone thought like a Scout?
Video games	What are the effects of video games for kids?	Video Games	Peace and Justice	Why are video games violent? Can violent video games impact people's actions in real life? How have video games changed the peace in the world?
Fashion	How did inequality and gender equality affect the history of fashion?	Fashion Design	Responsible Consumption and Production... Life under water	How is the fashion industry causing damage to the environment? How can recyclables be used in fashion? How can people make better choices about their shopping?
Fashion	How have horseback riding gadgets changed through time developing styles?	Endangered Animals / Fashion	Climate Action, Life under water, life on land	What are the causes of endangered animals in the ocean? How does the fashion industry impact animals in the ocean? How can fashion be used to help animals on the ocean?

Topics and Inquiry Questions				
Control		Experimental Group		
Topic	Inquiry Question	Topic	Global goal	Inquiry Question
Climate Justice	What is the influence of young activists in the world?	Global warming	Climate Change	How does carbon dioxide affect global warming? How does our everyday life impact global warming? How can governments be more responsible about global warming?

Additional topic examples Control group	
Topic	Inquiry question
Design & Architecture	How has technique and design for architecture evolved over time?
Dance	How has dance impacted artists?
Drawing	How have painting materials and techniques changed through time?
Kawaii Culture	What might Kawaii culture affect your lifestyle?
Violin	How has violin evolution impacted humanity?
Art	What is the impact of having your art judged?
Olympics	What is the impact of the Olympics?
Cars	What is the impact of cars in the world?

Additional topic examples Experimental group		
Topic	Global Goal	Inquiry Questions
Deforestation	Life on Land, Climate Change	Why does deforestation happen? How does deforestation impact the world? What role do governments play in preventing deforestation? What daily decisions can we make to help prevent deforestation?
Sustainable Tourism	Sustainable Cities	What is sustainable tourism? How can tourism impact a culture? How can countries apply sustainable tourism to protect their environment?
Earth Health	Climate Change	What are the main environmental issues the Earth is facing? How has global warming changed the world? How does global warming affect rich countries versus poor countries?
Ocean protect and DT (design and technology)	Life Under Water / Climate Change	How is the ocean being damaged? What are the roles and responsibilities governments play in regulating illegal fishing? What changes can people make to protect the ocean?(Design)
Stereotypes	Reduce Inequalities	What is the purpose of stereotypes? How can stereotypes impact your daily life? How can stereotypes be prevented?

Additional topic examples Experimental group		
Topic	Global Goal	Inquiry Questions
Racism and Prejudice	Reduce Inequalities	How does racism and prejudice impact everyday life? Why does society pressure people to be the same? How can we reduce racism and prejudice in society?
Travel	Reduce Inequalities	How do people choose where to travel? What can we learn from traveling? How can traveling help us become more compassionate?
The brain (taking care of it)	Good Health and Wellbeing	How does the brain impact our social and emotional health? How can we keep the brain healthy?

9.1.2. Presentations' content - IB recommendations

As explained before, the final product of the PYPx is expected to be a presentation where the students exhibit the journey of their learning process. The IB recommends the following options:

9.1.2.1. The exhibition could include

- PYP exhibition journals by students, with the opportunity to articulate and present their learning processes and progress
- Learning products, such as dioramas, songs, poems, dramatic performances, and so on.
- Learning through a variety of languages and modalities.

There are also infinite possibilities to make the learning process visible. Students, in collaboration with mentors, may use existing—or develop new—tools, artifacts and strategies to further explore and present issues and opportunities.

9.1.3. Transcription of interviews (Students)

The following are the interviews performed to students. They were named S1,S2 and so on. Answers can be found after each question and it is important to clarify that the questions in the interviews conducted to students were all open-ended questions used to collect qualitative data.

1. What was the hardest part of the project?

- S1: the most difficult thing was to research about compassion and my thick questions because I didn't know what to put and the paragraphs
- S2: It was the research because there were a lot of things to do there, it was really stressful because of the time and we needed to complete as many things as possible at the same time.

- S3: The research, because I looked for a question and I found other information so it was difficult to find the response of the question.
- S4: The research because for me I find it difficult to do research, because sometimes I don't find so many sources, or the information is not that good or things like that. So for me the research was really difficult but I always had help from others so that made it easier.
- S5: Writing the paragraphs, because I had to erase them and write them again
- S6: I had a lot of difficult parts, but the most difficult part was doing the research because sometimes I didn't get the information I wanted so I had to look everywhere but I didn't find it.
- S7: Making the questions, because sometimes I needed to change the thick questions because it didn't connect with the first thick question, so I needed to change and change and change. With Mr Jaime and Ms Rachel we were in the library of Bach when we found out about stamina, and I decided that's a good one for both of them to connect.
- S8: The animation, the action took a long time and the research paragraphs and the research itself because I didn't know which website was good or not because Ms Rachel said " .org works best" but a lot of them were .com, and I talk to a professional and he says that those ones are alright, just check. So it was pretty difficult. Paragraphs was very difficult too because you have to summarize everything into one big paragraph
- S9: My most difficult part was building all these, it took me a lot of time, but also researching, because I had to find good resources and I had to find information that really answered my question so that was the hard part.
- S10: I think building the tunnel, because it was so time consuming, not only the painting but also the sawing but I really liked how it turned out.
- S11: I would say that the hardest thing of my project was first, doing the cornell notes, then put it all on researching and put all my information in there, and then pass it to my research document, and then pass it to my paragraphs, and then pass it to my website, but I think the hardest was passing the research document to the paragraphs.

2. What was the most interesting part of your project?

- S1: I want to share my information to other people because I'm not good at sharing information but when I started working on my speech I started to get better.
- S2: How actually women are protesting in a strong way but pacifically, even here a mom took a little girl to protest so she could be aware of the problem and also the pay gap, how big the actual pay gap is and how men actually don't believe that women have power. For example some boys came here to ask me, "Is gender equality being feminist?" And I said "Yes". For them feminism is being more towards the girl and feminism is actually believing that one should have the same power as men.
- S3: That didn't know that 2016 was the hottest year, I thought that every year was hotter and hotter. So I felt that last year was going to be the hottest.
- S4: That we all are racist somehow, because I didn't know that for me that had a great impact when I researched that.
- S5: That there are many ways to solve zero hunger and one of them is soccer
- S6: That fashion is now responsible for all of that and that it is the second most polluting thing in the world, because I thought that fashion was just creating things and nothing was happening but now I know that.
- S7: The research because I saw many different things and it was like crazy
- S8: It really surprised me how governments use sustainable cities as advertisements for the things that they are making which is mind blowing.
- S9: The most interesting thing I learned was how people use people to fish, so like they become slaves.
- S10: I think that the most interesting thing that I learned was really often because I was just researching about 2070 to see what I could put in my tunnel and I really thought it was interesting that there are 3 billion people would live in states over 59° Fahrenheit of temperature
- S11: I think that the most interesting thing that I learned about my process is that when I was researching, a part that I read about social media and how it impacts to the brain and that was for me very interesting, because it told that it damages you and makes your brain is excited when you talk about your own things in social media so I think that was the most interesting part.

3. How did you grow as a person? The most interesting thing you learned about you during your process?

- S1: That I can know many things about traveling and I can be more passionate about traveling, so I can look at more things when I travel and I can be more focused on them.
- S2: I grew definitely by being more opened minded because at first I just thought that gender inequality was the women didn't have as much power but it actually was how they aren't getting paid well, how they have to walk 30.000 miles a year and stuff like that, so it is very mind opening.
- S3: I feel that I can choose complicated topics and work through them.
- S4: I grew as a student by being more open minded with this process, because this made me open my eyes to new ideas. I thought all the world was perfect but now I know that it isn't true.
- S5: I grew a lot as a student and of knowing about football and I got a lot of knowledge about football and I accomplished my goals I learned that I could accomplish my goals if I do a lot of effort

- S6: I was not caring about the environment when I started doing this but now I care a lot about doing that and saving everything, picking up trash everyday, being conscious about what I buy and if I will use it or if I will throw it. So I think I grew in that. That is one of the most growing things.
- S7: I grew because I developed myself because I want to be a soccer player, I developed myself by not getting into doping, because that could give me heart disease, deph disease and a lot more.
- S8: Well one, now I know how the daily life I live in is actually how it is made of, so every day walking in the local community that I live I know what is what, how I can save energy, how I can reduce the transportation and pollution. So it kind of informs you a lot, the PYPx process informs you. And the PYPx project itself.
- S9: I grew as a student by learning more information and like creating new ways to show my research.
- S10: I think I grew, because I'm a better person because of the exhibition, because of the agency tracker and I think I really push myself to do not only the easy thing but also the hard thing as well and yeah.
- S11: With all this process it makes me learn how to research and present to people about my project, and also like first I didn't know a lot of things about the brain and because I researched about it makes me know more so It makes me grow that I know more about the brain.

4. Did the agency tool help? Why?

- S1: For my agency journey, I wanted to create a to-do list with all the little works I was doing realistically so focused and neat, so I used a timer for each task so I can do it quickly. I will write faster so I can start concentrating more and do more things.
- S2: Yes, it was very useful because I could see that it is more like a reflection. At first I thought let's do this to get rid of it but after I did this I noticed that It actually helped me grow and the more I do it, it helped me be more reflective and be aware of what I've improved and what I need to improve.
- S3: Not really, no
- S4: I would say yes, because it helped me to be more confident in my ideas, because that was my goal and I think that I accomplished it very well.
- S5: Yes, it helped me to accomplish the tasks
- S6: Yeah it did, I make my own decisions now. Because at first I had to ask Ms Rachel if this was right, if this was wrong, so I think that was really helpful because now I make my own decisions every time.
- S7: Well it helped so-so, because it helped me to show my plans to other people and to show my improvement so people could know how I am. I followed my plans, even these two that took me a lot of time researching but it made me work in my presentation

- S8: It was kind of like the note taking of growing up, like the questions you just asked me. It was kind of a note taking of what I learned, how I grew up. I have a question:" Why are emotions part of PYPx? The agency?"
- -Researcher: Why do you think that is important?
- S8: Because I thought the PYPx was just a big project so I can get into fifth grade, but why the agency journey?
- - Researcher: What do you think is the goal of the exhibition?
- S8: Well I have heard that it is for students to grow up, right?
- - Researcher: So why do you think agency would be important there?
- S8: That's true, yeah. So, to be more mature, ah, that makes sense
- S9: A little, it helped by helping me express my emotions and my feelings.
- S10: I think it helped because I actually had a goal, maybe before I was just trying a big part but maybe just one small detail point really helped me
- S11: Oh yes, it helped me a lot because, first I needed a lot of help in my research, but thanks to the agency journey with all the things that I proposed to do makes me work very hard on my research and focus on everything

5. What advice would you give to the next year's fourth graders?

- S1: Don't be scared about it because it's more to have fun and share more information so they don't have to be nervous.
- S2: Be confident about yourself, just do as quickly as you can the work, also be open minded and be reflective.
- S3: If they can, choose a complicated topic because it can be better the display of things.
- S4: I would say that be relaxed because all of these is like really cool and you don't need to stress too much about it
- S5: That they put a lot of effort in their PYPx because if you forget and don't do work at your house you will have to work in vacation or in the weekends to catch up with that
- S6: That this is a really great project, that you have to listen to your teacher when she tells you something. Ms Rachel was like " But why this and why the other" because she's done this a lot of times and she is right when she tells you something is wrong about the facts.
- S7: To get concentrated in which topic you are really passionate about and also in which questions you are really interested because it was a problem that happened to me. And if you follow the steps and do extra steps you could be better and even in the future.
- S8: Interview someone, ask for help and I don't know
- S9: I would say to them that they have to be the most creative as they want, like to be super creative and to follow their heart and to choose the topic that they want.

- S10: I think really, try your best and even if you think that you are not going to be able to do your displays or something like that, you can do it if you put your mind into it and yeah, just have fun and do your work at home, if not you're not going to finish in time.
- S11: An advice would be first, it won't be easy for the first time but then it would be easy to tell it, explain it and all the other things, so like my advice to them would be to make a great job put in a lot of effort into their research and that they would have to work at home, because for me it was very easy to work at school.

9.1.4. Transcription of interviews (Teachers)

The following are the interviews performed to teachers. They were named T1, T2 and so on. Answers can be found after each question and it is important to clarify that the questions in the interviews conducted to teachers were all open-ended questions used to collect qualitative data.

1. What is the purpose of the exhibition?

- T1: For me the purpose of the exhibition is to see all the skills, or that the students apply all the skills that they have learned during their primary and preschool years. And up to the moment we had focused it to a passion project and that they enjoyed their research process; and I understand that there are different perspectives and the proposal now is that is focuses more towards action and Global Goals and that they become more aware of their world, and how they can help the world having an impact.
- T2: The purpose of the exhibition is that students demonstrate in an assignment or a final assignment all the knowledge and skills that have had during the PYP programme, that is basically, skills, content in short everything that has to do with the academics
- T3: The purpose of the exhibition is to see how much the students have grown throughout their primary years, it's to see them apply the approaches to learning, to basically to have more student agency, to have more voice in what they choose for their topic and ultimately is to kind of give an assessment of what they learned and how they have grown as a learner.

2. What is agency?

- T1: For me agency is that each person is capable of making decisions taking into account what they know, the reality, the problems and to be able to take action in their learning and in their actions to have a real impact in the world.

- T2: Is like what a person has to decide, like the power that one has to decide. Based on some guides, it is the power that one has to make independent decisions.
- T3: I think agency in terms of the IB is focusing on voice, choice and ownership and becoming confident in those three areas in different parts of your life whether as a learner, as a friend, as a peer. I think the agency is also proactive and yeah, When you see something that you care about and you notice something about yourself that you don't like or that you want to be better at then you notice it and you come up with a plan to improve.

3. What does agency look like for your class?

- T1: Well this year we worked a lot in action and at the beginning it was difficult for them to define what they wanted to do and it seemed impossible for them and that only powerful people can generate a change. I thought it was cute that they understood that each one can decide and take small actions, and that little by little we are making something for the world.
- T2: More than anything it can be seen in the student participation, not in the sense of me making questions but them deciding how they want to present, how they want to do obviously guided by me, but let's say that is something like the students having the power to decide and dare to talk to their teacher or guide and take decisions in any academic aspect they have. One thing that we have been struggling about is that they have agency in the decoration of the classroom for example, which has not been as easy but it is like having a decision power of how they want to learn and how to show their results.
- T3: Well we have different levels of agency, I don't think we are the best we can be, I think we have room to grow. But they have more choice, they are able to, I feel as a teacher that I give them the opportunity to express themselves, when they agree with me or disagree with me, or one another. I hope that we have a safe space to have those deep discussions and be able to make mistakes. So I hope that's what's happening, that they feel that they're able to make mistakes, that they can ask questions freely. But I think it can improve a lot. There is also something about ownership. I do throw it to them when it comes to me with a problem, I say, "what can you do about it?, to help them realize that they have the potential to take on things. They don't necessarily have to need to look at me for resources or for help, but they can come up with their own action plan, and reach up to peers. I often when people, the kids come to me asking for help I often steer them to somebody else. If they are asking for math problems I steer them to somebody else in class so that the person who is teaching them gets confidence but also the one who is asking for help realizes that one another is a resource to grow.

4. What would a proficient student in agency look like?

- T1: He needs to be critical because if he is not a critic he can't identify problems nor how to act in each situation and that he doesn't stays only in the criticism, and in seeing problems and difficulties but that he proposes solutions and that he takes action
- T2: Is the student that makes the right questions, that allows you to guide him and that makes decisions how they should be. Let's say with how they should be is that they take decisions whether they are right or wrong but that they take decisions and show the learning they have had, not a student that asks silly thing as always but one that asks something to do with what they are learning and in the other hand that he questions himself about why present it that way, why learn that way if I can learn in this other way. Why this math result I need to present it like this if I did it in this other way. All these questions that they make to themselves, are the students that have agency.
- T3: I would say that it depends on the student, where the student is at as a learner. It's hard to assume, to say a grade level, that there is a grade level expectation at this stage in grade four, they should be able to ask questions without being fearful of making mistakes. Or they should not worry about what other people think of them, I think that is a very personable thing. And they all come with their own backgrounds and challenges as people, that it's hard to say where they should be or where the ideal student is. I would assume at the very least, students by the time they are in grade four, they take responsibility for their learning, they take responsibility for their actions. They don't sit here and blame other people or depend on other people to work for them, or to have their hand held the entire time, I expect them to be more independent. And I guess I would also expect them to be confident enough to choose assignments for themselves. Some students for instance, they down themselves so much, and they overthink so much that they can even make a decision. And I would hope that, by the time they get to me, they should be able to make a decision for themselves. But I do think it is very personal.

5. What is action and what is its importance?

- T1: For me action is, as I told you, this year we worked a lot in action and there can be different types of action, and action not necessarily needs to be something that can be seen impressive, but simply to be aware and share with others, and make realistic proposals and help others, I think that we are stuck in helping others, like in donations, but not necessarily it needs to be donations. But I think that action is to change your mindset and change your ideas helping others understand something in a different way making small changes, and I find it interesting that those changes don't stay only in school but that they get to the families so they understand that the students can make something to change the world and that the compromise from the families is ti support that change.
- T2: Is the last step in the learning process and it is when the students can transfer their knowledge to make something with that information. Either to solve a problem, or to inform someone that it has an extra objective with all the information that is in their heads. We can say that this is very important in the exhibition because it is the last step they need to take after doing a lot of research. So they have to make an essay with the information but at the end they have to know what to do. Based in a question they have already answered And I always tell them that, that information cannot stay in the air and that what better way to show it than with an action
- T3: There are different types of action, not only in the IB, but different zones, and what I mean by that is that you have different students that want to take action to develop themselves as people, like I want to develop my study skills, so that's taking action on a personal level. So a lot of people think that action needs to be something so grand and on the outside but it doesn't necessarily need to be that way, so I think that, that distinction is important. But action is basically, you see a problem and you are passionate enough about that problem that you want to come up with a solution, and you have enough confidence in yourself and enough support around you to be able to take on that solution and follow through. It's important because so many of the kids, especially these days, say my opinion doesn't matter, or I'm only a kid, what can I possibly do? And I think, especially in the younger years, it's so essential that they have opportunities to follow through with their own actions and to actually see how it is affected and solve the problem, so that they realize what you do actually counts. And no matter how old or young, or whatever boy, girl, it doesn't matter, what you do actually counts and it has an impact, positively, negatively, whatever, but it counts. And that's why I strive for it, and take extra time for it out of my other lessons, because I think that 's more important to me than the reading and writing scores. I want them to know that they matter and that they have a voice, and that they have the power to do something if they are not happy with the world around them

6. Do you think that action is related to agency? How?

- T1: Well I think of students are able to define effective actions with a purpose they should be able to be agents of change and generate activities, ideas and propose real changes in them and in others, and those should come from them obviously in many cases the teachers and the schools have to approve and help, and they need a push sometimes but those changes ,ust come from them so that they are truly significant.
- T2: Yes definitely, the action is based in a certain type of agency so if there is no agency the student will not know what type of action he can take, because

there can be different types of action and if he doesn't know and of he cannot show and take the decision on how to demonstrate it, there would simply not be any agency nor action, because if I tell him do this is not going to be the same, it won't be his action nor the agency that should be. It is supremely important and is linked to action.

- T3: Yes, absolutely, I think they go hand in hand, because that they gain from student agency, from building agency, helps them develop and follow through with their actions.

7. What is the most important tool you used during the exhibition?

- T1: I don't know, I think that sitting down and talking to them and revising where they are at, what are their doubts because each one needed something different. Beyond any tool, is like having those conversations with them was the most important
- T2: The most important tools from this year were actually two. The first one was to do more organized research and they could make summaries with their own words. That was one of the goals that we had and we accomplished it by using the Cornell chart. In terms of action it was really important to do it step by step. All the steps should be done step by step so they have an important guide so nobody stays behind in the process although it is independent and everyone goes at their own pace. Those were the two tools related to the research and the action, and that they don't do that copy paste, and that they understand what they are reading. And if they don't understand it is because it is not at their level, and that they recognize that.
- T3: I feel the agency tracker, was probably the most useful, and something I would continue using in the future, not just using it during the exhibition, because it made everything more conscious, they were more aware of what they were doing, and they were more aware of how they could use the task around them to continue to grow, so it was bringing awareness to the things that they needed to work on, so the agency tracker itself was allowing them to have choice, the tool itself had choice, voice and ownership in the way it was designed. In addition to that the kids were able to document their process. Of course there are ways that it could be improved but it made everyone more conscious about what we were doing and how the tasks that they have, have more that one purpose, is not just something that just takes off, but it was also an out-lid to practice some skill.

8. What went well and what went wrong?

- T1: Well all of them completed their work finally and all of them felt proud of their things, but I think that there were some that gave the best of themselves and made sensational works and others that simply accommodated and at the end showed whatever, and with the parents it seemed nice but there were many that their work I don't know up to what point, it's horrible what I'm going to say but didn't deserve to be in the exhibition because it was something that they knew they didn't do that well.
- T2: For me the things, in general, went well because after all the students made their presentation, they did their best effort. I think that we could have had more time to improve the implementation of tools. What I wish to happen is that they were more prepared to take those steps in a more depth. I feel they were not prepared and that time was not enough. So preparation not only in previous years but also in previous units. We could say that all the tools that we use should be shared with previous grade levels and transferred all along the school year.
- T3: I feel that my answer for both is the same. What went well is that there were some kids who picked challenging topics and applied the Global Goals fully to their topic. They kind of surprised themselves with how much they learned and how important their topic came to be for them, so for some of them their topic worked really well. But then at the same time is the other side, where the topics didn't work well with some of the kids, and they didn't meet their fullest potential. What was also unique about my class was, I think, that they had a deeper understanding about why we are doing this, why this whole exhibition was important, why does it actually matter, I think that we really drilled them that it is about learning as a student, growing, showing of how much you have grown, I think we had really that message pretty hard for them to realize, it's your growth, it not so much about the finding the shiny thing at the end, it the growth that you have made and that you noticed, an reflected on, I think that we did that pretty well, compared to other courses.
- About the topics, I think it was more us, as a staff, having different understandings, and different criteria, for the students to start comparing our class with other classes .

9. What is the biggest area of improvement of the PYPx?

- T1: In think that we need to unify the criteria a lot, I think that each one made really different things and each one had quite different views of how was the exhibition and what was the importance of the exhibition and when all of us think differently we transmit different messages and every students did different thing and then they felt disappointed because of what other students could do and they couldn't. That I think was very difficult for the students.
- T2: I think the area of improvement is to have previous planning. We had a meeting not so long ago about how our collaborative planning meetings should be more focused on the PYPx, implementing tools that you did with Rachel and you could implement them directly in the units, so that when they are in the exhibition we would only hand them over because they would recognize them. This would allow them to do research more in depth, about more in depth topics,

and everything would be more in depth. Well everything would be much better. Because we all spent a lot of time only explaining the tools and how to use them, at that moment we shouldn't because we only have the time of a unit, we don't have more.

- T3: In the exhibition, consistency across the grade levels, across the classes. I feel that, that was the biggest area of improvement that was under our control. When we talk about the other grade levels and grade three needs to do this, and grade two needs to do this, and whatever, and yes I agree that, that is important, and we can say it, we can write it on paper but at the end of the day is not under our control, is not our job to chase that down. Whereas having consistency in all six classes, and all the teachers being very aware about what the process is, why does it matter, what are we trying to achieve, so that the students are all singing the same tune, I feel like that is really, really important.

9.1.5. ESAGE: Agency questions in the survey

As described in a previous section, the agency survey was adapted from the ESAGE (scale for the measure of personal agency and empowerment). These were the actual questions of the survey the students received:

ESAGE Question adaptation for the Agency Survey	
VOICE	
1	I stand up for my rights even if others disagree with me
2	I inform the authorities when I see someone breaking the rules.
3	I care too much about the opinions of others.
4	I find it difficult to express my opinion publicly
5	I am embarrassed to be wrong
6	I am embarrassed to speak in public
7	I am afraid of being complemented
CHOICE AND OWNERSHIP	
8	I look for the solution to a problem, even if others tell me there is no solution.
9	I like to plan my activities
10	It is better to act than to wait and see what happens
11	I find it easy to make decisions
12	I have initiative to get things done
13	I find creative solutions to difficult problems
14	I like to take responsibility
15	I like to be the first to do new things
16	I do what I think is best for ME regardless of what others think.
17	I understand the consequences of my actions.
18	I leave things half done
19	Completing my plans is out of my control.
20	I feel I have little control over what happens to me.
21	I only focus on doing what is easy
22	I feel insecure about my decisions
23	I find it hard to finish what I am doing
24	When I have a problem, I know what I need to do to solve it.
25	I cover up my mistakes so that no one notices them.
26	I get desperate in difficult situations