

A Masters of
Design Exegesis

**CO-DESIGNING
PRIMARY LEARNING
SPACES IN AOTEAROA
NEW ZEALAND**

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CONTENTS

Abstract	3
Acknowledgements	4
1. PART ONE	
1.1 Introduction	5
1.2 Aims & Objectives	7
1.3 Literature Review	9
1.3.1 General Process of Co-design	10
1.3.2 Co-design Definitions, Process and Different Outputs	11
1.3.3 Focusing on Co-design in the School and Communication with the Children	15
1.4 Methodology	17
2. PART TWO	
2.1 Design Challenge	19
2.2 Frame of the Project: (Studies Around the Key Words)	20
2.2.1 Co-design	21
2.2.2 Primary Learning Spaces: (Children's Participation)	22
2.2.3 Aotearoa New Zealand: (Cultural Approach)	24
2.3 Maori Art and Design	25
3. PART THREE	
3.1 Planning for the Workshops and Clarifying the Steps	27
3.2 First and Second Workshop (Hear and Create Phases)	36
3.3 Results and Analyzing	37
3.3.1 The Students' Maquettes	37
3.3.2 Paintings and Summary of Results	56

3.4 First Design Phase	65
3.4.1 Sketching	66
3.4.2 3D Modelling	70
3.4.3 Making a Maquette	72
3.5 Third Workshop (Deliver Phase), Data and Analyses	76
3.6 Second Design Phase	79
3.6.1 Sketching	80
3.6.2 3d Modelling	82
3.6.3 Making a Maquette	86
3.6.4 Prototype (Furniture)	87
4. PART FOUR	
4.1 Conclusion	91
4.1.1 Changeable Spaces and Dynamic Spaces	92
4.1.2 Cultural Design Points	94
4.2 Summary of Data	95
4.3 Design Toolkit	97
Bibliography	99
Appendix	103

Abstract

Research Question: How can co-design assist students at a bicultural primary school in central Auckland transition into a "Modern" or "Innovative" learning environment (MLE/ILE)? New Zealand's Ministry of Education has planned for the renovation and rebuilding of schools on the basis of "Modern" or "Innovative" learning environments. This project attempts to review and rethink (together with students) the spatial and interior design of a typical classroom in a bilingual primary school, thereby assisting students in the transition to such new learning spaces.

The project's methodology is based on human-centred and participatory design. This involves the conceptualization, planning and delivery of three workshops, the analysis of data from the workshops and the conversion of this data into design principles and a brief. The project's output takes the form of a proposed design solution (maquette and 3D models) as well as recommendations (a toolkit) for future co-design projects with primary school children.

Acknowledgements

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1. PART ONE

1.1 Introduction

Primary school is a student's first experience of an educational environment and is an important platform for engaging students with education.

According to the statistics, each year up to 10,000 young people in New Zealand leave school with little or no formal qualifications (Statistics New Zealand, 2001). This is an important concern for a country that prioritizes developing a knowledge economy, though things are gradually improving due to new plans in this field.

This research reviewed an Auckland primary school classroom's procedures and its environment under a design and culture lens in order to improve the visual aspects. It involved working alongside the students.

The students' behaviours, desires and creativity helped direct the designer to an eventual design solution.

Classroom environments vary slightly according to the methods of learning and teaching. This research focuses on a group of 13 students and their teacher in a bilingual primary school in Auckland. Direct and indirect consideration of the behaviour and ideas of both students and the teacher, combined with inspiration arising from the children's creativity can, with their cooperation, guide us to an eventual design solution.

Co-design is a collaborative design process in which the students are at the heart of decision making, from identifying the design challenge to finalizing the eventual design solution through various methods such as free observation, recording images, holding workshops, model making, painting and other practices. The United Kingdom's experience of more than 30 years in co-designing education and health care centres accounts for its significant and satisfying results in improving the users' experience in these environments (Sorrell & Sorrell, 2005).

The age group of students in a primary school classroom when compared to that of students at a secondary school means this target group cannot be assumed to be designers, but the researcher as a facilitator tries to extract a design theme from their ideas to improve their experiences and goals in the classroom.

Due to this co-design feature, the design area has to be limited and clarified (Sorrell & Sorrell, 2005). Therefore, this project focuses on the visual aspect of the interior space of the classroom by exploring the role of culture among the students in a bilingual school. The cultural perspective is a new factor in co-designing with students. It seeks to understand the students' relationship with their culture in the spatial design process.

The researcher is confronted with this question:

Research Question: How can co-design assist students at a bicultural primary school in central Auckland transition into a "Modern" or "Innovative" learning environment (MLE/ILE)?

Aim: To enrich the students' experience of a mainstream primary classroom space in Auckland using a co-design approach.

1.2 Aims and Objectives

This project attempts to engage students with their classroom environment as a hidden part of the curriculum and to create spontaneous learning in an effort to re-design it.

The hidden curriculum (subliminal curriculum) consists of all learning and development experiences, direct or indirect, received from the environment in which people spend their time learning, and the general psychosocial atmosphere in which the students learn (Chişiu, 2015).

Education itself is evolutionary and specially designed spaces will reflect this dynamic and evolutionary character (Chisiu, 2015).

According to the Ministry of Education's investigations and its plans for upgrading and updating the style of education in New Zealand, there are some points to be considered in this re-designing.

The first point relates to student centred classrooms(Ministry of Education, 2016).

A classroom that has been designed by the students can be influential in creating confidence, the feeling that their thinking is important, and an awareness that they can be influential in shaping their surrounding environment.

The second point links to Maori students' under-achievement (Ministry of Education NZ, 2016). Re-thinking the role of culture in their classroom's design; answering the question of how cultural attitude in a bicultural school can be influential in designing their classroom. Lastly, the role of renovation aimed at focussing on a Modern Learning Environment (or Innovative Learning Environment) in New Zealand's schools. What is the students' attitude towards the MLE and ILE plan? Is it something that accords with their desires or not? Accordingly, this project rethinks classroom design based on these points to help the students review and improve the visual aspects of their classroom, and utilizes their participation and creativity through a co-designing process. Co-designing has always been aimed at re-thinking and re-designing with the customers or clients of an organization to improve and develop their future experiences. This project in a primary school in New Zealand is a process with two aspects. The first aspect, which is temporary and can be considered as a learning process, is about communication and designing with the children. This is a nurturing relationship between the designer and the students with some beneficial influence on the students' self-esteem and confidence, as they feel they have a role in the design of their classroom. They also learn about spatial design and the various steps in it. The designer helps to apply their comments and ideas, and can use their creativity and perception in the design process. This experience can be used as a package of data about the results of this communication, which can then be used by different design groups, from architecture projects to interior or furniture design. The second aspect is about the output of this co-designing. The output, which may be slightly unclear before starting, can reside in different categories of interior design such as building, furniture, lighting, and graphic design, or a combination of these fields.

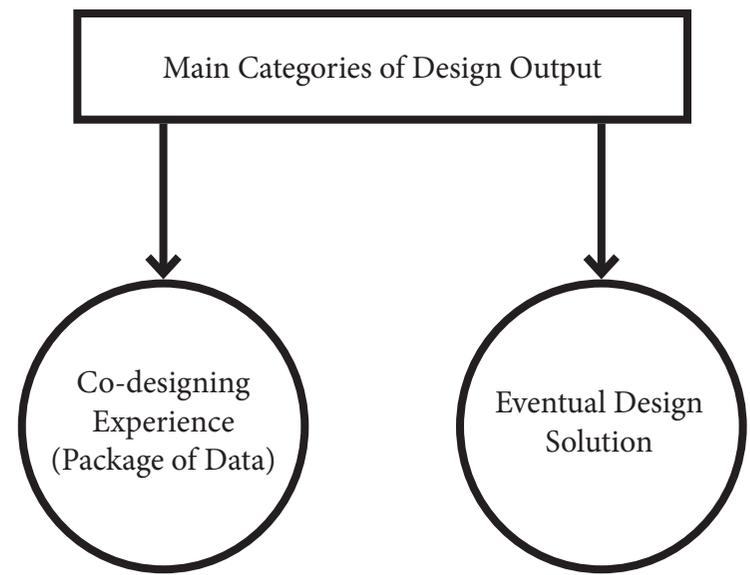


Figure 1
Main Categories of Design Output

1.3 Literature Review

This literature review tries to address some steps of this project through a comparison of previous co-design projects in this field.

The main questions that need to be asked are:

1. What is a general process of co-design? (What are the common steps that always need to be considered?)
2. Focusing on co-design in schools:
 - In what areas has this process been done?
 - The methods or planning for communicating with and provoking the students (users)
 - What kind of eventual design solution has been achieved?
3. How can we consider the role of culture in this process?

Nowadays, in human-centred design processes, the design teams co-operate with the target groups for problem solving and decision-making. Satisfaction with the results of this process has been proven, including in the education and healthcare systems in the United Kingdom and other countries. This methodology has been adapted and used in New Zealand's health care centres since 2008 (Boyd et al., 2014).

The aim of the literature review is to discern a clear pattern in previous co-design projects, especially co-design in schools, in order to clarify the process and predict the probable eventual results. Similar design co-design projects do not always have tidy and organized steps because of its human-centred essence. So it is better to find a general theme from among the successful projects to address the various parts of this research.

Experience-based co-design (EBCD) was developed in England approximately 12 years ago, then other countries used it including Canada, the United States and Australia. In New Zealand, this methodology has been used mostly in healthcare services (Boyd, 2014).

The Auckland co-designing lab has introduced this method for complex problems, and this approach has been deployed in big social projects (Auckland Co-design Lab, 2015). “Rethinking” and “re-designing” are terms that have been used to explain co-designing in some fields that need to be updated with the users’ experiences. “Co-creation” and “participatory-design” are other terms for this approach, which emphasizes the users’ role in the process. All the terms are a subset of the human-centred design process which are intertwined with the term “improving”, that refers to improving the users’ experience in a public space (Boyd, 2014).

The following sections in this part are a closer overview of these points.

1.3.1 General Process of Co-design

1.3.2 Co-design Definitions, Process and Different Outputs

An important point about this definition is clarifying and distinguishing human-centred design projects and co-designing projects.

In “The Field Guide to Human-Centred Design”, the human-centred design project is defined by the belief that all problems, even the most complicated ones like poverty, gender equality, and clean water, have a solution. Additionally, it means believing that the people who encounter these problems in their lives have the answer to these problems. Human-centred design offers the design teams a chance to explore the problems and to design with communities. This enables them to completely understand the people who are faced with such issues, to come up with design ideas, and to create new solutions obtained from a deep understanding of the community (IDEO.org, 2015). This method has been used for products, services, experiences, and social enterprises.

In co-designing, which is a subcategory of HCD projects, there are lots of definitions. The central common aspect of this description is that the clients are invited into the heart of the design process and they design directly with each other to improve the experience of clients and staff.

This section reviews the definitions and design steps of some famous and successful co-design projects. It is necessary to consider the point that in co-design projects, because of the different target groups, the steps are not always tidy and may not occur in the same way, so a general theme needs to be established from previous projects.

1*In Bradwell and Maar's (2008) research on co-designing, co-design has been defined as having an emphasis on:

- Collaboration
- Clear methodology, input, output, goals and current state of the process for the participants
- Exchange of information and expertise in the developmental process
- Equality of value and validity in inputs from all the participants, whether their ideas relate to large or small scale changes

In considering these points, co-design has been defined as an answer to the need for meetings or any productive communication between the different stakeholders and designers.

2*“Joined up design for schools” is a famous project that was carried out in more than sixty primary and secondary schools by the Sorrell Foundation. It aimed to inspire creativity in young people to improve the quality of their experiences in school through suitable design (Sorrell & Sorrell, 2005).

In this project, users took on the role of the designer within a certain category such as art, landscape, or furniture. They were asked to express their own design ideas, although the contribution was not directly to design their school's building. In other words, this collaboration was used to identify key themes for the designers.

3* In the Cruickshank project (Cruickshank, 2014), the designer defined co-design in the “Beyond the Castle” study. He compared the results with different types of co-design as a process in which they employed the designers to be constructive by provoking the non-designers to be creative. In many other projects, co-design is closer to a user-centred design process in that the designers come up with the design ideas with the target group, then report it back to the stake holders.

4* Solaymantash (2013, p. 21) has expressed the philosophy of co-design from the point of view of an interviewee, Françoise Vos (2014), as below:

“Co-design involves all stakeholders and starts from the beginning of the process. No direction to follow and no elitist behaviour.”

It is clear that co-design really depends on the target group that is involved and with the design subject. In this project for a primary school classroom with the pupils as the target group, the issue is whether or not co-design can be undertaken without a certain direction from the outset.

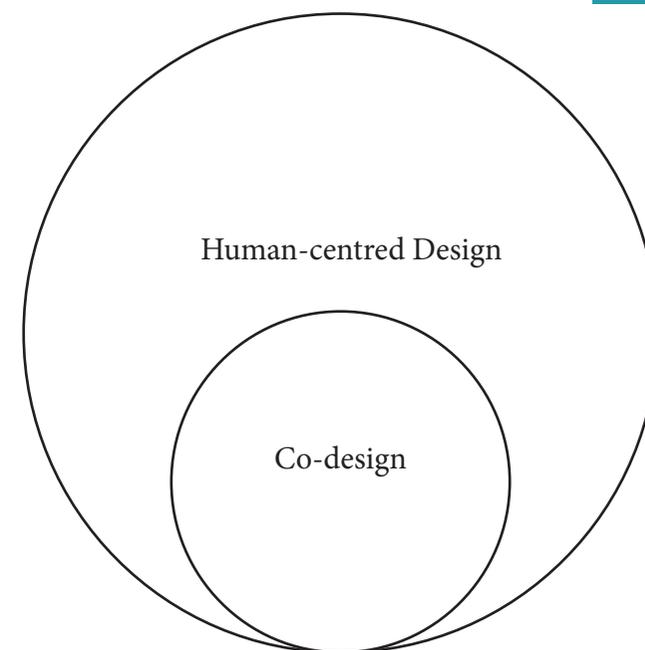


Figure 2

5. Co-design is where users and designers work directly and collaboratively with each other, rather than indirectly, with the users providing information to be considered by the designers or by working on sub-projects (e.g. landscape) (Wake & Eames, 2013).

As has been stated in the “joined up design for school” project, the development of the client/consultant relationship is at the heart of the project. Two factors influence their objectives:

1. Investigation of the potential through an effective collaboration between the design team and the school to show that a suitable design can improve the quality of the experience of school.
2. Focusing on the educational value of this nurturing relationship and how it can provoke the student’s creativity.

This process in this project includes four main phases, the challenge, the brief, the conversation and the concept.

In the IDEO human-centred design toolkit three main phases are introduced, including hear, create and deliver (IDEO.com, 2016). Hear, the first phase, starts by “Identifying a design challenge”. “The sense of possibility” is identified as the key point in the design challenge.

Improving patients’ experience in the cancer services at Waitemata District Health was a co-design process. It was divided into six steps:

1. Engage. 2. Plan. 3. Explore. 4. Develop. 5. Decide. 6. Change (Boyd, McKernon, Old, 2010). These steps are easily understood from their names. Common to these steps is communication and engagement between the design team, the patients and the staff. In this case, the second step was to establish the goals that needed improving through a close communication with the target group.

Four points are emphasized in this project as important considerations for co-designing: 1. Prioritizing the patient experience. 2. Trusting the process. 3. The ‘means’ is as important as the ‘results’.

4. Acknowledging the patients’ contributions throughout the process.

Co-design has mostly been used in service design in healthcare systems, including some interior design changes or related aspects in visual design, all of which have been used to deliver better experiences for patients and staff. (Boyd, McKernon, 2010)

In a research paper about co-designing healthcare centres within a hospital setting EBCD (Boyd, 2014), variations were introduced including:

- Improving current services or developing new services, e.g. cancer services
- Designing facilities, e.g. new wards
- Dealing with certain issues within or across services, e.g. waiting times
- Designing products (Boyd, 2014).

Services, facilities, and specific issues like waiting times and products are introduced as four main categories in co-designing healthcare centres in this report.

“Improving the experience of users” is the main and initial goal of the co-designing approach. The first step rethinks the design of the environment by listing the difficulties faced by the clients and staff. Narrowing the results into a final design challenge is the most important phase of the co-design project.

1.3.3 Focusing on Co-design in Schools and on Communication with the Students

The main areas of co-design in schools are:

- Physical transformation (a school's physical environment)
- Educational transformation,
- Learning and development (related to the new school/design process)

The important point is that while the school's physical transformation is considered to be the initial focus in these changes, educational transformation, learning and development play an equal, if not more important role (Parnell et al., 2010).

Some co-designs have covered all these three areas, (which should be the aspiration). The expectations of the participants and the scope of this participation are not always clear to them. This project focuses on the physical transformation of the classroom.

In one successful co-design project, the researcher introduced successful communication in her research with these points (Vos, 2014):

- Preselecting the participants
- Clarifying the project for the participants
- Clarifying the principles of the project for the participants, and their role in it

Roger A. Hart (1992) mentions the following points in his research:

1. Clarifying the intentions of the project
2. Knowing who made the decisions concerning their involvement and why
3. Having a meaningful (rather than decorative) role
4. Volunteering for the project after the project was made clear to them

These points were covered in an initial presentation to the children and clarified points such as the goal of the project, MLE design ideas, the role of the designer and their role in this process, the time frame and the steps that have to be taken with their cooperation.

An important tool for understanding the children and getting their ideas out was drawing. Children's drawings are a common methodology that designers use to get closer to a child's perception (Hart, 1999) There are two critical drawbacks to this; one is the limitation that can occur due to children's ability in drawing; and the other is the adults' interpretation, which can be different to the idea behind it.

Hence, talking to the children about their painting in order to interpret it; having other activities like making maquettes, writing, discussion groups and playing are other options to engage them with the design process and to help them express their ideas. These are also effective communication tools.

1.4 Methodology

Two major and initial areas of co-design in health-care centres and educational centres are the areas of interior and service design. However, this researcher's background and experiences have involved working with students at a primary school level. For this reason, the primary school environment is the focus of this project.

The methodology that has been used in this human-centred design research is the IDEO human-centred design toolkit (IDEO_HCD_ToolKit, 2009). In this methodology, the research is based on three main phases - hear, create, and deliver.

In the hear phase, the researcher obtains information through different steps, especially by hearing the students and the teachers' voices, comments and ideas, and also by observing their behaviour in their classroom. In the second phase, the students and the designer create something based on the data obtained from the hear phase.

Finally, after testing and modifying the initial design, they deliver the eventual design solution to each other.

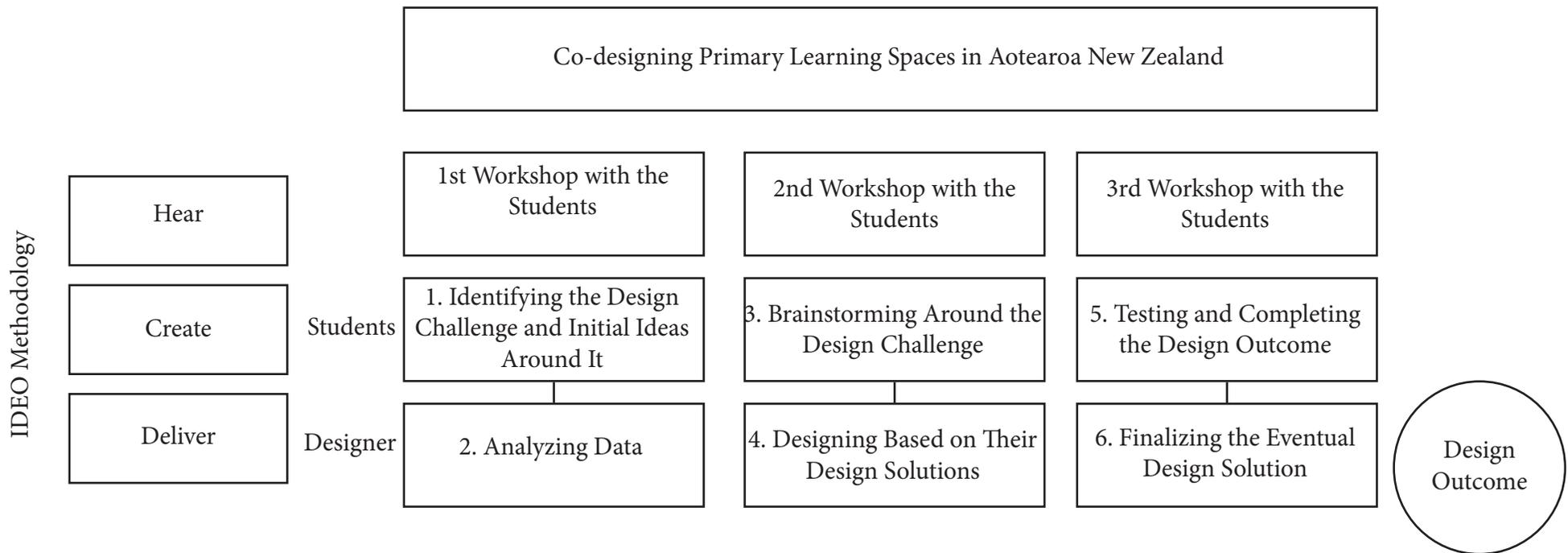


Figure 3
Specifying the Title

According to the IDEO methodology these phases will be performed in three workshops with the students in their classroom.

2. PART TWO

2.1 Design Challenge

A concise design challenge has been introduced as a foundation of human-centred design projects, which can guide the design procedure to the opportunities and solutions that have to be developed in the next steps of the design process. It has to be set of with the sense of possibility. (IDEO_HCD_ToolKit, 2009).

This co-design, therefore, wants to find an answer to this question:
How can co-design assist the students of a bicultural primary school in central Auckland transition into a "Modern" or "Innovative" learning environment (MLE/ILE)?

The Sorrell Foundation in the United Kingdom has more than 30 years of successful experience in co-designing educational centres. One of the important points mentioned in their experiences is that of clarifying the design area; for instance a space for art, the landscape, the furniture or other areas (Sorrell & Sorrell, 2005).

This project focuses on the spatial design and the visual aspects of the classroom, with close attention also paid to the bicultural situation.

Co-designing Primary Learning Spaces in Aotearoa New Zealand

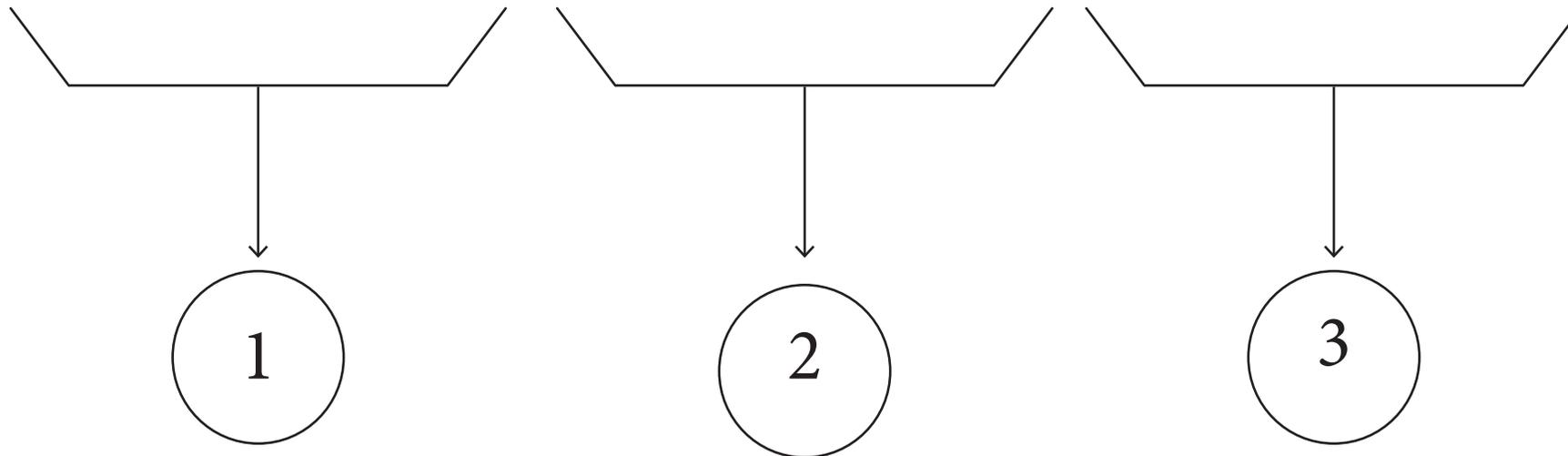


Figure 4
Key words

The literature review investigated different but related parts of co-design in different projects. Here the key parts of the project are framed to specify the borders. A “what do we know?” is also conducted to gather information related to the design challenge. (IDEO, 2009, p.39). For this purpose, the key words of the title are framed and investigated to cover all the required aspects of the design process.

2.2. Frame of the Project: Studies Around the Key Words

2.2.1 Co-design

This keyword has been explained comprehensively in the previous section (the literature review). A further point however is that this project follows the general theme of the IDEO human centred design toolkit. The three main phases of hear, create and deliver are used as the main steps and obviously these can be altered slightly during communication with the students.

2.2.2 Primary Learning Spaces (Children's Participation)

A classroom is one of the most important and influential public places in a society as it shapes part of the students' behaviour. Children usually spend significant time in it. This is especially true in the primary school environment, which is a student's first experience of an educational environment. Their participation in defining this environment is not only a step toward democratic decision-making and the initial steps to becoming a citizen, but it is also an innovative way of improving children's self-esteem and confidence when they study in a place that has their own design ideas. In addition, as part of a nurturing relationship they learn about the design process as well as giving their ideas to the design team.

Creating a professional co-design experience with the children is challenging considering the budget and the time limitations in most real projects.

This concept of redesigning their schools has recently attracted attention as a valid process in student empowerment and contribution in projects such as the United Kingdom's Building Schools for the Future (Burke 2007).

In other words, children are natural designers, without the constraints of adulthood and with different perceptions about spaces. However, they are not qualified for technical challenges and some complex aspects of the design process (Dudek, 2005).

Sanders and Stappers (2003), have developed participatory tools and mention that pre-school students are useful partners when appropriate tools are given to them for expressing their ideas. It has been also pointed that every person has creativity and can take part in the design process with suitable participatory tools.

For this research, the researcher had some experiences in Auckland primary learning classrooms to become familiar with the style of education and the type of classrooms. The researcher also has a background in working as a volunteer teacher in some NGOs related to child-labour and with refugee students in Iran. Some methods for students' participation were chosen and three workshops with a group of 13 students were selected and designed.

Thus, this project is a combination of direct and indirect understanding from the focus group in workshops, using some influential communication methods with the children.

In terms of the children's participation, some points need to be considered by a co-designer, including:

- The Age Group:

The participant's age group is very influential in the co-designing process. In this research the students are in primary school and aged 6 -11 years old.

In this age group, there are some points that are important to understand in order to effectively communicate with them:

8-9 Years Old's Cognitive Development

- They are interested in reading fiction.
- They may show special interest in collections or hobbies.
- They fantasize and dream about the future.
- They like planning and organizing different tasks.
- They are product and goal oriented.
- They have lots of interesting ideas and intentions, but have difficulty expressing them.
- They enjoy more complex games (Ashcraft, 2009).

Besides these facts about this age group, during the experience of working in a primary school as a teacher's assistant, it was noticed that the students have their own ideas about their interests. They have their own tastes about, for example, whether something is beautiful or not. For instance, it is common to hear something from them like, "I want to sit on this chair" or "I don't want to sit on that blue chair" or "I do not like that red one". However, they cannot express the reasons for why they like something or why they do not. Hence, during the cooperative phase with students in this age group it is possible to develop a conversation with them about the reasons behind their comments, something that has been mentioned as the five Whys technique in the IDEO toolkit (IDEO.org, 2015).

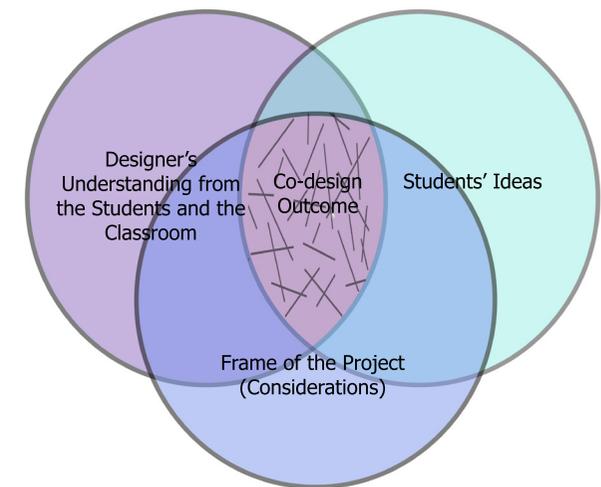


Figure 5
Intersection of This Co-design

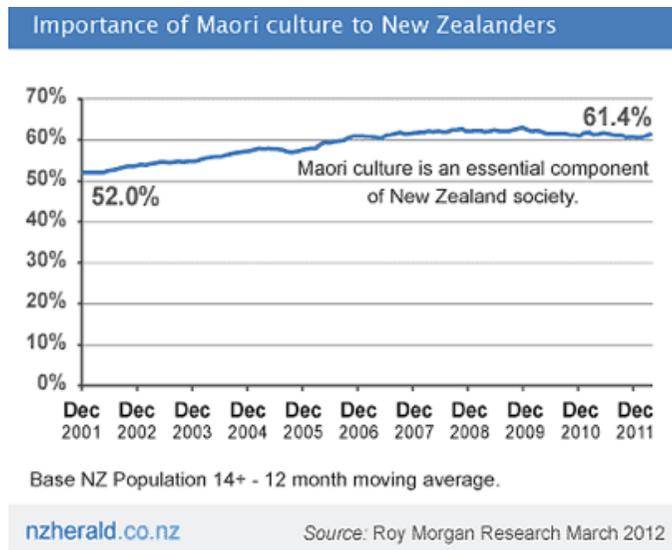


Figure 6
Importance of Maori Culture to New Zealanders
(2001-2011)
(Roy Morgan Research, 2012)

The Roy Morgan company, in research on The State of the Nation, reported in March 2012 that there has been an upsurge in the number of New Zealanders who consider Maori culture to be an essential component of New Zealand society.

A considerable percentage of students in New Zealand are from Maori and Pacific backgrounds, many of whom disengage from education before getting adequate skills and qualifications that are necessary to develop their full potential (Ministry of Education NZ, 2013). A National Certificate of Educational Achievement (NCEA) report showed a worrying gap between the achievements of Maori and Pacific learners and New Zealand European learners in 2011 (Education Review Office, 2016).

The New Zealand Ministry of Education considers this group of students as “Priority Learners” in its strategies for improving New Zealand’s education system. The promising point is that their performance will hopefully be improved as a result of certain plans made by the Ministry of Education (Ministry of Education NZ, 2013).

One of the major causes of Maori and Pacific students’ lower achievement is the traditional difference between their home and their school environment (Ministry of Education NZ, 2013).

Accordingly, this point is a focus of the project. In a bilingual classroom and bicultural country, what is the students’ connection and relationship with their classroom’s visual and interior design in terms of their cultural background? Is there any contrast between the students’ cultural preferences and their classroom interior design?

2.2.3 Aotearoa New Zealand: Cultural Approach

2.3 Maori Art and Design

A western perspective on design is assumed to be a process of bringing all elements together in a coherent and functional manner, whereas from a Maori perspective, the meaning of design must be expanded so that coherence and function reflect the world view at the time the design was conceived and created (Paama-Pengelly, 2010). The differences of these two perceptions of design can be considered in students' perception in the design process.

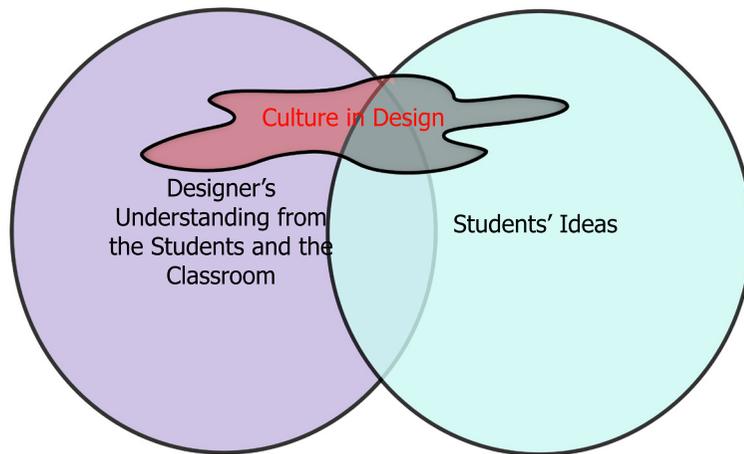


Figure 7
Cultural Approach in
Co-design

Regarding the democratic quality of co-design, a cultural approach cannot be entered into in the design process without an indication from the students. As illustrated in Figure (3), there are three main parts in co-designing with children, which leads us to the design output. There are considering the students' ideas, the designer's understanding gained from the students and the classroom, and the frame of the project (considerations). Investigating the role of culture in the design of the classroom during co-designing with the students can be looked at as the "designer's understanding from the students and the classroom". Also, with a general explanation about culture students can be provoked to think about this and to give their ideas about culture in the students' ideas section.

In this project, students did not express any specific comments about the culture directly during the first presentation and discussion. So, this part was mainly from the researcher's (designer's) understanding. The details will be further reported in the Workshops section.

"The Hole of Yellow Archipelago" is the title of a project performed at the Creative Learning Centre at the Auckland Art Gallery Toi o Tamaki with the co-operation of the artist Judy Darragh, a group of the students from a primary school and AUT's TurnSpace Collective (2015).

In this project students designed a space with inspiration from Judy Darragh's art works. There were five workshops at the school, with Judy presenting her sculpture collections and art works. The students were asked to make their own 3D objects with hand craft materials including cardboard, wool, pieces of sticks and so on and to place them in boxes to form their favourite space.

Getting inspiration from an artist's art works and art perception was something close to the cultural focus of this project. In a meeting, Judy Darragh and Meg Nicoll, the coordinator of the Creative Learning Centre at the Auckland Art Gallery, gave some details of their project, which guided this project into a clearer way of dealing with the students.

Judy mentioned that she showed some photos of her art works to the students and explained her process in making them. Then she asked them to make their own favourite objects with the materials provided.

Judy suggested “keywords play” to discover the students' relation to their culture, instead of showing them photos about specific art so they avoided copying. In this game, they were asked to tell us the first thing that came into their minds after hearing some words that we asked them. Some keywords were Aotearoa, New Zealand, Maori and more.

In a meeting with Nigel Borell, the Maori Art curator at the Auckland Art Gallery, he suggested talking about kowhaiwhai (carving patterns) and then talking about Maori myths to explore their creativity in this field.

Something that was planned in this project was a mix of both suggestions. In the first presentation, which will be explained completely in the workshops section, I started by introducing myself as an international student from another culture. I asked “what is culture?”; then displayed some photos about different architecture and different kinds of classrooms in my country and other countries. I asked them to think about “how can their classroom be different in their culture?”

In another part of our workshop we played with the key words and they told me some words that came into their minds; words like Aotearoa, New Zealand, Maori, Kiwi and more.

Observation was also a way to understand the cultural differences and desires in the students' behaviour to understand the role of culture in this design process.

In this co-designing approach, as mentioned before, an initial plan for the workshops with the students was considered to reduce the probability of an effortless participation with the children, as depicted in Figure 3.

3. PART THREE

3.1 Planning for the Workshops and Clarifying the Steps:

Before going to the school for the workshops with the students the plan had to be clarified to reduce any possibility of an unproductive workshop. Thus, in this section different parts of the co-design are explained.

Table 1 categorizes the aims and different steps in this process.

Aim 1	Re-thinking and re-designing the interior space of the classroom
Aim 2	Considering the bicultural situation of the school in this design process
Aim 3	Sharing MLE and ILE concepts with the students and getting their comments around them
Students' Role 1	Thinking and deciding about how their surrounding environment could be re-designed
Students' Role 2	Checking the initial design solution and sharing their ideas about it
Step 1	Hear Phase: A presentation (Power Point slides): Introducing the project, the steps, the students' role in this process and brainstorming around the design challenge
Step 2	Create Phase: Developing their ideas and making some maquettes or drawings to share with them
Step 3	Analyzing the results
Step 4	Checking the results with the students
Step 5	Finalizing the design outputs

Table 1
Main Steps of Co-design

Table 1 is a worksheet that was used to address the main points of co-design with the children. This worksheet helps the planners keep track of goals, objectives, strategies, and action steps (Sanoff, 2000).

Table 2

<p>Goal: Discovering and understanding the favourite designs for the classroom and looking at their imaginative responses</p> <p>Discovering the students' dependency on their culture. How it this important for them in their classroom design?</p> <p>Answering the question "Is their classroom culturally suited to them?"</p> <p>What are their priorities in this space and how can these priorities be decorated (designed), using the children's imagination, creativity and interpretation of culture and art?</p>
<p>Objective: Understanding the students' desires, interests and taste in terms of shaping their surrounding environment by getting some clues directly or indirectly (as data for forming a design theme) using a range of methods.</p>
<p>Strategy:</p> <ol style="list-style-type: none"> 1. Free observation 2. Photography 3. Listening 4. Drawing 5. Maquette Making (individually and or in groups) 6. Collage
<p>Methods for Provoking the Students:</p> <ol style="list-style-type: none"> 1. Presentation 2. Snow Card 3. Home Work 4. Discussion

Table 3

Action Step	Responsibility	Timeline
Hear Phase	Co-designer	1st of Sep 2016- 1/5 h
Create Phase	Co-designer	5th of Sep 2016- 1/5 h
Deliver Phase	Co-designer	15th of Nov 2016-1/5 h

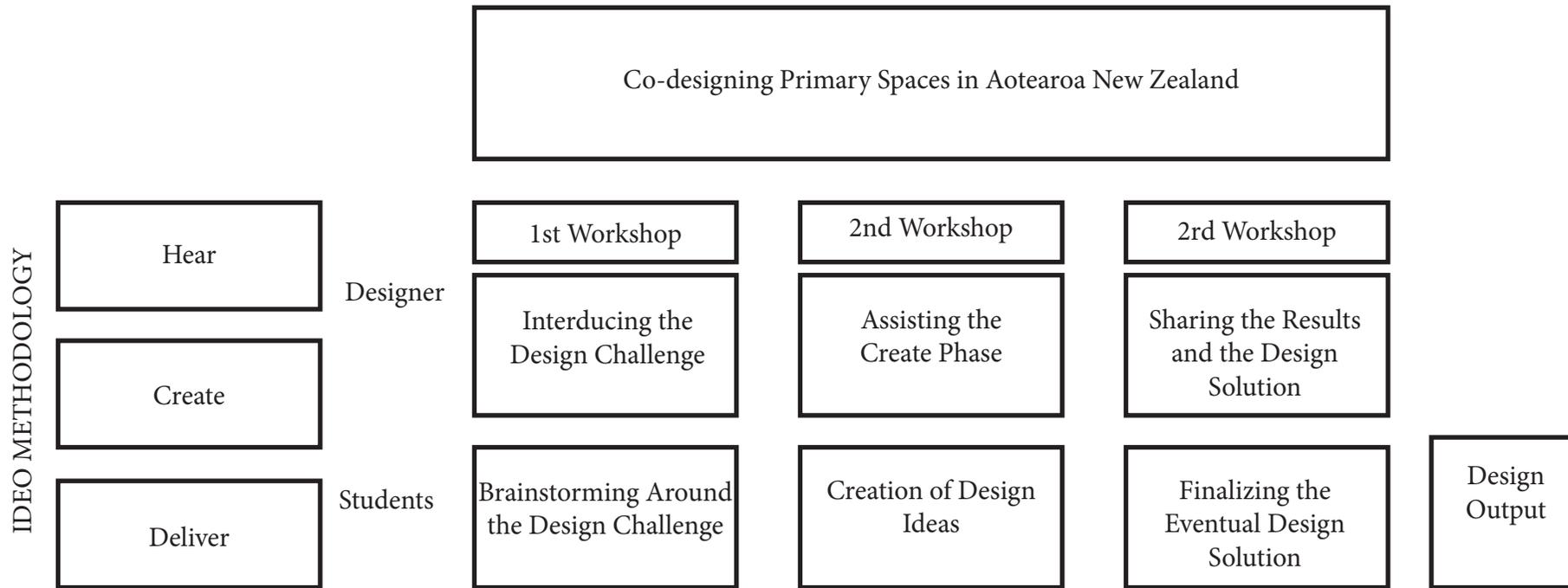


Figure 8
Co-designing the Initial Plan

In Figure 8, the storyboard for the project and the main steps in this co-design process are illustrated.

The following are the ten main steps of the project in the storyboard:

1. Studying around the subject
2. Clarifying and filtering the co-design purposes
3. Getting familiar with similar design or research groups with the children and the details of communication with the children
4. Planning for the three workshops
5. Negotiating with the schools to select a case study
6. Getting familiar with the final school
7. Planning for the first workshop in the school
8. Planning for the second workshop in the school
9. Planning for the third workshop in the school
10. Finalizing the students eventual design solutions

All the results obtained from each workshop were evaluated by the designer, as shown by the three small slanted squares in the storyboard.

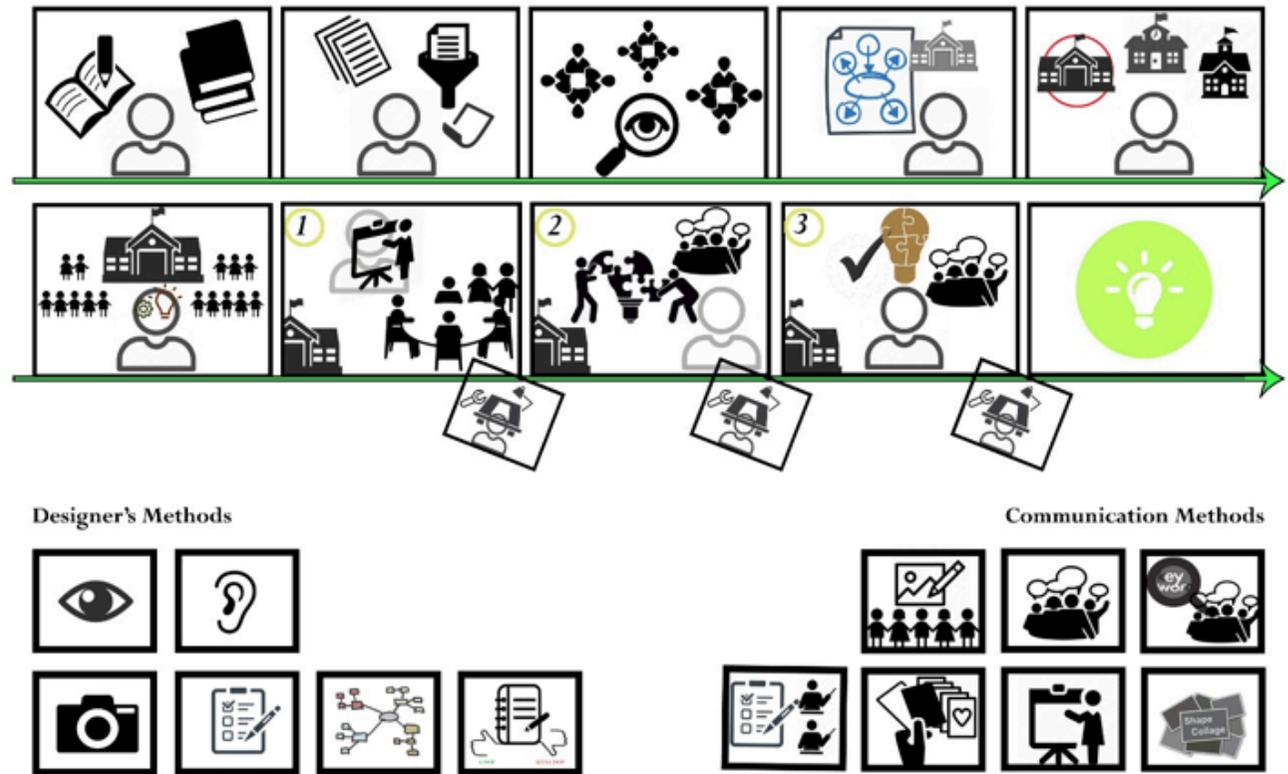


Figure 9
Project's Story Board

As depicted in the storyboard, six different methods were used to get data and to understand the students' ideas for their favourite classroom:

1. Observation: Getting familiar with the classroom and the students' behaviour patterns
2. Listening: Talking with the students and listening to their answers, demands, interests and interpretations of their environment and classroom
3. Photography: Recording the moments, the children's crafts and painting; also, to get more familiar with their behaviour patterns
4. Note Taking: Recording the key words and ideas during their conversations and activities
5. Mind map: Drawing a mind map to organize their suggestions and ideas around different categories of the interior design of their classroom

The following seven techniques were used to communicate with the students by the researcher:

1. Presentation

- i) The presentation started with introducing myself and asking the students to introduce themselves
- ii) My background in art and design, their favorite subjects
- iii) Introducing the project and our beliefs about their creativity and their ability in making crafts and maquettes, thus giving them confidence in their ability to design for themselves
- iv) Talking about culture: asking them about what culture means, hearing their comments and then defining them and talking about different architecture and interior design, especially about classrooms in different cultures and countries. This began with my country, Iran, and then other countries, like China, India, Japan, Maori architecture and the style of classrooms in New Zealand. In each section, there was a pause to hear the students' ideas and comments about the photos.
- v) Finally, I asked them to look at their environment. I paused to do it carefully. Then I asked them if there is something that they would like to change to make it better. This was the initial point for the main discussion and led to the practical part, making a maquette.

Figure 10
This picture was printed on A4
paper and distributed among
the students to draw on



2. Discussion

Discussion and conversation were part of every workshop. The Five Whys technique was used as suggested in the IDEO Human Centred Design Toolkit in order that there was a deeper understanding of their designs and ideas.

Asking why about their comments to get the main reasons behind their ideas.

3. Snow Cards

Some photos in the slide show presentation about different architecture, interior design and classrooms in different countries were printed. This was to control and remind the students about the purpose of the workshop.

4. Drawing

Drawing is a popular means of expression among children. Photos of an empty room were provided for them, which was helpful in imagining a 3-D room (Figure 10). As well as this technique, they were told that they could use their own painting notebook if they wanted to. Most students wanted to draw on this photo. 15 photos were distributed among the students.



Figure 11

5. Maquette Made by the Students

I used some shoe boxes for this section, removing the lids and cutting out one side of the box to help in making the maquettes.



Figure 12

6. Collage

Eight interior design magazines were provided for the students so they could use some of the photos instead of drawing or making images. They used these in their paintings, maquettes or in separate collages.

7. Keywords Play

In this play, I selected some words that could be difficult for the students to talk about, things I felt when I talked to them about their cultures. I asked them to “please tell me the first word that comes into your mind after hearing them”. The words are:

1. Aotearoa
2. New Zealand
3. Kiwi
4. Maori



Figure 13

- Drawing a Mind-map
In a discussion group, the students mentioned different categories of interior design. Drawing a mind-map was a way to categorize these in front of them and to ask them to express their ideas one by one in an organized way.

- Taking Notes
During these discussions, notes were taken about their ideas, points, keywords and behaviour, covering all aspects of their participation.

Keywords	Students' Answers
Aotearoa	New Zealand, Auckland, iwi, hapu, boring, kia ora, waka, awa, Maori, Moana, ao
New Zealand	Cruise, boring, green, Aotearoa, Maori, dog and cat, Kiwi, shark, food (kumara, candy)
Kiwi	Bird, kiwi fluff, kiwi fruit, playing soccer, can't fly
Maori	Moko, kapahaka, language, Portugal, awhina, old times, Tokotoko (in every corners)

Table 4
Results of Key Words Play

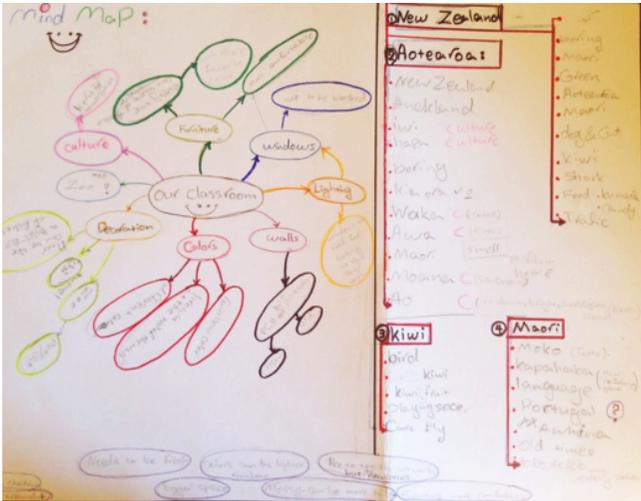


Figure 14
Mind-map and Key Words
Play Result

There were some common aspects in the first and second workshops, and the students' activities in these two workshops were complementary, so they are explained together. The first step in starting a workshop with the students is planning according to an accurate timetable.

After consultations with some co-design researchers, who held workshops with the children, and finally with the Ethics Committee's permission, three workshops took place, each of 90 minutes (see Appendix for UREC Approval). Consequently the plans had to be divided into 90 minute sections for each workshop. The general phases of the IDEO Human Centred Design methodology mean the themes in the three workshops are Hear, Create, Deliver. Thus, in the first workshop the target group's ideas are heard and the general stream of the design process becomes clearer. The second workshop gets closer to the students' practical ideas, which will be used in redesigning their classroom. Eventually, in the third workshop, the designer shares their design solution with the students and gets their feedbacks about it.

3.2 First and Second Workshop with the Students (Hear and Deliver Phase)

3.3 Results and Analyzing Data

3.3.1 The Students' Maquettes

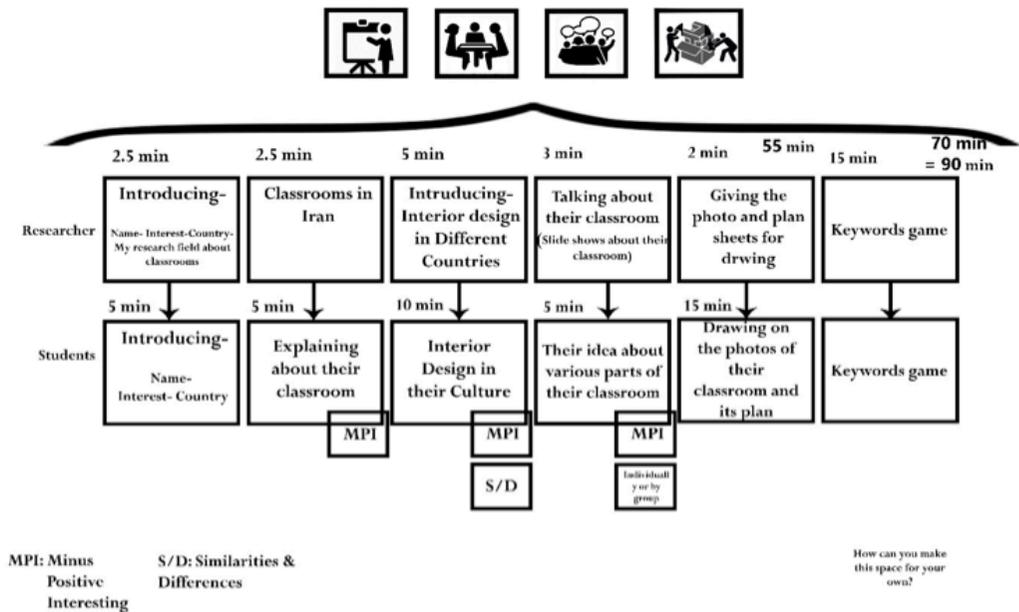


Figure 15
Storyboard for the First Workshop

In this section, some important points about the students' maquettes are explained; 1. Maquette 1, figure 16:

The most important points in this maquette are the use of a specific section in the classroom for the teacher and the presentation, a mat in front of the teacher for the children to sit around him/her, and some woolen strings formed into a kind of seat, emphasizing a soft and comfortable surface. There are also some colourful strings hung from the ceiling as a decoration, the use of a box with motifs as the main wall and a floor covered with colourful paper. These are some of the decoration ideas in this piece.

2. Maquette 2, figures 17 and 18:

In this maquette we can see that the floor is covered with foil, there are some photos like an armchair and a desk with flowers on it in a corner with another flower box beside it. The student explained that it is possible to be comfortable in a corner. She used the woolen string as a seat in a corner, with a green stair on the other side. She explained that it could be used to go to the second floor or as a decoration.

Again, there were strings hanging from the ceiling, which might have been copied from the other maquette. Also, there is a note on the main wall with the words “Fire Works” on it and a picture of fireworks. The student thought fireworks are beautiful so they can be put on a wall. Another note, “Creative Classroom”, is written on the front of the maquette as a kind of title for her classroom, although these words were deliberately not mentioned in the presentation. words like make it better, more interesting, solve problems had been used instead. This title for her maquette can show that a desirable classroom is a creative classroom to her.



Figure 16
Maquette 1



Figure 17
Maquette 2



Figure 18
Maquette 2



Figure 19
Maquette 3



Figure 20
Maquette 3



Figure 21
Maquette 4

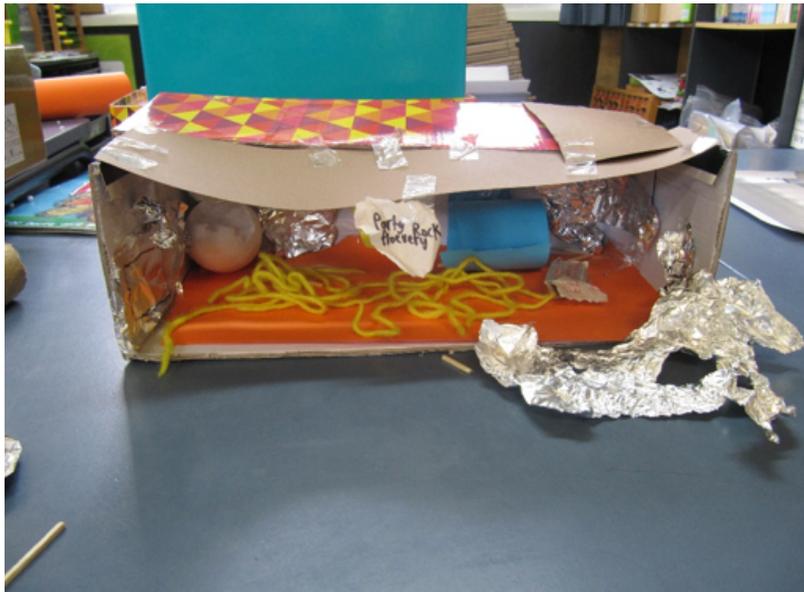


Figure 22
Maquette 4

3. Maquette 3, , figures 19 and 20:

The student separated the boxes into two sections, one part for presentation with a seat in front of the board and another part as a study room. She made colourful benches and a colourful bookshelf. Another seat like a bench sits against the wall and there are seats like bean bags made from foil. In addition, she made a kind of doll as a teacher for her classroom and a poi for playing with. In the second workshop, she added some sections on top of the bench in the study room and made it into bookshelves and put another board in this room in case the children wanted to share something with each other. An orange string sits in front of the classroom to add more colour and decoration to her design, while another orange string decorates the floor.

4. Maquette 4, Figures 21 and 22:

The student who worked on maquette four was very passionate about making a maquette. He involved himself entirely with his maquette and did not talk to anyone. In the second workshop, he made another maquette (maquette 5, figure 23). His first maquette, figures 21 and 22, is titled “Party Rock Forevery(one)”. He covered the walls with foil and the floor with orange paper to make it as exciting as its title. A blue cylinder creates a tunnel for going through or sitting inside as a private and cosy space. He put yellow wool on the floor and explained that it’s soft to walk on and can also be a decoration.

He separated some parts of an EPS sphere to make a bean bag for his classroom.



Figure 23 Maquette 5



Figure 24 Maquette 5



Figure 25 Maquette 5



Figure 26 Maquette 5



Figure 27 Maquette 5



Figure 28 Maquette 5

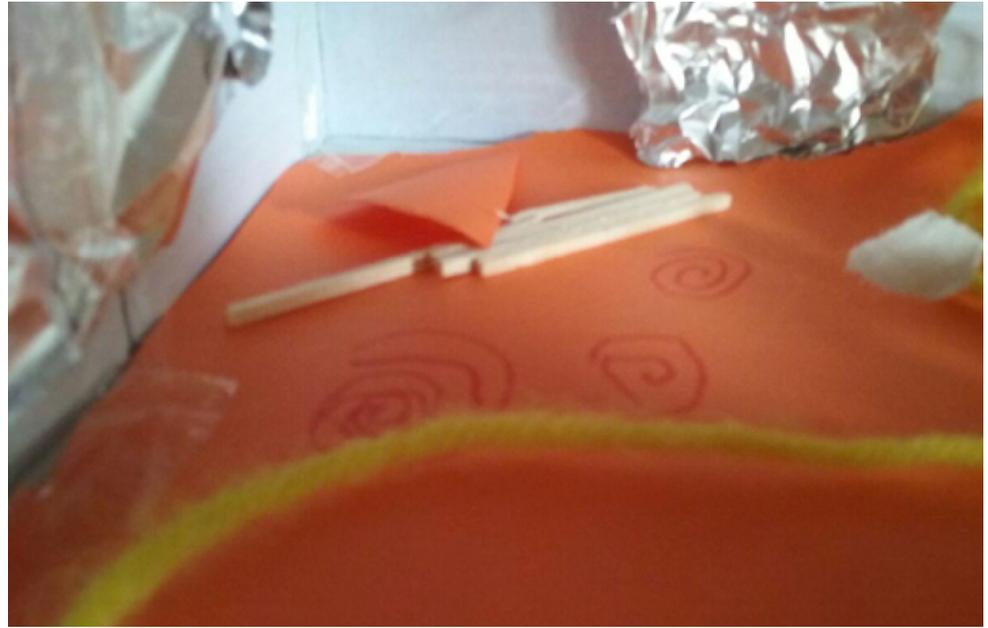


Figure 29
Maquette 5



Figure 30
Maquette 5



5. Maquette 5, Figures 23 to 31:

Figures 23 to 31 are the same student's second maquette. One interesting feature of it is another tunnel made from the cubic cover of an eraser. He put an entry note, "Look Inside" for this tunnel and inside there was another paper with a smiley face on it. It is easy to see that he was trying to design something interesting and to have an adventure in his classroom. The same point about a specific place for the teacher was made in this maquette as a desk was designed and some motifs placed around it on the floor as he emphasized this is for our teacher.

Figure 31
Maquette 5



Figure 32
Maquette 6



Figure 33
Maquette 6



Figure 34
Maquette 6



Figure 36
Maquette 6



Figure 35
Maquette

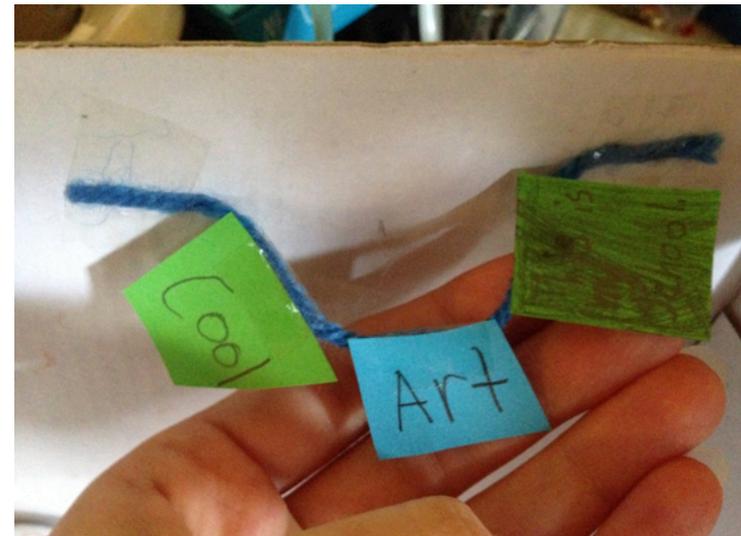


Figure 37
Maquette 6

6. Maquette 6, figure 32 to 38:

Figures 32 to 38 are of another interesting maquette. This student used a clever technique to make this, as we can see in Figure 33. Walls are separable from the floor. She used words like Love, Hello, Cat, Lol on the wall as her favourite words (Figure 37) and words like Art and Cool on her entry. Using written words to express feeling in their designs is something that can be seen in most of the maquettes.

The girl painted a wall gradually and put a window in the ceiling. She emphasized the sky window as her favourite part of the design, something that in the third workshop all the students mentioned they wanted in their classroom. Some bean bags are another feature of this classroom, as in the other maquettes.



Figure 38
Maquette 6



Figure 39
Maquette 7 and 8



Figure 40
Maquette 7 and 8

7.Maquette 7 and 8, figure 39 to 43



Figure 41 Maquette 7 and 8



Figure 43 Maquette 7 and 8



Figure 42 Maquette 7 and 8

Figures 39 to 43 are the results of cooperation between two students who were very active in expressing their ideas in the initial group discussion. One was informed about and interested in Japanese interior design. She suggested a sliding door or a glass door facing a peaceful garden as in Japanese interior design. She knew about this because of her mother's trip to Japan.

In their maquette, the students separated different parts of the classroom using colourful floor coverings. They designed a cozy corner as seen in figure 41. They filled this part with some pieces of EPS to make it more comfortable. Using soft materials for different parts of the classroom was popular amongst the students.

Another inspirational creation in this maquette can be seen in figure 43. The boy formed a piece of foil and put it in the box. When asked what it was, he answered that "I do not know but I will tell you later". Later he said this could be a desk or a chair.

This is a reminder that their dynamic imagination and creativity can be used in designing their classroom; some features that their different functions can be defined by them.



Figure 44 Maquette 9



Figure 45 Maquette 9



Figure 46 Maquette 9

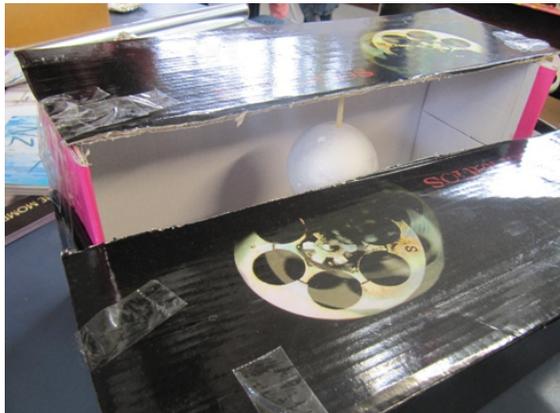


Figure 47 Maquette 9

8. Maquette 9, figure 44 to 48:

Figures 44 to 48 are the work of a student who was not engaged with this workshop and was very quiet and reserved. These kinds of students are the key in the co-designing process because the co-designer can get closer to them to understand why they are reluctant to participate in the classroom. This gives consideration to the idea that all their problems might not be related to the classroom or cannot be solved through a design solution.

This student did not express a reason for his reluctance. When observing his behaviour, he was interested in painting motifs on the box of his maquette. Painting on the walls and cleaning them and painting again was something that he was accustomed to. He was comfortable with this kind of paintable wall.



Figure 48 Maquette 9



Figure 49 Maquette 10



Figure 50 Maquette 10



Figure 51 Maquette 10

9. Maquette 10, figures 49 to 51

Figures 49 to 51 are by another student. During the initial discussion, she agreed to removing the walls in classrooms and to having a big space with different study groups, as in the MLE/ILE plans. But in her maquette, like the other students, she put walls, explaining that “sometimes we need a quiet or private space to study”.

10. Maquette 11, figures 52 and 53:
Some bold features in maquette 12 are the use of rich colours, some games like tennis table and a ramp for sliding down like a wave. She added that we could use the space under this ramp as a cosy corner or shelves.



Figure 52 Maquette 11



Figure 53 Maquette 11



Figure 54 Maquette 12



Figure 55 Maquette 12

11. Maquette 12, figures 54 to 56:

In maquette 12, the student has emphasized his pets in the classroom, especially cats, together with his comments. This was something heard frequently from the children.

The boy used some Pokémon photos in his favourite classroom design as well, so it became a space where he could be surrounded by his pets, Pokémon, and a tennis table. Some necessary accessories such as a video projector screen and a bench are in a corner, but are less emphasised in comparison to the Pokémon and pet for decoration.



Figure 56 Maquette 12



Figure 57 Maquette 13

12. Maquette 13, figure 57:

The student who made maquette 13 did not spend enough time making it but the first thing that he put inside was some wool for a bean bag and some spherical pieces of foil as a seat.

Bean bags were very popular among the students and this word was heard frequently in this workshop.

In this part, as mentioned before, in order to keep the students' minds on the interior design of the classroom, not on other spaces, a photo of an empty room was used for the students to paint on. To save time, the children were asked to take these papers home and to draw their favourite classroom based on our discussion. But an unanticipated problem of this approach was that some of the students' imaginations were directed to their bedroom, as they were doing this exercise in their homes. Therefore, in some of the paintings were closer to a room at home instead of a classroom. Another problem was that some students forgot to paint or to bring their work back to the second workshop. So, there are only eight 8 paintings in this section. Some of the major points in these follow.

3.3.2 Paintings and Summary of Results

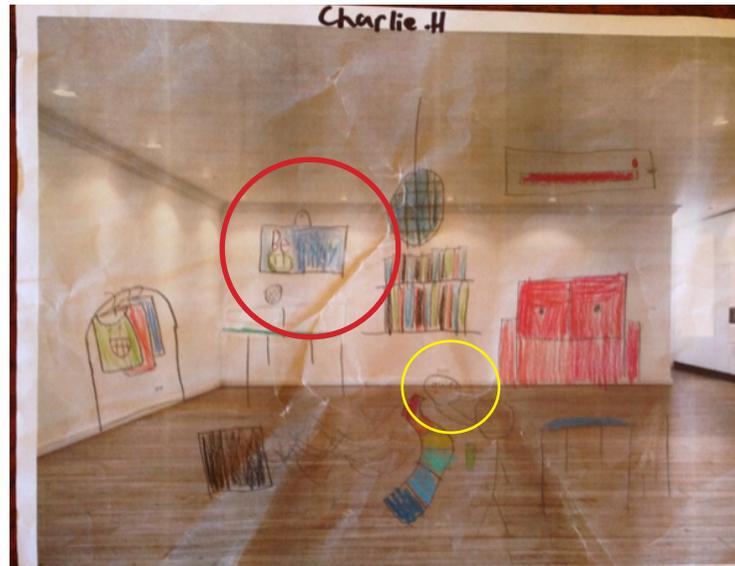


Figure 58 Painting 1



Figure 59 Painting 2

In figure 58, the word “Quiet” is written in a cloud quote above the teacher’s head, seen in a red circle in the painting. Having a quiet space is something that was expressed by some students during the maquette making. Despite their interest in having a big, spacious room and MLE’s idea of having fewer walls, in most of their paintings and maquettes students expressed the need to have a “quiet” or “private space”.

Another interesting point regarding the picture is that there is a tennis table in a corner for playing and writing on, with “be ...” and a smiley icon in a picture on the wall (in the yellow circle). These ideas also occurred in figures 28 and 36 where other students used them in their maquettes - some positive words on the wall and a smiley icon.

This painting and collage (figure 59) is closer to a bedroom. There is a special style of ornament on top of the bed, “Walkway of Honour” and “My Lovely Desk”, which shows the luxurious style of design the girl is interested in.



Figure 60 Painting 3

In figure 60, the classroom is divided into different floor areas covered in green and there are some bean bags as seats in red circles.



Figure 61 Painting 4

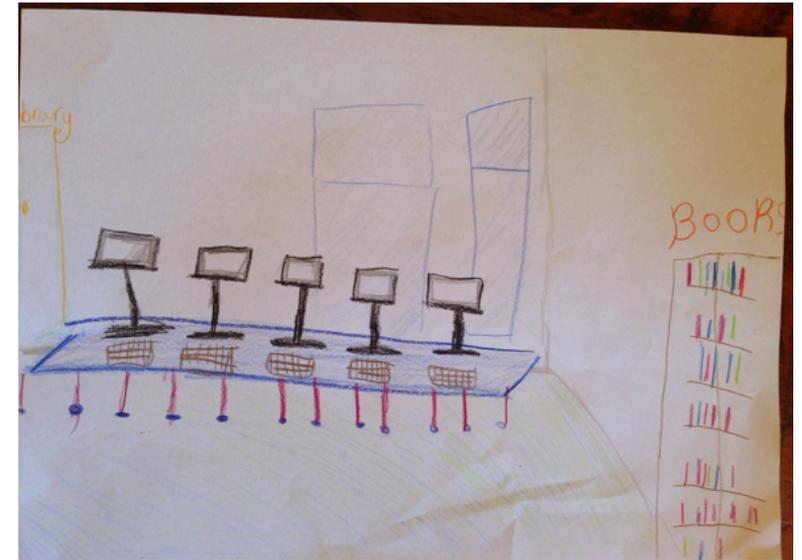


Figure 62 Painting 5

The same student who made the maquette with a big figure of a cat on the floor drew this painting (figure 61). He decided to paint in the classroom and did not have enough time to finish it, but as a fan of pets, especially cats, he just painted a cat in a special place.

In figure 62, the student who drew this painting said that they needed computers in the classroom and started to draw them.



Figure 63 Painting 6

This collage, figure 63, is completely a bedroom. This student had mentioned before that sometimes she needs a quiet place in the classroom. This reflects her desire for a quiet space.

Painting seven also shows a bedroom. It is a colourful space with a window that opens to a peaceful landscape, and a picture of animals and a tree as decoration are significant points in this collage.



Figure 64 Painting 7



Figure 65 Painting 8

Figure 65 shows a table tennis table, a playstation, a slide, and a board with the student's favourite subject - which is mathematics - on it.

Summary of Results

Methods	Important Points for Design
Maquette	<ul style="list-style-type: none"> . Special place for the teacher and sitting area around him/her with a floor covering such as a rug . Separate spaces with different coverings on the floor but without walls to create bigger spaces . Comfortable, cozy and private zones with smooth material . Soft floor coverings . Pets in the graphic designs . Bean bags . Some playing equipment . Rich colours
Drawing	<ul style="list-style-type: none"> . Rich colours . Comfortable spaces . Quiet spaces
Keywords	<p>(All the answers are mentioned in table 4 on page 31)</p> <p>General theme:</p> <ul style="list-style-type: none"> . Students strong connection with nature as a New Zealander from both Pakeha or Maori backgrounds . Students need for an exciting environment
Mind Map	<ul style="list-style-type: none"> . Sky windows . Furniture with different colours (each student is able to select his/her favourite colour) . Big windows . Exciting decoration like having a zoo or a tunnel in the classroom
Conversation	<p>Some negatives about their classroom and some suggestions for improving it)</p> <ol style="list-style-type: none"> 1. Messy (busy) space, 2. Old artworks on the walls (needs to be renewed) 3. Windows blocked by the old art works 4. Dark/pale colours in interior spaces

Table 5

	<p>5. Ceiling is dark</p> <p>6. This classroom needs to be refresh every year</p> <p>7. Walls are very bad</p> <p>8. Windows can be bigger</p> <p>9. Different furniture with our favourite colours</p> <p>10. We can have a sliding door facing a garden</p> <p>11. We need a bigger space</p> <p>12. Fewer walls are better because it can make our classroom bigger</p> <p>13. Sometimes we need a quiet/private place</p> <p>14. Rainbow colours</p>
Observation	<ul style="list-style-type: none"> . Doodling on the walls . Interested in physical activity . Because of their creative minds and dynamic imaginations, they need a dynamic space with some changeable details . They are more energetic in a bigger space . Sunlight and nature is effective for their mood . They are interested in stories and myths
General Experiences	<ul style="list-style-type: none"> . A friendly energetic communication with the students and understanding them is so important in changing the mood of space for the students . Creating something and designing something is very exciting for the students
Special Points	<ul style="list-style-type: none"> . " I don't know what it is but I like to have it here, after a while I will decide what it is."- using free forms to allow the students to have their own defenition of the items . Tunnel with entry and a smiley face in it- cozy space . Sky window . Paintable walls with pictures . Kind of desk hung from the wall
Product Design	<ul style="list-style-type: none"> .Pipe bench or bench from folded surfaces .Bookshelf from folded surfaces .Changeable wall

3.4 First Design Phase

Based on data collected from the first two workshops and the key points, this design phase started with sketching. Design points came from overlapping the three main parts: the students' ideas, the designer's understanding from this cooperation and the MLE/ ILE design plans, according to the students' interest in them.

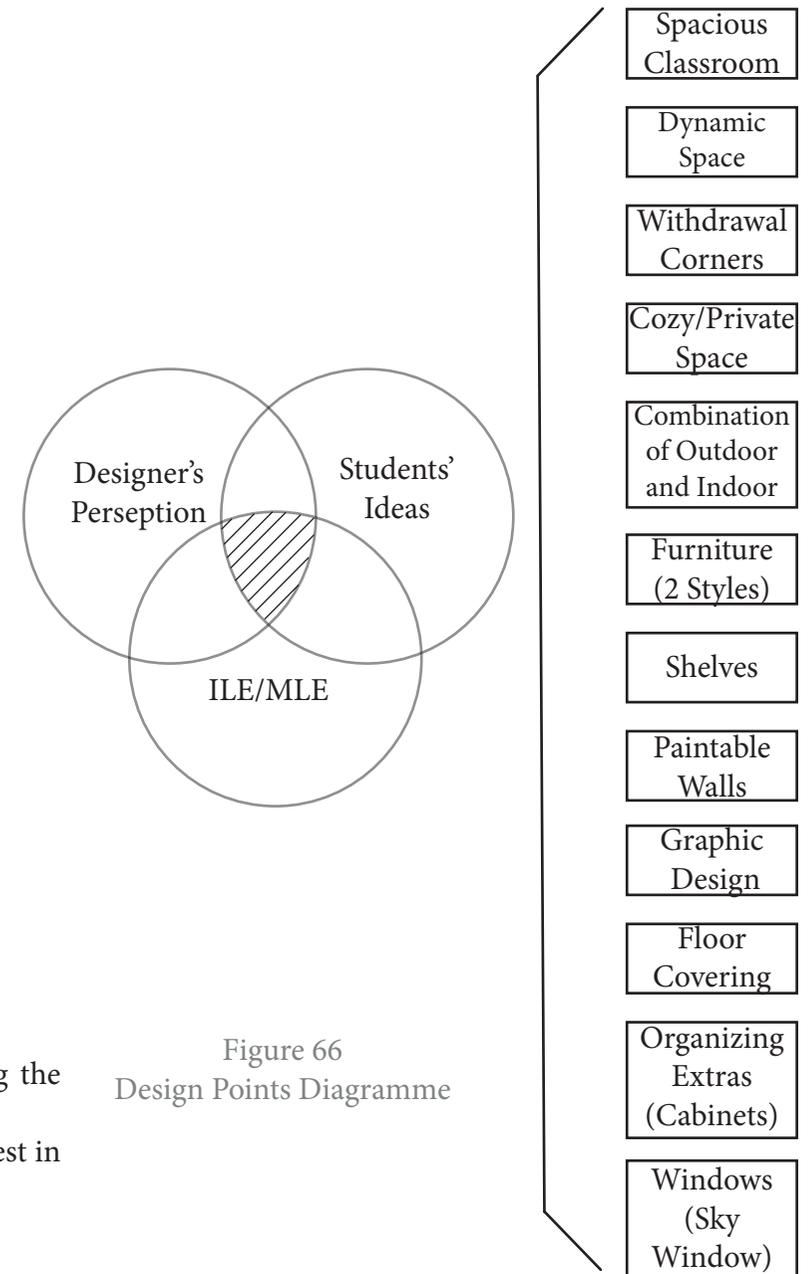
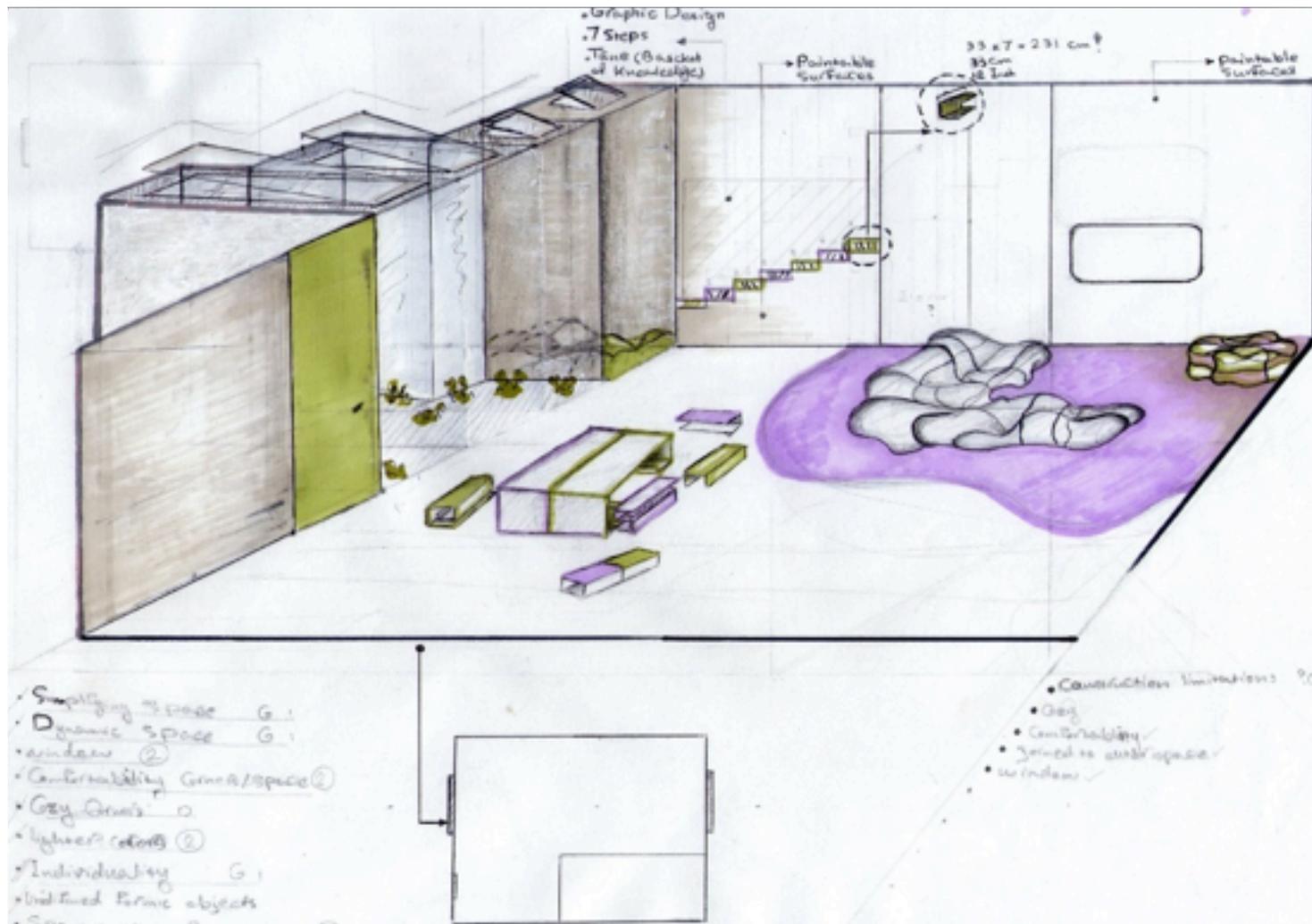


Figure 66
Design Points Diagramme



3.4.1 Sketching

Brainstorming and sketching around the design points:

Figure 67
 Sketch samples

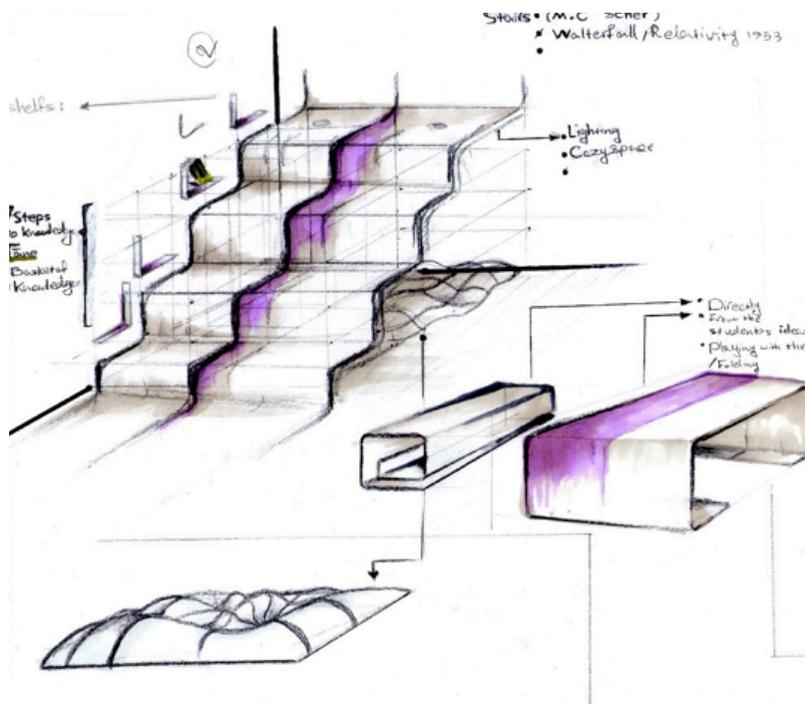


Figure 68
Sketch Samples

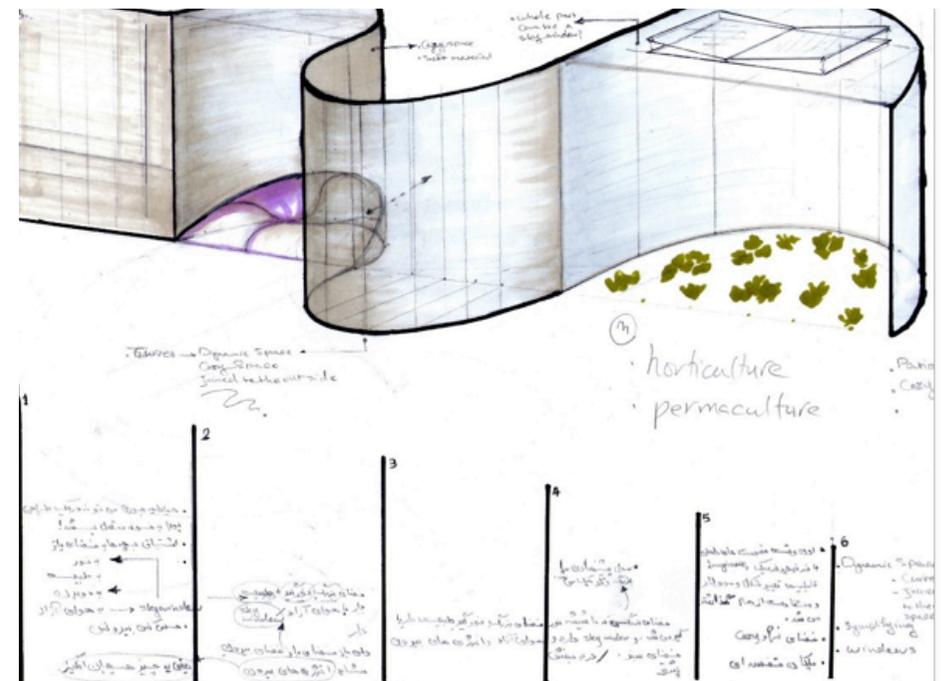


Figure 69
Sketch Samples

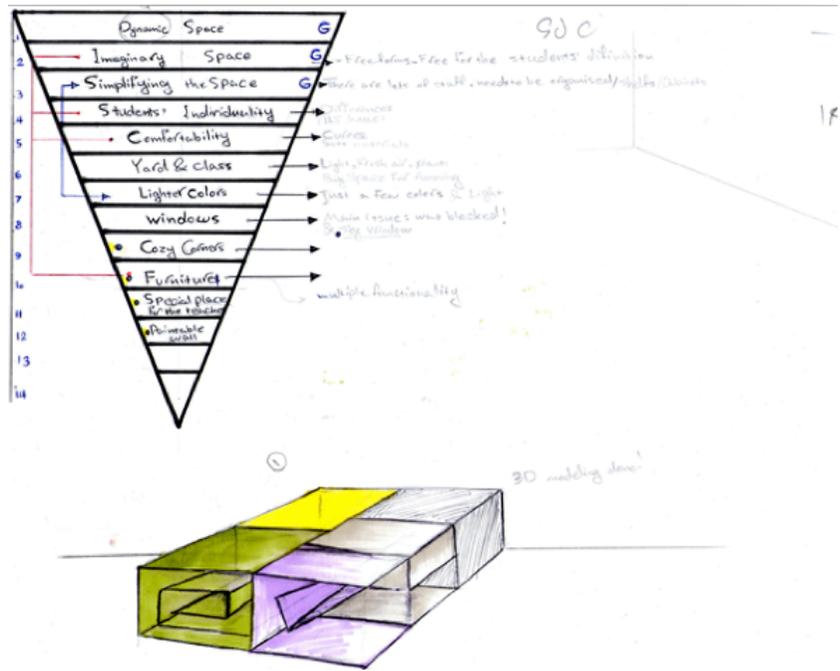


Figure 70
Sketch samples

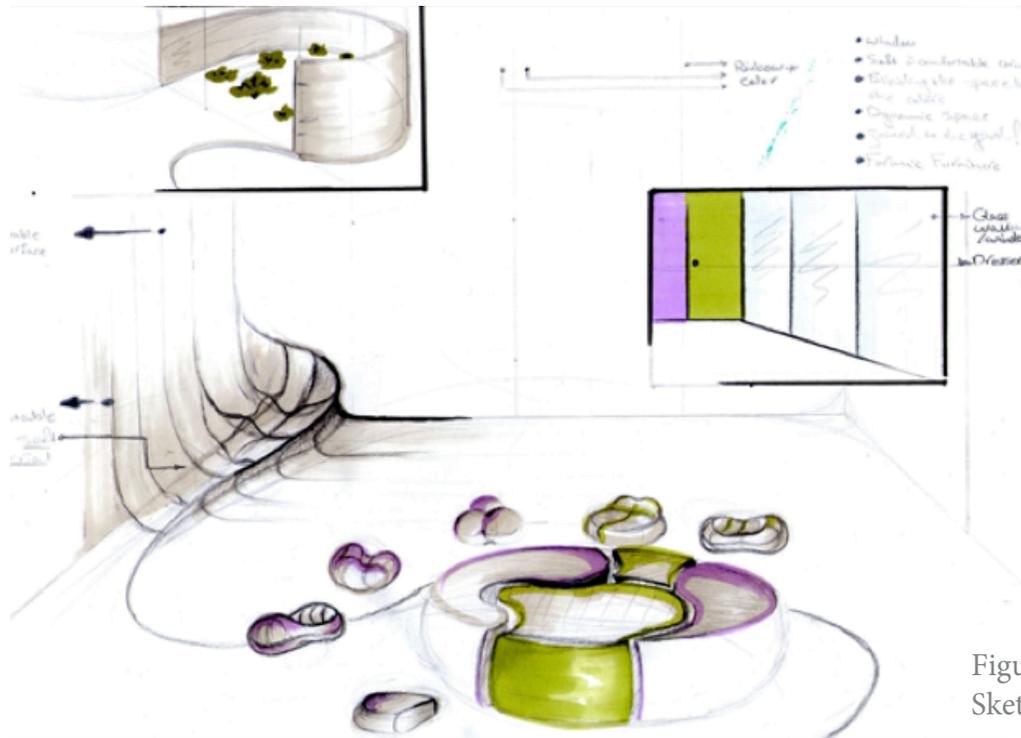


Figure 71
Sketch Samples

Figure 72
Sketch Samples

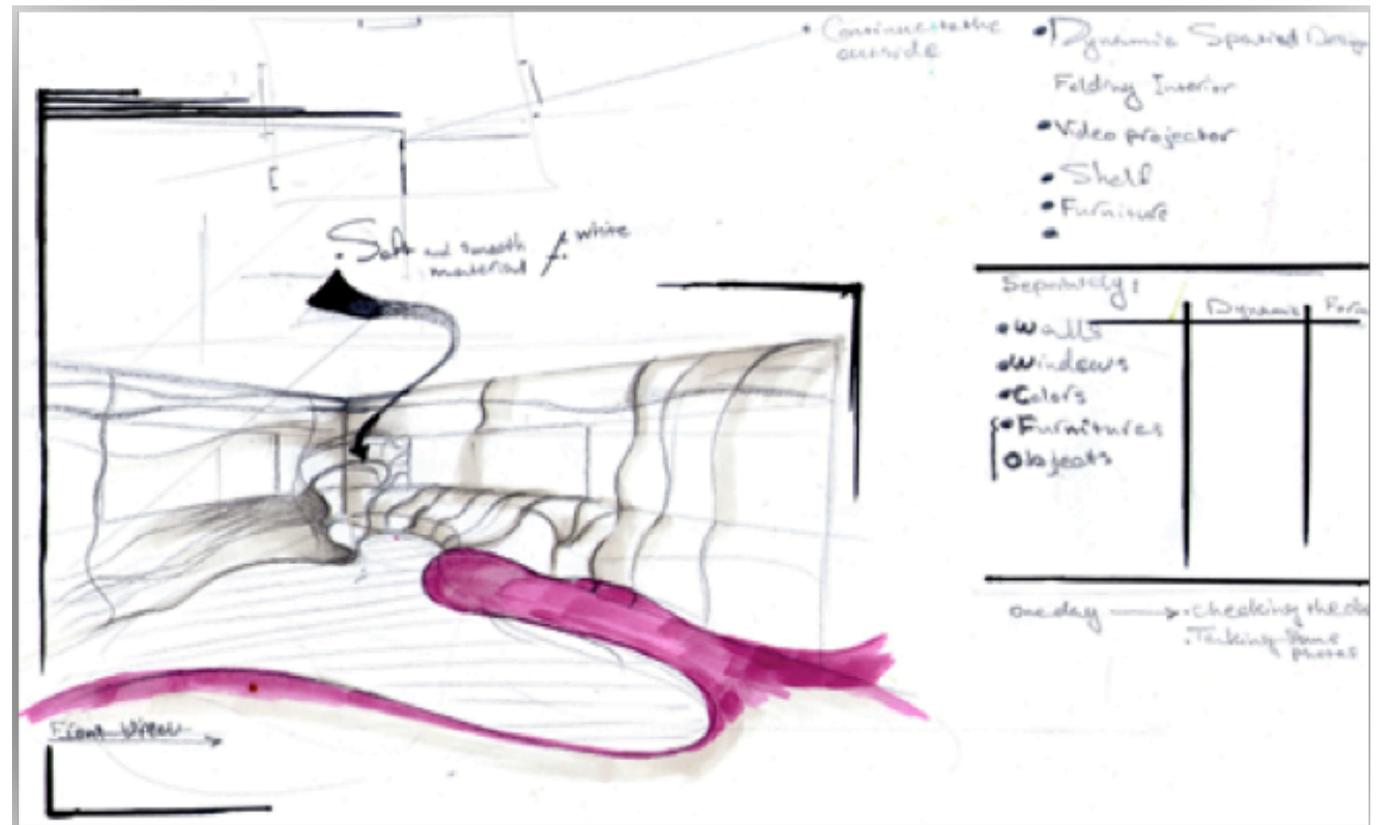
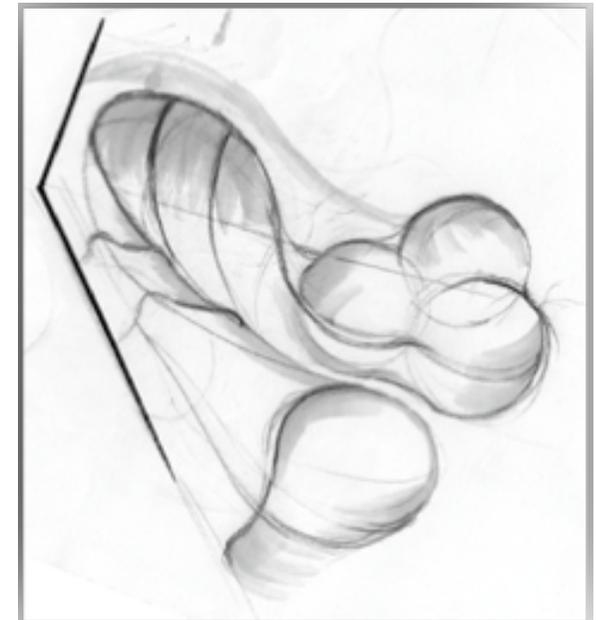
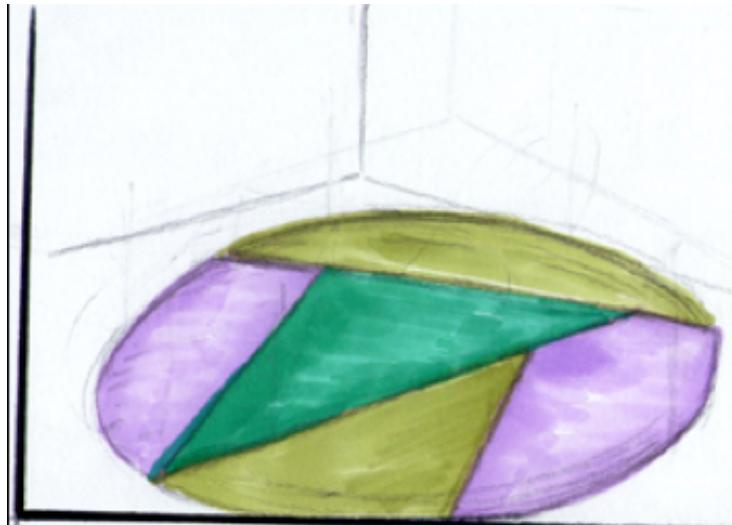


Figure 73
Sketch Samples



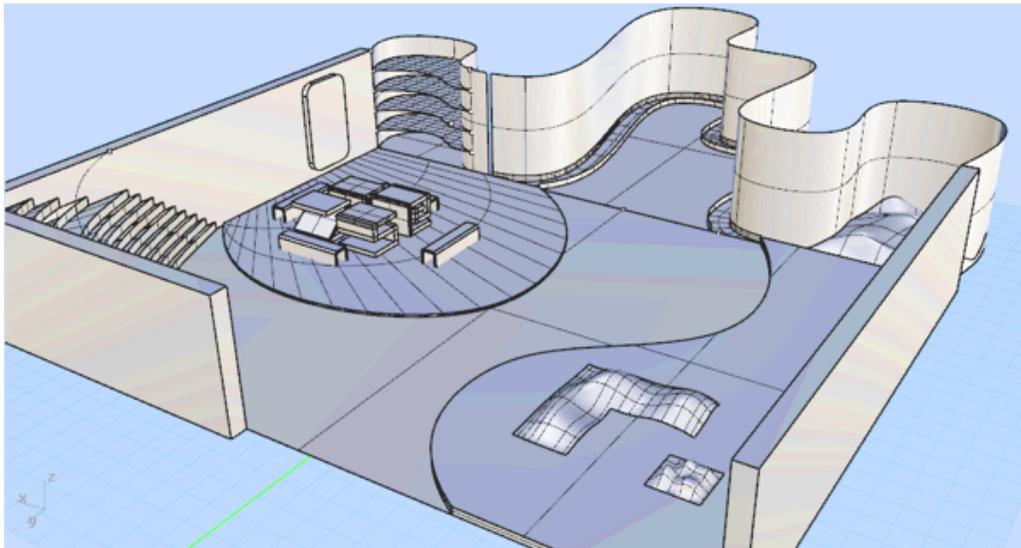


Figure 74
3D Modelling Sketch

The next step after obtaining the key points and sketching was to create some sketches using 3D modelling.

Figure 75
3D Modelling Sketch

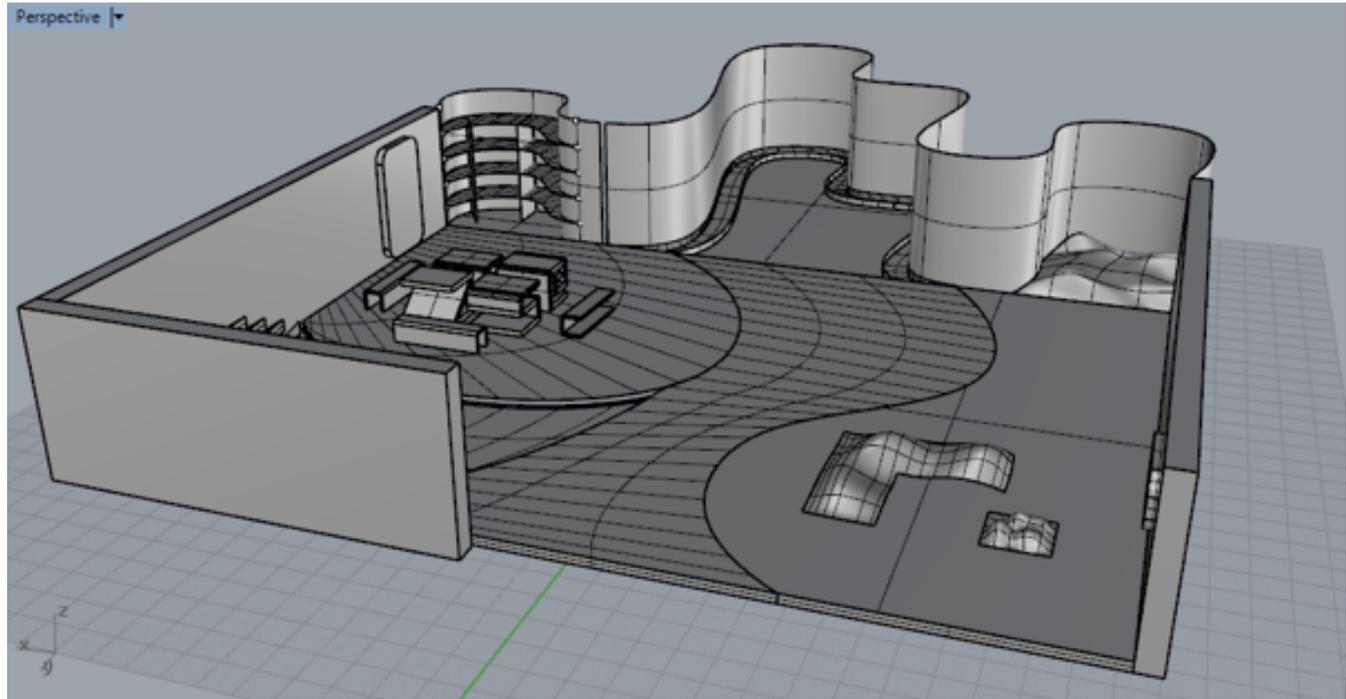
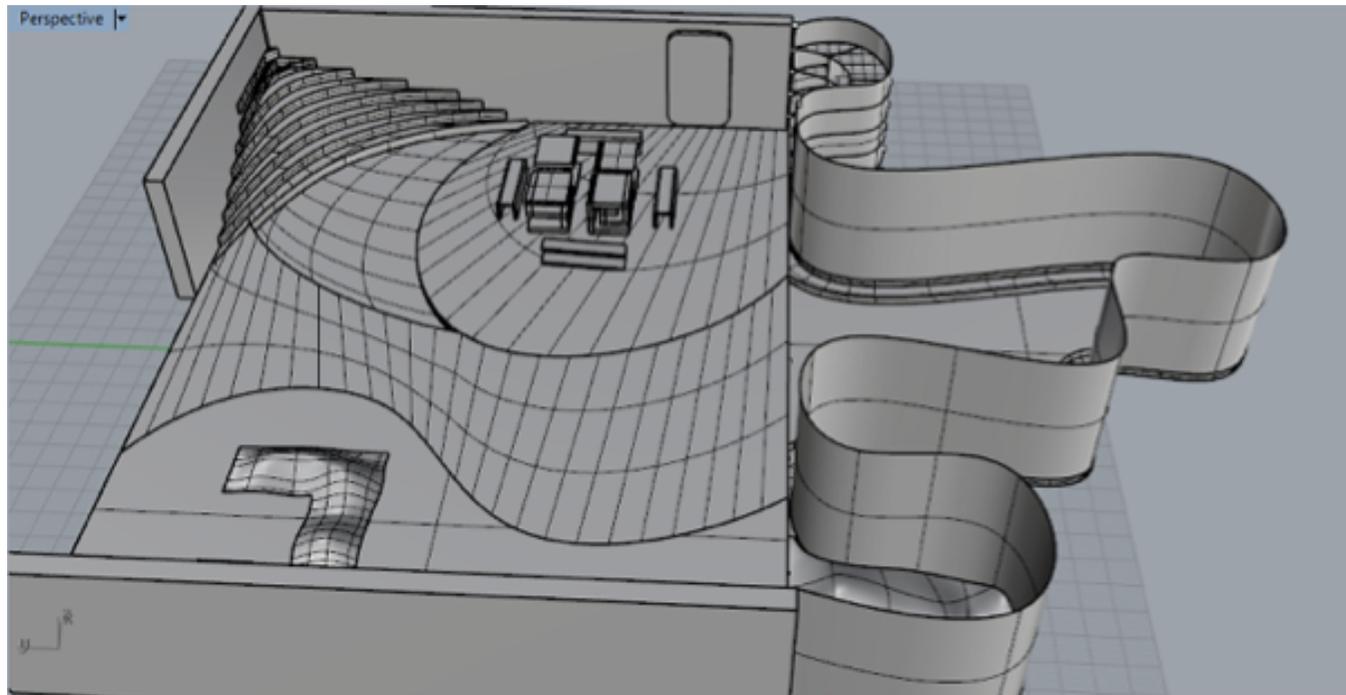


Figure 76
3D Modelling Sketch



3.4.3 Making a Maquette

The following photos show the process of maquette making. The important point about making this maquette was that details had to be able to be changed. This was because at the third workshop the students talked about things and changed them according to their ideas. So, most of the sections were fixed using blue tack and the cardboard was easily changed.

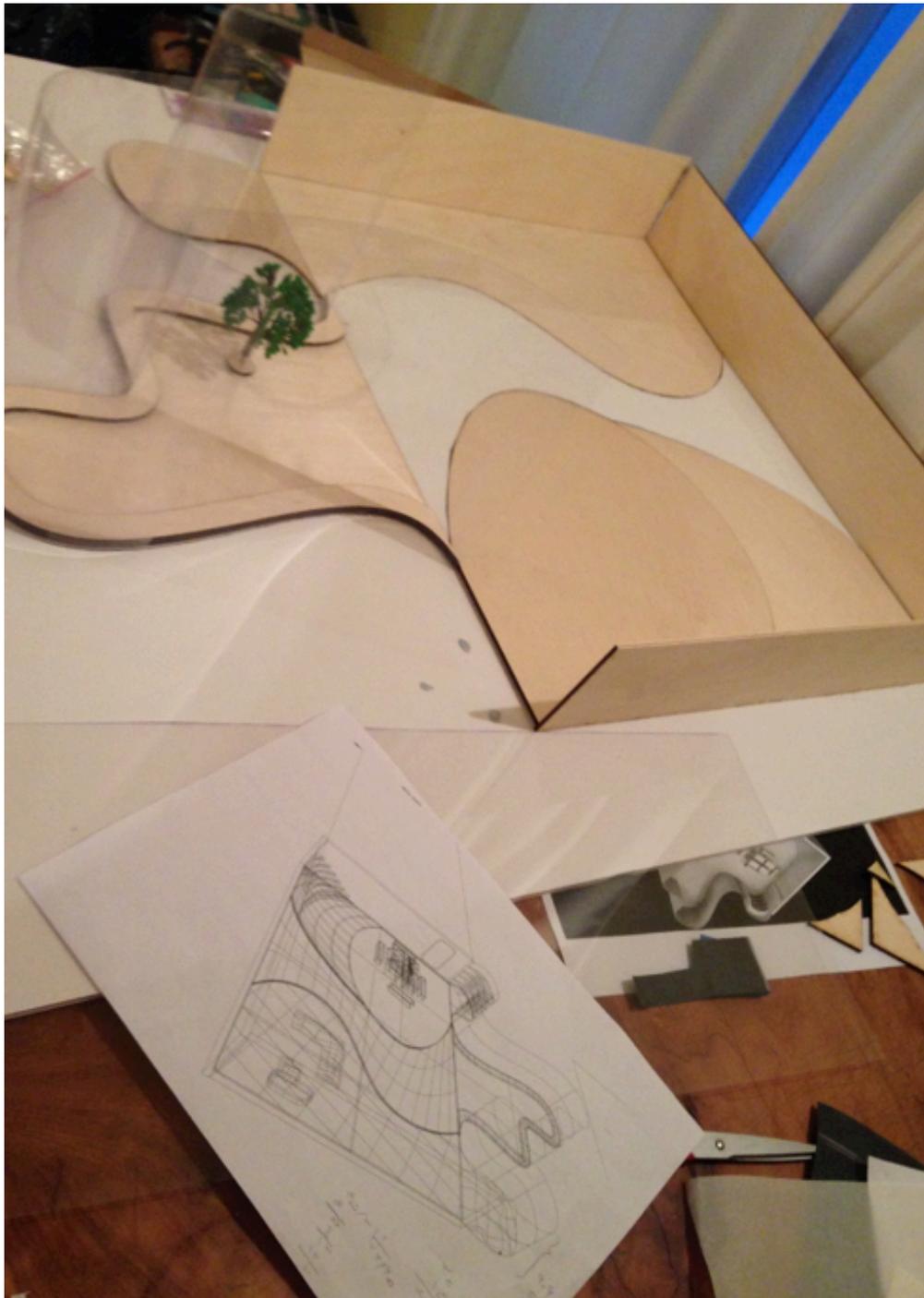


Figure 77
Maquette

Figure 78
Maquette



Figure 79
Details of the Maquette



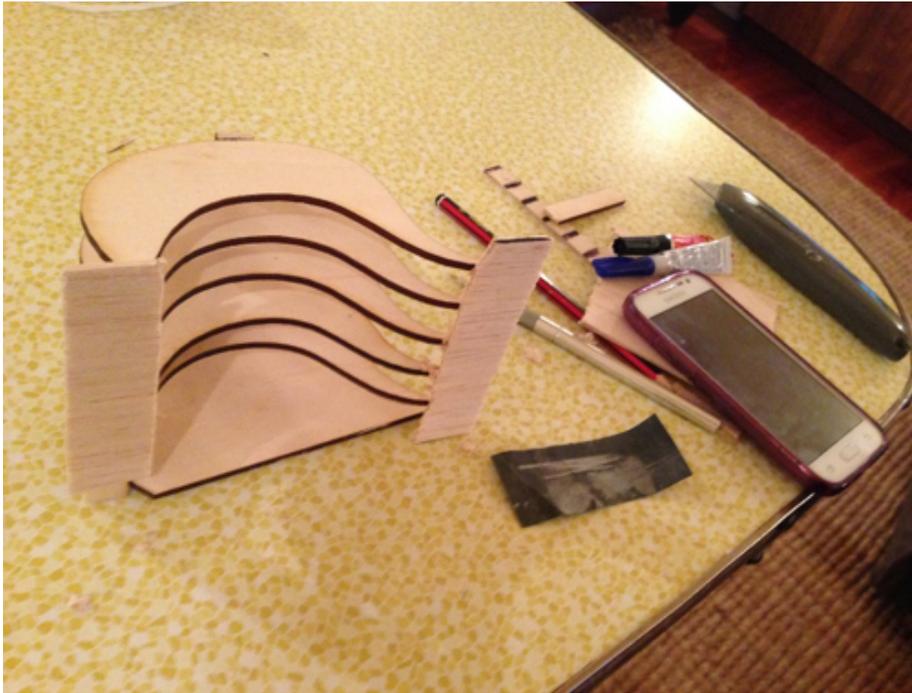


Figure 80
Details of the Maquette



Figure 81
Maquette



Figure 82 Maquette



Figure 83 Maquette

The third workshop was conducted in the same classroom with the same group of students. The general idea was to get the students' feedback about the initial design and maquette.

First we had an overview of the previous two workshops to remind the children about the project. Then the design phase was explained and photos were shared, along with key points based on the previous workshops about the reasons for the maquettes.

The students were excited when they looked at their photos from the two first workshops, their role in designing a new space and the maquettes.

After talking about the design points they had given, these and the reasons behind them were checked again to see whether they still agreed. The following are the main points that were checked with the students.

(Some of the ideas were not in the maquettes as it was important to see whether the children would notice or not.)

1	Dynamic Space (Changeable Space)
2	Spacious (Bigger) Space
3	Joining Indoors and Outdoors
4	Withdrawal Corners
5	Cozy and Private Corners
6	Furniture Design Ideas
7	Shelves
8	Walls (Paintable)
9	Graphic Design
10	Floor (Carpet and Classification)
11	Organizing the Extras (Cabinets)
12	Windows (Sky Windows and Glass Walls)

Table 6
Design points checked with the students in the third workshop

3.5 Third Workshop With the Students (Deliver Phase, Data and Analysis)

After sharing these points with the students and getting their comments, we turned back to the maquette as the design concept.

The students started to change it; all the moveable details in the maquette were changed to make it different, with new stories told about why a thing should be in a new position and how this made it better. This reminded me that their dynamic imaginations needed a more dynamic environment.

When they had lots of new ideas and were talking about them, they were given paper and asked to write what they wanted to add to the maquette. I deleted a few points that were unrelated to a classroom such as a spa, Star Wars movie, soccer, people and other things. The rest of their ideas can be found in the following table (table 7).

1	2	3	4	5	6
1. Cats/ Kitten Hunt 2. Glass roof 3. Window 4. Ball Pit/Sand Pit 5. Statue 6. Farm 7. Stairs Going Up/Down 8. Trampoline 9. Arcade 10. Hydra Slide 11. Pokémon	1. Cats 2. Pokémon	1.Cats	1. Skyline 2. Window 3. Art Space 4. Bag Area/ Shelves 5. Library Corner 6. Play Space (Cave & Foam pit) 7. Trampoline	1. Statue of Animals 2. Up Stairs Playground 3. Down Stair 4. Learning Area 5. Outdoor Pool Area 5. Outdoor Seating	1. More Crazy 2. More Learning Space
7	8	9	10	11	12
1. Cats 2. Another Level and a Fireman's Pole 3. Indoor Plants 4. A Stage	1. Windows 2. Glass Ceiling 3. Tunnel Door 4. More Plants 5. Stage 6. Pillow Pit 7. Shelves 8. Patterned Walls	1. Cats 2. Glass roof 3. Reading Area 4. Ball Pit 5. Crayon Storage 6. Bookshelves	1. Cats 2. Glass roof 3. NFL room 4. Arena Foam 5. Ball Pit 6. Mini Roller Coaster	1. Cats 2. Indoor Aquarium 3. Ball Pit 4. Mini Roller Coaster 5. Indoor Swimming Pool	1. Cats 2. Ball Pit 3. Memes 4. Dogs 5. Octopus

Table 7

The most repeated words about the project written by the students that added to the initial design concept

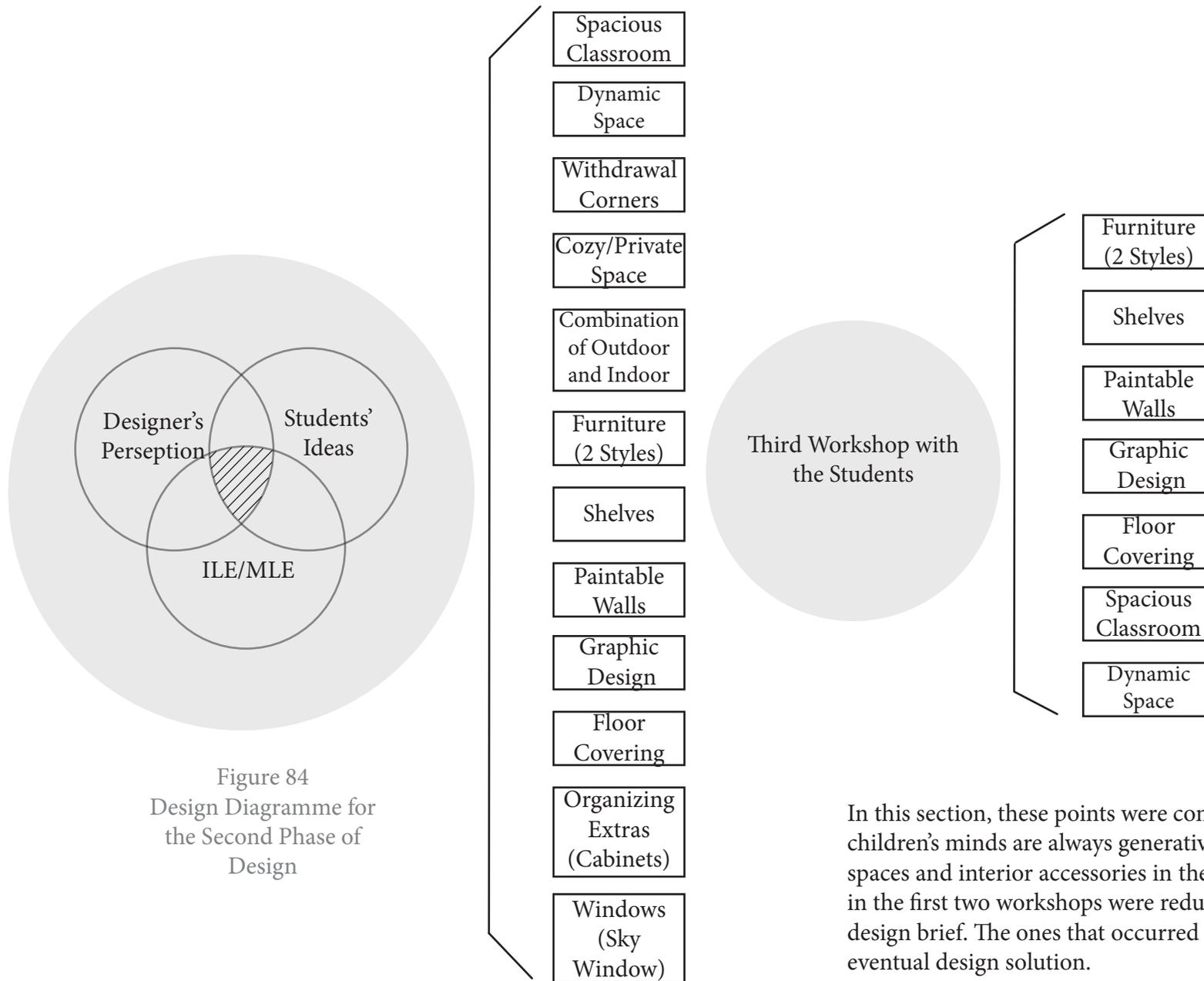


Figure 84
Design Diagramme for
the Second Phase of
Design

In this section, these points were compared to the design brief. As children's minds are always generative, they like to have their favourite spaces and interior accessories in their classrooms. The ideas mentioned in the first two workshops were reduced down and compared to the design brief. The ones that occurred the most were applied to the eventual design solution.

3.6 Second Design Phase

Some details to be applied in the second phase of design are:

Some details that were applied in the second phase of design are:

- Graphic design and motifs; pets, Maori words or myths and some funny designs
- More changeable features to have more activities and to be freer in defining the space; finalizing the paintable wall, some intractional details
- More storage and shelves
- Sky window
- Etc.

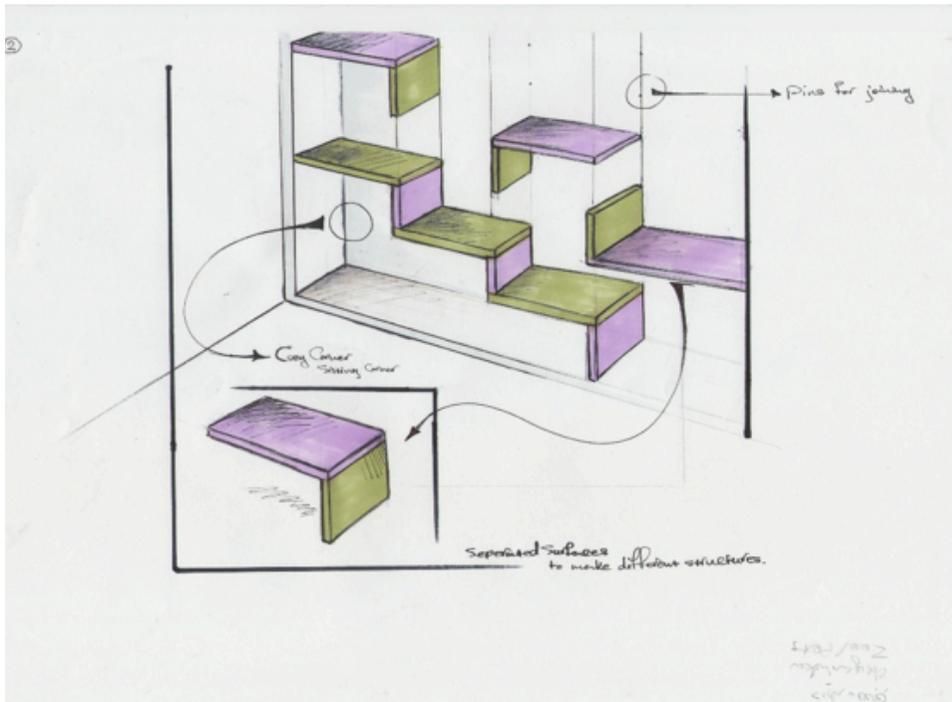


Figure 85

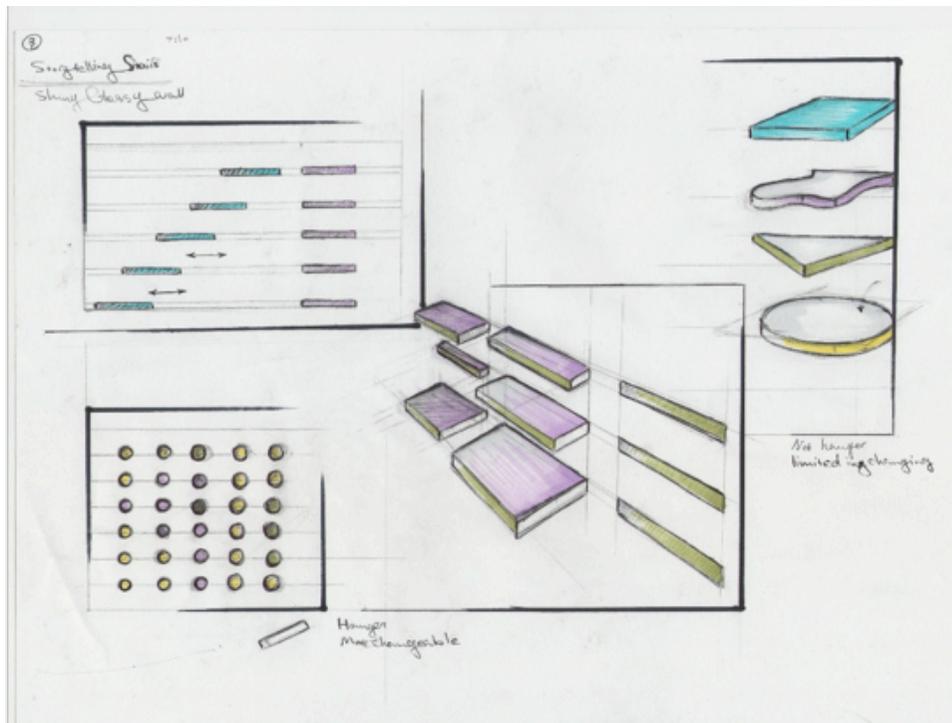


Figure 86

3.6.1 Sketching

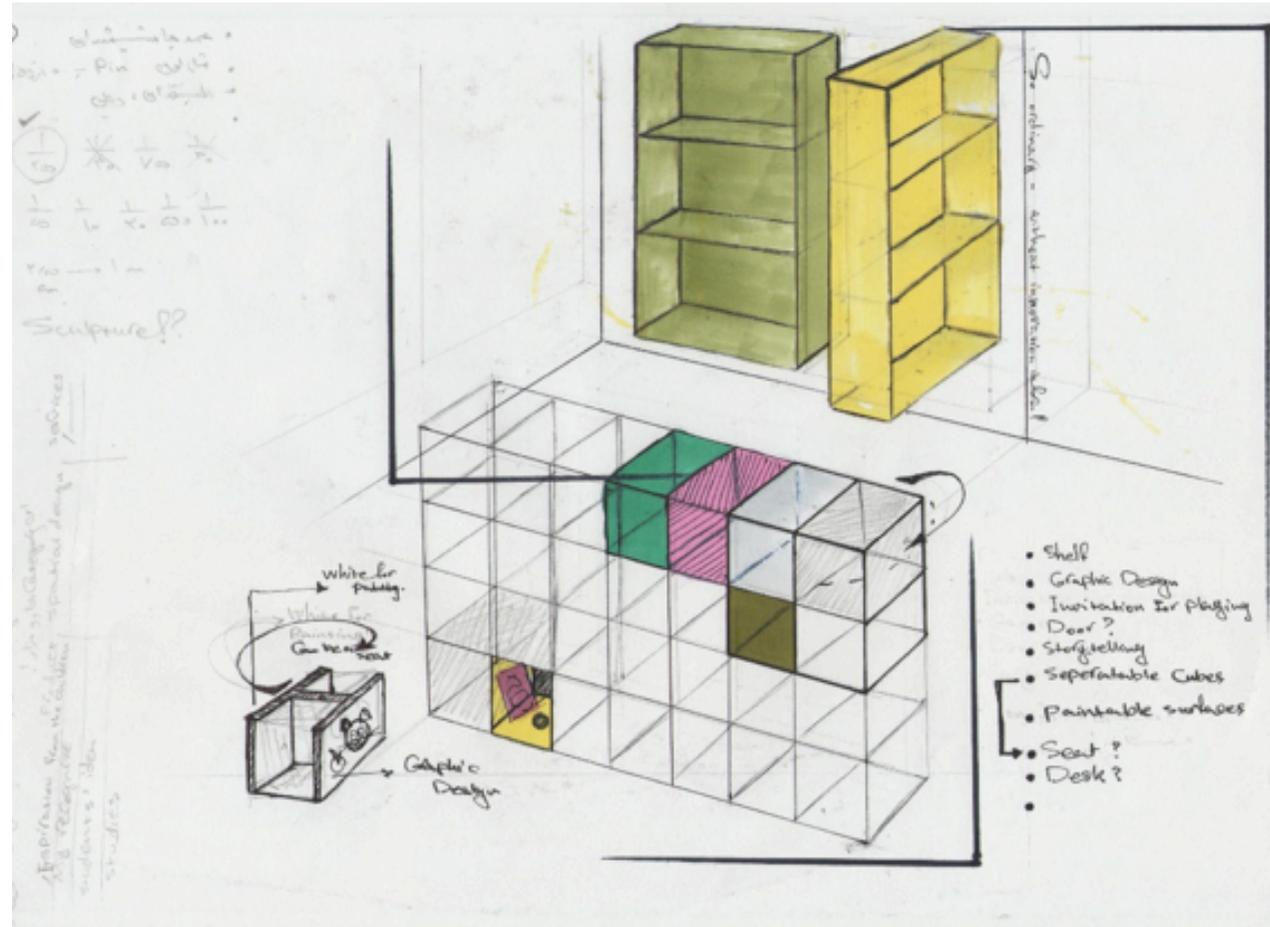


Figure 87

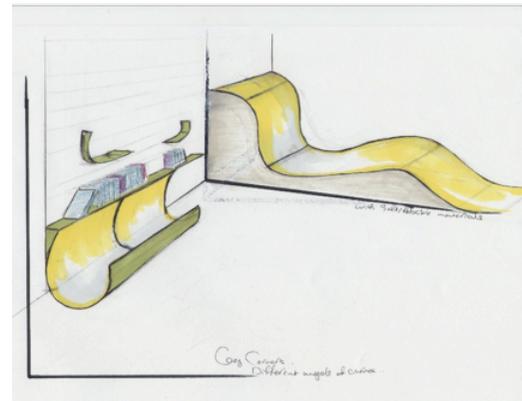


Figure 88

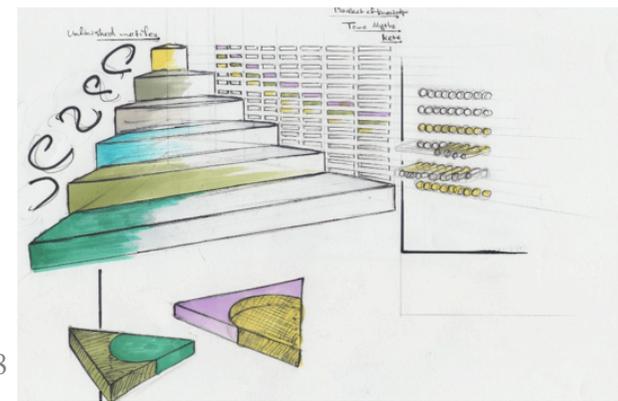


Figure 88

3.6.2 3D modelling

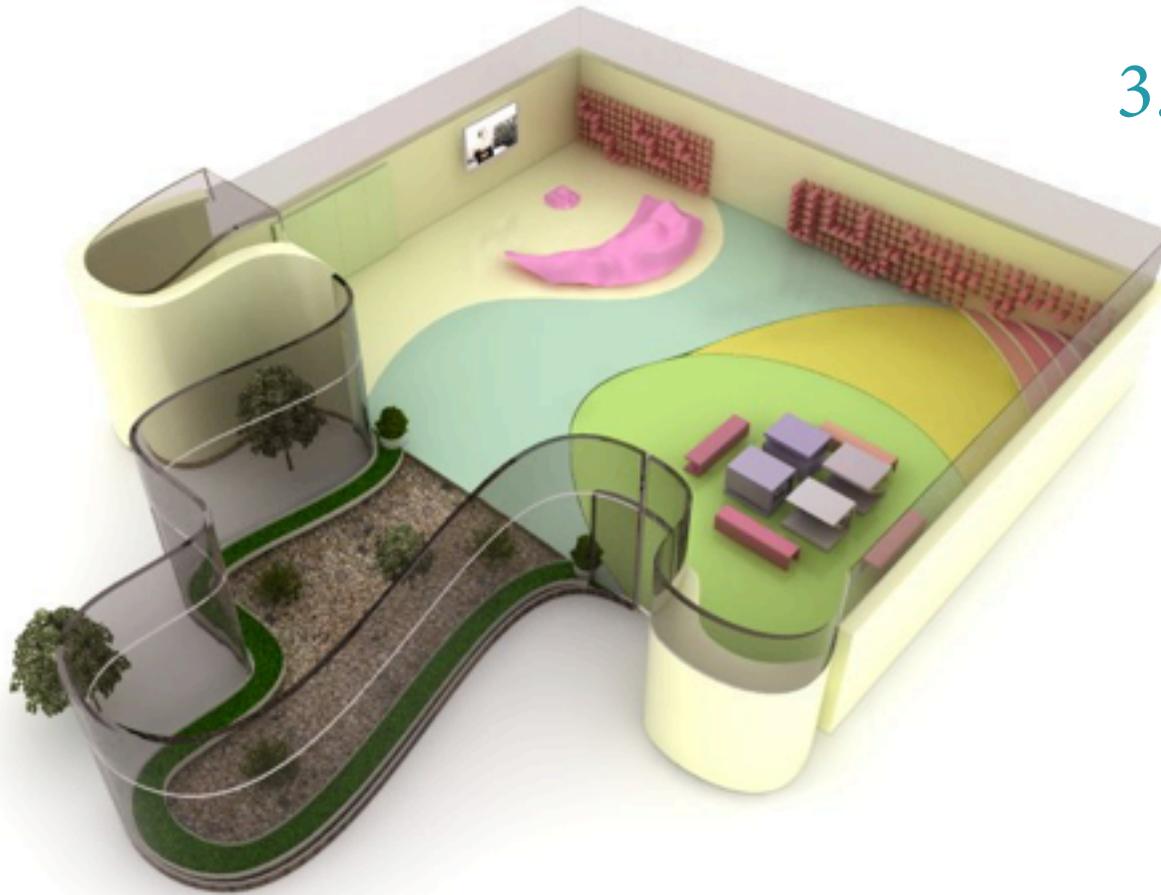


Figure 89

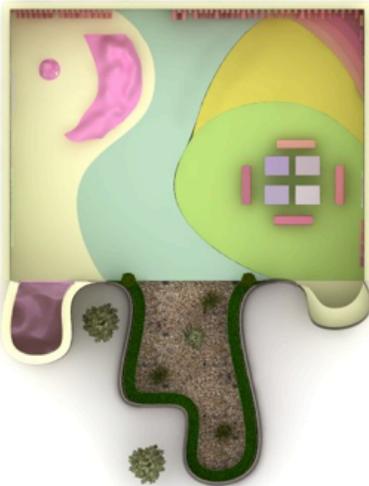


Figure 90



Figure 91

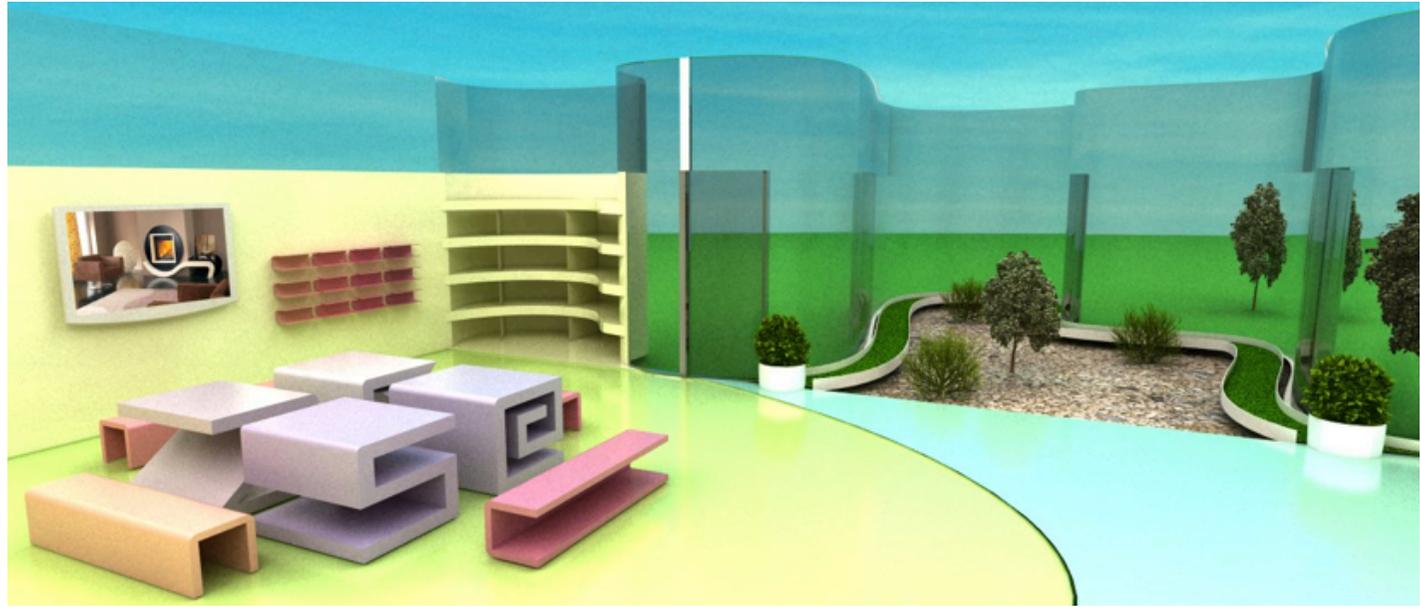


Figure 92

Figure 92 shows a small interior yard with a glass wall, a set of furniture, shelves designed by the students and a digital screen for displaying their art works instead of sticking them on the windows or wall.

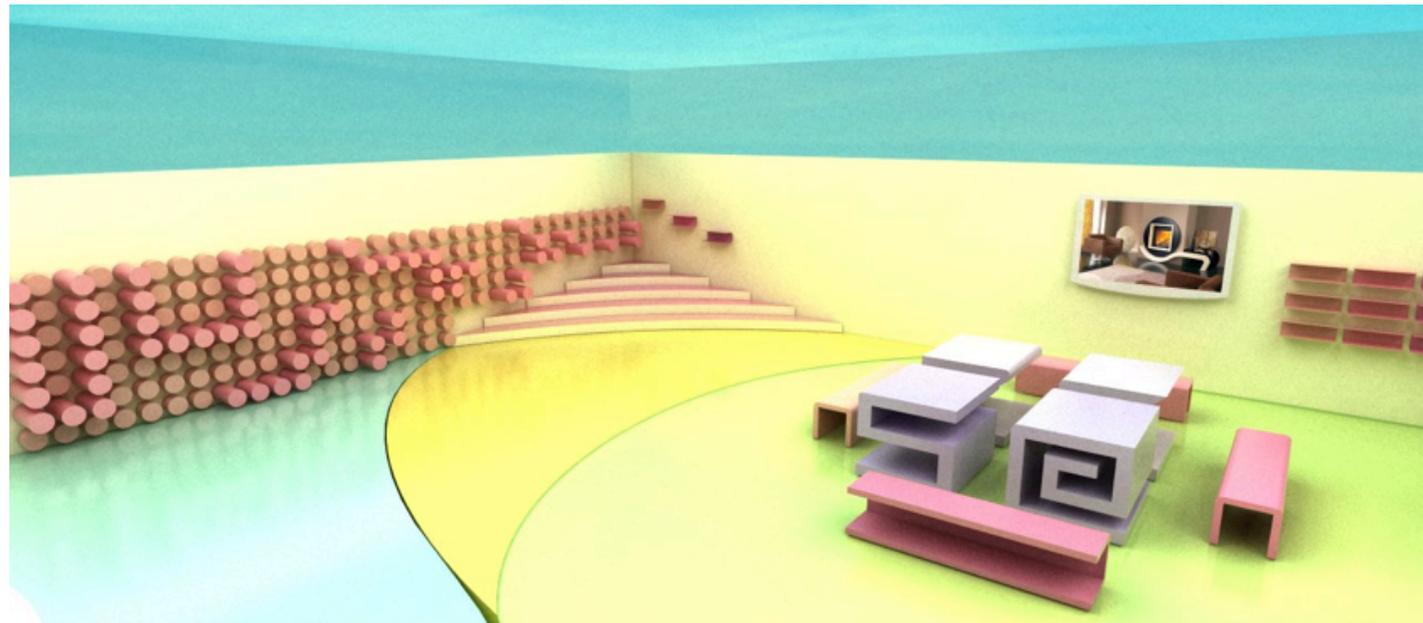


Figure 93

A changeable wall inspired by OOOMYDESIGN (2016) design group is used here (figure 93). The students can play with it, change it, and use it as shelves or hangers.

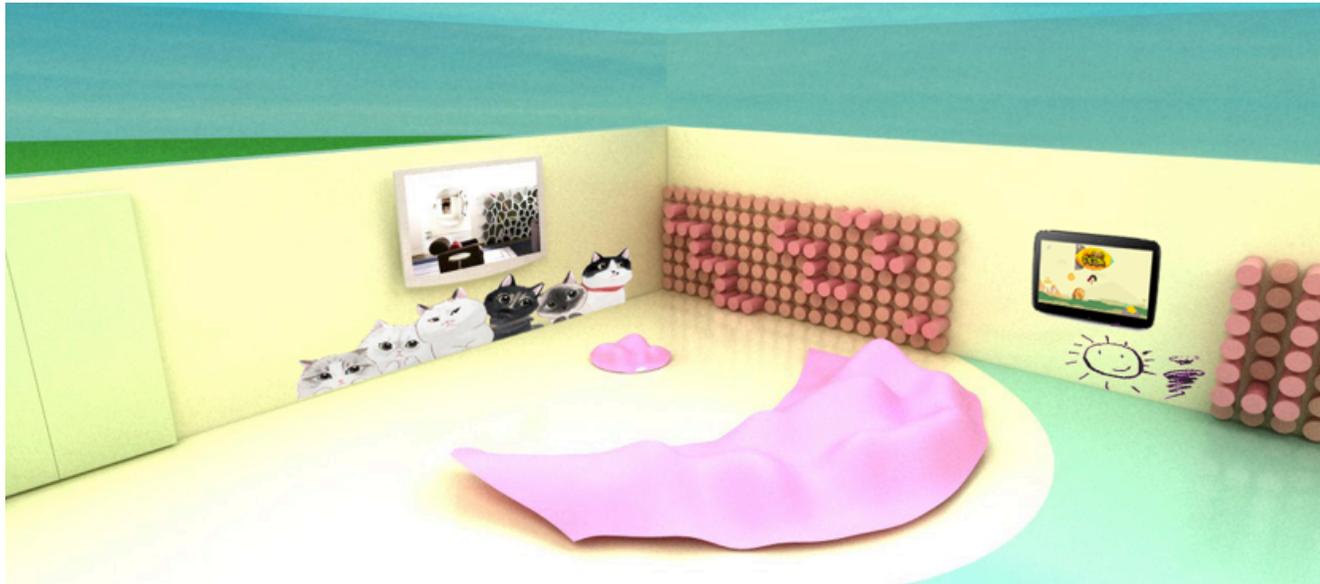


Figure 94

As the students are interested in bean bags as seats, a big seat like a bean bag has been considered here (figure 94), instead of different small bean bags, which can make the space messy. This helps create an organized environment and encourages the students in group study.

Design Element	Material Suggestions
Curved Glass Wall	Double Glazed Glass
Floor Coverings	EVA Foam
Decorative Stairs	EVA Foam
Furniture	Injected plastic
Paintable Wall	Powder-coated Aluminium Sheet

Table 8
Material suggestion

Figure 95 shows a cozy corner with a bean bag covering the floor. Also, a sky window to direct more natural light inside.

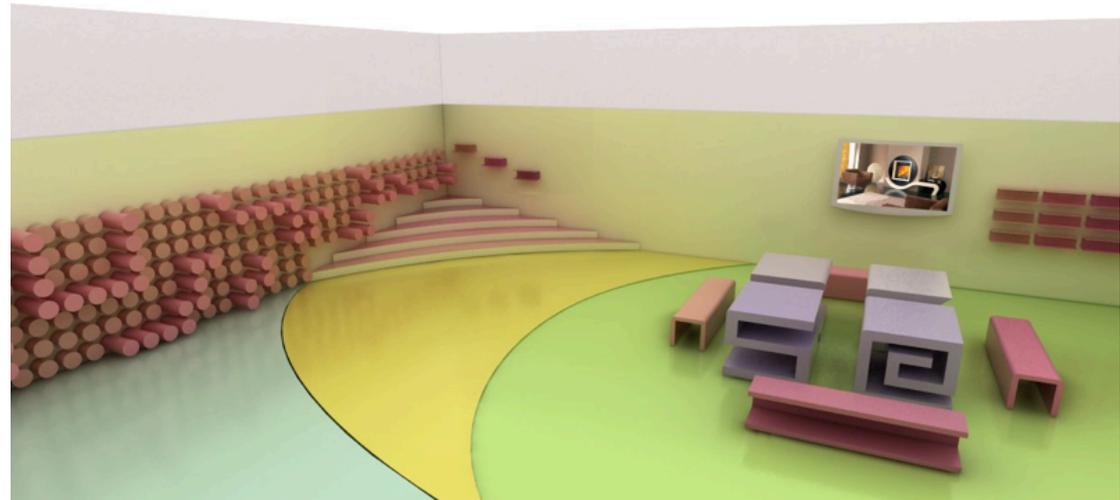


Figure 97

3.6.3 Making a Maquette

Figure 98



Figure 99



3.6.4 Prototype (A set of furniture inspired directly by the students' furniture design)

Figure 100



The following photos show a set of furniture inspired directly by the students' design. One valuable aspect of co-design lies in improving the students' confidence through facing them with their own designs. It can be more effective to make a design directly from their ideas and model making in the final spatial design stage.

This set of furniture was inspired by a maquette (figure 101) and the children's explanation of it. They made a minimal style of furniture by just folding colourful surfaces, which can be used in different directions. Some of these shapes are folded in a way that looks like the English alphabet. Students can discover and play with them (figure 102 to 106).



Figure 101
Maquette (Inspired for Furniture Design)



Figure 102



Figure 103



Figure 104



Figure 105

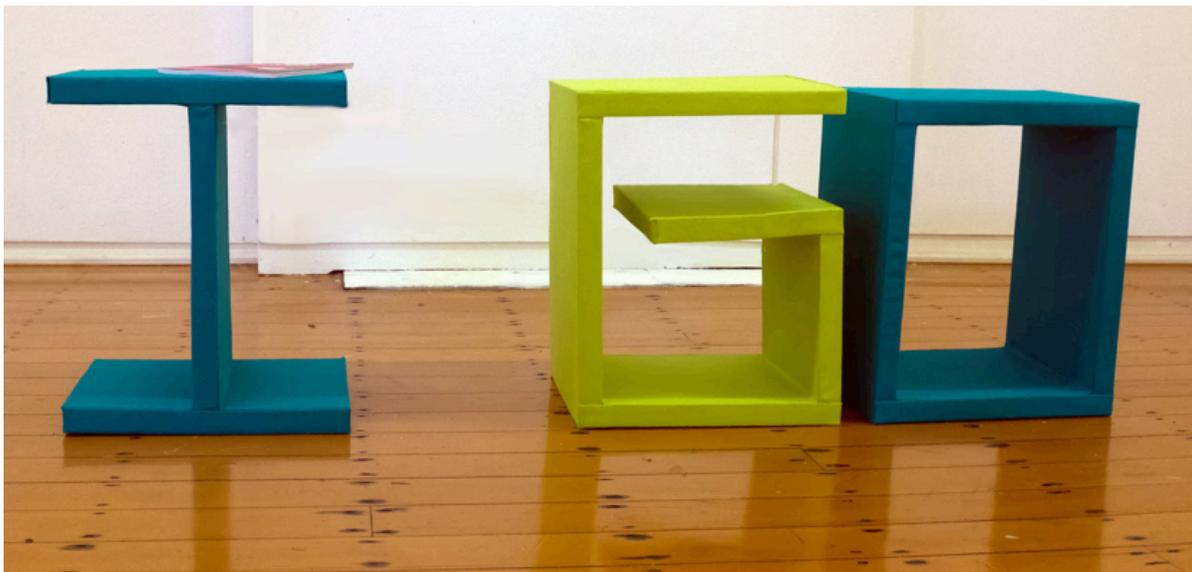


Figure 106

4.PART FOUR

4.1 Conclusion

Before starting this project, a point that needed to be considered was the children's qualifications, their understanding of spatial design and the ways in which they could be provoked and engaged with the design process. But this experience proved that children are intrinsically designers and they are always thinking about their surrounding environment with lots of imagination about how they can change it. They can be invited in, not only to design for themselves but also into design processes that need more creativity and innovation. They love creating and making something and taking these creations seriously has a real influence on their attitudes.

Another point that should be made about students and their classrooms is the role of teacher in the classroom. Communication with students can be effective for the educational process. Regardless of the interior design of the classroom. Ideally, interior design and communication with students function complementary to improve the students' experience.

Two notable points in this co-designing experience can be added here. They are the desire for changeable spaces and for dynamic spaces. These are important design clues for a space devoted to children and the cultural findings discovered in this experience. These two points are explained in this section.

Children always want to change their surrounding environment and to play with it. Because of their creative minds, they are always changing things around them, or thinking about how they can change it. In the third workshop with the students, the maquette was changed. The students could move the walls or most of the features easily. As predicted, they started to move the details around and constantly came up with new ideas. In particular, there was an emphasis on designing more changeable details.

Some design points about a changeable space are considered in the eventual design concept in this project, as mentioned below.

4.1.1 Changeable Spaces and Dynamic Spaces

1. Details in free forms:

Using forms or products in free shapes can help the students to interpret them by themselves. Also, these kinds of products (for example, the set of furniture in figure 105) can be used in different directions. Moving them in another direction can create a new form. They can play and let their imaginations go wild.

2. Moveable (changeable) details:

Some details of the eventual design solution should be easily moved by the students. It can help them change the space easily and define it differently according to their imagination, and they can feel that they are authorized to do this according to their taste or the different requirements of the environment. Examples are using the same furniture, special designs on walls, as in this design suggestion, and an interior garden that looks at the changing seasons. These are some suggested features that make the space a changeable one.

3. Multifunctionality:

Some aspects of the interior designs can be multifunctional. The students find the other functions and choose one of them (this point can be seen in the wall and the set of furniture).

4. Paintable walls or unfinished motifs or graphic design:

As has been mentioned before, the walls are planned to be paintable. Some motifs can be unfinished on the wall. This way the children can be inspired by the motifs and think about how they can be continued, and the paintings can be changed every day.

5. Curves in interior design:

Curves in some details is another suggestion to make the space more dynamic. This kind of line can direct the eyes in different ways as in, for example, the floor coverings or the glass wall in this design.

These points have been considered in this design process to create a more interactive and changeable space as a response to the students' dynamic minds and their tendency to change their surrounding spaces.

4.1.2 Cultural Design Points

During co-designing in this bilingual classroom, the differences in the students' cultures were considered in the re-design of their classroom. As already mentioned, the students did not have specific ideas when talking directly about their cultures, and it was quite a complicated question to ask "How we can design the classroom based on your culture?" Understanding this point came about indirectly through communication with the students and observation. When the co-designer is from a different country and different culture, these differences are more noticeable. Some design points obtained from this part of the co-design process are mentioned below:

- Barefoot in the classroom

In most of the students' maquettes, the students placed colourful paper on the floor as a carpet to walk barefoot in the classroom and they emphasized soft materials to cover the floor, just as some preferred to walk barefoot in the yard. This is not common in other countries with different cultures and can be considered as a specific design point in a bicultural school in Auckland.

- Maori words in keyword play and maquettes

In the keyword play, table 4, the students expressed most of their ideas in Maori words when they were thinking about New Zealand, Auckland and other related concepts. They also used some Maori words to talk about their design during the workshops. In addition, in their paintings and maquettes they wrote words on pieces of papers and used them as a title for their classroom or as a decoration (e.g. figures 32 and 33, p. 45). In this age group the students are practicing writing and reading, so there is a focus on words. This connection with language and words can be used in decoration, which they did. Maori words they mentioned were incorporated into their designs, as seen in the wallpaper, which helped with graphic designs in this design solution.

- Joined outdoor and indoor spaces

When observing and listening to the students, an interesting point was their interest in nature; plants, animals and playing in the yard in their lunch time. They wanted big windows facing a peaceful scene, without the sunlight being blocked.

This connection with nature lies deep in New Zealand and Maori culture, and this improved the children's ability to think about this interior concept.

The design idea around this point was a small garden with a glass wall in the classroom. This introduces change, which alters thinking through gardening and teaching more about nature.

4.2 Summary of Data (Table 9 and Figure 107)

Figure 107 shows a summary of the design clues about what the students want for their classroom, as shown during this co-design process. Table 8 gives a summary of some interesting design ideas thought up by the students, which are inspirational and can be interpreted in different design solutions.

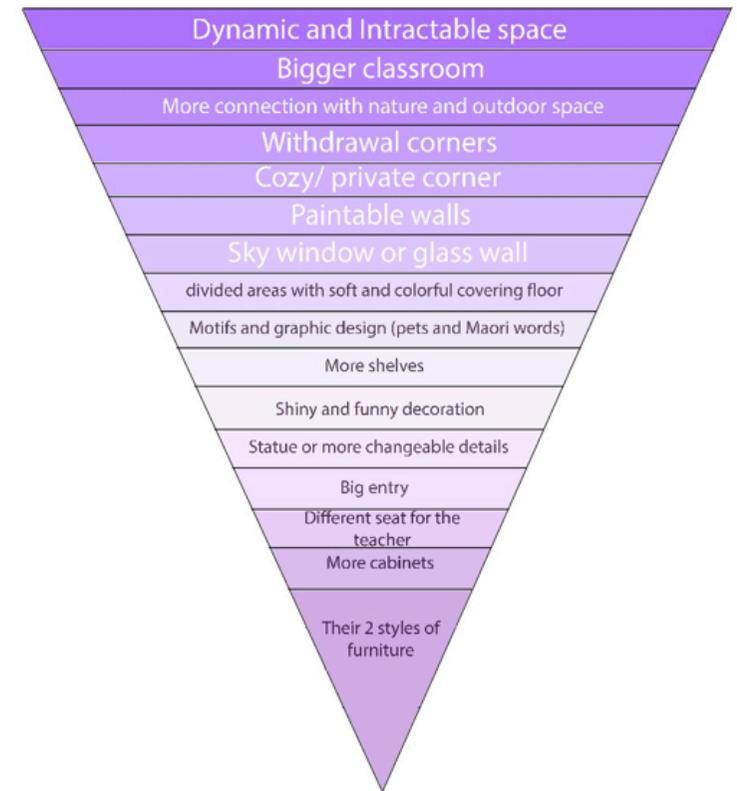


Figure 107 Summary of Design Clues

Some Considerable Design Ideas By the Students	Description
<p>1</p> 	<p>A cubic tunnel as a cozy and private space with an entry title “Look Inside” and some smiley figures inside it.</p>
<p>2</p> 	<p>A classroom design with the title of “Party Rock For everyone” and some pices of foil as some shiny rocks on the walls.</p>
<p>3</p> 	<p>A cozy and comfortable corner just with filling out some soft materials in frame.</p>

Some Considerable Design Ideas By the Students	Description
<p>4</p> 	<p>Some free forms made of foils as a book case and furniture.</p>
<p>5</p> 	<p>A minimal set of furniture and shelves by colorful surfaces (has been inspired in the eventual design solution of this project).</p>
<p>6</p> 	<p>Decorative stairs without any upper floor with usable underneath space.</p>
<p>7</p> 	<p>A blue ramp like a wave to play with and usable cozy space underneath.</p>

Table 9
A summary of considerable design ideas by the students

Design Toolkit

With regard to the growth of the co-design methodology, there are different target groups that are more familiar with design because of developing personal design technologies, such as different apps and co-design methodologies. These different steps are important to share between the co-designers so they can have productive communication leading to a design solution. This is a summary of the experience of the co-design steps. However, as has been mentioned before, the IDEO human-centred design methodology was used as the general methodology in this research, but some details are different, as depicted below (table 10):

Steps	Description	Question	Tools	Output
1.Design proposal	A general research question around some areas with the potential of improvement or multi aspect human- centred design fields	How can co-design assist students at a bicultural primary school in central Auckland transition into” a Modern” or” Innovative Learning Environments” (MLE/ILE)?		
2.Study phase	Identifying the design frame	What are the most important considerations in this field and how we can have a productive co-design with the students?	. Common study methods . Meeting the related co-design groups	Framing co-design, the extent of participation, and the cultural approach
3.Identifying the people	Specifying the target group and the particular environment in which the design or the co-design process will occur	In which school and with which group of students will this co-design be performed?		13 students at a bicultural primary school in Auckland at the eve of MLE/ILE renovation
4.Planning	Planning the workshops with the target group and setting a time frame	What are the main steps of the co-design process in the workshops with the students? How long does each step take approximately?		3 workshops, 90 minutes each with specific communication methods
5.Sharing and practicing the plan	Planning the workshops with the target group and setting a time frame		Drawing a storyboard	

Steps	Description	Question	Tools	Output
6.Initial Workshops	Sharing and practicing the plan with the design assistants or the related authorities	How do the students feel about their classroom design? How do they want to improve it?	Introductory presentation . Group discussion . Mind map . Keyword play . Maquette making . Drawing . Collage	Getting enough design clues for the first design phase
7.First design phase	Designing based on the results of the first two workshops		. Sketching . 3d modelling . Making maquette	An initial changeable maquette and 3d modelling photos to share with the students
8. Last workshop	Getting the target group's feedback about the design solutions	Do the students agree with the initial design concept and its details?	. Presentation (summary of the results and the initial design solution) Group discussion Maquette making (group work)	Supplementary design ideas to finalize the eventual design solution
9.Second design phase	Considering the third workshop's data to finalize the eventual design solution	How can we add the students' comments in the third workshop to the initial design concept	. Sketching . 3d modelling . Making maquette	. A finalized maquette (1/30 scale) . A prototype of a set of furniture designed by the students
10.Design output				. Co-design toolkit . Spatial design data . Eventual design suggestion

Table 10
Co-design Toolkit

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Appendix



Mana Haghighi
64 Taylor Street
Blockhouse Bay
Auckland 0600

21.4.16

Dear Mana,

Your file number for this application: **2016-1005**
Title: **Co-Designing Primary Learning Spaces in Aoteaora New Zealand**

Your application for ethics approval has been reviewed by the Unitec Research Ethics Committee (UREC) and has been approved for the following period:

Start date: 6.4.16

Finish date: 6.4.17

Please note that:

1. The above dates must be referred to on the information AND consent forms given to all participants.
2. You must inform UREC, in advance, of any ethically-relevant deviation in the project. This may require additional approval.

You may now commence your research according to the protocols approved by UREC. We wish you every success with your project.

Yours sincerely,

Sara Donaghey
Deputy Chair, UREC

MANA TALEBI TAGHIGHI
STUDENT NUMBER 1444650



Full name of author: *Mana Talebi Haghighi*

Full title of thesis/dissertation/research project ('the work'):

Co-designing Primary Learning Spaces in Aotearoa New Zealand

Practice Pathway: *Creative Industries*

Degree: *Master*

Year of presentation: *2017*

Principal Supervisor: *Dr. Leon Tan*

Associate Supervisor: *Rau Hoskine*

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Signature of author: *Mana Talebi Haghighi*

Date: *6.1.3.1.2017*



Declaration

Name of candidate: Mana Talebi Haghighi

This Thesis/Dissertation/Research Project entitled: Co-designing Primary Learning Spaces in Aotearoa New Zealand
is submitted in partial fulfillment for the requirements for the Unitec degree of
Master of Design

Principal Supervisor: Dr. Leon Tan

Associate Supervisor/s: Rau Hoskins

CANDIDATE'S DECLARATION

I confirm that:

- This Thesis/Dissertation/Research Project represents my own work;
- The contribution of supervisors and others to this work was consistent with the Unitec Regulations and Policies.
- Research for this work has been conducted in accordance with the Unitec Research Ethics Committee Policy and Procedures, and has fulfilled any requirements set for this project by the Unitec Research Ethics Committee.

Research Ethics Committee Approval Number: 2016-1005

Candidate Signature: Mana Talebi Haghighi Date: 6/3/2017

Student number: 144465