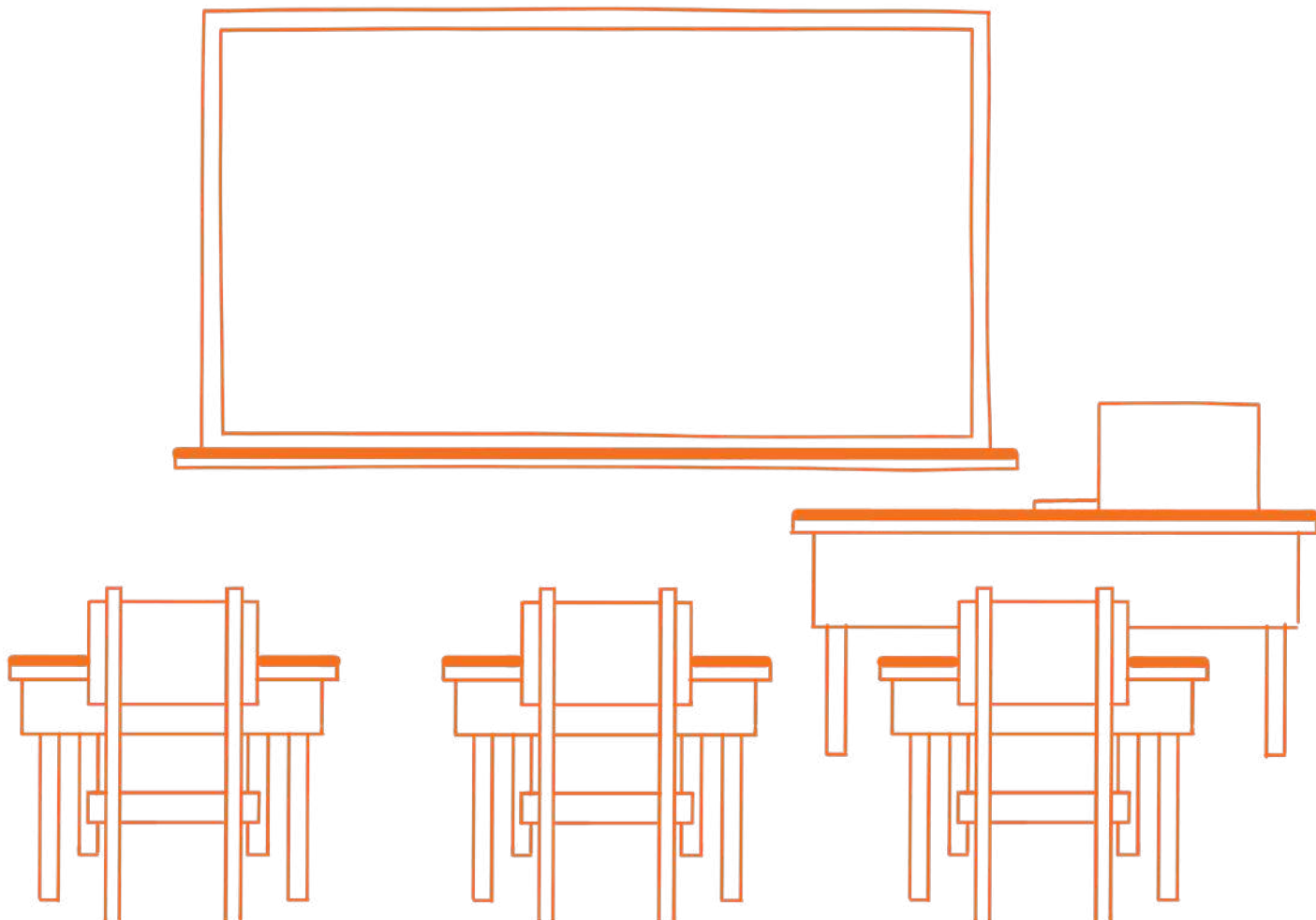


# LITTLE SCRIBBLER'S

## Creating a Dynamic Educational Setting in Primary School Classrooms: A Research Report

Mateias Largiader N10746943



## Authenticity Statement

This is to certify that to the best of my knowledge, the content of this report is my own work. This report has not been submitted for any subject or for other purposes. I certify that the intellectual content of this report is the product of my own work and that all the assistance received in preparing this report and sources have been acknowledged.

Your name: Mateias Largiader

Student number: N10746943

Date: 09/09/2023

## AI Use Statement

I have utilised Generative AI in this report (ChapGPT, Dalle, Bard, or similar) to assist in various ways. The way I have used Generative AI includes providing a guideline for how the interview questions should be wrote and also assisting in drafting a suitable executive summary.

Your name: Mateias Largiader

Student number: N10746943

Date: 09/09/2023

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# EXECUTIVE SUMMARY

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This research delves into the impact of flexible classroom designs towards student learning. It investigates this on a deeper level by combining both primary and secondary research to reach a solidified conclusion of what awaits the future of the education system. Research techniques such as interviews and observations were conducted at an existing primary school located in Brisbane, Australia, to identify critical design implications as a foundation for designing a multi-purpose, versatile, and engaging classroom atmosphere. The results provide underlying reasoning for incorporating elements such as naturalness, individualisation and stimulation when creating a flexible classroom. Nonetheless, challenges surrounding space constraints, the risk of causing distractions, and useability are all derived and key to making the design outcome successful. Overall, this study demonstrates the impending demand for intuitive and inventive solutions that can help steer the future of the education system away from its predecessor.

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# INTRODUCTION

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What is learning, and how does someone know if something has been learned? On average, students spend up to 13 years in a school-based educational setting in Australia (Australian Government, 2022). Throughout these 13 years of scholarly learning, students are encouraged to undertake schooling from preschool, preparatory (kindergarten), primary school, secondary school, and senior secondary school. Because of this, children must attend school until age 16 (Technology, 2022). However, in the end, learning is much more than just examinations and schools.

Learning is a change in knowledge or behaviour that results from a current experience (Pressbooks, 2021). Unlike instincts and reflexes, learning involves acquiring knowledge and skills through experiences. Therefore, why is it that although society has grown and adapted over the years, our overall structure of the education system has stayed the same?

In a time when education is vital to one's life, children are still forced to learn in the same educational setting established in the Industrial Revolution, where schooling focused on building workers with a relatively fixed set of knowledge and skills rather than nurturing and promoting innovation, adaptability, and learning agility (Krishnan, 2020). However, due to the digital age

of the twenty-first century, schools are now forced to shift from the traditional educational approach of teacher-led instructions to a more student-centred approach (Kariippanon et al., 2017). At the same time, the industrial-aged classroom layout, typically rows of chairs and desks, is no longer a viable way of designing a classroom to coincide with the inclusion of technology. About  $\frac{3}{4}$  of all New Zealand and Australian school students still house traditional classroom designs without access to flexible furniture or innovative spaces (Beparta, 2020). Thus, the most significant implication of breaking the traditional learning environment is down to classroom design. In order to better utilise the spaces in a classroom, teachers and students are encouraged to incorporate a more flexible learning style.

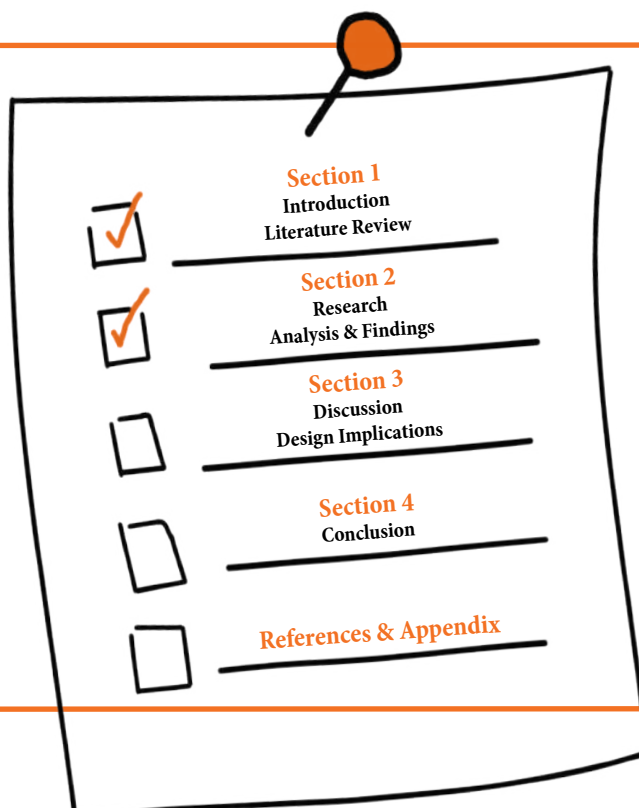
With this in mind, the overarching aim of this project is to create a product or system that can better help students and teachers design a more flexible learning environment. Understanding that the classroom holds all the stakeholders involved in this outcome is essential. The teachers, students and school as a whole are all stakeholders. Ultimately, the solution is to adapt the current furniture inside a typical classroom to provoke a more active and flexible learning style that can increase student concentration and the teacher's control.



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# STRUCTURE OF REPORT

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A review focusing on relevant concepts and theories targeted at the basic principles of learning, and the impact learning has when changing from traditional learning to a more flexible learning style.

## Principles of Learning

Although learning can be different for everyone, studies show that there are a total of three basic types of behavioural learning (see Figure 1). These include classical conditioning, operant conditioning and modelling/observational learning (University of Washington, 2013).

Classical conditioning describes a learning process in which an association is made unconsciously between both a previously neutral stimulus (sound of a bell) and a stimulus that naturally evokes a response (taste of food) (Kendra Cherry, 2019). In a primary school environment, an example of classical conditioning is when a teacher creates an association between auditory or visual cues and learning materials (Philo-notes, 2023).

Operant conditioning is a learning process made consciously, sometimes called instrumental conditioning. The learning method creates an association between a consequence and a behaviour, known as positive and negative reinforcement, to establish a strong learning pattern (Wahome, 2022). An example of operant conditioning used in the classroom setting can be when a teacher uses rewards to encourage academic achievement or good behaviour and punishments to discourage any interruptive behaviour (Mcleod, 2021).

Finally, there is modelling/observational learning, a method of learning done consciously and unconsciously. This type of learning occurs through observing others' behaviours and modelling someone's behaviour, emotional expression or attitudes (Stone, 2017). Observational learning is seen as four main elements in a classroom: attention, retention, reproduction and motivation. Therefore, most observational learning in a classroom is passive and is noticeably done when the teacher carries out a task and then has the students repeat it (fntadmin, 2021).

With all three of these essential learning processes in mind, it is clear that they are vital in creating a positive and structured learning environment. If all three learning processes are used correctly in a classroom setting, this can lead to a learning style known as associative learning.

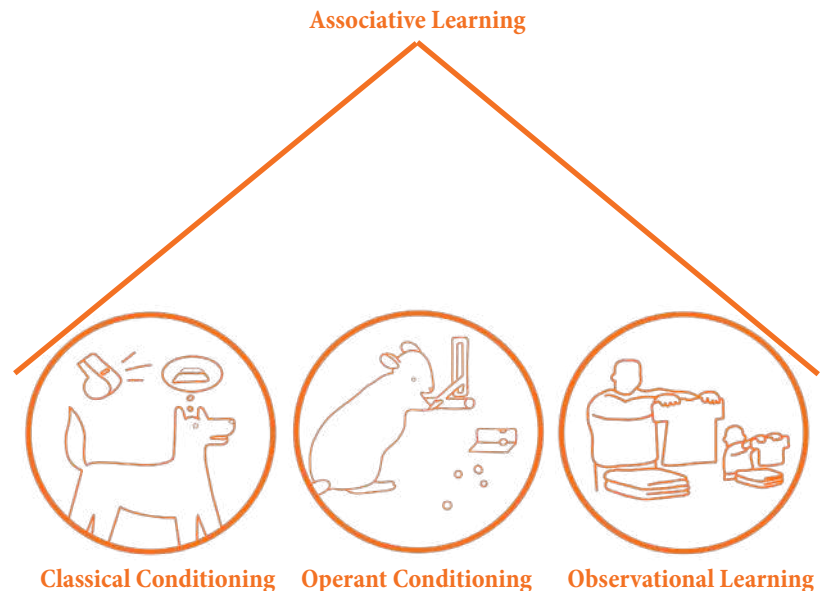


Figure 1: Graphical display of the three types of behavioral learning

## Focused Classrooms

To gain control over the classroom, the teacher must execute the following techniques accordingly. Establish a system of routines and rules from day one, explicitly model and teach appropriate behaviour, hold all students to high standards, and actively engage students in learning (Australian Education Research Organization, 2021). The teacher can manage the classroom more easily if control is utilised correctly. Classroom management focuses more on creating the right environment, thoughtfully choosing learning activities or materials and setting clear expectations for the classroom (Cool, 2021). However, it is crucial to understand that if there is too much control in a classroom, then the students might not feel safe. Therefore, in order to keep a classroom psychologically safe, teachers must consider setting the stage for learning and establishing a model of respectful, trusting and supportive communication (Clapper, 2010). Through this, both classroom control and classroom management play a vital role in the impact of how to design a classroom effectively.



## Impact of classroom design

Classroom design is crucial when creating or enhancing the outcomes of student learning. Physical factors such as layout, physical space, colour, lighting, furniture and technology contribute massively to how the overall learning environment performs (Rashid, 2023). Nonetheless, these physical factors were broken into three primary groups: naturalness, individualisation and stimulation.

Naturalness refers to the environmental parameters required to create physical comfort for the inhabitants. Individualisation is the understanding of how well the classroom meets the needs of the students. Stimulation relates to how vibrant and exciting a classroom is (Barrett et al., 2015).

Naturalness (temperature, air quality and light) accounts for 49% of the impact towards learning, just over a quarter (28%) accounts for individualisation (flexibility and ownership) and finally, 23% of the impact on learning is because of stimulation (colour and complexity) (Blyth, 2015) (see Figure 2). These percentages differ depending on the classroom context and how individuals interact with such factors. Overall, it is clear that the design of a classroom should consider the implications of naturalness, individualisation and stimulation, as these factors can determine how one individual might receive information about their surroundings (Barrett, 2011).

Additionally, an article written by E.A Herbert (1998) discussed a key factor towards classroom design: a thoughtful design of the classroom and school environment can give a sense of belonging to the students and shape their self-esteem (Herbert, 1998). However, a report by the HEAD Project (Holistic Evidence and Design) recently discovered that the physical characteristics seen in a classroom could justify 16% of the variation in learning progress each year (Portable Partitions Australia, 2021). Therefore, this reinstated that a well-designed classroom in primary school could increase academic performance whilst also maximising the individual student's achievement.

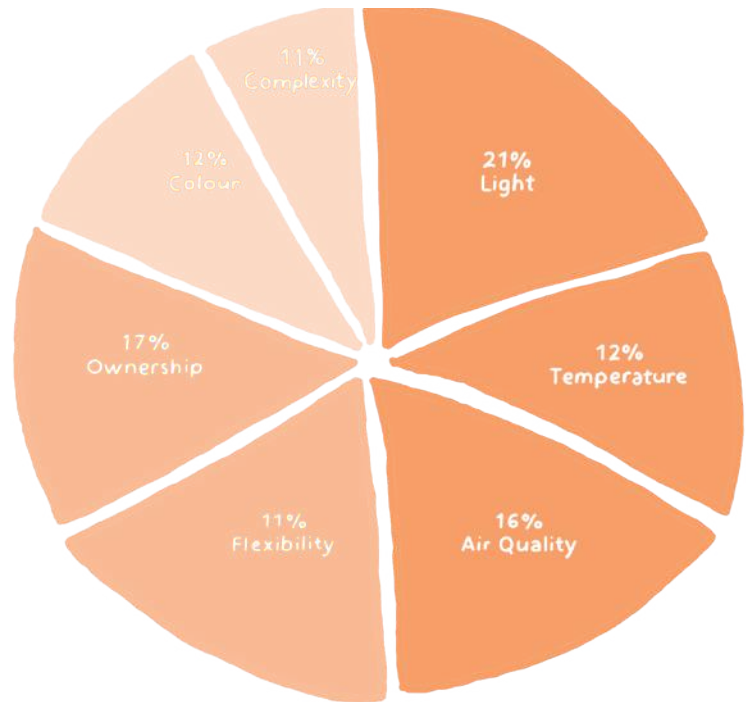


Figure 2: Graphical display of all seven factors and its influence in the classroom (University of Salford Manchester, 2015)

## Influence of furniture on learning

Classroom furniture is one of many design factors crucial for influencing how effective student learning is and how they perform academically. Furniture in a classroom can be seen as a physical impact that influences the classroom environment and as an integral tool for teaching and learning (Interia, 2017). Due to this, it is crucial to understand how furniture can encourage productive learning and also how furniture can promote healthy interaction in a classroom environment. Above all, the critical importance of school furniture is its impact on flexibility, mobility and adaptability in correlation to multiple circumstances (Harvey & Kenyon, 2013).

## Traditional Classroom Furniture

Typically, a traditional classroom environment establishes a clear sense of control between the teacher and the students while allowing easy face-to-face interactions (Black, 2002). However, this is more complex when considering traditional furniture, as these usually allow for little to no movement for the students, thus resulting in a lack of concentration and motivation (Higgins et al., 2005).



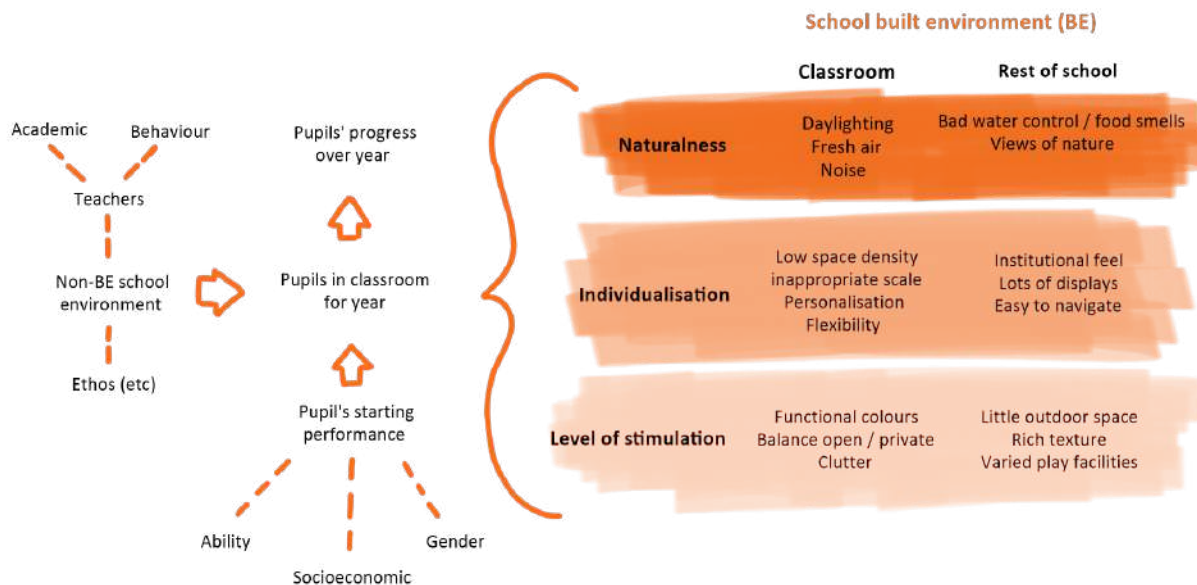


Figure 3: Conceptual model displaying the influence of Naturalness, Individualisation and Stimulation on a student (University of Salford Manchester, 2015)

## Flexible Classroom Furniture

A flexible classroom environment instead promotes the very opposite of traditional styles of learning. Rather than the class being only controlled by the teacher, flexible learning environments allow the students to control the classroom environment (Attai et al., 2020). If done correctly and thoughtfully, the overall learning environment will improve student engagement, motivation and concentration (Vijapur et al., 2021).

## Importance of clever classroom designs

'Clever Classrooms' is a research project based in schools to promote awareness of the impact different physical characteristics have on the variations in learning progression for students. These physical characteristics include naturalness, individualisation and stimulation (Laburnum Primary School, 2021). When research was conducted for that project, individuals were placed in the centre of the analysis, whilst non-built environment factors were located on the left, and built/physical features of the overall school environment were found on the right (see Figure 3). This figure provided an insightful overview of the student's academic phase from the beginning with the addition of their characteristics and the effects of both non-built environments and built environments (University of Salford Manchester, 2015).

## Possible Gaps in the Research

Although many articles and publications investigated how a classroom environment can benefit from a more flexible design, it was apparent that the only thing that needed to be added to all these articles was a definitive approach to use when establishing a more flexible design. Terms such as 'wobble' chairs and fidget toys were common strategies to create a more flexible classroom. However, what should have been explored further was how these can keep the student engaged and focused in the classroom rather than becoming more disconnected and distracted from the learning.

Overall, this literature review aimed to clarify what learning is, how these relays in a controlled classroom setting, and how incorporating flexibility can help change how classrooms are designed. These will now be used as a critical focus moving ahead with the primary research.



# STUDY SAMPLE

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BRISBANE

The image shows a map of Queensland, Australia, with a white location pin marker. The pin is placed on the southern coast of the state, near the Brisbane metropolitan area. The word 'BRISBANE' is written in a light blue font to the left of the pin. Below the pin, the text 'Redlands College' is written in a bold, black, serif font.

**Redlands College**

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# RESEARCH



Primary research in this report consisted of observations and interviews ranging from year levels 2 to 5. The research took place at one private primary school on the out skirts of Brisbane, Australia.

## Purpose of the Research

This research focused on understanding **how primary school classrooms are designed today and how the teachers and students interact with the furniture.**

For the research to meet the required focus stated above, all questions and observations were centred around those two questions.

The research was conducted over two weeks, from the 14th to the 22nd of August. Before beginning the research, Consent forms and background overview documents were given to the principal, head of junior education and the teachers.

## Interviews

As the focus of this study was primarily trying to understand the classroom environment, it was clear that teachers were the ideal candidates for the interviews. The teachers work up to 5 days a week and are frequently exposed to children of all ages and backgrounds. Thus, four teachers were interviewed across four different year levels (see Figure 4). Interviewing teachers across four-year levels allowed for a more insightful and vast data collection into how different year-level classrooms are designed.

A total of three female teachers and one male teacher were interviewed during this period. Interviewing male and female teachers could also provide further information on how either gender might influence a classroom design.

All interviews took up to 15 minutes to complete and were conducted sequentially. The interviews were semi-structured, allowing the teachers/interviewees to speak more passionately about this topic as they were the experts in the field. It also allowed for a more casual and calm interviewing process, not distressing the teachers/interviewees. The interviews each had 14 questions; however, out of the 14, only a select few were targeted at this report's primary area of focus (see Figure 5).

The questions were designed to cover how the teachers/interviewees structure their classes and create an active and supportive learning environment for their students. However, ensuring that all questions asked to the teachers/interviewees were not leading or biased was essential.

As the design concepts began to develop, the research evolved into what is commonly called 'codesign'. Several meetings were scheduled with the interviewed teachers to gather their feedback on the proposed design solutions. This approach provided valuable insights into which design ideas are worth further exploring and which pose potential issues.



Figure 4: Background of the 4 interviewed teachers

How do you ensure that students are actively engaged in the learning process?

Are there any specific teaching methods or techniques you use to enhance student learning?

Are there any opportunities for project-based learning or hands-on activities in the classroom?

What are your current limitations you face when advocating for different learning styles?

Figure 5: Main questions that were a 'must' when interviewing the teachers



# RESEARCH

## Observations

Along with interviews being crucial to understanding how classrooms are designed from a teacher's perspective, in order to gain a clear and insightful understanding of how classrooms are designed from a student perspective, observations were a vital method. Through observations, this allowed for an unbiased view into how the students and teachers interact with the furniture inside a classroom and other factors. The reason these specific observations were unbiased was that there was no way for the teacher to control how the outcome would be.

All observations occurred at one primary school and were conducted over two weeks. Each week, there were two observations across two days (see Figure 6). They spent most of the day in one specific classroom, allowing for a clearer understanding of how the students and teachers would react throughout the day. Additionally, the variation of year levels observed provided a substantial clarification of the difference in teaching styles through the years, the difference in classroom layout, the difference in classroom aesthetics and finally, a difference in classroom furniture.

For the observations to be semi-constructed, note-taking sheets were used throughout each observation in all four classes. These observation sheets' premise was to ensure that all the fundamental information to help further this design outcome was taken down, along with ensuring consistency in the type of observations noted throughout all four classrooms.

All observations were conducted on Monday and Tuesday, from morning to afternoon. It allowed for consistency in the days that the observations would occur and easy repetition in the data collection. Therefore resulting in a more robust and reliable source of data

In short, this research aimed to better understand the importance of classroom design and how these differences could result in the overall interaction between teachers and students. Observations were critical in gathering diverse information from different year levels and determining clear pain points. After all the data was collected, the analyses and exploration began.

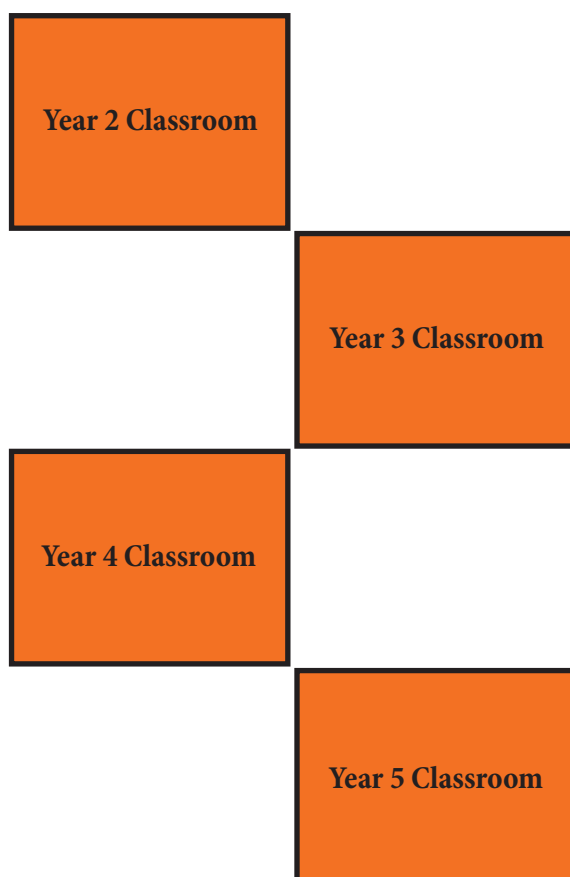


Figure 6: Locations of the observations that took place



After all primary research was gathered from both the interviews and observations, the analysis of the qualitative information had to be investigated to provide key insights into what schools currently do around the topic of 'flexible learning'

## Interviews

After the four teachers were interviewed, all the audio recordings were transcribed using Otter.ai. Afterwards, five critical areas of design opportunities or limitations to better create a flexible classroom were identified from the transcript. These five main areas are as follows:

- **Communication**
- **Active Learning**
- **Control of the classroom**
- **Reinforcement (positive and negative)**
- **Use of space**

From there, a Sankey chart was then made to better determine the value level that each of the five areas has about the interviewed teachers (see Figure 7). The chart showed that all teachers understood the importance of active learning when designing a classroom, yet it was evident that the year two

teacher valued this area the most. This may have been because, at the teaching stage, students find themselves more attentive when working in groups or around the classroom. Additionally, all teachers showed equal acknowledgment for communication when designing a classroom, which was continuously linked to how a student would perform during teaching times. The year 3 and 4 teachers were seen to be leaning towards more control of the classroom as their most important area. However, the year four teacher also valued reinforcement as high as she mentioned; both factors can significantly improve how the classroom runs during teaching periods. Finally, the year five teacher showed great interest in using space, which was frequently mentioned during the interview because this classroom had the least free space out of all the classroom designs.

Please see Appendix for all the transcripts of the four interviews done by the teachers.

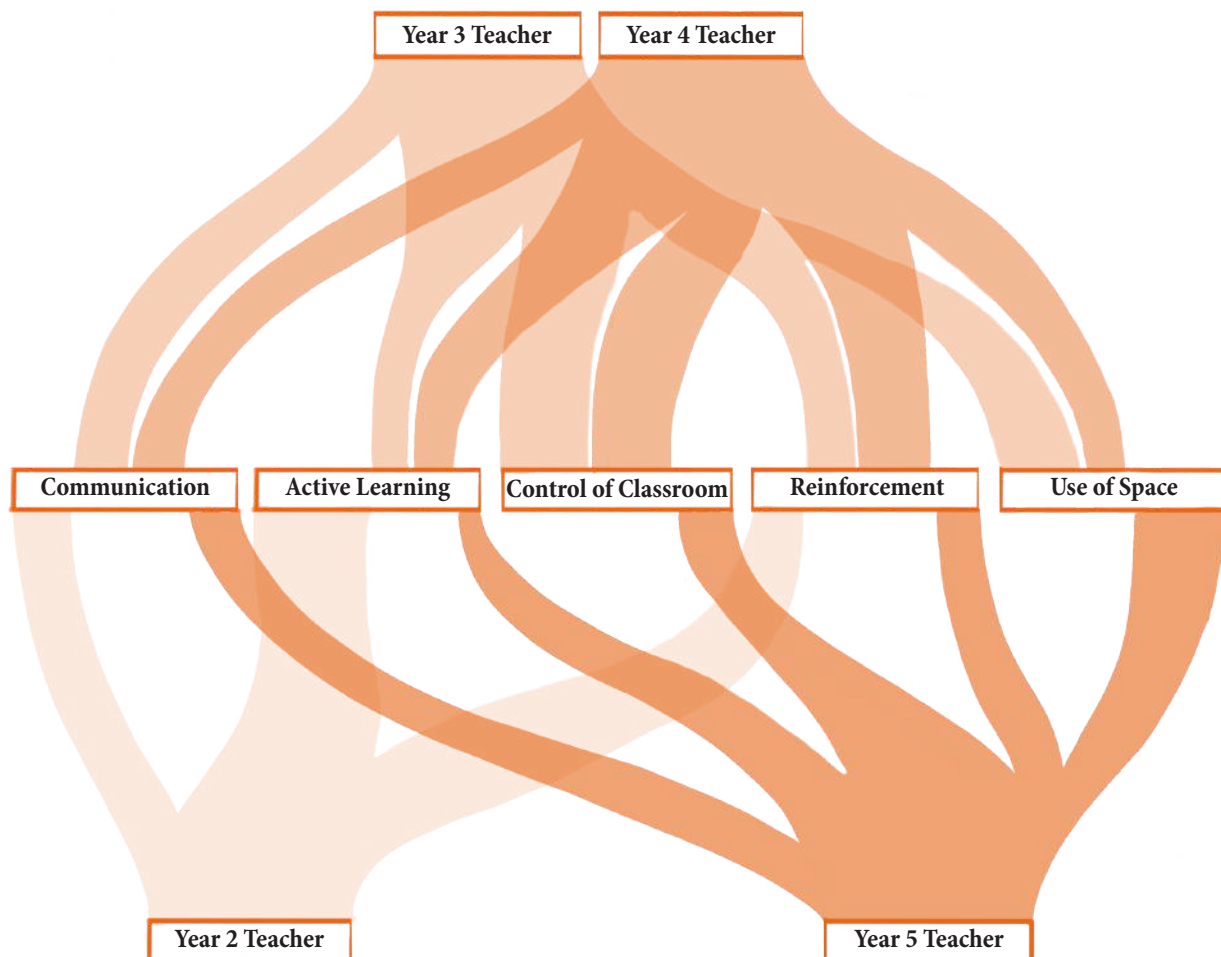


Figure 7: Sankey Chart displaying the most important areas to consider when designing a classroom from a teachers background

## Observations

The prime focus for observations was understanding how different year levels design their classrooms to cater to specific learning styles. Factors such as types of furniture, layout of desks and classroom structure were all components that were also highly observed at each year level.

The first observation took place in a year two classroom, and it was clear that this classroom design was targeted at creating an environment that fosters collaboration and creativity, using classroom layout and wall displays (see Figure 8). This was also further proven when drawing out the floor plan of the classroom (see floor plan). This was the only classroom out of the four with a substantial diversity in table types and sizes.

## Key standouts

In this classroom specifically, many key features or components separated it from the other observed classrooms. Some included different heights and shapes of the desks (see Figure 9), a 'well-being' tent in the back corner of the classroom, and what is described as a 'wobble' cushion (see Figure 10).

During teaching times, it was evident that the 'bean-shaped' table and the 'wobble' cushion helped better stimulate students' emotions and provided a strong sense of collaboration between the students and the teacher during group activities. What was also interesting about this year's level was the variation in learning style. One example of this was that instead of responding to a question verbally, the teacher would ask for a response from the students with their body language/ hand gestures. Therefore, making the learning activities more interactive makes the students more attentive and interested in what they are learning. Finally, the last few critical standouts from this class were how the teacher would go about making groups or picking students to answer questions and how the teacher would also enforce control or consequences. When creating groups or choosing a student to respond to a question, the teacher would randomly pull a name from a cup with all the students' names written on paddle pop sticks. This created great excitement in the classroom as this was a 'game of chance' with the students.

Furthermore, if the class misbehaved or did not participate in the class activities, the teacher would retaliate by removing a letter from the board that said, 'class game'. This technique was quite effective when establishing control in the classroom as this

showed the students that actions have consequences and that if they are not following the rules of the classroom, then they will not be rewarded. Hence, tying back to the influence of positive and negative reinforcement in teaching mentioned by some teachers when later interviewed.



Figure 8: Year 2 classroom layout

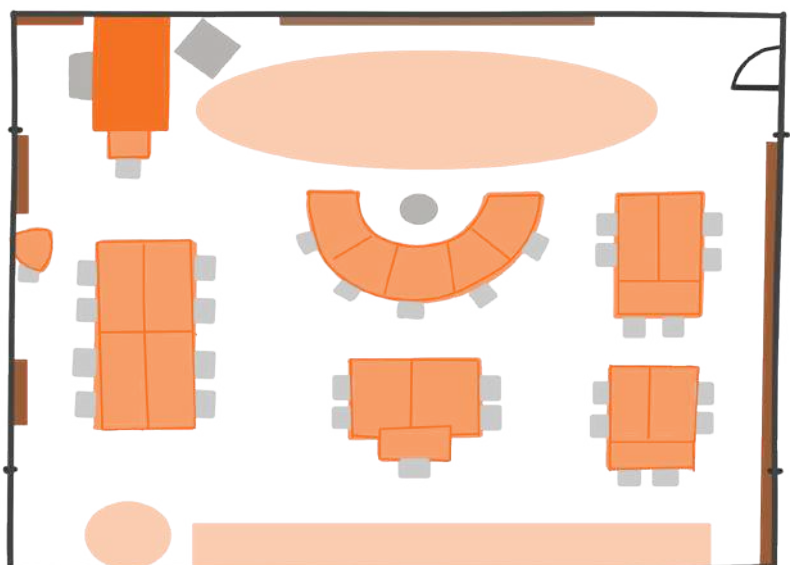


Figure 9: 'Bean-shaped' table



Figure 10: 'Wobble' cushion

## Year 2 classroom floor plan



- Students Desk
- Teachers Desk
- Free Space
- Storage

- Whiteboard
- Teachers Seat
- Students Seat
- Window Signifier

The following observation occurred in a year three classroom. Upon initial sightings, it was evident that the overall classroom design was very similar to the year two classroom (see floor plan). Features such as desk layout and designated areas of free space were almost the same (see Figure 11). However, unlike the year two classroom, this classroom did display a slight shift in learning style approaches.

## Key Standouts

One clear difference was how the teacher would establish control over the classroom using a bell (see Figure 12). Even though each year level did use noise, sounds or rhythm to control the classroom, this classroom specifically reacted quite powerfully towards the sound of the bell. The teacher would ring the bell only if the class got too out of hand or needed the whole class's attention. This was highly effective in controlling the class as it would remove the need for the teacher to elevate their voice, which would have resulted in a tense learning atmosphere.

Additionally, what also stood out in this classroom was the use of large rubber bands stretched around the legs of some student's chairs (see Figure 13). After further investigation, it was evident that the purpose of the design was to help students stimulate their built-up adrenaline. It resulted in the students' keeping their minds and bodies active throughout the teaching period, leading to a more attentive and focused student. Despite this, students still showed high restlessness and lack of concentration throughout the teaching times. These were clear whenever a student was seen leaning back on their chair or slouching over their desk, interrupting the entire class.



Figure 11: Year 3 classroom layout

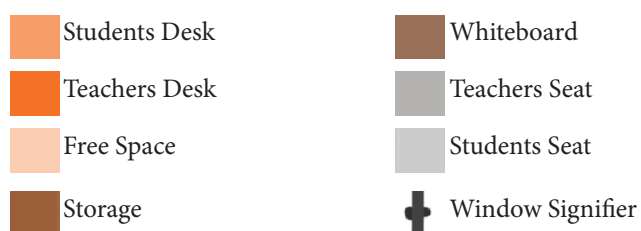
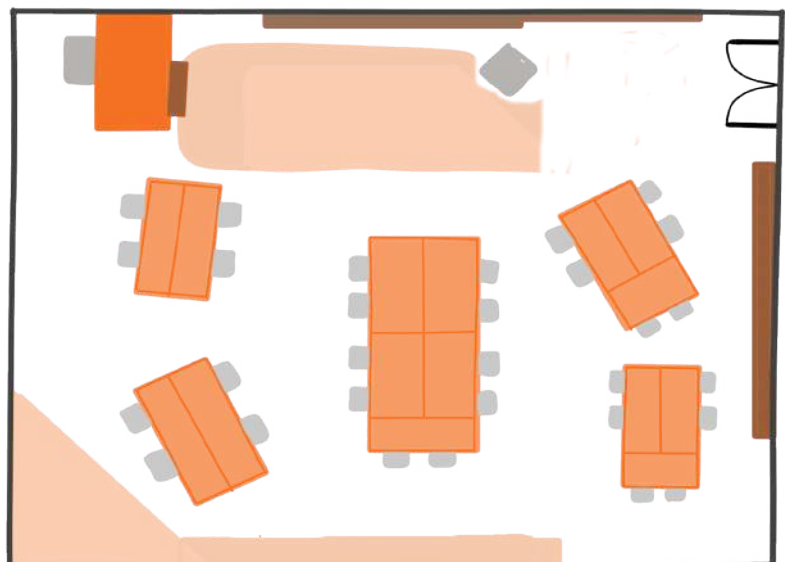


Figure 12: Teachers bell



Figure 13: Rubber Band

## Year 3 classroom floor plan



The following classroom observed was a year four classroom, and this classroom design began to show signs of a more traditional learning style through the layout of desks (see floor plan). Rather than the desks being set out in clear, distinctive groups like the floorplans seen in years 2 and 3, this classroom positioned all the desks in a linear formation facing the front of the class (see Figure 14). This was because, at this stage, the learning style was more directed at individual work rather than just collaborative work.

### Key Standouts

The biggest standout in this classroom specifically was more the style of teaching rather than the furniture itself. When the class was required to do group activities, the teacher allowed the students to get up off their chairs and work as groups around the classroom. This allowed for a great way to get the students more active during class and to help them stay focused on the task.

The teacher would also use positive reinforcement, such as giving out treats and physical contact, to show the students that they are doing a good job when needed. This was highly effective in this class as it made the students feel more acknowledged when they followed the teacher's instructions correctly. An example was when the teacher would reward the fastest students who could prepare for the next learning activity.

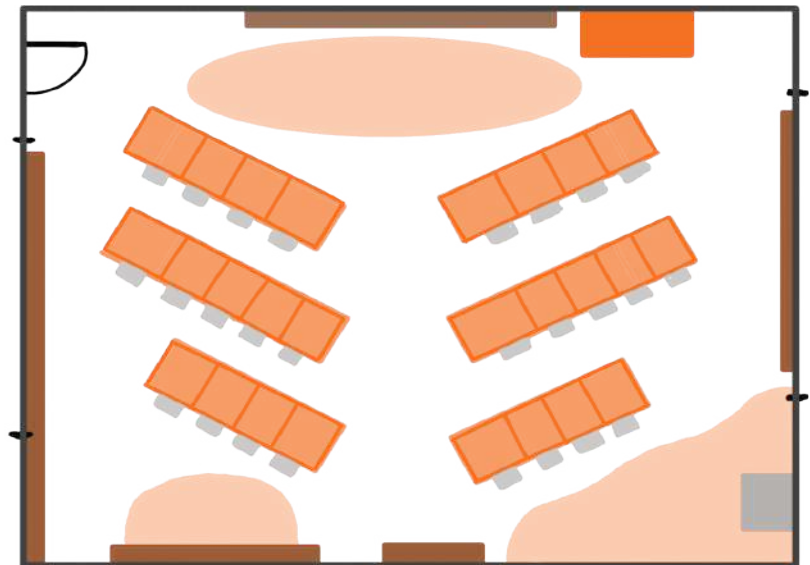
Another critical observation in the classroom was that the teacher had a standing rather than a seated desk. This allowed for more free space at the front of the classroom and made it much easier for the teacher to walk around and work with students individually if needed.









Finally, one last exciting thing about this specific teaching style was the effectiveness of including the students in making decisions for their learning outcomes. Asking questions such as, 'How would you prefer to work so that you can complete this task effectively'? By asking this question to the students, it was interesting to see them responding in a way that would lead to them bettering their learning outcome.



Figure 14: Year 4 classroom layout

### Year 4 classroom floor plan



- |   |  |
|---|--|
|  Students Desk |  Whiteboard       |
|  Teachers Desk |  Teachers Seat    |
|  Free Space    |  Students Seat    |
|  Storage       |  Window Signifier |



The last class observed was a year 5 class, and this class, by far, showed the most signs of a standard traditional learning environment (see Figure 15). Like the year 4 class, all desks were laid out in a more structured and linear style that faced the front of the class. However, one noticeable difference between the two room designs was the need for more free space in this classroom layout (see floor plan). Due to the lack of free space, this did result in a much more complicated way to encourage more active learning, as both the students and the teacher found it quite challenging to rearrange desks.

### Key standouts

Nonetheless, a surprising observation for this classroom was the number of fidget toys on certain students' desks (see Figure 16). Objects such as slime were quite effective in providing the required stimulation for the student; however, it was clear that at times of the teaching session, students with these objects were either losing focus more easily or showing solid signs of restlessness.

Another critical observation that could have been linked to the limited space was that when students were given a task to work independently, the teacher would make their way around and speak to each student. Despite this, students positioned further back in the class could not get feedback from the teacher and, as a result, became more distracted and inappropriate.

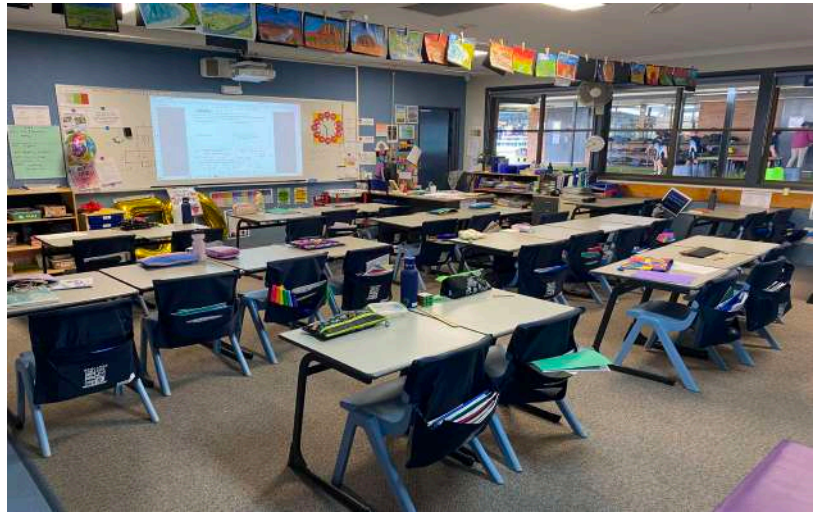
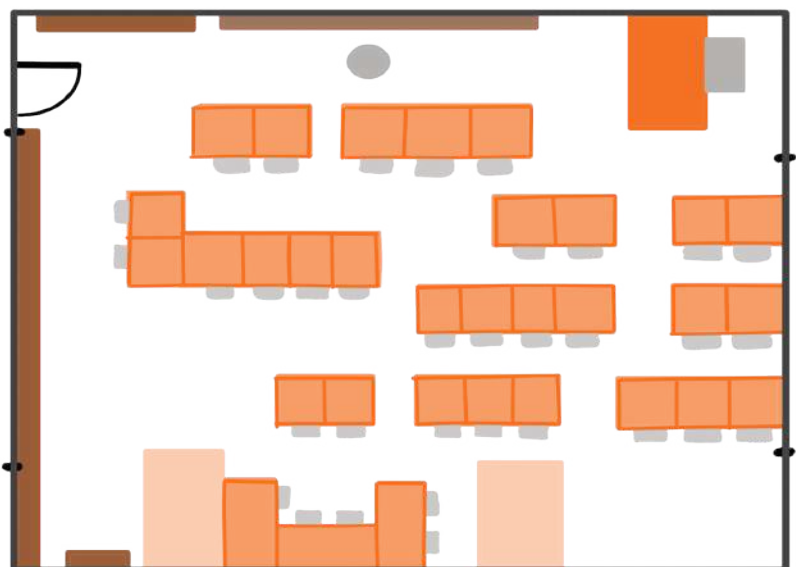




Figure 15: Year 4 classroom layout



Figure 16: Year 4 student fidget objects

### Year 5 classroom floor plan



- |   |  |
|---|--|
|  Students Desk |  Whiteboard       |
|  Teachers Desk |  Teachers Seat    |
|  Free Space    |  Students Seat    |
|  Storage       |  Window Signifier |



**Table 1: Flexible learning environment scale (Attai et al., 2020)**

No Flexibility 0 points	Low Flexibility 1 point	Some Flexibility 2 points	High Flexibility 3 points
Students do not have a choice of work surface, height of work surface, type of seating or height of seating	Students have at least 1 out of the 4 choices: Height of work surface Type of work surface Height of seating Type of seating	Students have at least 2 or more out of the 4 choices: Height of work surface Type of work surface Height of seating Type of seating	Students have at least 4 out of the 4 choices: Height of work surface Type of work surface Height of seating Type of seating
Furniture is not movable, could be fixed to floor	Some furniture can be moved, but is not easily movable by students	Most furniture can be moved, but only some is easily movable for students	All furniture can be moved and all/most are easily movable by students
Furniture is not reconfigurable	Some furniture can be reconfigured, but is not easily reconfigurable for students	Most furniture can be reconfigured, but only some can be easily reconfigured by students	All furniture can be reconfigured and all/most are easily reconfigurable by the students
Furniture is not condensible	Some furniture is condensible, but is not easily condensible for students	Most furniture is condensible, but only some are easily condensible for students	All furniture is condensible and all/most are easily condensible by the students
Teachers space consumes more than 10% of the classroom space and is not movable.	Teachers space consumes less than 10% of the classroom space and is not easily movable.	Teachers space consumes less than 10% of the classroom space, but only some is easily movable	Teachers space consumes less than 10% of the classroom and all/most is easily movable

Year 2	11 points
Year 3	9 points
Year 4	7 points
Year 5	4 points

### Flexible learning environment scale

After all observations were completed, a point scale was used to determine how flexible the classroom layout was (see Table 1). From this table, what was determined was that as the year levels increased, the overall flexibility of the furniture seen in the classroom decreased. The year two classroom scored 11 points, while the year five only received 4 points. However, surprisingly both the year 3 and 4 classroom designs received very similar scores. Despite their efforts, the year four classroom displayed a more traditional style of desk placements. Resulting, in the year four classroom design receiving a lower score as the year three classroom. This made creating a flexible learning environment challenging due to the limited feasibility of reconfiguring and moving the desks around.

### Limitations

Before any data collection could begin for this research project, it was clear that there were already quite a few limitations that could have been improved that restricted how this research outcome would look. A major initial limitation was trying to get access to perform the desired data collection at primary schools. Regrettably, this was a significant limitation of the research because only one primary school could agree to the research terms and consent. Thus, the entirety of the collected data is biased toward this one school and minimises the diversity of data across multiple primary schools.

What would have been ideal for this project would be to interview and observe both a private and public primary school, as this would provide adequate information towards how both schools differ from an economic and practical standpoint. Hence, this causes a shift in what both schools have access to provide a suitable learning environment for the students.

Additionally, other limitations arose while collecting the data. One was that the school only allowed for research to be collected on Mondays and Tuesdays. This was not too detrimental to the overall outcome of the research, but still, because of this, it was essential to make sure that all observations and interviews were planned out efficiently to cater for the loss of time.

Another limitation was that although four classrooms were observed and their corresponding teachers were interviewed, this still resulted in quite a low number of reasonable justifications for how specific classrooms are designed. This is because a classroom design, in the end, is determined by the individual (teachers and students). Therefore, although one class might have specific components this year, this does not guarantee that it will be the same for the following years.

The interviews and observations presented many key, insightful findings that helped steer the final design solution.





# DISCUSSION

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Throughout this report, both the primary research (interviews and observations) and the secondary research (literature reviews) that were analysed displayed a strong relationship towards the overarching impact that a flexible classroom design has upon student learning.

The literature review provided a broader understanding of learning, classroom control, furniture's impact, and the influence of clever classroom designs. Although these areas were investigated broadly, the observations undertaken at a primary school backed up much of what each area identified.

After observing each year level, it was apparent that each classroom was designed to tackle specific needs or requirements to facilitate a suitable learning environment. The research suggested that the earlier year-level classrooms (years 2 and 3) were designed in a way that could promote movement and collaboration in learning. Desks were arranged in groups of more than two; instead, all faced each other to activate an easy means of effective communication. Ensuring efficient classroom management did not involve imposing on students through force, instead allowing them to participate willingly as peers, with mutual encouragement among themselves. Their classroom was traditionally designed for the later year levels (years 4 and 5). The teacher was positioned at the front of the class, and all the desks were arranged in a linear formation facing the front. Although this did not allow for much flexibility in learning, the years 4 and 5 teachers relied more on using observational and operant conditioning to their benefit. Methods, such as verbally or physically showing excitement, gratitude and acknowledgment whenever a student completed set tasks, resulted in a more vibrant and enjoyable learning experience for the student.

Some final observations that helped back up research findings from the literature review included naturalness, individualisation and stimulation within classrooms. Windows and fake plants were used throughout all the classrooms to better ground the students with a sense of calm and relaxation as they could observe and feel the outside environment. Activity breaks, fidget toys and active learning activities such as whiteboards/iPads effectively stimulated built-up emotions or restlessness. Finally, asking open-ended questions and engaging with students personally helped strengthen the connection a student and teacher share.

The interviews reinforced these techniques used by the teachers, yet when asked why they have yet to implement certain existing products to help create a flexible learning environment. The standard response from teachers showed a strong need for more space and that current designs were only effective for students with specific learning difficulties. Therefore, the current designs do not address the other students and contradict what was reinstated in the literature review. Additionally, the interviewees agreed that although stimulation can be a good thing for students, components such as 'wobble' stools or fidget toys result in the students losing their focus and becoming more disconnected from learning.

To summarise, the research proved that although flexible classrooms are the way to improve how students learn today, current practices and techniques are becoming more inefficient.



# DESIGN IMPLICATIONS

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At this stage of the report, key design implications are identified and established from the findings analysed in the research and discussion. All the design implications that were identified will then be used as a sort of criteria or guide for the upcoming design concepts.

## Key Findings

At this report stage, critical design implications are identified and established from the findings analysed in the research and discussion. All the identified design implications will then be used as criteria or guides for the upcoming design concepts.

## Design Implication Findings

The research showed that six main points of interest could be taken further into the design phase.

**Adaptable** - Used in many different spaces of the classroom

**Multi-functional** - Can be used in multiple different scenarios

**Space** - Cannot be taking up too much valuable area in classrooms

**Engagement** - Has to help engage both the teachers and students in the learning activities

**Portability** - Be lightweight and easily condensable to allow for more free accessible space

**Communication** - Allow for solid communication between both the students and teachers

The research established that for a classroom to be more flexible, the design first had to solve the issue of needing to be more easily integrated into the limited space.

Overall, these design points should be used in collusion with one another. Instead of all leading to 6 individual designs, points such as adaptable and multi-functional could be used as one.

## Problems

It was evident through the interviews and observations that current classrooms need more space for easy, flexible learning, and they also need help finding a practical solution in any scenario. Ultimately, the education system is so complex that focusing on a specific user type is vital rather than trying to solve the entire education system. Therefore, the five design outcomes will also be targeted for use in specific year levels.

Nonetheless, the research concluded that creating a furniture piece that would not take up too much existing space can also be used in multiple scenarios to encourage collaboration and active classroom learning.

There were many occasions seen in the classroom when the students would either be asked to work in groups or choose to work on different surfaces/ areas of the classroom. However, this presented itself as an issue for some since the furniture seen in the classrooms needed to be lighter or more robust.

Whilst there is the issue surrounding the lack of space in the classrooms, another issue that should be at the forefront of the design is the possibility of it impeding the students learning. Ultimately, the design should promote learning rather than becoming a distraction.

The design must also assist the teacher when changing the classroom to suit a specific style of learning or activity. Rather than being complicated and hard to use, the design should be simplistic and easy to follow, allowing the student to take more initiative in creating the learning environment.

Durability is also a crucial factor to consider for this design outcome, as the prime users of this design are children. If the material or structural integrity cannot hold up to the physical demands imposed by the users (children), then this would overall lead to the design being unsafe for use and a safety risk.

Finally, above all, the design must also maintain the user's comfort. Whether this be physical or psychological comfort, the purpose of the design is to entice children into wanting to learn.



# DESIGN IMPLICATIONS

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Icons will be used throughout the five design concept presentations as a classification for which designs cater for which points of interest identified before.



**ADAPTABLE**



**MULTI-FUNCTIONAL**



**SPACE**



**ENGAGEMENT**



**PORTABILITY**



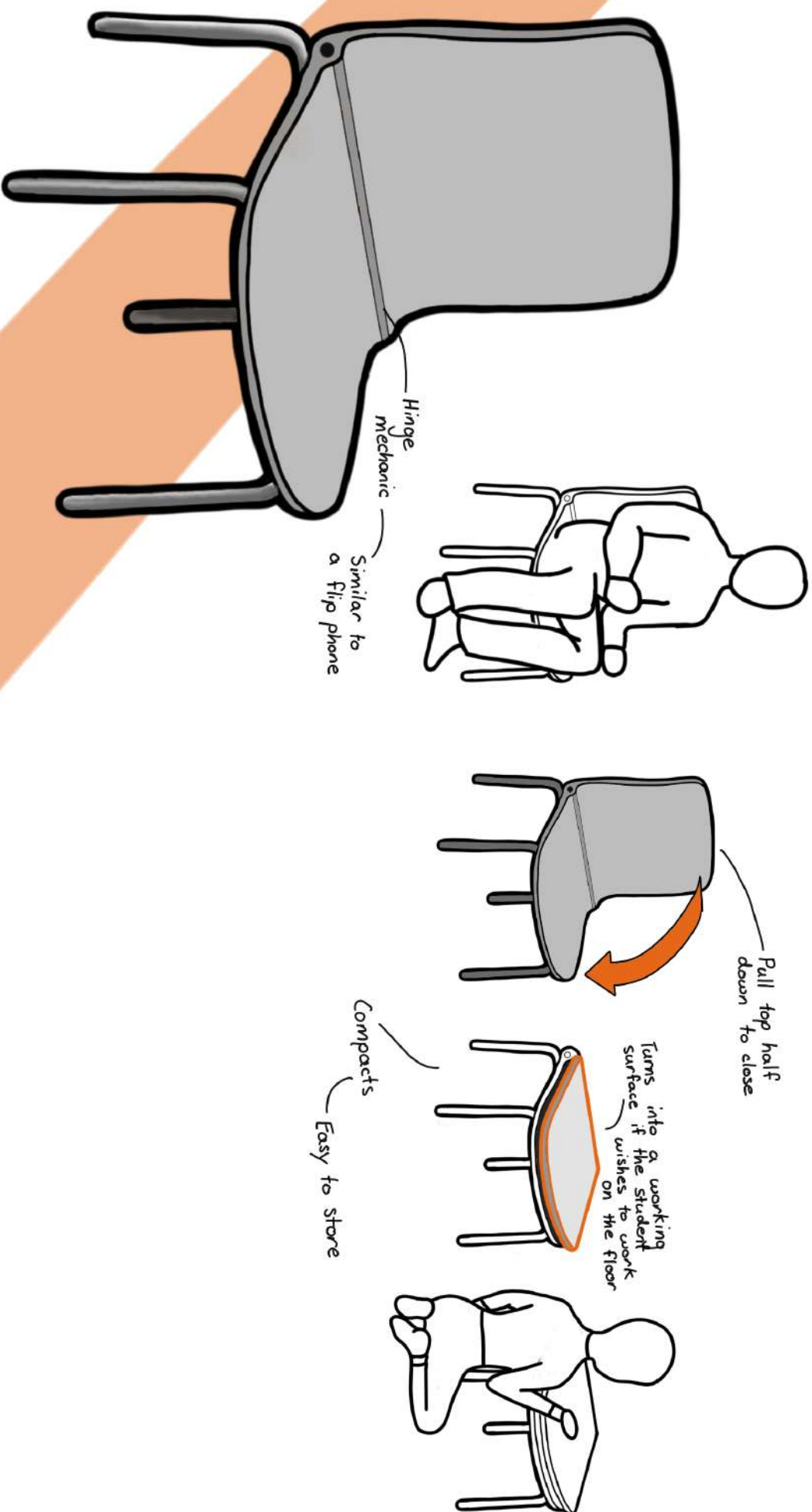
**COMMUNICATION**

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# COLLAPSIBLE CHAIR



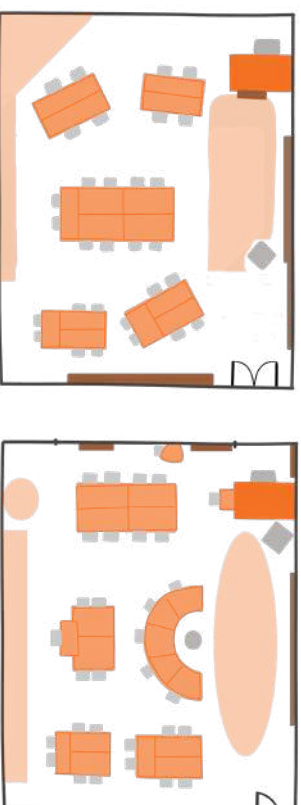
DESIGN INTENT: To reduce clutter in a classroom and allow for a quick and easy way for the student to manipulate their learning environment to better suit their needs.



# COLLAPSIBLE CHAIR



Where can the design be situated?



This design is most suitable for either a year 2 or 3 classroom setting as there are no signs of 'chair sleeves' that are designed to house the students learning material.

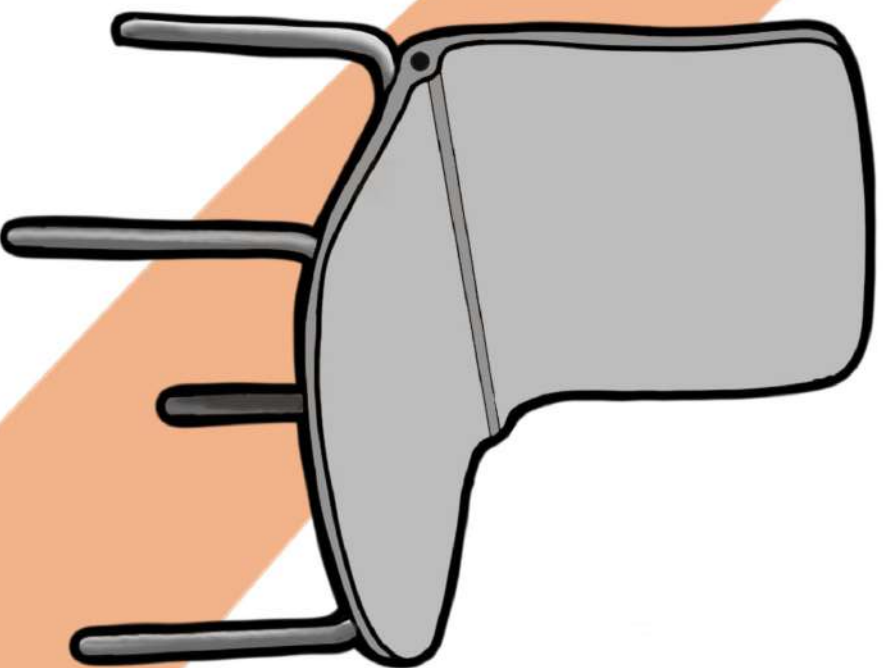
## Features & Benefits

**Portability:** Whilst folded, this design removes that awkwardness found when rearranging furniture around the class and making it more user friendly for all.

**Adaptability:** This design allows for a quick and simplistic way in changing the furniture to better suit different types of learning styles.

**Space:** Folds in half allowing for student who wish to work on floors use the overall space more effectively when learning.

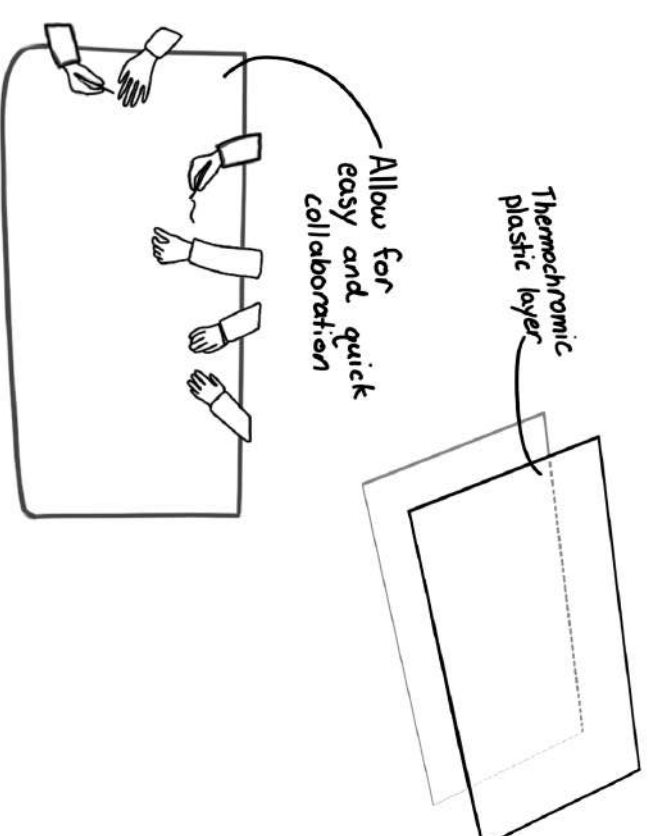
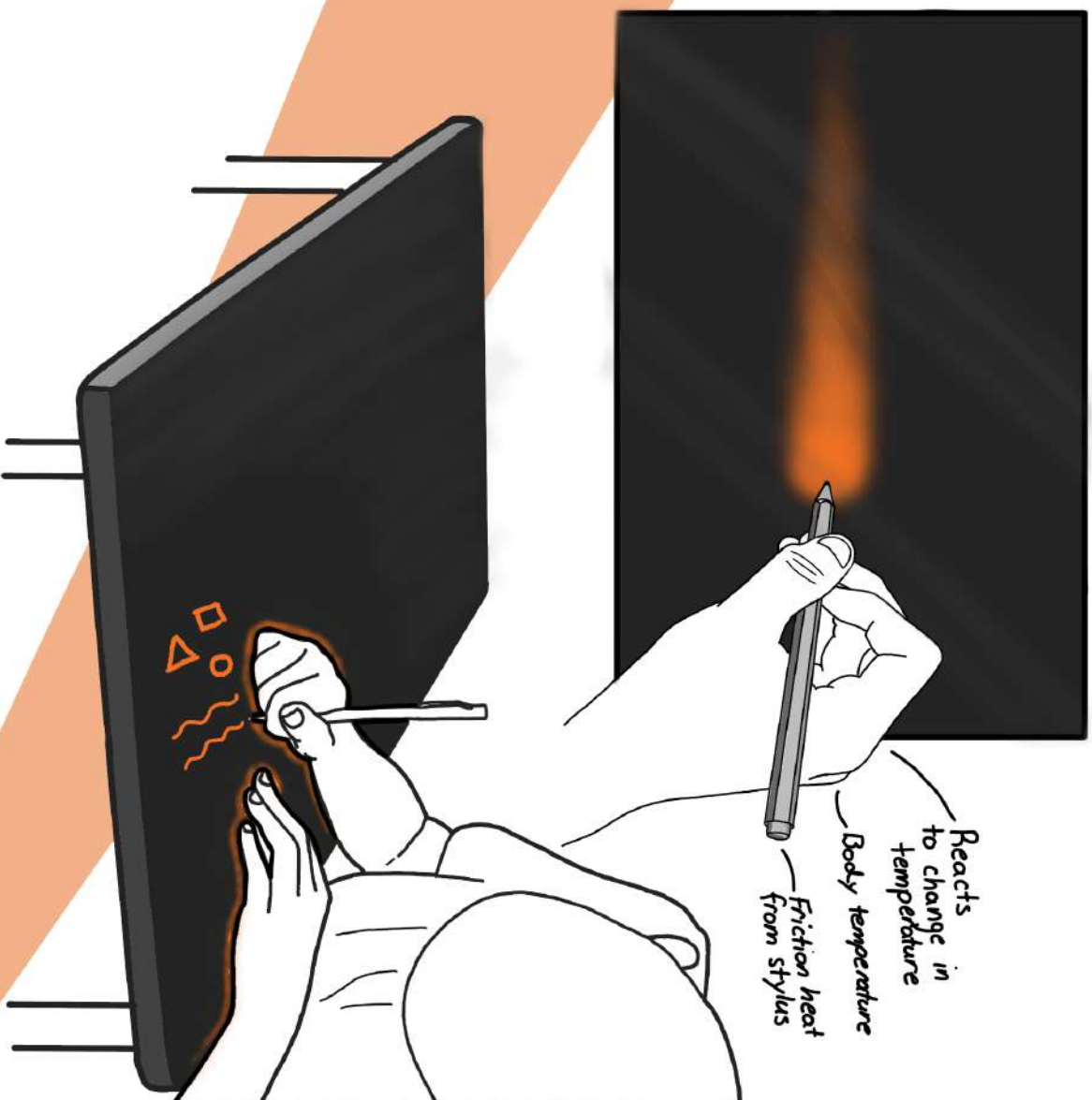
**Multi-functional:** Due to the designs key feature of folding in on itself, this furniture piece therefore is more suitable for use as a low bench or a small stool rather than just a typical single use chair.



# TEMP REACTIVE DESK



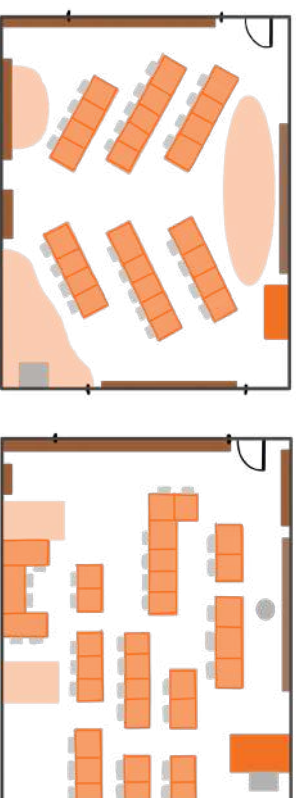
DESIGN INTENT: To provide adequate excitement for the students when undergoing collaborative or independent learning tasks.



# TEMP REACTIVE DESK



Where can the design be situated?

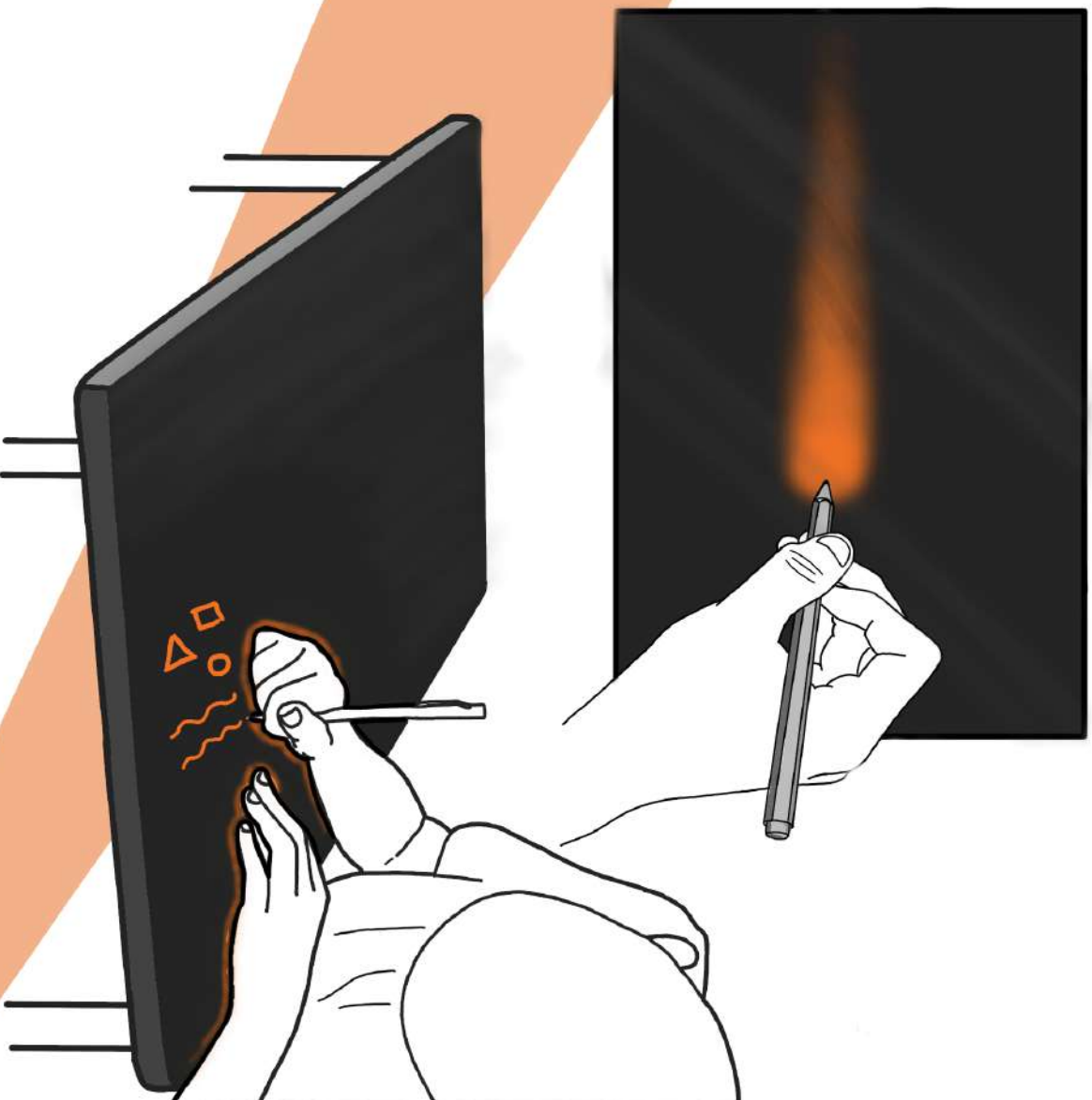


This design is most suitable for either a year 4 or 5 classroom setting due to the limited free space for creating a quick and accessible collaborative learning environment. Although, with a few more adjustments it's possible to incorporate something like this design for all classroom settings.

## Features & Benefits

**Communication:** Through this design, not only does it allow for easy communication between students but also a clear indication to the teacher that students are participating in learning activities.

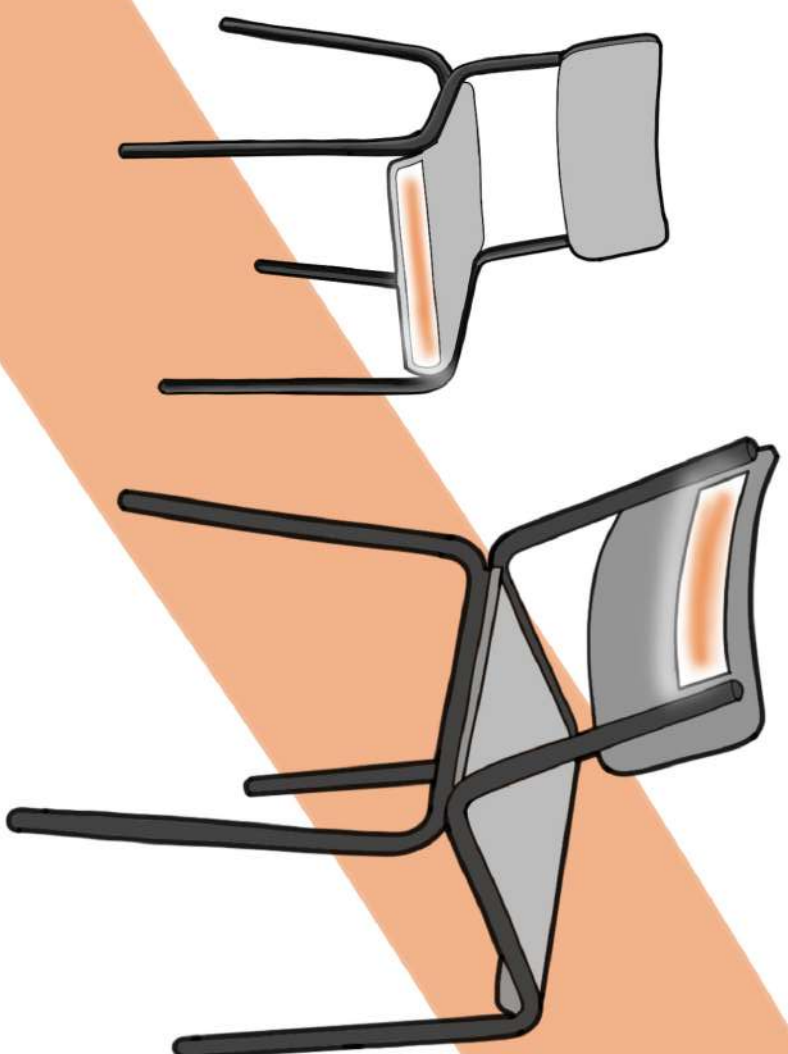
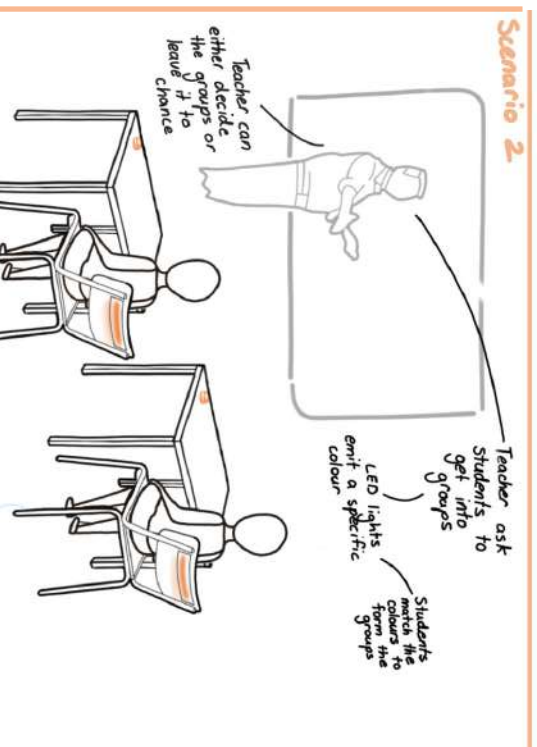
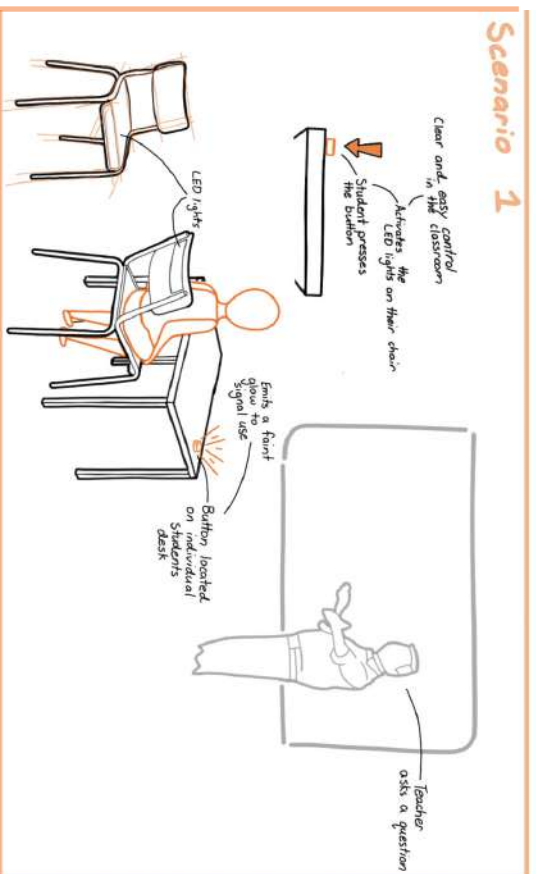
**Engagement:** Slight changes in colour due to temperature shifts, result in a more interactive and exciting learning environment for the students. It also allows for the students to feel more motivated throughout learning activities.



# GLOWING STRIPS



**DESIGN INTENT:** To establish a solid sense of communication and understanding between the students and the teacher through teaching times. Designed initially more as an attachment to preexisting school furniture.

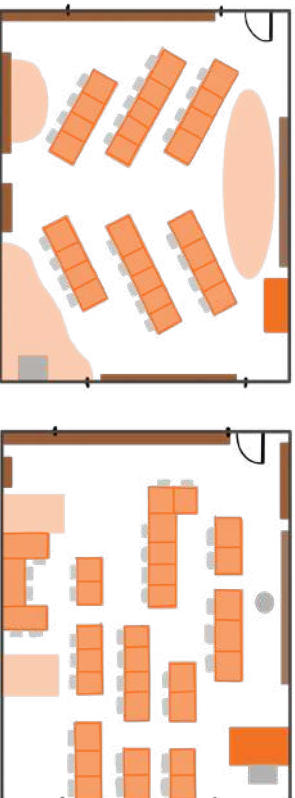




# GLOWING STRIPS



Where can the design be situated?



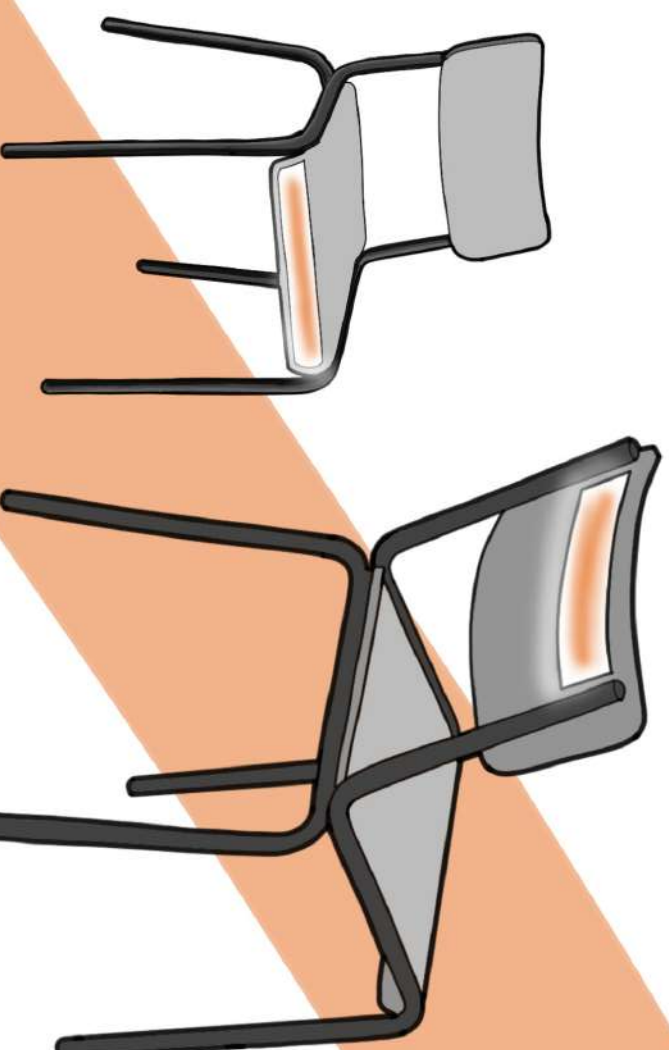
This design is most ideal for years 4 and 5 classroom settings as students can now take more initiative in responding to the teachers questions and, allows for the teacher to not rely on the students leaving other students out during group activities.

## Features & Benefits

**Communication:** This design uses LED light seen in the two strips and a button to provide effective reinforcement to the student when being asked to take part in learning activities. This also allows for more structure when students are required to complete set tasks.

**Engagement:** The slight glow in lights and colours provide more excitement towards learning.

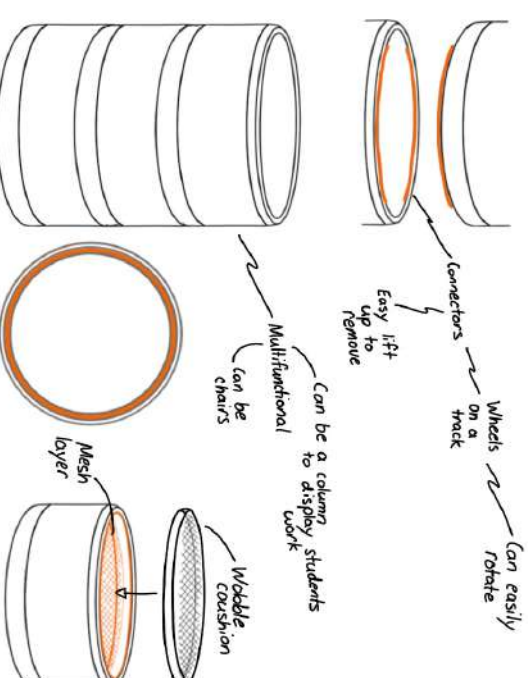
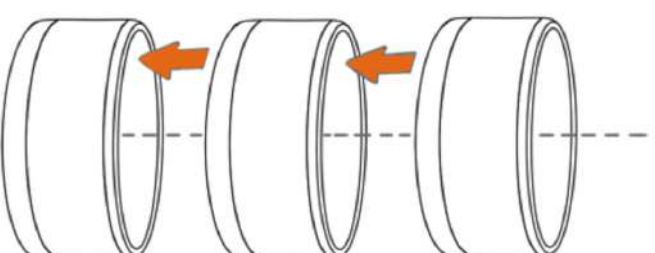
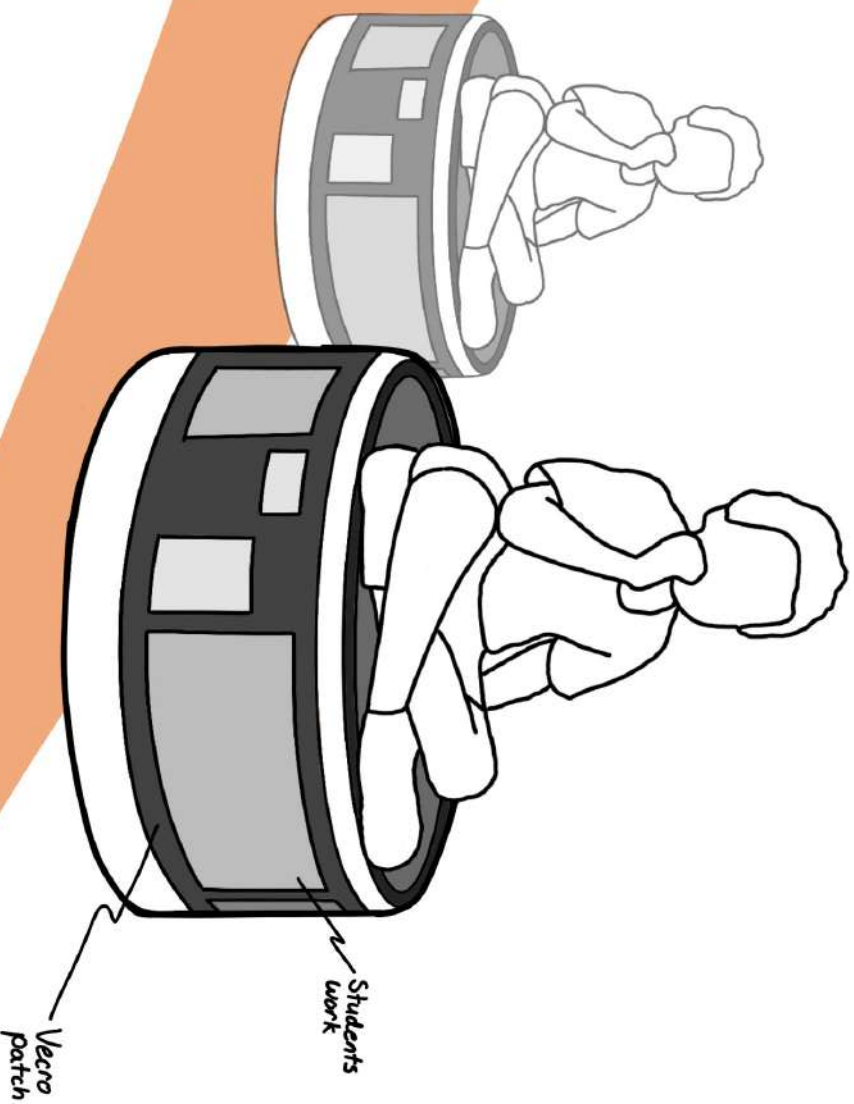
**Multi-functional:** With further development, this design can allow for the LED lights to establish a clear means for positive and negative reinforcement for the student when undergoing learning activities. Therefore, being used as a chair but also a way for the students to receive acknowledgment for how they behave.



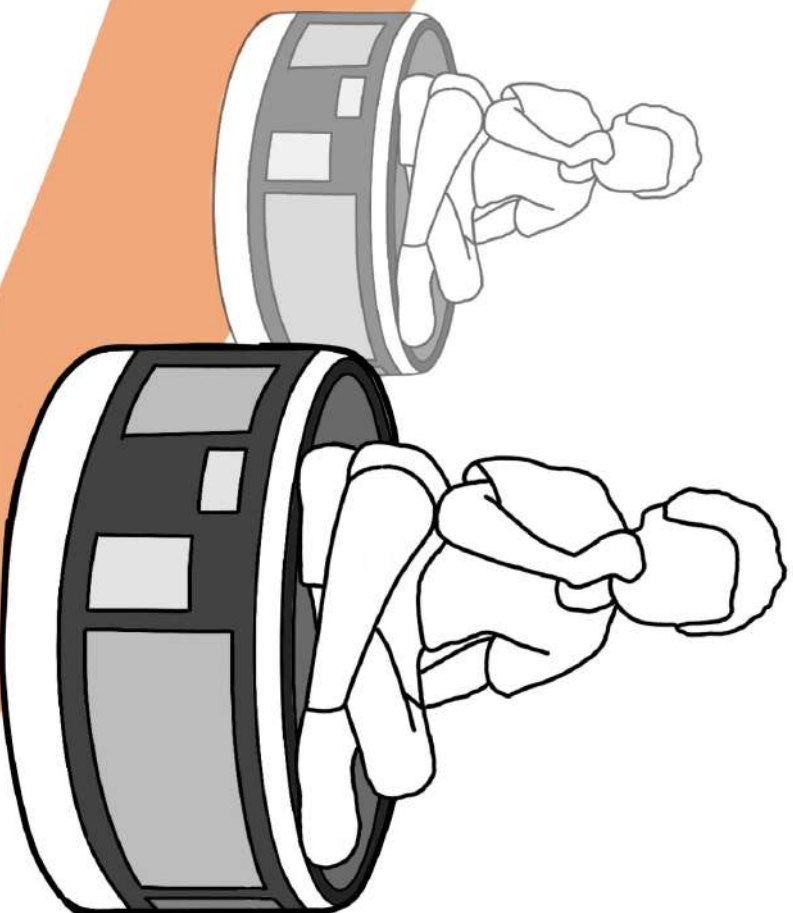
# VERSATILE STUDENT POD



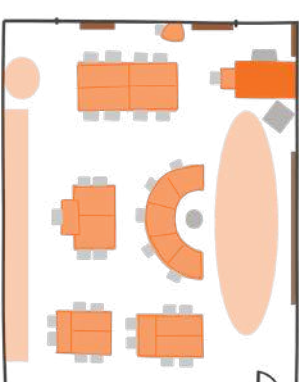
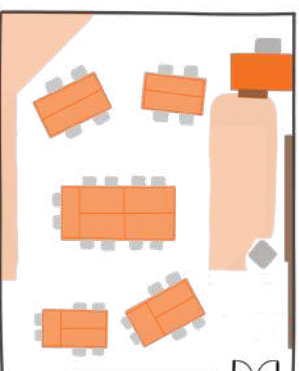
**DESIGN INTENT:** To be used as a way for students to sit more comfortably whilst away from their desks and to also act as a positive reinforcement through displays of students work



# VERSATILE STUDENT POD



Where can the design be situated?



This design is most suitable for either a year 2 or 3 classroom setting. However, with further refinements, this design could also be effective in a year 4 classroom setting.

## Features & Benefits

**Portability:** Small compacted designs that will be made from lightweight materials to allow for the students to also be able to move the pod around. Wheels positioned on the bottom face for easy transportation.

**Adaptability:** This design allows for quick seamless changeability from a seating ornament to a art display of some sort. The seating section can also be used to secure wobble cushions if student wish to use them.

**Space:** Stackable pods to form a column display. If the design isn't in use than it can be stacked therefore minimising the amount of space it will cover.

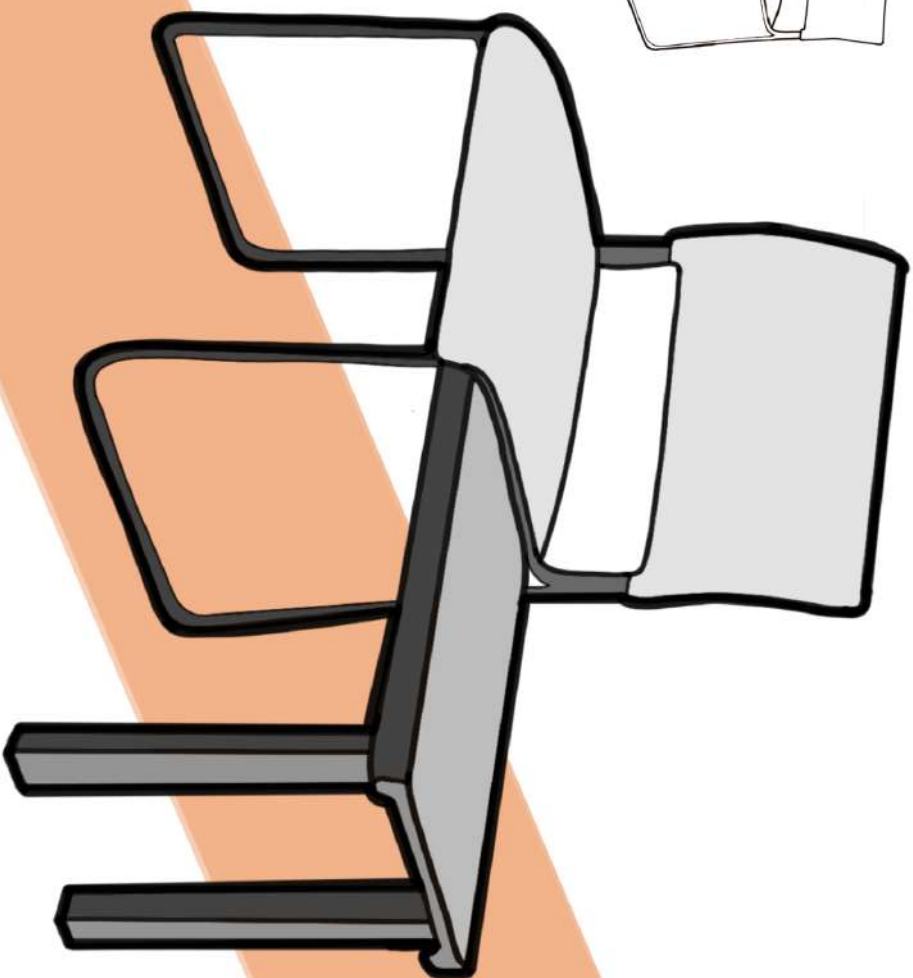
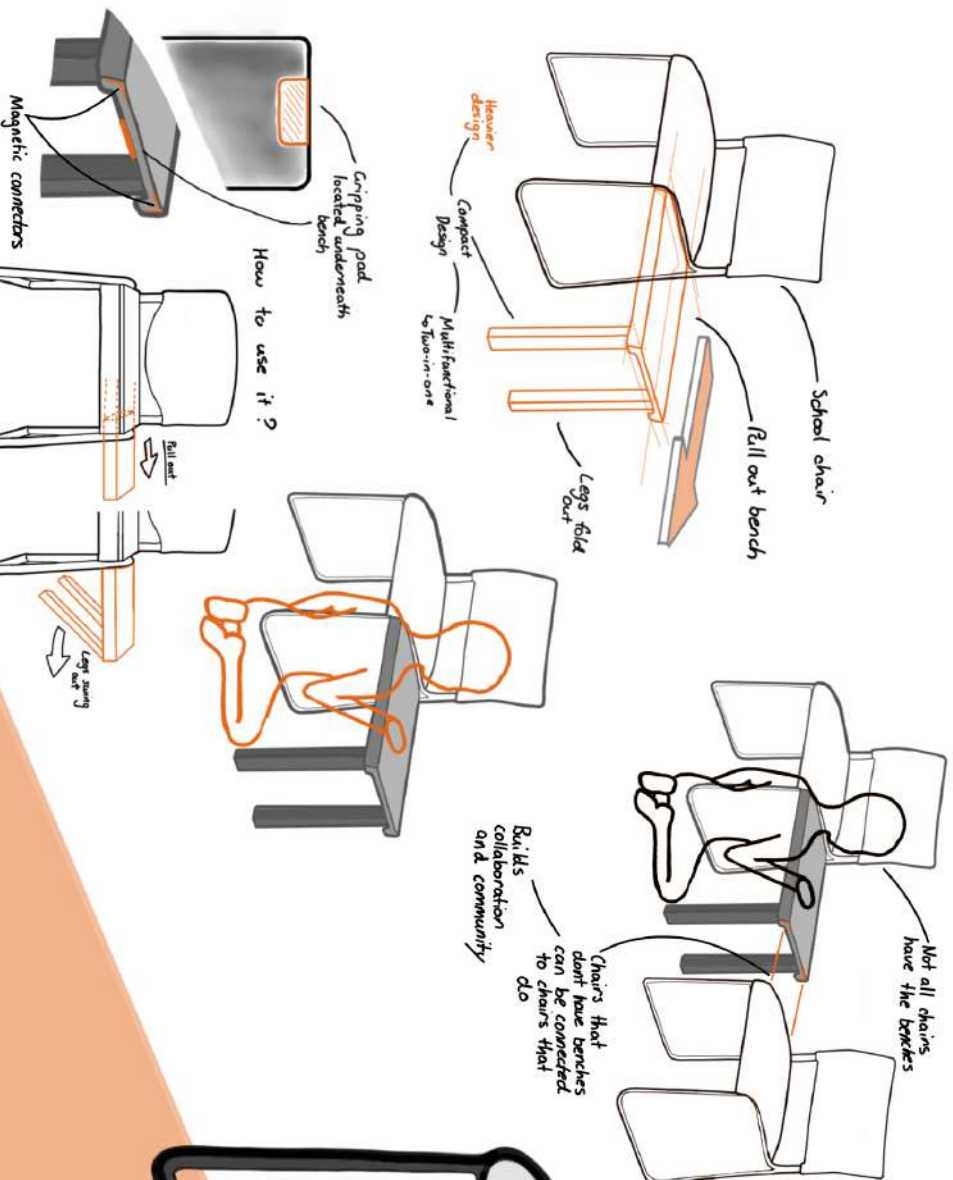
**Multi-functional:** Due to the designs key feature of folding in on itself, this furniture piece therefore is more suitable for use as a low bench or a small stool rather than just a typical single use chair.

**Engagement:** By allocating a section of the design to housing students work, students are able to develop a deeper connection with the furniture and feel appreciated when they see there work displayed in such a way.

# PULL-OUT BENCH CHAIR



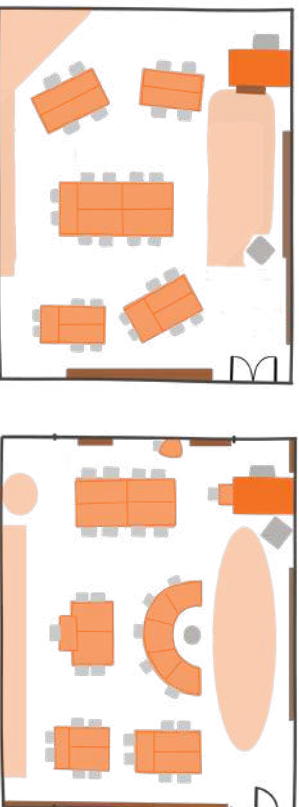
**DESIGN INTENT:** To provide and easy workspace for students who wish to work on the floor. This design is focused towards helping improve user comfort and productivity when performing independent learning tasks.



# PULL-OUT BENCH CHAIR



Where can the design be situated?



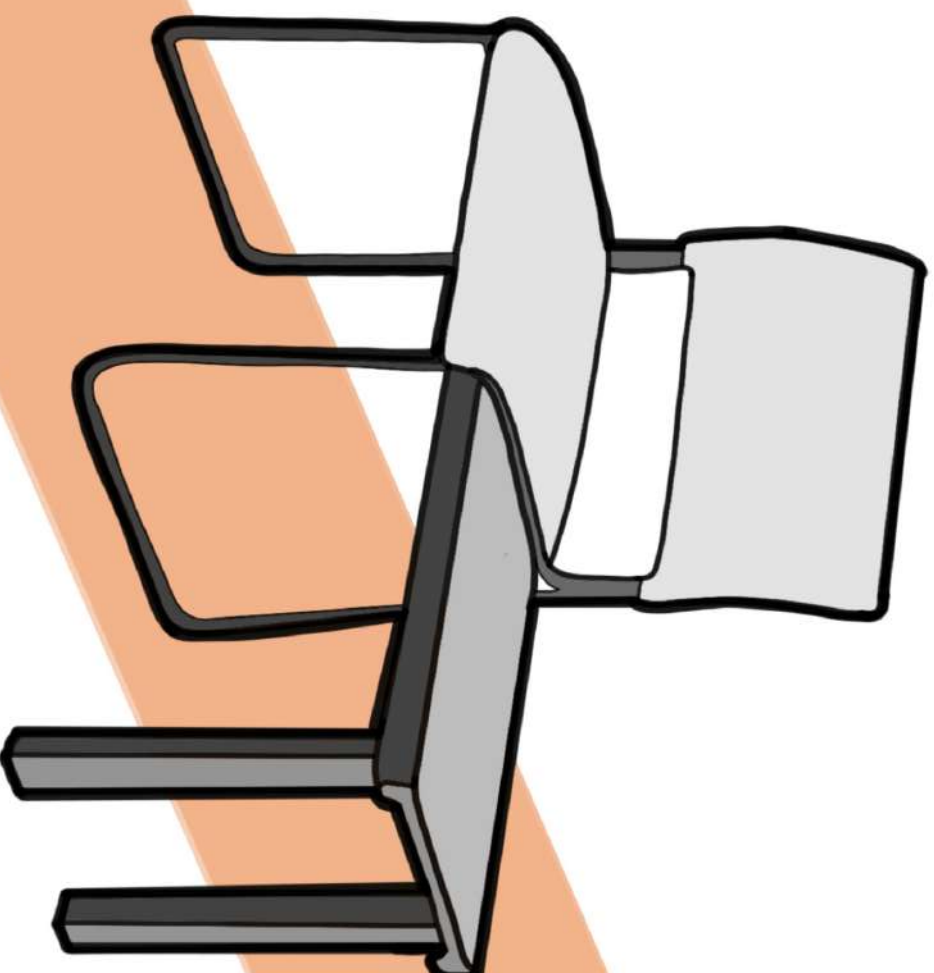
This design is most suitable for either a year 2 or 3 classroom setting due to both classrooms having large areas of free space for students to work on any surfaces.

## Features & Benefits

**Adaptability:** This design combines both a chair and a table into one design. Students and teachers therefore have more freedom in how to design the most suitable learning environment for learning activities. Students can also then use this design to either create a collaborative learning environment or an independent learning environment.

**Multi-functional:** This design incorporates two typical classroom furniture types (chair and table) into one. Students are given more diversity in types of learning surfaces they can work on.

**Engagement:** By only allowing some chairs to have the benches and the other chair have just the 'magnetic connector', students are given more choice in how they can engage with other students to create suitable learning environments for each other. Thus, building strong collaboration and community between everyone seen in the classroom.



# CONCLUSION

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Throughout this report, the research proclaimed much insight into the importance of flexible learning environments in today's educational setting. What emerged from this understanding was the lack of support and diversity that current furniture and traditional classroom designs have towards the needs of the teachers and students. This report also delved deeper into the vast aspects of learning, the controllability of classrooms, and the impact of furniture and clever classroom designs to provide sufficient insights into what opportunities and challenges await when designing flexible learning spaces.

Likewise, the information gathered from the literature review and primary research shed light on several critical design implications. These are as follows. Adaptability, space efficiency, multi-functionality, portability, effectiveness in communication and personal engagement. These serve a crucial purpose as the foundations for developing innovative design solutions to enhance the learning experience for teachers and students.

Regardless, what also followed from the research was a vital issue centred around the limited space seen already in classrooms and the challenge presented when introducing flexible designs or furniture. Therefore, the design outcome must strike a balance between advocating active learning and minimising any potential for becoming a more significant distraction for students. Additionally, factors such as durability and comfortability are other vital areas to consider during the designing phase, as the prime audience for use is children. Not only should the design focus on the physicality of comfort but also the psychological influence of comfort, as this plays a pivotal role in fostering a sense of love and excitement for learning within the students.

Any challenges or design solutions addressed must align clearly with the identified design implications. As of now, these solutions should be designed with a focus towards a specific year level, acknowledging that different year levels present new distinctive needs and preferences that come when designing a classroom, ultimately tying back to the overarching aim of this project. The outcome is to create a product or system that empowers teachers and students through flexible classroom designs, resulting in increased engagement, collaboration, and overall learning outcomes.

To summarise, transforming traditional classrooms into flexible classrooms is vital to help adapt the current education system to the growing changes in our society. This project aims to lay the foundations for future designs to create innovative solutions, revolutionising how our education system creates learning environments.



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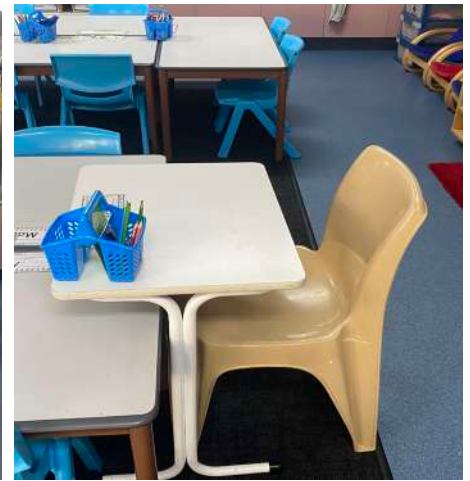


# APPENDICES

## Observation Photos - Year 2 Classroom



Year 2 Classroom image facing the exit



Different height in desk and chair to be more comfortable for student who is taller



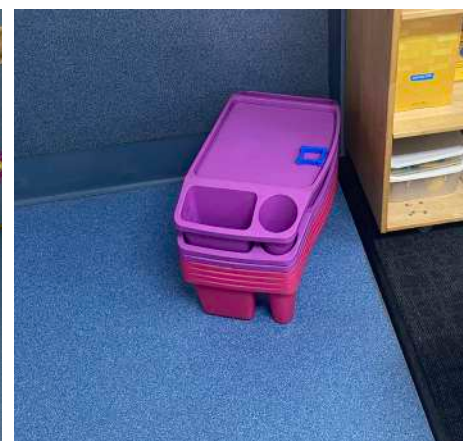
Year 2 Classroom image facing the back



Whiteboard Table located by the window



'Well-being' tent located in the back of the classroom for students who feel overwhelmed or need an escape



Floor trays used for student to put books on when working on the floor



# APPENDICES

## Observation Record Sheets - Year 2 Classroom

Measurements

→ Large chair  
→ loose plates  
→ loud for reading  
time

→ type of texture  
construction

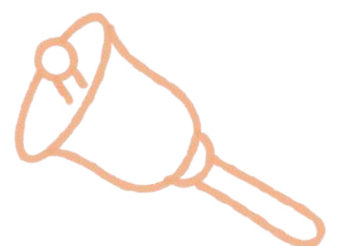
- Students are moving freely around the class and are following clear instructions
- One student is disrupting the class by making animal noises
- Teacher separates student who have had upset of being disruptive
- Music is also played to symbolise a start to a new text
- Some students have ear matts on their desk
- Teacher makes separate groups by using the paddle pop sticks and draws it at random
- Mainly the boys are sitting at a desk while most girls are sitting on the floor during group activities

Other interesting findings

- Few more students are spread out around the class while the rest of the students are sitting together at the front
- Might just be because its a catholic school but prays at the start of the lesson - builds community in the class and togetherness
- With every year level level - rhythm and music has been very effective in learning
- Teacher is getting students to do many different physical activities
- Rather than getting the students to constantly writing they instead use hand gestures to respond to questions
- 9.15 (move break) stretching practice, 'melting to your seats'
- teacher has a 'pick me sticks' bunch of paddle pop sticks with students names on it - student name gets picked they answer

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- Curved table is higher than the traditional furniture
- On the board there is 'Class game' written on it, when the class is misbehaving a letter is rubbed off



# APPENDICES

## Teacher Interview Transcript - Year 2 Classroom

Survey questions – Flexible learning furniture for primary school education

Teacher: Year 2 Classroom teacher, Redlands College, Wellington Point

### 1. How do you assess individual student learning styles and preferences?

Usually, early on we have like conversations with the students and mainly also the parents to understand what can work for the student best. I also try to make sure that the classroom caters better to their needs as they are still quite young and active so can be a bit of a challenge when either being too firm or too soft.

### 2. What strategies do you use to accommodate different learning needs in the classroom?

- I prefer to get a lot of active movement incorporated into my teaching style. So, things such as just stretch breaks or ways that students can express themselves through body movement.
- I also like to make the classroom activities more dynamic and have the students walk around when doing certain activities. Like for example the sound recordings.

### 3. How do you ensure that students are actively engaged in the learning process?

- I run the children through a daily planner in the morning to make sure that everyone understands what the day looks like. I also make sure to have this up for the day as it helps a lot in keeping the student focused.
- I use a lot of change in my tone to bring excitement and fascination towards what we learn. Allow for the students to also show their expression through their tone too.

### 4. Are there any specific teaching methods or techniques you use to enhance student learning?

- Similar to what I touched on before, a lot of getting the students up off their chairs and working together and moving their bodies a lot. Because at this age the students tend to have a lot of energy and they struggle to sometimes let it all out during break.
- I also have 'Class Game' written on the board. This just acts as a way to keep the students accountable for any misbehaving or bad behaviour. If a student doesn't behave well then I remove a letter from the word. Usually, they still get to play a game by the end of the week if all the letters are still there.

### 5. How do you incorporate technology into the curriculum to support learning?

- We used technology for a lot of more interactive types of learning. Topics such as maths and English are done still with students following along on what I teach but also they can use their iPads to play certain learning games to boost enjoyment.

### 12. How do you integrate creativity and arts into the curriculum to foster well-rounded development?

- Students in Junior School have a 1.5hr visual art lesson per fortnight with a specialist art teacher. They also have a 45-minute Music lesson per week with a specialist music teacher. Students in Year 4 and 5 have the opportunity to join a drama club and be taught some drama techniques by middle and senior school students.
- Students are also invited to join lunch me clubs run by teachers or teacher aides if they would like to learn some new skills (ie. knitting club, art club, book club, etc)

### 13. How do you approach teaching subjects that students may find challenging or less interesting?

- I just try to make everything relevant and/or fun. Not everything will be fun and enjoyable for every student but if you can try and keep things interesting that is half the battle.
- Use technology to help engage students – in this day and age most students love using technology. There are lots of educational apps that can be used to consolidate concepts and make learning fun.

### 14. What are the current limitations that you face when advocating for different learning styles?

- I think the biggest limitation is just implementing something that can be used more than once in multiple environments.
- Also a way to make the students feel more free to move around the class during activities and allowing for an easy flow of movement

### 6. What role do group activities and collaborative learning play in the classroom?

- I get the student to really just walk around the classroom a lot. Engage with each other whilst I'm also with them.
- I let the students do most of the talking during activities as this instills more responsibility into the students.

### 7. How do you address students who might be struggling with certain topics or concepts?

- More frequently I find students who are struggling tend to work on the floor or in a corner and don't really engage with the actual learning material. So, to help prevent this I tend to just be supportive of the students and be guiding them through certain challenges they might have with learning specific topics.
- Techniques such as just changing to tables around or the seating plans can really help improve students engagement.

### 8. Can you describe any differentiated instruction techniques you use in the classroom?

- The use of splitting into groups even for independent activities sometimes works really well as I might struggle to speak to everyone in some lessons. This just allows them to instead ask one another rather than rely on waiting for myself to get to them.
- Using rhythm or rhyming when talking about next activities as this just helps in making the information more straight forward and easier for the students to than follow.

### 9. How do you encourage critical thinking and problem-solving skills in your lessons?

- I encourage critical thinking by asking students lots of questions and having them consider different perspectives. I ask "why" questions and give them to me to think and then share with a partner and then with everyone.
- I try to also get students talking about more than one outcome for an answer. Kind of promote more explorative thinking when answering questions.

### 10. How do you provide feedback to students and involve them in their own learning process?

- I do a lot with body language at the end of the day. High fiving the students, or hugging them. Just things like that show that they are on the right track.
- Also letting the student feel more included in how we might preform certain activities.

### 11. Are there any opportunities for project-based learning or hands-on activities in the classroom?

- So I try to make the learning topics that might be less interesting for the students more interesting through music videos or sounds.

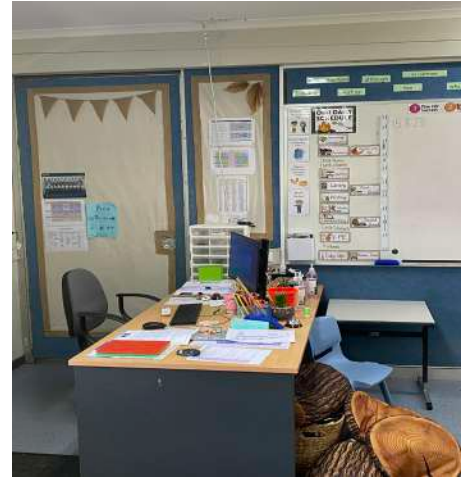


# APPENDICES

## Observation Photos - Year 3 Classroom



Year 3 Classroom facing the front whiteboard



Closer look into the teachers desk featuring 'bean bags' shaped as logs for variety in seating



Reading/ Relaxation space located in the back corner of the classroom



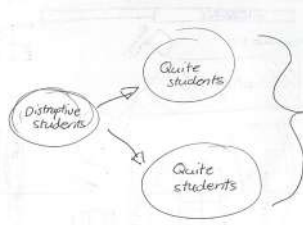
Influence of windows looking out into nature in the classroom (natural lighting, naturalness)





# APPENDICES

## Observation Record Sheets - Year 3 Classroom



Distruptive students seem to be close together

- Just before break teacher asks if student would like to say grace
- The students who are in trouble are asking the teacher after every time they get positive feedback from teacher to get their name off the board
- Teacher does have to repeat herself often in order to stop students from getting out of control
- Teacher writes the students who continue to misbehave in class on the board → Powerful
- The two students who are interrupting the whole class are also sitting close together
- When controlling the class the teacher tends to 'stush'
- Teacher uses the word 'game' to bring attention to the class
- 9:35 students sit back at their desks
  - ↳ students are constantly moving their feet
- 9:45 students are becoming more restless but also following instructions when asked
- 9:45 students head out the class to go to the library
- 15/8 was a public holiday (long weekend)
- 16/8 is there sports day

Year 3 - Measurements

Students desks  
120  
sits 2 students 60  
Height: 2 FT

No. Desks  
15 desks - 5 groups

Students chair  
195-43  
2925  
25-28  
139

Other interesting findings

- Teacher has to consistently stush students and tell the student off for interrupting the class
- ~~stush~~ Some students at times are banging on making loud noises that disrupt the whole class
- 9:05 teacher puts up some clear rules for the class
  - ↳ Eyes on the screen or teacher
  - ↳ Listen
  - ↳ Move together
  - ↳ Be safe and kind to each other
- Teacher uses a laser pointer instead of pacing around the class front
- ~~When the student~~ as when one student interrupts, another student follows (chain reactions) → seems to be the same student that starts interrupting
- Some students have a band across the legs of their chair
  - ↳ help stimulate movement
- Teacher mentioned that they tried

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→ Section of the whiteboard with specific notes for the students



# APPENDICES

## Teacher Interview Transcript - Year 3 Classroom

### Survey questions – Flexible learning furniture for primary school education

**Teacher: Year 3 Classroom teacher, Redlands College, Wellington Point**

#### 1. How do you assess individual student learning styles and preferences?

At the beginning of a new school year I, as a classroom teacher, talk to the child's previous teacher and ask for any notes on the students coming into my class. This allows me to prepare for the year to come. Once students arrive in my class I usually talk to them and ask how they learn best. This is one done as a questionnaire or by asking the students during a teacher-student conference. During parent-teacher meetings, I will ask the parents if their child has any particular learning preferences.

#### 2. What strategies do you use to accommodate different learning needs in the classroom?

- Small group work, with the teacher or teacher aide, for students who require extra assistance is a concept that has been taught
- Pairing students who may require some additional support with a more capable peer who can help them
- Scribing for students who struggle with writing
- Students take a photo on their iPad of work on the whiteboard that they need to copy – this allows the teacher to wipe the board but the student can continue copying into their book.
- Students can use voice-to-text technology on their iPad if they have a literacy learning need.
- Students who have ADHD, ASD or struggle with controlling their body have a variety of items at their disposal (ie. bands around the legs of their chair, noise-canceling headphones, wobble cushions, stools)
- Seat students who I know struggle to engage or focus towards the front of the classroom so I can make sure they are focusing on teaching.

#### 3. How do you ensure that students are actively engaged in the learning process?

- Constantly walking about the classroom during independent work to ensure students are on task.
- Glancing around during teaching to ensure students are focused.
- Asking a lot of questions and ensuring that I don't always ask those students with their hands up. I often ask students who may not be focused to see if they are listening.
- Have students repeat instructions to ensure they have been focused.

- For some students who have slow processing or working memory issues I often write sentences on a small whiteboard for them to copy from instead of making them look at the large whiteboard as they lose their place often.
- Students take a photo on iPad to copy from
- Some students don't have to write as much as others (if they struggle with literacy and it is tiresome for them I might say "You write 1 sentence and I will write the others"). Or I will write the sentence I want them to copy in a different colour on the board so they know which one is theirs.
- Give students checklists so they know what to do
- Use a visual timetable of what is coming up in the day
- Use iPads for writing/typing for those students who struggle with handwriting

#### 9. How do you encourage critical thinking and problem-solving skills in your lessons?

- I encourage critical thinking by asking students lots of questions and having them consider different perspectives. I ask "why" questions and give them to me to think and then share with a partner and then with everyone.
- We have done a lot of comparing and contrasting this term with our Soil, Rocks and Minerals unit of work.
- We do maths investors where the students are given a problem to solve and they work collaboratively to come up with a solution

#### 10. How do you provide feedback to students and involve them in their own learning process?

- Verbal feedback is given as students are working by the teacher walking around and talking to them about their work.
- Students hand in their books and their work is marked. If the students are struggling with something I will ask them to come and I will go through the work with them as I am marking it.
- Students do self-reflection for most of their assessments as well as for their weekly reading
- They all have a portfolio of work that they do throughout the year. This is sent home at the end of each term to show parents their child's work. Parents are encouraged to talk to their children about their work.

#### 11. Are there any opportunities for project-based learning or hands-on activities in the classroom?

- In Year 3 we do quite a lot of hands-on activities, especially in Maths and Science. We use concrete materials to demonstrate and allow those students who need to touch and move materials to understand concepts better and their own set to use whenever needed. In Science, students bring in items to help with learning. This term

- Try to make learning fun and engaging by involving them in discussions and hands-on activities

#### 4. Are there any specific teaching methods or techniques you use to enhance student learning?

- Research shows that explicitly teaching a concept is the best form of teaching new concepts. This is why I teach a lot of concepts explicitly.
- Reopening is also really important so students have the opportunity to be exposed to the same concept many times.
- Pairing students (less capable with a more capable peer)

#### 5. How do you incorporate technology into the curriculum to support learning?

- Redlands College has a 1:1 iPad policy for all junior school students which means that every student from Prep to Year 5 has a school-owned iPad that stays at school but is used by them for learning.
- Only educational apps are installed on the iPad by the school's technology department so no games, messaging apps etc are available to students
- We use the iPad for learning and research. Students use educational apps such as Mafic, Literacy Planet etc for consolidate concepts and use school-approved websites for research. Students do not have access to Google or Safari unless the teachers have approved the websites.
- We also have interactive whiteboards for teaching

#### 6. What role do group activities and collaborative learning play in the classroom?

- As mentioned above we use group active and collaborative learning for a lot of concepts. Students work on projects and some assessments as a group (usually pairs).

#### 7. How do you address students who might be struggling with certain topics or concepts?

- Students who might need a small amount of help (or who were away during teaching) with a concept usually form a small group and work with either the teacher or teacher aide in a withdrawal room
- Students who require more additional help will be withdrawn by a learning enrichment teacher who will do more intense work with students (usually for reading or spelling)
- I email parents and let them know what concepts we have covered and which ones their child struggled with and suggest they work on it for homework.

#### 8. Can you describe any differentiated instruction techniques you use in the classroom?

we have been learning about Soil, Rocks, and Minerals and students brought in soil and rocks from their backyard to compare and classify. We used magnifying glasses to see what was living in the soil the students brought in and to look at the different colours of the rocks.

#### 12. How do you integrate creativity and arts into the curriculum to foster well-rounded development?

- Students in Junior School have a 1.5hr visual art lesson per fortnight with a specialist art teacher. They also have a 45-minute Music lesson per week with a specialist music teacher. Students in Year 4 and 5 have the opportunity to join a drama club and be taught some drama techniques by middle and senior school students.
- Students are also invited to join Lunch me clubs run by teachers or teacher aides if they would like to learn some new skills (ie. knitting club, art club, book club, etc)

#### 13. How do you approach teaching subjects that students may find challenging or less interesting?

- I just try to make everything relevant and/or fun. Not everything will be fun and enjoyable for every student but if you can try and keep things interesting that is half the battle.
- Use technology to help engage students – in this day and age most students love using technology. There are lots of educational apps that can be used to consolidate concepts and make learning fun.
- Year 3 students also find learning more enjoyable if we use hands-on materials, so I try to incorporate concrete materials where possible.

#### 14. What are the current limitations that you face when advocating for different learning styles?

- Probably the biggest issue that I face is just trying to get the classroom under control when getting the class to work in groups. There's typically a lot of valuable time that is lost due to some students being a bit to eager and causing quite a lot of disruptions.



# APPENDICES

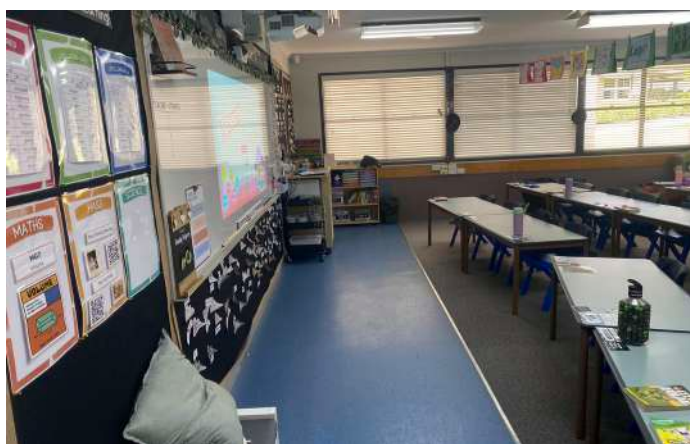
## Observation Photos - Year 4 Classroom



Year 4 Classroom image showing the amount of free space in the back of the classroom



Different height in desk and chair to be more comfortable for student who is taller



Year 4 classroom image showing amount of free space in the front of the class



Whiteboard Table located by the window



'Well-being' tent located in the back of the classroom for students who feel overwhelmed or need an escape



# APPENDICES

## Observation Record Sheets - Year 4 Classroom

Observation Research Document  
Curriculum-focused furniture for primary school education. Sessions: Morning  
21/8 Mon 8:30-9:40  
Year: 4-5

Classroom Floor Plan labels: Whiteboard, Wire-Standing desk, Teacher's Desk, Free space, Windows, Entrance, Storage, Cushions, Charge area, Door to back room, Reading Zone.

Key Standouts

- > Upon entry teacher greets student with a handshake, hug, high-five
- > Start of the lesson the students play 'who's who's' to sort out the student helpers
- > More female students than male students
- > 8:45 = snacks & reading time
- > Students are very well behaved
- > Teacher is keeping the students engaged during reading time (change in tone)
- > Seems to be no fidget toys/objects on the students desks
- > 8:50 = reading time ends
- > Teacher has classroom structure placed up on the board for everyone to see. -> Positive Impact

Subject focus: English & writing

Flexible Learning Environment Scale for Primary Classrooms Year 4

No flexibility 0 points  
Students do not have a choice of work surface, height of seating, type of seating

Low flexibility 1 point  
Students have at least 1 out of the 4 choices:  
 Height of work surface  
 Height of seating  
 Type of seating

Some flexibility 2 points  
Students have 2 or more out of the 4 choices:  
 Height of work surface  
 Height of seating  
 Type of seating

High flexibility 3 points  
Students have 3 out of the 4 choices:  
 Height of work surface  
 Height of seating  
 Type of seating

Column total: 7 points  
Opinion: 1 point  
Total score: 6 points

Year 2 - Year 4 - Observation Questions

QUESTIONS	Y	N
Are the desks laid out in groups? How are they arranged? Desks are arranged in rows of 4's and 5's sort of an industrial set up	Y	N
Are there areas in the classroom that have empty space? Areas includes at the front of the class (near whiteboard), back corner of the classes (reading section/zone).	Y	N
Does and can the teacher move freely around the class whilst teaching? Yes, the teacher is walking freely around the class interacting with students - either together, individual	Y	N
Is the teacher sounding enthusiastic about learning? Teacher used her tone to build up excitement and acknowledge when students did a good thing	Y	N
Do the students at any stage of the teaching (see look or show signs of restlessness)? Depending on how fun for through the lesson, students are becoming slightly more restless with their movement	Y	N
Are there times in the lesson when the teacher is allowing the student to move freely? Start of the lesson students get up from their tables to do a fun, music activity before they start learning. Students also are asked to get some snacks at 8:45 and sit on the floor around the teacher (reading)	Y	N
Do the current items of furniture in the classroom promote any signs of active learning? Very static traditional learning style	Y	N
Are there any clear distinctions of areas seen around the classroom that are used for other types of learning means? (eg: reading area, etc) Different furniture is seen	Y	N

Q) What do you want to see in the classroom that can help improve flexible learning through furniture?  
-> Round tables, natural lighting, greenery

Body Language Observations Year 4

What is the body language of the teacher?	Disruptive behaviour	Formulating the class	Learning (comprehension)	Assessing questions (answers)	Reading with an object or their hands	Learning back participating in class	Leaving the classroom	Sounding or speaking at the desk
What is the body language of the students?	Y	N	Y	Y	Y	Y	Y	Y

Q) What is the body language of the students?  
-> When students are presenting in pairs, the teacher is walking around to observe and check for all students are performing the task correctly


Q) What is the body language of the students?  
-> A lot of students are bouncing off each other when discussing the class

Q) What is the body language of the students?  
-> Some students have their hands on their desks  
-> Some students have their hands on their desks  
-> Some students have their hands on their desks



# APPENDICES

## Observation Record Sheets - Year 4 Classroom

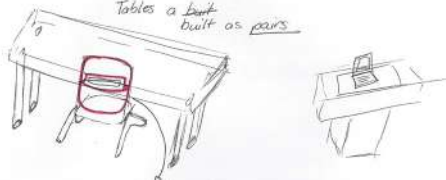


→ 8:50 = Daily review  
 → 2 boys sat at the front = causing the most disruption  
 → ~~Timing~~ → Students rush to get ready for next activities  
     ↳ fastest students are rewarded  
     ↳ positive reinforcement  
 → Students bring their whiteboards on the desk 'bin it'  
     ↳ promotes noise only at/water the activities require it  
 → Hands out prize for students who are participating in class  
 → Interactive powerpoint  
     ↳ animations/colours/photos  
 → Teacher is asking students at times what they would prefer to do in order to complete the tasks  
 → Teacher uses hand gestures to signal the time student perform their activities → very interactive learning style  
 → Because class is split down the middle the room is created to feel that there are 2 groups (left side - Right side)  
 → Overall class feels more structured & consistent in its learning from  
 → Teacher sketches in ~~planning~~ rhythm and student's copy it  
 → 9:15 = reading group activities  
     ↳ students can move anywhere around the classroom to do this group activities  
     ↳ **Active learning!!**

Year 4

Measurements

Tables a ~~bank~~ built as pairs



Similar to the yr 5 chairs have a pouch to store their books

→ Student work around the class → encouragement  
 Other Interesting Findings  
 → Students seem to follow instructions  
 → Classroom overall utilises the whiteboards each student gets → Makes the learning more interactive and fun  
 → In this class specific positive reinforcement is clearly effect in a structured learning style by giving the students treats/prizes  
 → 9:45 = More students are seen to be leaning back in their chairs and changing their body language  
 → Students are feeling more calm & motivated to respond to the teachers (not shy)  
 → Teacher instead asks students many open-ended questions - students respond differently (blink if you agree/yes)  
 → 10:00 boys are becoming more restless and fiddling  
 → Teacher exits the class with a fun learning activity (wordle)  
 → Kids play a short game of hide and seek (one student is chosen to hide while the other student guesses who is not there)



# APPENDICES

## Teacher Interview Transcripts - Year 4 Classroom

### Survey questions – Flexible learning furniture for primary school education

Teacher: Year 4 Classroom teacher, Redlands College, Wellington Point

#### 1. How do you assess individual student learning styles and preferences?

Sometimes questions are asked early on in the year, and I frequently like coming back to those. Like in terms of your learning styles, like conversations with the children, even using the language of like, oh, I noticed that you're, you like to move around. And that helps you learn, like, I wonder if you that's how you learn this and kind of like putting that almost in their own words. assessing can be a whole range of things. It can be a verbal conversation, it can be like a roleplay. It can be written, like a test short response, like the English is going to be a narrative. It's never just that was you in turn one. Like, it's just always checking back in. Yeah, because they change and their bodies are changing in year four. And friendships and dynamics here are changing.

#### 2. What strategies do you use to accommodate different learning needs in the classroom?

- Yeah, incentives
- repeating back to me, like if it's an important instruction, they have to repeat it, or you know, using rhythm even with my voice, like, leave your iPad on your desk, like they just know to repeat it.
- They hear rhythm, and or a melody, and they just know to repeat that. And then it's not just one kid, that I'm checking that they've heard it, every kid says it back to me once they've then said it, they remember it.
- Sometimes, like on the carpet, like the option to sit at their desk.
- Desk positioning like where they are in the classroom, a lot of physical touch. Like just coming up and just like ruffling hair, or you know, like, yeah, hand on the shoulder.
- Just connecting with kids to help them feel calm. And then the learning comes from that, like, I don't have to do so much learning-wise if their bodies are in a regulated state.

#### 3. How do you ensure that students are actively engaged in the learning process?

- I just have high expectations is a big one
- Just like you would have seen it in our daily review where they see the word, write the word, chin it, and go, instead of waiting for the lowest and slowest kind of just yet, keep up. Let's keep that moving.

- I email parents and let them know what concepts we have covered and which ones their child struggled with and suggest they work on it for homework.

#### 8. Can you describe any differentiated instruction techniques you use in the classroom?

- The use of splitting into groups even for independent activities sometimes works really well as I might struggle to speak to everyone in some lessons. This just allows them to instead ask one another rather than rely on waiting for myself to get to them.
- Using rhythm or rhyming when talking about next activities as this just helps in making the information more straight forward and easier for the students to than follow.

#### 9. How do you encourage critical thinking and problem-solving skills in your lessons?

- I encourage critical thinking by asking students lots of questions and having them consider different perspectives. I ask "why" questions and give them to me to think and then share with a partner and then with everyone.
- I try to also get students talking about more than one outcome for an answer. Kind of promote more explorative thinking when answering questions.

#### 10. How do you provide feedback to students and involve them in their own learning process?

- Similar to before, a lot of positive and negative feedback but also just clear and strong communication between one another is powerful. Giving the thumbs up to students or body language changes to signify that they are doing a good job.
- They all have a portfolio of work that they do throughout the year. This is sent home at the end of each term to show parents their child's work. Parents are encouraged to talk to their children about their work.

#### 11. Are there any opportunities for project-based learning or hands-on activities in the classroom?

- So kind of trying to make it relevant for them. I try to make any activity more relatable to the topic we are currently learning as this just works better in making the overall lesson feel more active.

#### 12. How do you integrate creativity and arts into the curriculum to foster well-rounded development?

- Students in Junior School have a 1.5hr visual art lesson per fortnight with a specialist art teacher. They also have a 45-minute Music lesson per week with a specialist music teacher. Students in Year 4 and 5 have the opportunity to join a drama club and be taught some drama techniques by middle and senior school students.
- Students are also invited to join lunch me clubs run by teachers or teacher aides if they would like to learn some new skills (ie. knitting club, art club, book club, etc)

#### 4. Are there any specific teaching methods or techniques you use to enhance student learning?

- We generally do a lot of like, no hands up. So I'll just call on the person. If I can generally gauge that it's not like they're maybe just getting weary and tired, I might come up next to them and talk while I'm physically next to that child.
  - And are you going when the behaviour is disruptive? Because they're not engaged? I'll say like, Hey, go for a walk to the art room and back. And the kids just No, give them a job. You know, can you go carry these heavy library books to the library? For me? That's always a good one.
  - A lot of focus towards reinforcing the standards I expect from my students really.
  - Positive and negative reinforcement.
- #### 5. How do you incorporate technology into the curriculum to support learning?
- Redlands College has a 1:1 iPad policy for all junior school students which means that every student from Prep to Year 5 has a school-owned iPad that stays at school but is used by them for learning.
  - Only educational apps are installed on the iPad by the school's technology department so no games, messaging apps etc are available to students
  - We use the iPad for learning and research. Students use educational apps such as Mafic, Literacy Planet etc for consolidate concepts and use school-approved websites for research. Students do not have access to Google or Safari unless the teachers have approved the websites.
  - We also have interactive whiteboards for teaching

#### 6. What role do group activities and collaborative learning play in the classroom?

- Our rotations are all in groups. Yeah, none of that is collaborative. They're all individually working on tasks. But that's always displayed during our rotation so they know where they need to be who's in their group, what they need with them, and they will know what they can do when they're finished as well.
- In terms of collaboration, that's a really tricky one in year four, because of the friendship especially with the two girls as well, because there's so much drama.

#### 7. How do you address students who might be struggling with certain topics or concepts?

- Students who might need a small amount of help (or who were away during teaching) with a concept usually form a small group and work with either the teacher or teacher aide in a withdrawal room
- I also try to speak with the students who are struggling more one-on-one to find better ways that can help them in learning certain topics. I find that getting engaged with the student on this matter helps them also feel more comfortable.

#### 13. How do you approach teaching subjects that students may find challenging or less interesting?

- I just try to make everything relevant and/or fun. Not everything will be fun and enjoyable for every student but if you can try and keep things interesting that is half the battle.
- Use technology to help engage students – in this day and age most students love using technology. There are lots of educational apps that can be used to consolidate concepts and make learning fun.

#### 14. What are the current limitations that you face when advocating for different learning styles?

- Round tables, like the community that comes from the round table? I really like.
- This is so limited, like, even in groups, it's so limited to, you know, where people sit and who they're with, whereas I would love for it to be more collaborative.
- Just kind of a space where they can kind of all be in one space, but have eyes on other people.
- The lack of standing tables I feel. Just having adjustable tables works really well in easily changing up the environment without getting too complicated.
- I also think now with technology being such a useful tool in the classroom, cyberbullying has started to become slightly more prominent. So, just a way to make students feel more proud of themselves and the work they do.

# APPENDICES

## Observation Photos - Year 5 Classroom



Year 5 classroom image showing the amount of free space located at the front of the classroom



Photo looking at the chaos of the charging bay for the students iPads



Year 5 classroom image showing what the classroom looks like when facing the back end of the class



Instead of trays, students store their books in a chair 'sleeve' located on the back of their chairs



Looking more closely at the 'lounge' section and the collaborative area for where students work if they do not wish to work on their desks





# APPENDICES



## Observation Record Sheets - Year 5 Classroom

Measurements  
Student Desk  
60  
60  
Height  
68

Other Interesting Findings

11:00 → As soon as students entered the classroom some students were not listening to the teacher → distractive to sent to the office  
→ Students were more attentive and focusing on the teacher  
→ Most classes rely on limited space thus lack the space to adapt learning  
→ Some teachers don't want to have to constantly tell students off for behaviour as it brings down the whole class  
→ Size of the class  
↳ Close learning

11:50 → Start of lesson class would work independently  
12:00 → than after teacher would let them go off into groups  
↳ would involve reorganising the chairs & tables

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How can students learn effectively

- ↳ Flexibility
- ↳ Adaptability
- ↳ Compactable
- ↳ Multifunctional
- ↳ Lightweight
- ↳ Minimalistic

↳

↳ How to improve the system for when students need help/ assistance from the teacher

↳ Current practices

- ↳ Ticket system
- ↳

↳ How to make everyone feel included in the learning?

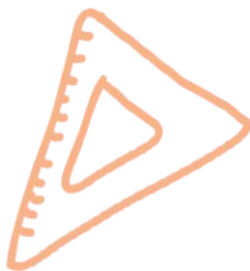
↳ Learning activity

- ↳ Paragraph on screen - student by student reads a sentence each
- ↳ Makes everyone involved

↳ Brain breaks

- ↳ A way to have breaks after learning activities
- ↳ Themed desk
- ↳ Make the chairs more comfortable

↳ Can't be a distraction



# APPENDICES

## Teacher Interview Transcripts - Year 5 Classroom

### Survey questions – Flexible learning furniture for primary school education

#### Teacher: Year 5 Classroom teacher, Redlands College, Wellington Point

##### 1. How do you assess individual student learning styles and preferences?

Lots of small personal adjustments that get the best from that particular student.

##### 2. What strategies do you use to accommodate different learning needs in the classroom?

- Small group work, with the teacher or teacher aide, for students who require extra assistance is a concept that has been taught
- Pairing students who may require some additional support with a more capable peer who can help them
- Making sure to have a conversation to every student during activities to make sure that they are following the tasks correctly. Very important to communicate with the students.

##### 3. How do you ensure that students are actively engaged in the learning process?

- Constantly walking about the classroom during independent work to ensure students are on task.
- Glancing around during teaching to ensure students are focused.
- Be sure to use certain words that can bring more excitement to the learning
- I try to also whenever I ask questions make it link to what we are also learning at the time. For example, in English we are learning about debating, therefore I try to make students have friendly debates through the class when learning about certain topics. This works is just allowing the students to easily attain more information at once whilst also making the experience more entertaining.

##### 4. Are there any specific teaching methods or techniques you use to enhance student learning?

- Try and promote that mistakes are part of learning and that we all have different strengths and weaknesses.
- Try to make everyone feel valued and seen when learning about tough or difficult topics as this just helps boost their motivation.

##### 5. How do you incorporate technology into the curriculum to support learning?

- Redlands College has a 1:1 iPad policy for all junior school students which means that every student from Prep to Year 5 has a school-owned iPad that stays at school but is used by them for learning.

- Students do self-reflection for most of their assessments as well as for their weekly reading
- They all have a portfolio of work that they do throughout the year. This is sent home at the end of each term to show parents their child's work. Parents are encouraged to talk to their children about their work.

##### 11. Are there any opportunities for project-based learning or hands-on activities in the classroom?

- I would say that the best opportunity for project-based learning should be something that can make learning more adaptable in a classroom and not take up too much space or create clutter. If it is easy and stress free than it will be used more frequently.

##### 12. How do you integrate creativity and arts into the curriculum to foster well-rounded development?

- Students in Junior School have a 1.5hr visual art lesson per fortnight with a specialist art teacher. They also have a 45-minute Music lesson per week with a specialist music teacher. Students in Year 4 and 5 have the opportunity to join a drama club and be taught some drama techniques by middle and senior school students.
- Students are also invited to join lunch me clubs run by teachers or teacher aides if they would like to learn some new skills (ie. knitting club, art club, book club, etc)

##### 13. How do you approach teaching subjects that students may find challenging or less interesting?

- I just try to make everything relevant and/or fun. Not everything will be fun and enjoyable for every student but if you can try and keep things interesting that is half the battle.
- Use technology to help engage students – in this day and age most students love using technology. There are lots of educational apps that can be used to consolidate concepts and make learning fun.

- Only educational apps are installed on the iPad by the school's technology department so no games, messaging apps etc are available to students
- We use the iPad for learning and research. Students use educational apps such as Mafic, Literacy Planet etc for consolidate concepts and use school-approved websites for research. Students do not have access to Google or Safari unless the teachers have approved the websites.
- We also have interactive whiteboards for teaching

##### 6. What role do group activities and collaborative learning play in the classroom?

- Group learning is important and this could be enhanced with innovative design ideas.

##### 7. How do you address students who might be struggling with certain topics or concepts?

- Students who might need a small amount of help (or who were away during teaching) with a concept usually form a small group and work with either the teacher or teacher aide in a withdrawal room
- I also try to speak with the students who are struggling more one-on-one to find better ways that can help them in learning certain topics. I find that getting engaged with the student on this matter helps them also feel more comfortable.
- I email parents and let them know what concepts we have covered and which ones their child struggled with and suggest they work on it for homework.

##### 8. Can you describe any differentiated instruction techniques you use in the classroom?

- I'd like design elements to support easier use of small groups for focussed learning support. Eg close, easy to access rooms for small groups.
- A way that the student can also take more initiative in creating a more suitable learning environment for themselves without generating more disruption in the whole class.

##### 9. How do you encourage critical thinking and problem-solving skills in your lessons?

- I encourage critical thinking by asking students lots of questions and having them consider different perspectives. I ask "why" questions and give them to me to think and then share with a partner and then with everyone.

##### 10. How do you provide feedback to students and involve them in their own learning process?

- Verbal feedback is given as students are working by the teacher walking around and talking to them about their work.
- Students hand in their books and their work is marked. If the students are struggling with something I will ask them to come and I will go through the work with them as I am marking it.

##### 14. What are the current limitations that you face when advocating for different learning styles?

- Always a struggle with 'time' to create tasks that promote problem solving activities.
- Have some sort of classroom where you always feel close to kids. But it needs to be adaptable. So, you can do group work quickly. Do that work quickly. Have some spaces, that sort of stuff because as you saw when the kids have the questions you want to get to as fast as you can, but you can't wait to do that that will be good to keep some sort of structure of who I touch base with today. But yeah, I don't know, proximity access to the kids through desks and chairs.
- So you can also get to kids for feedback individually, which is native to pro approximately. I suppose, but also names all that something I have some way if kids need help, but you can see them easily.
- Space, just more spaces for individual things in the classroom, a reading zone when you do group work and rotations and things to help children? Because as a teacher, you're generally that group time spend time with one group? And others are independent. So if they're doing an independent job, if there's some physical feature, the class that helps them stay in that group, work together, work in that quiet area is a noisy area, we need to swap.
- So like, if you hadn't walled off glass sections, where there's a couple of rooms, if you know, there's a discussion room there where kids are talking about the teacher, but they need to discuss and talk as opposed to kids who are doing like a little comprehension activity in their reading and writing their own work. But in a group, yeah, you want them separate but visible.
- Having access to visibility, always had that visibility of kids. But then inside those rooms, do you have the right seating arrangement for them, so I don't have to go and move things and shuffle things. Things are ready.





# APPENDICES

## Observation Photos - Areas outside of the classroom



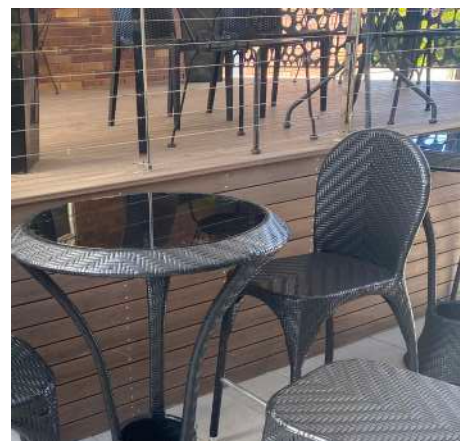
'Egg' chair located in the well-being department



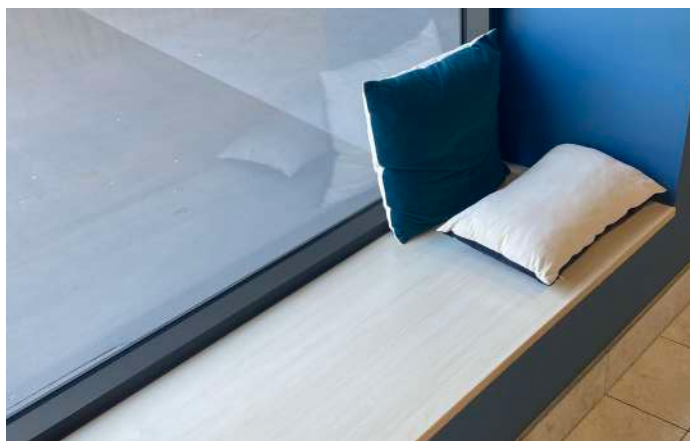
Outdoor bean bags located outside of the well-being department



Couch like furniture located in the well-being department



Outdoor furniture located near the tuck-shop



Window bench located in the tuck-shop looking out into the courtyard



Indoor student display of art projects located in the library.



