RESEARCH REPORT

DNB311 INDUSTRIAL DESIGN CAPSTONE

Supporting Self-Regulation in Prep Children During Classroom Transitions

Author

KIARA ROBINSON

AUTHENTICITY & AI USE

STATEMENT

AUTHENTICITY

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 the report is the product of my own work and that all the assistance received in preparing this report and sources have been acknowledged.

Kiara Robinson
11/09/2026

AI USE

I have utilised Gen AI in this report, Chat GPT, to assist in various way. The way I have used AI includes:

- to assist in reducing word count in Analysis Findings, Discussion and Implication sections.
- to edit coherence, grammar, and clarity throughout report writing as a peer review/editoral assistant for proof reading.
- to generate cover photos for section dividers in report.
- to assist in accurate referencing style in accordance to QUT cite write.

Kiara Robinson
11/09/2026



EXECUTIVE SUMMARY

This report investigates the key factors within Prep classroom environments that influences children's self-regulation during transitions, whilst identifying what supports or hinders their ability to regulate emotions, behaviour, and attention. As children between the ages of 4-6 begin formal schooling, they encounter unfamiliar environments and expectations that can be cognitively demanding to navigate, thus challenging their developing self-regulation. Hence, this report aims to identify an opportunity and intervention that can support children's self-regulation during transitional demands.

In order to uncover opportunities within this scope, a rigorous analysis was conducted using primary and secondary findings. Specifically, secondary research such as a literature review and product benchmarking was conducted to understand the foundational findings of self-regulation and transitions, and the current support tools used in the existing market space. Additionally, primary research including a multidisciplinary survey, and an interview with secondary and expert users was conducted to gather breadth and in-depth insights from users who are experienced in working with Prep aged children. Hence, this research explored expertise' observations to understand why transitions can be demanding for children during this crucial milestone. Using the triangulation method, a statistical and thematic analysis was then conducted to identify patterns and themes. Overall, the findings identified that children may find transitions demanding due to unexpected changes, lack of preparation, and unfamiliarity in learning cues and expectations in Term 1. The findings also highlight that the main methods used to support children in transitions included preparation tools rather than sensory comfort, including visual supports, repetitive and consistent cues, gradual pacing, and adult support.

Based on these findings, implications were identified to support children's self-regulation during transitions, therefore informing relevant future interventions applicable to children's needs.



Supporting Self-Regulation in Prep Children During Classroom Transitions

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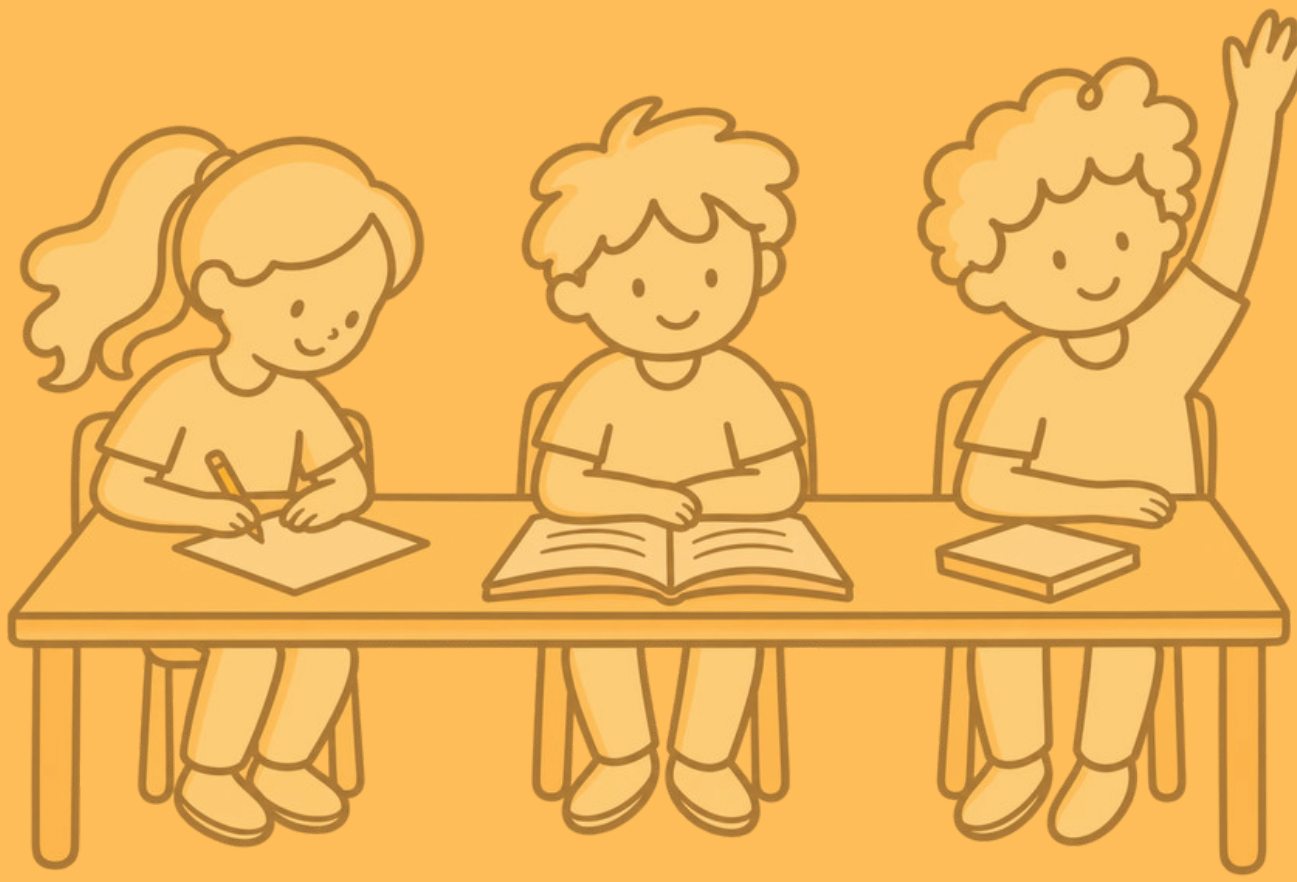
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01 Section

1.1 INTRODUCTION
1.2 PROJECT STRUCTURE
1.3 BACKGROUND
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NOTE. IMAGE GENERATED USING CHATGPT (OPENAI, 2026)

1.1 INTRODUCTION

PROJECT OVERVIEW

Self-regulation in the context of early childhood is a child's ability to control behaviour, emotions, and mental processing adaptively in particular situations (Bronson, 2000). Over time, children's metacognitive abilities, which play a crucial role in self-regulation, develop through interactions with others and the mental and material tool kit provided by culture (Whitebread & Basilio, 2012). These developing abilities are supported by key cognitive processes, including **response inhibition, attention, and working memory** (Savina, 2021).

The development of these self-regulatory abilities become particularly important when children between the ages of 4-6 go into formal schooling and begin to encounter new social, behavioural, and learning expectations. This period is a **crucial developmental milestone** that has a lasting impact on a child's success in schooling and later in life (Jun, et al., 2025).

In particular, self-regulation is essential in children within the classroom to support their ability to follow instructions, maintain attention, manage emotional responses, and interact appropriately with peers whilst adapting to classroom routines (Edith Cowan University, 2021). However, a child's self-regulation can be heavily influenced by the surrounding environment. This includes classroom factors such as:

- Transition demands
- Structured routines
- Sensory and environmental demands

that either support or hinder a child's ability to regulate their response (Timmons et al., 2016) and (Madanipour et al., 2026).

AIM

With research indicating that self-regulation is associated with later positive developmental outcomes and continues to develop during early elementary school (Savina, 2021), understanding this relationship may help educators create classroom environments that better support children's development during transitions and routines.

Therefore, this report **aims to investigate how the Prep classroom environment influences children's self-regulation during transitions and identify classroom factors that can support or hinder their ability to regulate emotions, behaviour, and attention**, ultimately informing design interventions that supports children's self-regulation during classroom transitions (see Figure 1).

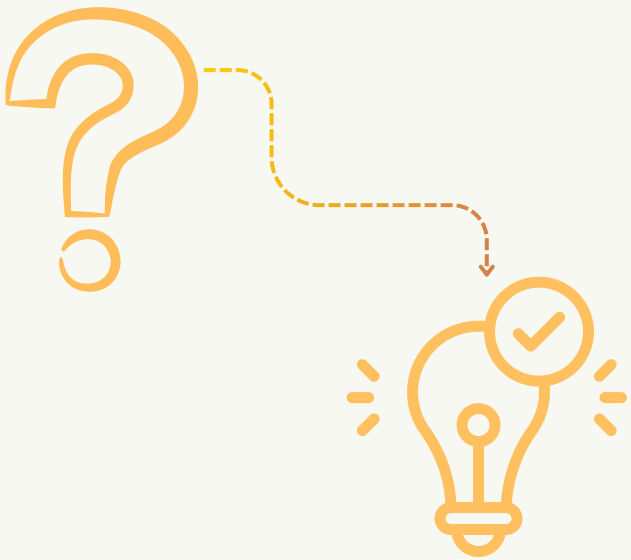


Figure 1. Representing aim to design an intervention that supports children's self-regulation during classroom transitions.

SECTION 01.

INTRODUCTION

BACKGROUND

BENCHMARKING

SECTION 02.

RESEARCH

ANALYSIS & FINDINGS

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DISCUSSION

DESIGN IMPLICATION

CONCLUSION

STRUCTURE

1.3 BACKGROUND

Within Prep environments, children frequently move between routines, activities, and expections (Iwai et.al, 2026). These moments are known as transitions, which refers to periods that involve a change of roles and expectations (Lim et.al, 2021). Thus, as children enter formal schooling with varying developmental capabilities, the recurring transitions that are embedded throughout the Prep day can place additional demands on their developing self-regulation skills. According to the 2024 Australian Early Developmental Census (AEDC), a survey of 288,483 children and 16,723 teachers determined that only,

53% of children were developmentally on track when they had started school.
(Australian Government Department of Education, 2025).

These varying developmental capabilities may influence how children respond to the demands of the Prep day, where they may spend 20% to 35% of their day transitioning between activities, expectations and spaces (Sainato, 1990). Consequently, these frequent shifts may place significant demands on their self-regulation whilst possibly contributing to behavioural disruptions.

In particular, transitions can be cognitively demanding for children due to shifting focus, waiting periods, stopping activities, or an unexpected change (Hemmeter et al., 2008). These demands require children to engage their neurocognitive processes such as their response inhibition, attention, and working memory, which are fundamental elements of their executive functions (see Figure 2) (Savina, 2021).

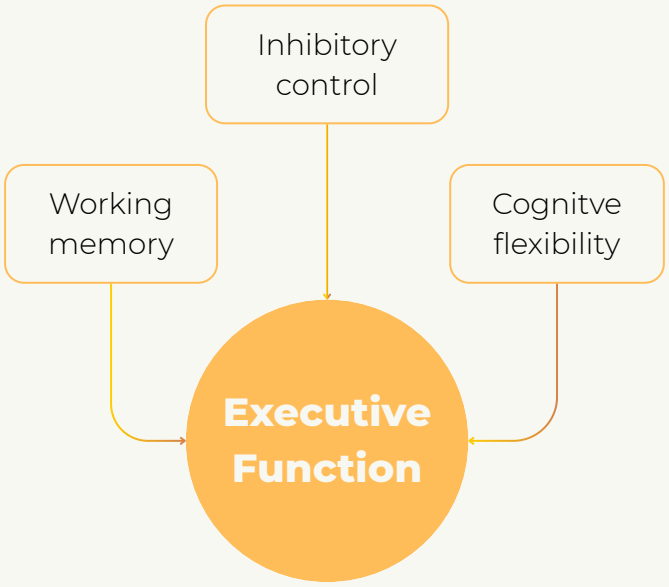


Figure 2. Executive Function Mapping

Note. Adapted from What Is Self-Regulation and Executive Functioning? (Freedom Psychology, 2023).

This is supported by Timmons et.al. (2016) who conducted an observation study of 40 children across nine early-learning classrooms and found that children demonstrated lower self-regulation during transition periods when compared with play, small-groups, and whole-group classroom contexts.

With research indicating that self-regulation is challenged during transitions, it is suggested that the way these periods are structured and communicated may influence children's ability to navigate them successfully. Peters (2025) argues that structured routines – referring to consistent and predictable activities and transitions – can help establish clear behaviour expectations, overall reducing instances of off task-behaviour in classrooms.

Likewise, predictability in routines helps children manage behavioural expectations by providing certainty on upcoming activities, with repetition helping them internalise expectations and regulate behaviours more effectively (Peters, 2025).

Ultimately, these findings suggest that communicated transitions and predictability can support children's self-regulation by preparing them for changes throughout the Prep day.

Alongside the structure and predictability of transitions, the classroom environment itself may also influence how children regulate during these moments. Bagais and Pati (2023) suggests that the physical environment can provide affordance to children to support their engagement and self-regulation. Examples of this includes:

- Activity areas
- Furniture
- Spatial Layout
- Accessible materials

To contrast, environmental confusion can also arise during transition periods due to:

- Noise distruption
- Movement patterns
- Crowding

These factors can place additional demands on children's attention and behaviour regulation (Bagais & Pati, 2023). This research suggests that environmental affordances may be used to communicate expectations within the classroom routines, subsequently reducing environmental confusion that can challenge children's self regulation (Kim et.al, 2024).

Therefore, the design and organisation of the classroom may influence how children regulate themselves during transitional moments.

SUMMARY

In summary, transitions can be cognitively demanding for young children as they develop self-regulation within new and unfamiliar environments, such as Prep classrooms, meaning that the way they are structured and supported plays a critical role in how children react to them. Hence, this project will focus on a design intervention that supports children during these transitional moments (see Figure 3).



Figure 3. Visual representation of cognitive demands affecting children's self-regulation during transitions, thus requiring an intervention of support.

1.4 BENCHMARKING

Referring to Section 1.3, research suggests that self-regulation during transitions can be particularly challenging in Prep-aged children due to unstructured routines, lack of predictability, and environmental confusion (Peters, 2025) and (Bagais & Pati, 2023). Hence, in order to develop solutions that genuinely improve children's transition experiences, it is vital to review what products already exists on the market and evaluate how well it meets the needs of young learners.

This is achieved through benchmarking; a systematic process of measuring and evaluating the performance of your own and other's products or processes and using the results to make informed decisions (Karypis & Kumar, 1998). With children's self-regulation being recognised as a developmental priority when first entering school (Jun et al., 2025), a wide range of products have emerged on the market to support Prep-aged children during transitions. In particular, this benchmarking narrows products that are marketed within **four themes** related to transitions in Prep classrooms; transition zones, transition support, transition predictability, and transition flexibility (see Figure 2).

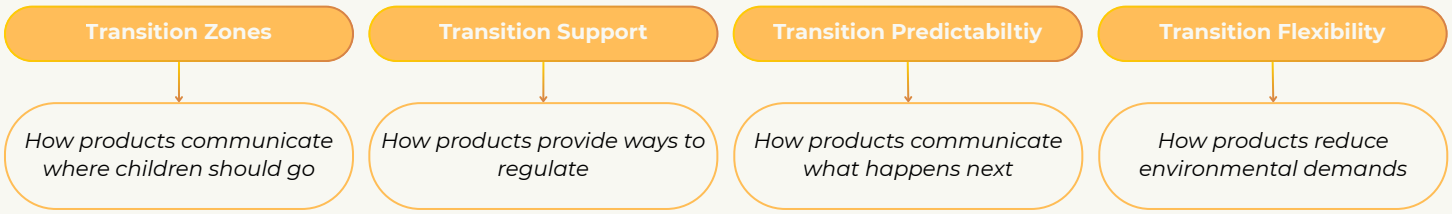


Figure 2. Transition Theme Definitions

This benchmarking aims to understand how products designed for classroom spaces are currently supporting children's self-regulation during transitions, and their overall success within the market space. Figure 4 highlights the defintions used for the benchmarking criteria.

COST: *Affordability for classroom implementation*	*1 = high cost* — *5 = low cost*
EASE OF INTEGRATION: *Amount of classroom space it takes up and how easily can it fit into existing classroom routines/layouts without disruption*	*1 = large foot print* — *5 = small foot print*
MATERIAL SUITABILITY: *Hygiene, durability, safety and suitability for Prep classrooms*	*1 = poor quality* — *5 = high quality*
MANUFACTURING COMPLEXITY: *Complexity of components, materials and manufacturing processes*	*1 = complex* — *5 = simple*
CHILD ACCESSIBILITY: *Can a Prep child independently see, reach, understand or interact with it without extensive instruction?*	*1 = unclear* — *5 = intuitive*
VISUAL SUITABILITY: *Does its visual design support attention/understanding without unnecessary distraction?*	*1 = difficult* — *5 = seamless*
ADAPTABILITY: *Can it accommodate different activities, transitions or classroom contexts?*	*1 = fixed* — *5 = highly adaptable*
TRANSITION EFFECTIVENESS: *How effectively does the product prepare, guide or support children when moving between activities, spaces or routines?*	*1 = ineffective* — *5 = effective*
SELF-REGULATION: *How strongly could the product support emotional, behavioural or attentional regulation during transitions?*	*1 = minimal* — *5 = strong*

Figure 4. Benchmarking Definitions and Legend

PRODUCT	ROOMSCAPE PANEL	CIRCLE-TIME SEATING	HIDEAWAY HOOD	AUTEX ACOUSTICS	WOBBLE STOOLS	TIME TIMER	VISUAL SCHEDULE	FLEXIBLE FURNITURE	ROUND TABLES + CHAIRS
TRANSITION THEME	**ZONES:** room divider	**ZONES:** Visual carpet cue	**SUPPORT:** personal refuge/space furniture	**SUPPORT:** wall/ceiling application for noise dampening	**SUPPORT:** Provides vestibular, tactile and proprioceptive input	**PREDICTIBILE :** visual progression timer	**PREDICTABILE:** timber visual schedule with picture tiles	**FLEXIBILITY:** Short, light-weight, accessible organisation stoarge	**FLEXIBILTIY:** easy access to compartments
COST	1	3	1	3	5	5	5	4	2
EASE OF INTEGRATION	3	5	4	1	5	5	5	4	4
MATERIAL SUITABILITY	3.5	3	3	4	5	5	5	3	2
MANUFACTURE COMPLEXITY	2	3	1	1	5	5	5	4	4
CHILD ACCESSIBILITY	4	4	4	1	4	3	3	4	4
VISUAL SUITABILITY	4	3	4	5	5	4	3	5	5
ADAPTABILITY	2	2	2	1	3	5	5	2	2
TRANSITIONS	4	4	4	3	2	4	4	2	3
SELF-REGULATION	3	3	5	4	4	4	3	1	1
OVERALL SCORE	26.5/45	30/45	28/45	23/45	38/45	40/45	38/45	29/45	27/45

Table 1: Benchmarking Table of Transition Products used within the Market Space

Table 1 presents a benchmarking evaluation that highlights key products designed to support children's self-regulation during transitions (refer to Appendix A for images of products). Evidently, these products are benchmarked against a criterion to compare its overall performance (See Figure 4). Against this evaluation, the table indicates that **Time Timer (40/45)** had ranked the highest, following with **Visual Schedules (38/45**), which both scored highly against cost, ease of integration, material, manufacturing, and adaptability, with their major downfall lying in child accessibility. This is due to the timer requiring adult prompting after it ends, whilst the schedule requires additional prompting for when the next activity is to begin.

Alongside Time Timer, **Wobble Stools (38/45)** had also performed substantially well from cost to manufacturing complexity. However, their scoring had dropped due to poor adaptability, and poor transition effectiveness as it mainly used for self-regulation support through low sensory input. Additionally, **Circle-Time seating (30/45)** performed highly in ease of integration, however had scored lower in adaptability as it is primarily used for one function; seated group activities.

Flexible-Furniture (29/45) and **Round Tables and Chairs (27/45)** were outstanding in visual suitability due to simplified and bio-mimicry colour schemes, but both appeared to have little impact on transitions and self-regulation as they primarily focused on accessibility of resources and on one particular transition point; organisation.

To contrast, **Hideaway Hood (28/45)** and **Roomscape panels (26.5/45)** performed exceptionally well in either self-regulation or transition support, yet performed poorly in cost due to high manufacturing complexity – making the product inaccessible to various educational budgets. Lastly, **Autex Acoustics (23/45),** although an exceptional product for assisting children in self-regulation through noise absorption, had scored the lowest across ease of integration, manufacturing, child accessibility, and adaptability due to the product's large scaling and its application at an interior architectural stand-point.

Overall, the table presents a range of products that support different aspects of transitions within a Prep classroom, resulting in **varied performances across the scoring criteria.** These findings highlight that the market does not currently offer a product that succeeds across all areas; demonstrating a highly variable market space.

To visually compare these differences, a spider chart was developed. Referring to Figure 5, the chart demonstrates that none of the products achieved consistent high scores across all criterias, further reinforcing this gap. Additional to this gap, the chart also demonstrates that one criterion consistently under performs across all products: **child accessibility.** Hence, an opportunity for an intuitive interaction can be created within an intervention by applying sensorimotor experiences developed through interactions with the physical world. For children, these interactions should draw upon familiar visual and physical experiences to further enhance the intuitiveness (Desai et.al., 2019).

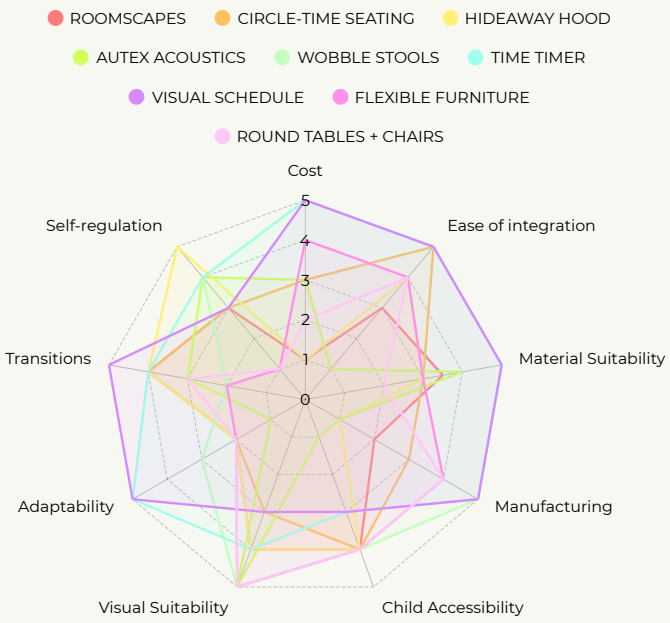


Figure 5. Radar Graph comparing performance levels of benchmarking

MARKET OPPORTUNITY

Through benchmarking, the results reinforced the need for an affordable, child-suitable, and highly accessible design that intuitively supports transitions throughout the Prep classroom to ultimately support children's self-regulation.

While the reviewed products are designed for different transition needs within the Prep classroom space, the benchmarking demonstrates that some products excel in one category, and perform poorly in another, with the most prominent gap centred on accessibility and intuitiveness (see Figure 6).



Figure 6. Market Gap Identified

Given that Prep children's key cognitive processes - including response inhibition, attention, and working memory - are still being developed, there is a clear need for transition supports that are simple, intuitive, and easily accessible within the classroom environment, subsequently supporting children's self-regulation during transitions (Savina, 2021).



02 Section

2.1 RESEARCH
2.2 ANALYSIS & FINDINGS
2.2.1 SURVEY
2.2.2 INTERVIEW

2.1 RESEARCH

OVERVIEW

To further understand what supports or hinders children's abilities to self-regulate during transitions in Prep classrooms, it is essential to gather insights from secondary users and professionals within this domain, allowing validation of the common triggers and supportive factors identified in secondary literature to create a triangulation of data (see Figure 7) (Thurmond, 2001).

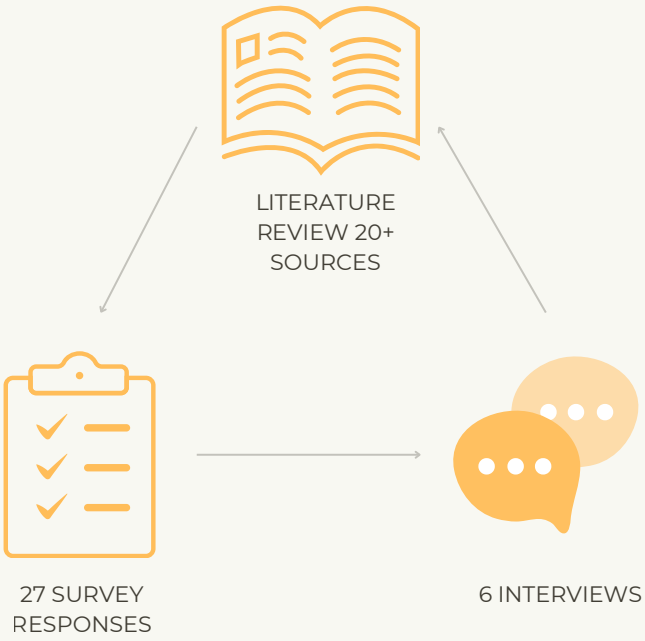


Figure 7. Triangulation Research Method

Consequently, primary data is vital for this study, as it provides accurate and context-specific information directly relevant to children's self-regulation during transitions (Bergstrom & Hoglund, 2024).

METHODOLOGY

In relation to the methodology, qualitative data collection involves nonnumerical information from a greater variety of sources to understand people's experiences, meanings, behaviours, and perception (Schreiber, 2008).

To contrast, quantitative research is the process of collecting measurable numerical data that is analysed to examine relationships between variables from a statistical standpoint (Creswell & Creswell, 2018). For this study, both qualitative and quantitative methods are used through two different methods of data collection.

The first method was a qualitative and quantitative approach, which involved three surveys that integrated Likert selection options, multiple choice, and open-ended responses. The surveys were designed for three different user groups;

- Prep Educators
- Paediatric Occupational Therapist
- Education Environmental Designers

This enabled a collation of data from a large number of participants, subsequently allowing for broader patterns, attitudes and behaviours to be analysed within the data scope (Goodfellow, 2023).

The second method was semi-structured interviews across six users that were secondary or expert users within the field, which allowed for flexible and open-ended discussion for participants to express their thoughts, feelings, and beliefs relative to the topic area (DeJonckheere & Vaughn, 2019).

01 SURVEY DESIGN

This method was chosen and was distributed across three different users mentioned in Table 2 to provide a multidisciplinary understanding of transition experiences for Prep children in relation to self-regulation. Surveys were a crucial research method in order to collate broader evidence base data, whilst ensuring that the proposed intervention responds to not only real user needs, but also educational, developmental, and environmental considerations. Hence, surveys were the initial research method conducted in order to provide breadth of data, allowing for information to be gathered from a larger sample efficiently, therefore identifying broader characteristics and patterns within the sample space (Ponto, 2015).

SURVEY METHODOLOGY

PURPOSE	To collate data from a range of expertise in relation to their knowledge and experiences of transitions and self-regulation within Prep classroom environments. **Survey 1:** Related to Prep Educators experiences of transitions within Prep classrooms, the tools and strategies they currently use to support transitions, and factors that contribute to dysregulation during transitions. **Survey 2:** Related to Occupational Therapists experiences in understanding children's self-regulation capacities during transitions, and effective tools to support them. **Survey 3:** Related to Environmental Designer's expertise in understanding how the classroom environment influences children's ability to self-regulate during transitions.
PARTICIPANTS	**Survey 1:** A total of 18 Prep Educators; 6 Prep Teachers, 6 Prep Teacher-Aides, 1 Support/inclusive teacher, 2 Pre-service Prep Teachers, 2 Early Childhood teachers, and 1 Prep OSHC educator. **Survey 2:** A total of 4 Occupational Therapists, including one practicing Paediatric Occupational Therapist, and three undergraduate Paediatric Occupational Therapists with completed placement. **Survey 3:** A total of 5 environmental designers in primary school settings, including 2 Practicing Interior Designers, 1 Educational environment designer, and 2 Educational learning environment researchers.
RECRUITMENT	Participants were recruited through a combination of emails located either publicly, through school association from the outside school hours care, LinkedIn connections and media flyer posts on Facebook groups and Reddit.
DATA TYPE	**Survey 1:** 17 questions; Likert responses (1-5 scaling), multiple choice selections, and open response follows up. **Survey 2:** 14 questions; Likert responses and multiple choice selections. **Survey 3:** 10 questions; Likert responses (1-5) scaling, multiple choice selections, and open response follow ups. *Survey data closed on 24th of September.*
LIMITATIONS	It is important to note that some participant backgrounds had expertise as an undergraduate during placement (Pre-service teachers and undergraduate paedaitric occupational therapists), meaning their limited practical experience may have constrained the depths of insights gathered. Additionally, Survey 2 and 3 were also limited by a smaller participant pool, with lower response rates therefore reducing breadth of data collection.

02 SEMI-STRUCTURED INTERVIEWS

This method was chosen to provide depth of data, where participants can elaborate on their experiences, observations, and reasonings from their expertise in relation to transitions and supporting self-regulation in Prep children. Moreso, this method allows for follow-up questions when something unexpected is revealed during the interviews, helping to further understand why children may struggle with particular classroom transitions. Hence, this method captures professional experiences outlined in Table 3. By conducting these interviews, the comparison across these perspectives identified common themes and differences between classroom observations and specialist knowledge.

INTERVIEW METHODOLOGY

PURPOSE	To gain expert insights into how transitions are experienced within Prep classroom environments, and to identify factors that support or hinder children's self-regulation during these periods.
PARTICIPANTS	The following interviews included 6 participants: 2x Prep-Teacher Aides (followed up from survey) 2x Prep Teachers (followed up from survey) 1x Paediatric Occupational Therapist 1x Early Childhood behavioural researcher
RECRUITMENT	Participants were recruited through emails located publicly, through school association from outside school hours care, or through LinkedIn connections.
DATA TYPE	The questionnaire followed a semi-structured approach, with questions focusing on participants' observations in children's responses to transitions within the Prep environment. This included exploring why transitions can be demanding for Prep aged children, which transitions are most challenging, the support tools currently in practice, and potential opportunities for future interventions **Educators:** 10 questions as a follow up from survey responses **Paediatric OT and Early Childhood Behavioural Reserchер:** 8 questions
LIMITATIONS	It is important to note that participants were experts rather than the end user (children), meaning insights were indirect due to consent restrictions.

SUMMARY

In summary, qualitative and quantitative data was collected through surveys and semi-structured interviews with secondary users and professional experts experienced in working with children to further understand transitions and self-regulation needs. These methods explored the factors affecting children's ability to self-regulate during transitions in Prep classrooms, whilst identifying supportive strategies and tools used or recommended to assist children during these periods.

2.2 ANALYSIS & FINDINGS

2.2.1 SURVEY

A statistical analysis and inductive thematic code analysis were conducted to interpret the qualitative and quantitative data collected from surveys. Quantitative survey responses were analysed using raw frequencies and percentages to identify patterns across varying participant groups, thus accounting for unequal group sizes. Additionally, qualitative responses were analysed by creating codes in a word document, formatting findings in excel, and translating the raw data into graphs using RawGraphs.

SURVEY ANALYSIS 1: ENVIRONMENTAL FACTORS AFFECTING CHILDREN'S SELF-REGULATION DURING TRANSITIONS IN PREP ENVIRONMENTS

Overall, the surveys yielded 27 responses from Prep educators (n=18), paediatric occupational therapists (n=4), and environmental designers (n=5). A bivariate analysis was conducted using an Alluvial diagram to examine the relationship between participant groups and the environmental factors influencing children's self-regulation during transitions.

Referring to the diagram in Figure 8, noise levels were the most frequently identified environmental factor overall, commonly identified by both educators and paediatric occupational therapists. Additionally, clear movement pathways were frequently identified by environmental designers, whilst **visual clutter and displays** was most frequently **identified across all three participant groups.**

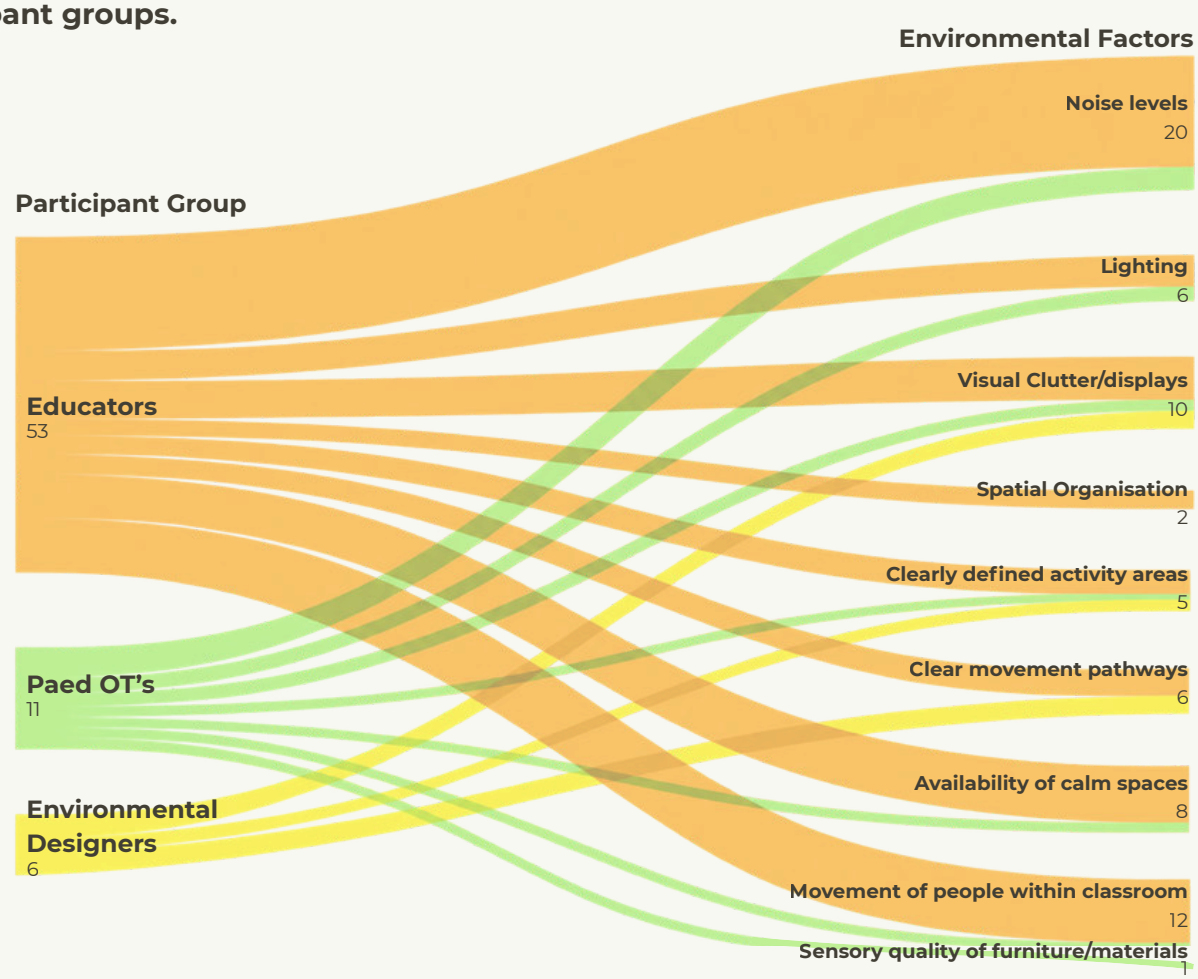


Figure 8. Alluvial Chart of participant's opinon on environmental factors influencing children's regulation during transitions. Please note: Educators and Paed OT's could select up to three responses, whilst educator's responses were open discussion. Hence, the frequency counts represent number of selections rather than individual participants.

SURVEY ANALYSIS 2: IDENTIFYING WHICH ASPECTS OF TRANSITIONS PLACES ADDITIONAL DEMANDS ON CHILDREN'S SELF-REGULATION

A bivariate analysis was conducted to compare educators and paediatric occupational therapists responses in relation to which aspects of classroom transitions contribute to dysregulation amongst Prep-aged children.

Referring to Figure 9, **unexpected changes** during transitions was highlighted as the leading contributing factor to dysregulation according to educators (72.22%), whilst **sensory stimulation** was most selected by paediatric occupational therapists (75%).

Across both professional groups, **children not knowing what was happening next** was also prominent, selected by 50% of both groups.

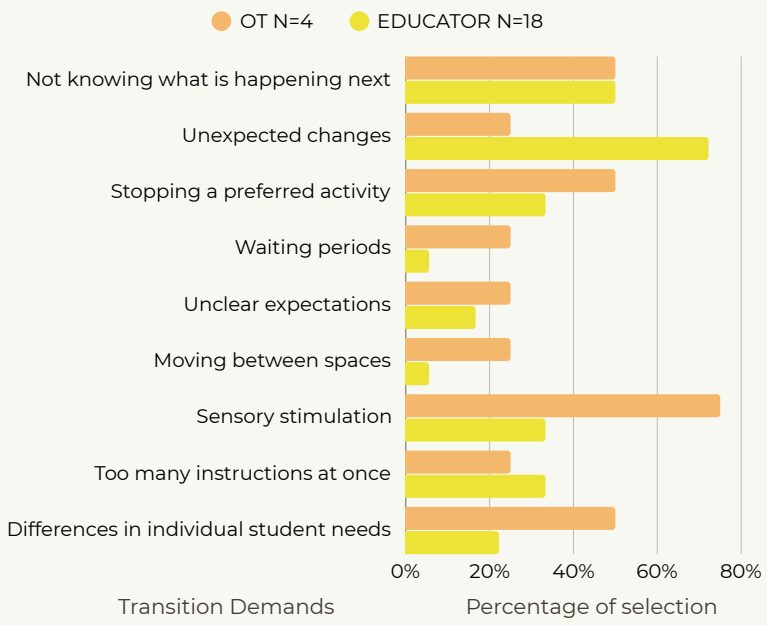


Figure 9. Bivariate analysis between Educators and OT's opinon on which aspect of transitions places additional demands on children's self-regulation.

SURVEY ANALYSIS 3: HIGHLIGHTING STRENGTHS AND LIMITATIONS OF CURRENT EXISTING TOOLS

Educator's qualitative short responses relating to existing tools were coded and visualised using a grouped horizontal bar chart, highlighting the frequencies of strengths and limitations mentioned (See Figure 10).

Tools preparing children for upcoming transitions, including adult support, visual schedules, timers, and sound cues received more strength-related mentions than limitations. However, qualitative responses identified specific limitations within these supports, including timers "inducing anxiety" or "increasing arousal", and visual schedules being "overwhelming" or "less adaptable" when unexpected changes occur. In comparison, some regulation supports, including calm corners and movement strategies, received a mixed distribution of strengths and limitations.

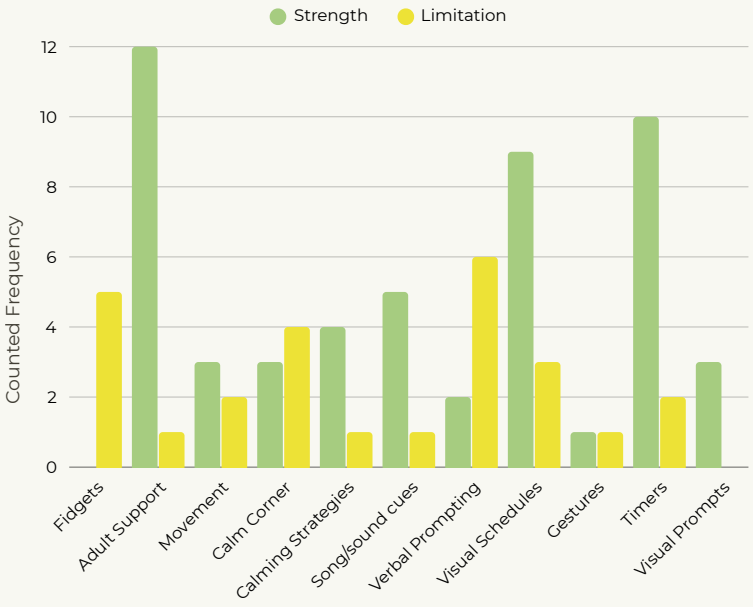


Figure 10. Coded responses of strengths and limitations mentioned in relation to existing tools educators use for transition support

SURVEY ANALYSIS 4: OPPORTUNITIES IDENTIFIED FOR IMPROVING CLASSROOM TRANSITIONS

The analytical approach used in Survey Analysis 2 was applied to identify and compare the areas of classroom transitions that eduactors and paediatric occupational therapists believed required most improvement.

Referring to Figure 11, paediatric occupational therapists collectively agreed that **preparing children for an upcoming transition change** was most required. To contrast, educators selected **providing clearer transition cues** as the most required (61.11%). **Communicating unexpected changes** also received similar percentages, selected by 55.56% of educators and 50% of occupational therapists.

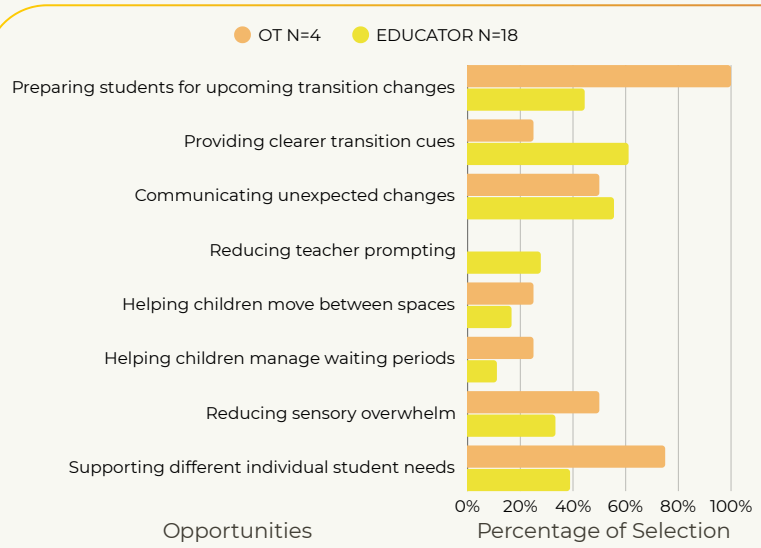


Figure 11. Bivariate analysis between educators and OT's responses to opportunities for improvement

2.2.2 INTERVIEW

Interview data was analysed using inductive thematic coding to identify recurring patterns, challenges, and supports across participants relative to transitions and self-regulation. Thematic coding was conducted by using apple voice memos to record interview transcripts, which were then coded in a word document using comments. This information was then formatted into themes, codes, and sub-codes using an excel sheet, which was then translated into graphs using RawGraphs.

Through coding, the behavioural researcher described self-regulation as the, "ability to manage our own attention, emotion and behaviour...", with observed signs of dysregulation including inability to stay focused (3), impulsive reactions (6), refusal to listen and follow instructions (10), internal shutdown (3), fixation (1), and reliance on adult support (2).

Overall, three prominent categories were identified: factors contributing to dysregulation, factors supporting children during transitions, and educator's role in transitions (see Figure 12).



Contributing to Dysregulation



Supporting Children during Transitions



Educator's Role

Figure 12. Categories identified through coded interviews.

FACTORS CONTRIBUTING TO DYSREGULATION

Four prominent sub-codes contributing to dysregulation were identified (see Figure 13). **Poor time understanding (22)** was most frequently identified, with 66% of participants *(educators and behavioural researcher)* describing children's difficulty in understanding verbal representations of time such as "five minutes". **Back-to-back transitions (20)** and **excessive verbal instructions (16)** were also frequently discussed, with the paediatric occupational therapist emphasising "proactive supports that reduce the need for verbal instruction will be better received", as children have a limited capacity to process information during transitions. Lastly, **not knowing what was next and uncertainty (14)** was identified by all participants, with the behavioural researcher emphasising that children struggle around uncertainty due to an "unexpected or abrupt routine change that often requires rapid regulation shifting."

Unfamiliarity in learning new routines and cues (21) was identified by 83% of participants *(educators and occupational therapist)* as the dominant challenge for children navigating transitions in Term 1. Educators described that children are, "learning classroom routines, transition cues, expectations, and what was required of them..." while the behavioural researcher explained that children's "limited battery and capacity" can make transition expectations and information difficult to remember.

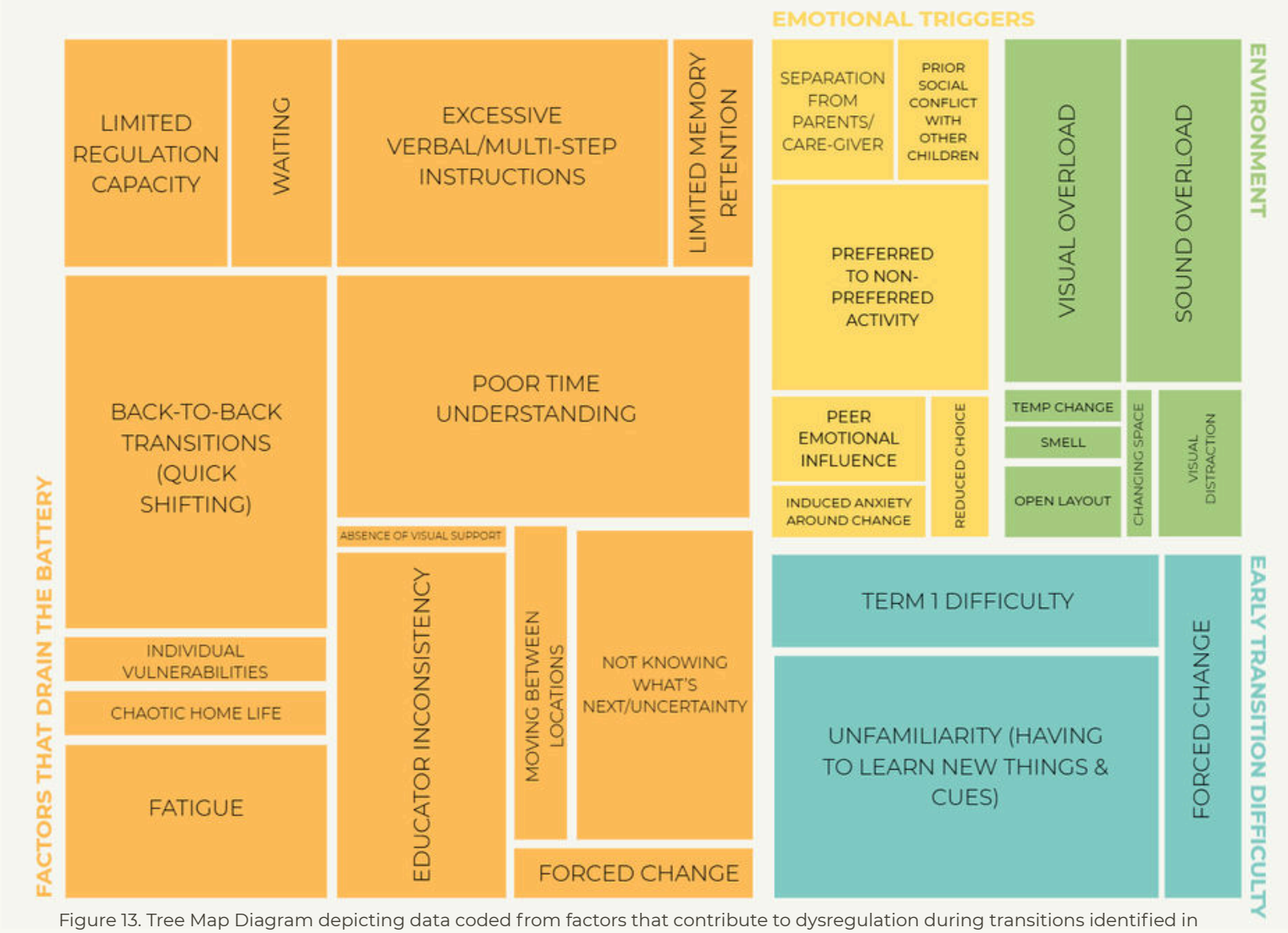


Figure 13. Tree Map Diagram depicting data coded from factors that contribute to dysregulation during transitions identified in interviews.

FACTORS SUPPORTING CHILDREN DURING TRANSITIONS

Predictability and preparation were identified as the most prominent area of support across interviews, with **repetition and practice (30)** being the most frequently coded support and mentioned amongst 100% of participants, following with **advanced warnings (15).** The paediatric occupational therapist described that predictability tools allow children to, "know what's coming and prepare themselves for it and to prepare their body", emphasising that "consistency within the staffing team" and repetition helps establish clear expectations (see Figure 14).

Transition pacing (27) was also frequently identified across interviews, with 83% of participants *(educators, behavioural researcher and occupational therapist)* describing the importance of allowing children additional time to gradually move between activities. Evidently, a Prep teacher-aide described that pacing is integral for processing time as, "..if you try and rush them, it makes things harder, they get overwhelmed...".

Lastly, visual supports were frequently identified amongst all participants; **Visual Schedule (14), timer (9), markers (19)**. Participants described that these tools were used to communicate visual information about daily routines, upcoming activities, defined areas, and progression of time. Educators emphasised children being "visual learners", with visual supports being perceived as a universal design learning support tool as, "if it works well for a child with autism, it most likely worked well for all children". Interestingly, the paediatric occupational therapist also emphasised educators should act as a "co-regulator" with visual supports to allow for gradual change.



Figure 14. Sunburst Diagram depicting data coded from factors that support children's regulation identified in interviews.

EDUCATOR'S ROLE

All participants identified that adult support is integral in supporting children during transitions, including **emotional empathy (18) and individual support (14).** The paediatric occupational therapist described co-regulation as important in "proactively managing transitions to avoid reactive behaviours", although one-to-one support was described as challenging due to educator-to-child ratios. **Repeated adult prompting (20)** was also prominent amongst all educators, with participants describing that children often required constant reminders and guidance around expectations, instructions, and upcoming transitions (see Figure 15).

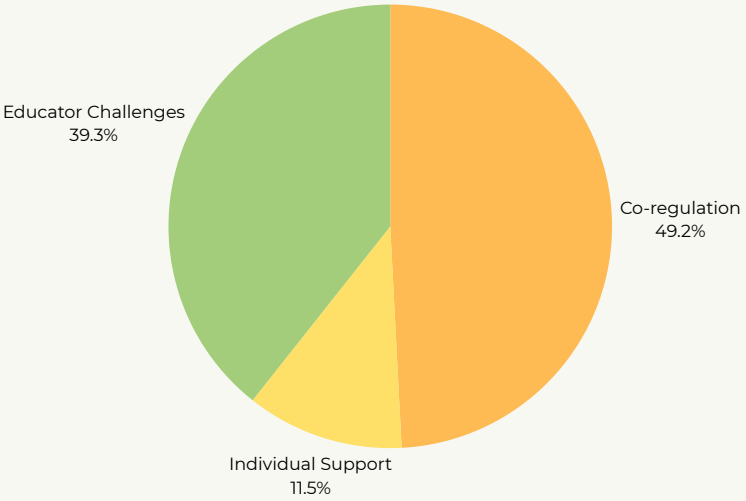


Figure 15. Pie Chart depicting data coded from eduactor's role identified in interviews.

SUMMARY

In summary, surveys and interviews across secondary users and experts revealed why transitions can be demanding on children's self-regulation, whilst describing which supports are effective or ineffective. These highlights collectively inform what is needed in order to develop an effective intervention to support children's self-regulation during classroom transitions.



03 Section



3.1 DISCUSSION
3.2 DESIGN IMPLICATIONS
3.3 CONCLUSION

NOTE. IMAGE GENERATED USING CHATGPT (OPENAI, 2026)

3.1 DISCUSSION

The initial research question gap identified was, *"How the Prep classroom environment influences children's self-regulation during transitions"*. Literature identified that transition demands, predictability and characteristics of the physical classroom can influence children's self-regulation (Hemmeter et.al., 2008; Peters, 2025; Bagais & Pati, 2023). However, primary research placed greater emphasis on how transitions are understood, communicated, and prepared for, thus narrowing the initial problem.

PREDICTABILITY AND ROUTINE

A prominent alignment between literature and primary research highlighted the importance of predictability and routine. Peters (2025) argues routines help children understand behavioural expectations, which was further reinforced by participants in Section 2.2.2 that noted repetition, advanced warnings, and familiarity with transition cues allows children to "prepare themselves" for change as routines become familiar over the schooling year. This relationship was further reflected within survey findings in Section 2.2.1, Figure 9, where children not knowing what was happening next (72.22%) and unexpected changes (50%) were identified as prominent challenges in transitions. Together, these findings reveal a crucial tension; predictable and consistent routines are integral in supporting children in transitions as it builds familiarity, however, unexpected changes and unfamiliar cues when learning transitions in Term 1 can reinforce uncertainty, placing additional demands on children's regulation capacity during the early learning stages.

PREPARATION

Preparation supports were frequently identified in Section 2.2.1, Figure 10, as more effective in supporting transitions in comparison to regulation supports. Interviews further reinforced this finding as the paediatric occupational therapist ackowledges that "proactive management" in transitions can assist in avoiding reactive behaviours, inferring that preparation supports are integral in supporting children during transitions. These findings highlight that supportive tools should focus on better preparing children before a transition occurs or for unexpected changes, rather than solely on strategies implemented once difficulties have emerged which is further reinforced in opportunities found in Section 2.2.1, Figure 11.

TRANSITION INFORMATION COMMUNICATION

Primary research further revealed that the way transition information is communicated can influence children's ability to navigate upcoming changes. During Term 1, Section 2.2.2 highlights that children required substantial educator guidance, often struggling with excessive verbal instructions and with understanding the concept of time such as "five minutes". Rushed transitions further required children to rapidly shift between activities and expectations, such as outdoor play to indoor learning, thus increasing cognitive demands (Hemmeter et al., 2008). Participants emphasised that gradually paced transitions and using visual supports for communicating upcoming transitions were seen as a, "universal design learning tool". However, Section 2.2.1, Figure 10 identified limitations, including reliance on repeated adult-prompting to facilitate a "gradual change", inability to adapt to unexpected changes, and becoming a visual distraction. Together, these findings suggest that current transition information solutions may be overwhelming and insufficient if children cannot intuitively interpret when a change will occur or what is expected next, thus reinforcing opportunities for more accessible and adaptable transition supports.

INDIVIDUAL NEEDS

Interestingly, environmental factors were less prominent in interviews than initially anticipated, despite literature emphasing their

influence on self-regulation (Bagais & Pati, 2023; Kim et.al., 2024). However, Section 2.2.1, Figure 8 identified noise, sensory stimulation and visual clutters as demands, suggesting these factors should inform the intervention's aesthetic, rather than its primary function. More prominently, interviews in Section 2.2.2 revealed that varying individual supports needs presented a greater challenge than environmental factors, with all participant interviewees identifying co-regulation as valuable, yet were limited by 1:1 support feasibility across the classroom. This suggests that transition supports should accommodate for varying needs to ensure it is "beneficial for the broader classroom" as highlighted by the occupational therapist, whilst reducing repeated prompting from educators. This aligns with benchmark findings, which identified a critical gap in existing transition tools needing to be intuitive and accessible for children to accommodate for varying needs.

SUMMARY

Therefore, the project scope shifted from broadly investigating how the Prep classroom environment influences self-regulation, towards exploring how Prep children can be better prepared for upcoming transitions and changes to support their self-regulation (see Figure 16). Conclusively, the identified opportunity points to developing an intuitive, accessible and adaptable transition support that communicates and prepares children for change in a predictable manner, whilst reducing reliance on repeated educator prompting.

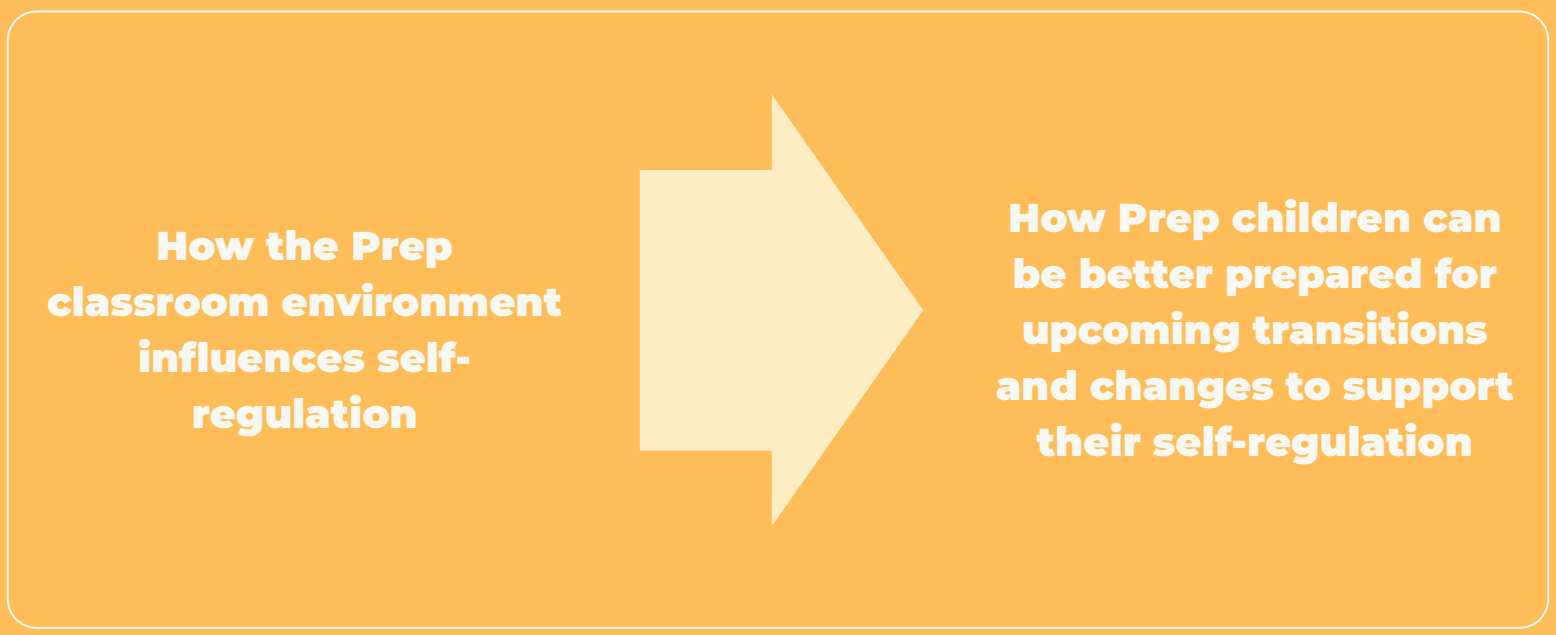


Figure 16. Project Aim Change

3.2 IMPLICATIONS

After identifying prominent themes and discussing the findings of these studies, there are a few opportunities present in preparing children for upcoming transitions and changes to support their self-regulation, with a particular focus on an accessible and intuitive approach. Hence, these design opportunities place greater emphasis on proactive transition preparation, rather than solely relying on regulation strategies once difficulties have emerged.

01 INTUITIVE TRANSITION COMMUNICATION

Current supportive tools lack intuitive, independent, child-readable communication to combat the difficulties surrounding excessive verbal instructions, repeated adult prompting, and children's unfamiliarity with transition expectations in Term 1. This suggests a need for a simple pictogram-based communication system with low-information visual cues that children with varying needs can independently recognise to understand what is happening, what is occurring, and what is expected next, whilst reducing repeated verbal prompting from educators.

02 GRADUAL TRANSITION PREPARATION

Back-to-back transitions were identified as challenging due to children needing to quickly shift behavioural expectations, while transition pacing and advanced warnings were emphasised as supportive tools. Hence, this presents an opportunity to design for progressive transition indicators, such as visual progress bars or incremental staged cues that prepare children gradually for change, rather than signalling transitions abrupty, thus supporting arousal regulation without sensory overload.

03 ADAPTABLE SYSTEMS

Consistent routines, repetition and familiar transition cues were highlighted as supportive tools in children learning transition expectations, while unexpected changes and uncertainty remained as prominent challenges. This presents an opportunity for a transition support that is familiar and recognisable, yet modular by using swappable or reconfigurable componets to allow educators to quicky communicate unexpected changes, therefore maintaing predictability through flexible adaptation.

04 INCLUSIVITY AND LOW-DEMAND

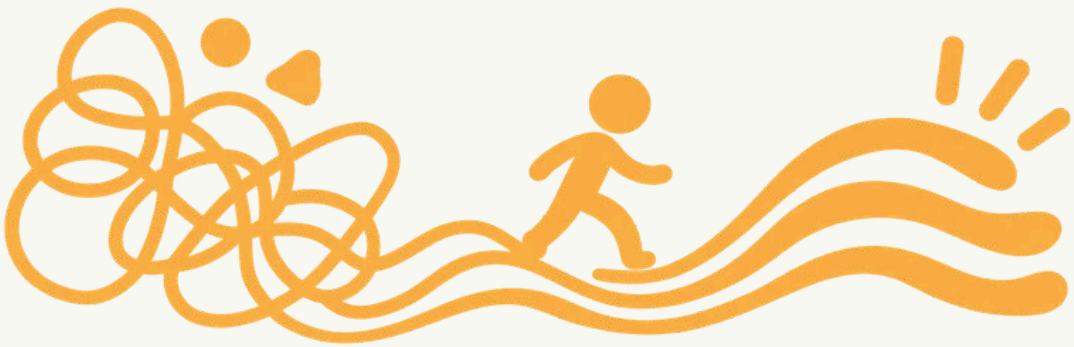
Due to analysis identifying the importance of supporting children with varying needs, transition supports should be integrated purposefully without contributing to unnecessary sensory or informational demands. Hence, the design should consider calm sensory cues such as soft visual contrasts, non-vibrant colours, and gentle auditory information, whilst integrating minimalistic information layouts that remain noticeable for communicating essential transition information, without becoming a distraction or sensory overload to children.

05 SIMPLE CLASSROOM INTEGRATION

As educators play an integral role in initiating and supporting classroom transitions, an opportunity exists for transition supports to integrate within existing classroom practices. Interventions should consider size, placement, and quick operation, enabling educators to activate or adjust the device under one minute, ensuring the support is practical to everyday routines.

3.3 CONCLUSION

The research conducted throughout this report identified gaps in how Prep-aged children are currently supported for classroom transitions. Findings from literature, interviews, surveys and benchmarking demonstrate that while existing strategies provide valuable support, challenges still remain surrounding uncertainty, unfamiliarity, transition pacing, accessibility, and reliance on repeated adult prompting. Hence, the research presents an opportunity to shift from solely supporting children once dysregulation occurs, towards preparing children for change through intuitive, predictable and adaptable transition supports. For industrial designers, these findings highlight the importance of considering how transition information is communicated within the classroom, presenting an opportunity to support children's self-regulation by enabling them to navigate everyday classroom changes with greater understanding, familiarity, and independence.



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APPENDIX

APPENDIX A

PRODUCT IMAGES IN BENCHMAKRING

ROOMSCAPES PANELS



CIRCLE-TIME SEATING



HIDEAWAY HOOD



AUTEX ACOUSTICS



WOBBLE STOOLS



TIME TIMER



VISUAL SCHEDULE



FLEXIBLE FURNITURE



ROUNDED TABLES

