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# Pedagogy, place, and food education in Australian schools: lessons from Tropical North Queensland

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## ABSTRACT

Children today have limited food origin awareness. The further we move away from food production practices, the less exposure children have to them, and the more food vulnerable we become. This is especially true for children growing up in urban areas where there is limited space for food gardens. Schools have developed targeted pedagogical approaches to raise food origin awareness, and this paper examines one such attempt in Cairns, Australia. We compare how students aged 5-6 responded to an activity where they drew their immediate response to the word 'food'. Comparisons were then made between those learning under explicit instruction and those using a more experiential, place-based pedagogical approach. The findings suggest students in the experiential class who regularly use the garden as a learning space drew significantly higher levels of fresh, place-appropriate fruits and vegetables ( $U = 61.5$ ,  $P = 0.002$ ). We discuss the ramifications of exposure to a globalised food system and how experiences at school can nurture children's understanding of food. We interpret the outcomes of the different pedagogical approaches and unravel the importance of 'place' in a child's food experience. The evidence presented suggests that children's food knowledge could improve if food education is bolstered with experiential and place-responsive pedagogies.

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School gardens; children's drawings; food; gardening; place-responsive pedagogy; placelessness

## Introduction

Food is an essential, sensorially experienced component of life that ties us firmly to the present and the past, situating us in place (Bhattacharya 2021). However, our relationship with food has become fragmented. Our food chain is globalised, and although food used to directly connect us to place, many of the foods we consume today contribute to a placeless society (Delind 2006). The process of globalisation, while creating connected economies, has ruptured our relationships with the environment, homogenised our way of living (Banks and Overton 2010; Gibson-Graham, Hill, and Law 2016), and seriously altered our relationship to food. While many urbanites were once well versed in the seasons, local environment, and where their food came from, there is a growing consensus that children (and many adults) are now so removed from natural experiences that they lack the knowledge that comes with them (Artmann, Sartison, and Ives 2021; Kahn 2002; Uhlmann, Lin, and Ross 2018). As such, we have become overly dependent on the monetised economy that food is embedded in (Ruel, Garrett, and Yosef 2017). Being entirely dependent on the economy

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to procure food, as we are in urban areas, means many are vulnerable to becoming food insecure due to unexpected events such as sudden inflation, global pandemics, or natural disasters (Reis and Ferreira 2015; Ruel, Garrett, and Yosef 2017). One way to address the growing problem of food vulnerability is to reconnect people and place ecologies, thus reducing their dependence on the monetised food-economy.

Food vulnerability is a wicked problem that requires multidirectional problem solving. Wicked problems are not easily solved due to their large array of complex causalities (Svane, Evans, and Carter 2019). Consequently, food vulnerability is influenced by a wide range of interconnected factors, including socio-economic status, ethnicity, access to resources, climate change, agricultural practices, political (in)stability, and more (Hamann et al. 2011). Most metropolitan urban areas in post-industrial, Western capitalist societies suffer food vulnerability – with much good quality agricultural land making way for suburban development (Food and Agriculture Organisation 2020). How can cities respond to disasters without the means (space) and knowledge to procure their own food? One of the many ways to overcome this wicked problem is by using education as a catalyst for change. By understanding where food comes from and how to grow it, the food vulnerability faced in urban areas can be ameliorated, as knowledge to procure and/or grow is a pre-requisite for food security. We propose, alongside other scholars (Carlsson et al. 2016; Datta 2016), that urban gardening can equip children to deal with food vulnerability, by connecting them to the origin of food.

How do we effectively implement urban gardening to assist children in dealing with food vulnerability? While scholars have investigated the role of school gardens in enhancing food availability (Reis and Ferreira 2015), the important role that pedagogy plays in delivering this knowledge is less understood. Pedagogy is the art and science of teaching, and encompasses the methods, strategies, and principles that educators use to facilitate student learning (O'Neill, Geoghegan, and Petersen 2013). Currently, Australian schools follow the Australian curriculum to develop learning programmes for students from Prep through to Year 12. In the P-6 curriculum there are various subject codes and content descriptions that focus on food. But the national curriculum body, the Australian Curriculum and Assessment Reporting Authority, do not provide instructions on the pedagogical approaches that ought to be used. Such approaches are up to state body discretion. So, while the Australian curriculum is a nationally designed, place-adaptable policy document that is meant to respond to current societal needs (Walshe, Evans, and Law 2022), incorporating issues such as food vulnerability in ways that are locally relevant and easy for children to understand can prove difficult. The structure of schools, standardised testing, teacher shortages, and data driven approaches to learning constrain the pedagogical approaches teachers use to adapt and deliver the curriculum (Billmeyer 2019; Liddicoat, Scarino, and Kohler 2018).

There are many different pedagogical approaches that teachers, and schools, can choose to draw from. In Australian schools, a prominent approach is explicit instruction, which focuses on the transference of knowledge from teacher to student, in a staged and structured approach, limiting the mental effort students need to learn new content by using a scaffolded 'I do, we do, you do' approach (Australian Institute for Teaching and School Leadership 2023). Whilst explicit instruction is a research-based pedagogical approach (O'Neill, Geoghegan, and Petersen 2013), some scholars argue for more place-responsive pedagogies which respond to experiences in the local context in a way that is less effort for the teacher to adapt. Place-responsive pedagogies are developed to produce educational experiences for children to equip them with the knowledge to discuss and understand climate adaptability, sustainability, and global issues (Renshaw and Tooth 2017; Somerville 2010), by collaborating with an 'assemblage of people, place, and purposeful activities' (Mannion, Fenwick, and Lynch 2013, 793). As such, they are predominantly drawn on in outdoor and environmental education where the environment already plays a pivotal role. Place-responsive pedagogies are an extension of inquiry-based and experiential pedagogies, which rely on a process of asking, doing, and then knowing (Amels et al. 2019; Marshall 2017). Experiential pedagogies were born from educational philosopher Dewey, who argued learning should be pragmatic

and based on doing first to then build knowledge (Jayanandhan 2009). These approaches are generally seen in schools where alternative styles of learning are employed, such as Montessori (Marshall 2017), or as a means to engage disengaged children and those with diverse learning needs (Moore McBride, Chung, and Robertson 2016).

This paper is a case study investigating the outcomes of explicit instruction and experiential/place-responsive pedagogical approaches to teach food education in primary school. The school setting examined here is in Gimuy (Cairns), located in the tropical zone of Australia. The aim is to understand the effectiveness of each pedagogical approach for enhancing children's food awareness and learning to overcome the deficiencies of the globalised food system. However, gathering relevant data to explore children's knowledge is challenging. We join scholars using children's drawings as important evidence in classrooms (Anning and Ring 2004) to contribute to debates about the importance of place-responsive pedagogies and gardening in enhancing children's food knowledge. We appraise whether children who learn under experiential/place-responsive pedagogies, with substantial garden contact time, have an increased awareness of food origins in comparison to those who learn under explicit instruction with little garden contact time. By doing so, this paper contributes valuable insights to the conversation surrounding food education in schools and is one of the first to compare and critique the outcome of two pedagogical approaches in the same school regarding food education and food awareness.

To situate the research, the next section presents a framework that underscores the interplay of place, food, and school gardens in enriching children's food knowledge. We acknowledge that research with children can present challenges and potential imbalances in researcher-child power dynamics (Bland 2018), and our methods section elaborates the merits of employing free drawing as an ethical method for collecting data from young children. Our discussion sections go on to interpret the drawings obtained in our study. We explore how different pedagogical approaches shape children's engagement with tasks, and evaluate how each approach enhances food awareness. We present evidence suggesting that experiential/place responsive pedagogies result in enhanced place awareness. In the final section, we examine the influence of media exposure and the globalised food system on children's perceptions, enthusiasm, and conceptualisation of food. We conclude by presenting the broader implications of our findings for food education in Australia and consider the potential applicability of our insights in diverse national and global contexts.

### ***Food, place and enhancing children's food knowledge***

We begin by exploring how food, place, and gardening are important concepts to frame the research. Food situates us in our local context, connects us to culture, and eating or cooking is a sensorially encompassing experience that embeds itself in our visceral memories (Bhattacharya 2021; Hart and Monterescu n.d.; Law 2001; 2005; Wesser 2021). When lonely, simply by eating foods reminiscent of lost times, we can find a sense of comfort or ease (Bhattacharya 2021; Law 2001). Food also helps us integrate into new environments and cultures while maintaining a connection to our origins (Chen 2021). Food can be our familiar in the unknown.

Food is also a material manifestation of place, with physical and cultural landscapes simultaneously contributing to the way food tastes; Dijon mustard, King Island cheese, Valencia oranges, and Italian tomatoes all connote this relationship. Banks and Overton (2010) stress this significance of place identity in their analysis of wine, exploring how the wine industry has successfully reinvigorated an understanding of place through celebrating the ecologies and bottling processes in each region. The importance of understanding this sense of place, or 'terroir', is translatable to the world of food – especially for place branding scholars who explore this link between food and place explicitly (e.g. Khamis 2007). If the geographic context of food, and the practices and traditions involved in its production and consumption were more widely appreciated, children might have deeper place connections through food experiences.

Participating in local food systems can also help people gain a sense of place through food experiences. People re-connect to place by visiting locally owned grocery stores, engaging in communal gardening practices, and participating in food co-ops (Delind 2006). By actively participating in these alternative social, economic, and ecological spheres, everyday citizens can reinvigorate their sense of place (connection), enhance the visibility of their local food system, and bring about food resilience. But how do these concepts relate to increasing children's awareness of food and place through gardening in schools?

School gardens, part of the community-based food system, can deepen a child's understanding of food. They provide access to fresh fruits and vegetables (addressing one aspect of food vulnerability [Carlsson et al. 2016]), and improve a willingness to try new foods (Eugenio-Gozalbo, Ramos-Truchero, and Suárez-López 2021; Nowak et al. 2012; Somerset et al. 2005). Gardens are also a place of trial and error (Artmann, Sartison, and Ives 2021; Cutter-Mackenzie n.d.; Payne 2020; Uhlmann, Lin, and Ross 2018), and gardening thus instils in children (and teachers) how difficult it can be to grow food. School gardens stand in contrast to unhealthy and processed foods, which children are highly susceptible to (Cooke 2007; Gorn and Goldberg 1982; Hastings et al. 2003). Gardening at school exposes children to where their food comes from, and acts a grounding reminder that food is not just processed and quick – it takes time, love, and dedication.

Gardening in schools teaches children about cultural landscapes and people's role in local ecologies. It can help integrate migrant children into their new 'place' while allowing them to foster connections to their cultural roots (Cushing, Beazley, and Law 2017; Hardy and Grootenboer 2013); it can also help children contribute to changing cultural landscapes by engaging with and repopulating native foods that are important to Indigenous cultures (Walter 2013). Embracing the holistic thinking and being that comes with gardening exposes children to the needs of our more-than-human counterparts (bugs, plants, animals), and how they rely on food in the same way we do (Sarmiento 2017; Turner 2011). Garden design and choice of plants itself is a responsive embodiment of physical place (Law 2019). For these reasons, gardens are ideal spaces for teaching children about place, culture, and our role in local ecologies.

So far we have suggested that considering the geographic context of food, along with the traditions and practices involved in its production, can deepen connections to specific places through food experiences. We have also indicated the significance of school gardens as educational tools that can enhance children's understanding of food, culture, and local ecologies. School gardens are spaces where children can access fresh produce, learn about the effort required to grow food, and gain a deeper awareness of where their food comes from. But how place responsive pedagogies enhance a child's understanding of food is still relatively under-explored. The next section presents the research context and the methodology used to capture the data, before going on to examine these issues at a particular school.

## Methodology

Tropical North State School (TNSS) (pseudonym name) is a government funded primary school in Australia's Far North wet tropics, and the setting for the research. Demographically speaking<sup>1</sup> TNSS is one of the largest schools in Gimuy (Cairns) with just under 1000 students from Preparatory to Year 6 in attendance. One third of the people who live in the school's catchment area have relocated to Gimuy within the last two years (since the 2021 census). Most relocations are from interstate or overseas, with very few coming from Queensland or other tropical areas. This means many residents' everyday sense of place has been shaped by different environmental experiences.

TNSS offers two educational streams using different pedagogical approaches: explicit instruction and the Montessori method (which we subsequently refer to as the experiential stream). Parents and caregivers have the option to select either of the alternative learning streams that best suit their child's educational needs. If a Montessori method class has available space, the school extends the opportunity for parents/caregivers to transition their child into this stream, based on their

identified learning requirements. The explicit instruction stream is focused on the transference of knowledge from teacher to student, and follows a scaffolded 'I do, we do, you do' approach (Australian Institute for Teaching and School Leadership 2023). The Montessori method, on the other hand, uses experiential/ place-responsive pedagogical approaches. The method focuses on children learning in dynamic social and emotional learning environments that use hands-on and sensory activities to engage children in developmental learning (Marshall 2017). The educators draw on activities that use gardens, kitchens, live animals, and various social settings to enhance children's knowledge via hands-on methods. These alternative styles of education are equally academically effective with school leavers achieving identical 'test' scores to other children learning under explicit instruction (Marshall 2017).

The experiential stream using the Montessori method at TNSS spends one full day each week where all curricula is delivered using their garden and outdoor environment as their learning space. In addition, students participate in growing various seasonal or local products such as dragon fruits, watermelons, strawberries, different types of potatoes, and pineapples. TNSS is one of five government funded schools in Australia that have separate streams for the differing pedagogical approaches (Montessori 2022). This positions TNSS as a unique place and opportunity to investigate the benefits of each pedagogical approach.

Three different classes at TNSS<sup>2</sup> participated in the research. The first is a Prep and Year 1 composite class using experiential and place responsive pedagogies ( $n = 17$ ). Two additional classes learning under explicit instruction were included: a Prep class and a Year 1 class (combined  $n = 38$ ). The latter two classes accounted for the composite class in the experiential stream and helped provide representativeness of both pedagogies. Once teachers from the experiential and explicit streams in Prep and Year 1 agreed to participate, parent consent was sought. All children were aged 5–6 years old.

Three drawing sessions were conducted by the lead researcher/author, one for each of the three classes participating in the research (in total  $3 \times 45$  minutes). The setup process included explaining the activity, consent, and addressing any queries. The students were given the opportunity to consent/dissent for themselves by using 'red light, green light' place cards for dissent/consent during drawing sessions. This was an ethical consideration to respect the children's autonomy in making their own decisions (Deguara 2019). Children used crayons and blank paper that were supplied by the researcher to respond to the question, 'What comes to mind when you hear "food"?' A follow up conversation was conducted with each child to confirm and annotate what they drew, as per Loureiro et al. (2019). This minimised interpretation bias and accounted for age and cultural differences between children and the researcher (Bland 2012; 2018). In total, there were 22 pages from the 17 experientially taught students, with a total of 99 individual food items drawn; and 46 pages from the 38 explicitly taught students, with a total of 95 individual food items drawn.

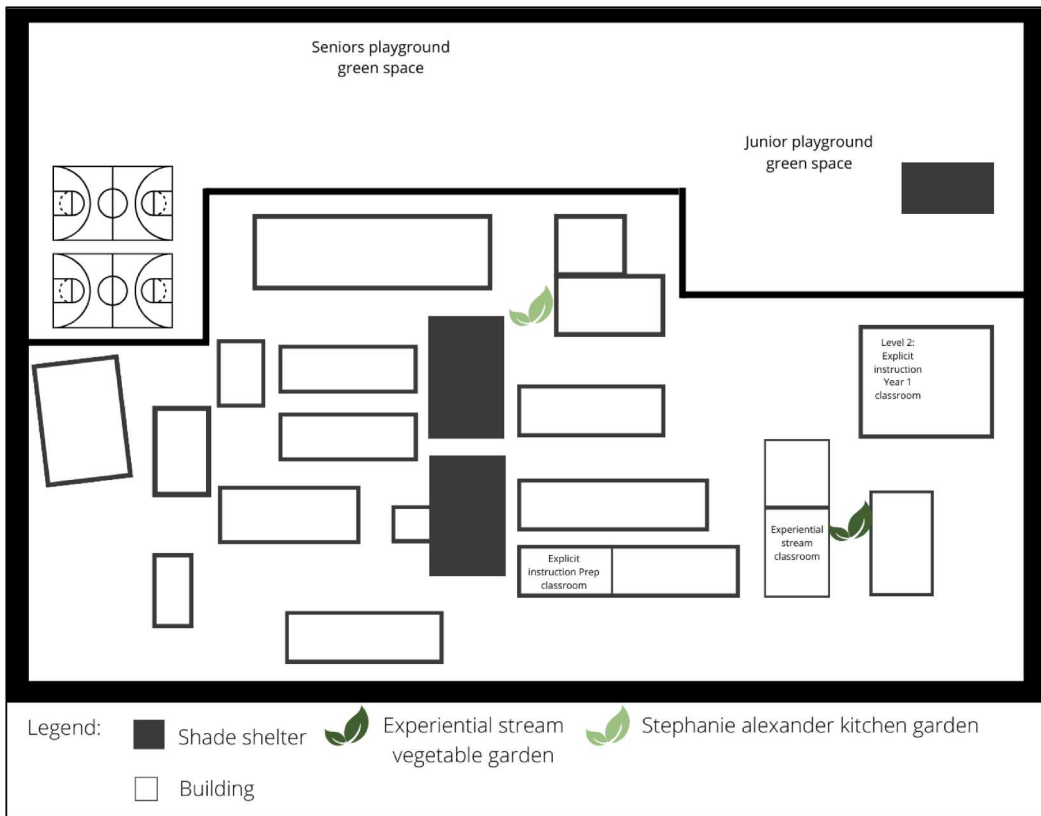
The visual analysis of the drawings acknowledged the different considerations required when analysing children's drawings. Some considerations included using follow up questions to enable accurate interpretation of their drawings, observations of their ability to stay engaged with the task notes on the values of the adults in their life (in this instance, their teachers) and notes on the physical environment during the task (Anning and Ring 2004). Children under eight years of age draw from what they know, and use imagination to bolster what they do not (Anning and Ring 2004). This often results in drawings being wildly colourful, often abstract, and 'simple' (in terms of composition). Many standard image analysis techniques look at placement, colour, composition, and symbolism – which stylistically can discredit a child's work (Anning and Ring 2004). Thus, this analysis is positioned from the viewpoint that children are autonomous with valid thoughts, emotions, and experiences to convey and the images are analysed accordingly.

Multiple different analysis techniques were used to do justice to the children's perspectives (Loureiro et al. 2019). First, drawings were deductively (or denotationally) analysed, following similar techniques and recommendations from Boyatzis (1998). Branded, fresh, and processed foods were sought out and the drawings were denotationally categorised accordingly. This was followed

by a round of inductive, or connotative, analysis to further explore common themes across the drawings. Denotation requires deductive thinking and seeks an object's literal meaning; connotation requires inductive thinking and explores the suggestive power or emotion images might evoke. Statistical analysis was also conducted using Excel and SPSS. Food occurrences were tallied and compared between experiential and explicit groups through Mann–Whitney U tests (due to the uneven population sizes), assessing differences in processed and natural foods drawn. Significance scores  $<0.05$  were identified. This straightforward methodology provided sufficient rigour to analyse how gardens impact food perspectives.

### *The difference pedagogical approaches make to food awareness*

In this section, we evaluate the impacts and effectiveness of different pedagogies in enhancing children's food awareness. As discussed above, two distinct pedagogical approaches are taken in classrooms at TNSS. For students in the experiential stream, gardening and harvesting are regular (weekly) activities that engage them in real-world learning. The garden is easily accessible, located just outside their classroom (see [Figure 1](#)). By engaging in seed-to-plate gardening, students in the experiential stream experience a comprehensive integration of food education into various subjects, including English, Maths, Humanities and Social Sciences, Art, Health, and free play. In contrast, students in the explicit instruction stream engage with the natural environment differently. Their classrooms are not near a garden, and they do not participate in weekly gardening sessions like their experiential stream counterparts. Typically, they join gardening clubs or participate in the



**Figure 1.** Overview of the TNSS campus.

*Stephanie Alexander Kitchen Garden* programme, but these programmes mainly cater to the older students from Years 3–6.

There were differences observed across the two streams in terms of children's behaviour and engagement when conducting the drawing activity. Students in the experiential stream took the entire 15 minutes to complete their drawings, whereas students in the explicit instruction classes rushed to complete the task, often drawing only one singular food item per A4 sheet of paper (Figure 2). This significantly reduced the number of food items drawn (on average) in the explicit instruction stream. The difference in their engagement aligns with findings from other scholars investigating pedagogical approaches (Marshall 2017; Moore McBride, Chung, and Robertson 2016), and suggests experiential learning empowers students to think and engage critically with tasks.

While both experiential and explicit instruction pedagogies play pivotal roles in shaping students' understanding of food, notable differences were observed across the streams, especially

	
Explicit Prep: McDonalds cheeseburger	Explicit Y1: Chocolate
	
Explicit Y1: Carrot	Explicit Prep: Pizza

Figure 2. Singular food items provided by explicit instruction Prep and Y1 students.



regarding the quantity and origin of fresh fruits and vegetables depicted. On average, students in the experiential stream not only engaged with the activity in a more engaged fashion than those in the explicit instruction stream, they also drew significantly more natural foods ( $U = 61.5$ ,  $P = 0.002$ ) (Table 1). This data reinforces the idea that students in the experiential stream, learning within an education model that promotes inquisitiveness (Sibatuara 2022), approached the activity more thoughtfully. It also implies they are more acquainted with a greater range of fresh produce than their explicit instruction peers, suggesting the importance pedagogical approaches might play in delivering effective food education.

These differences in childrens awareness of natural food, and the impact gardening and experiential/place-responsive pedagogies may play in enhancing it, is also evident in the background of the student drawings. Figure 3 showcases one student's drawing of potatoes growing in their school garden. It reflects a tangible connection with local ecologies – the sun, soil, and surrounding plants. Although the methodology deployed here cannot discern if this child gardens outside of school, the portrayal of potatoes directly echoes their school garden's produce. Just prior to conducting the data collection for this study, the students engaged in harvesting potatoes – which they do on an annual basis with this teacher. The drawing also underscores the transformative potential of gardening in cultivating an understanding that food is grown within local ecosystems, thereby bridging the gap between children and the origins of their sustenance. This is evident when compared to other nature scenes received from the explicitly taught students, who do not engage in gardening, also in Figure 3. The bottom drawing shows little awareness of the local tropical ecology and incorporates no food growing elements. Instead, it depicts a temperate tree, possibly a fir or pine tree (it could be a homage to the Christmas tree and is a standard tree type in childrens cartoons).

While students in the explicit stream have engaged in growing potted plants (beans in this instance) in the classroom as part of the Science curriculum, this approach to teaching Science did not yield noticeable results in the data (no potted bean-plants). Nevertheless, it's worth acknowledging the importance of such practices in effective education. Since the 1900s, plants have been used to provide students with opportunities to closely observe life cycles (Ramey-Gassert 1997). This fosters an awareness of biological processes and critical left-brained thinking. However, the 'bean-plant on a windowsill' approach lacks the immersive experience that outdoor gardening provides. The limited scope of growing beans in isolation from broader ecologies raises questions about the depth of understanding it imparts regarding fresh fruits and vegetables. In contrast, experiential and place-responsive learning appears to foster a deeper understanding of food origins, resulting in drawings that depict more natural foods.

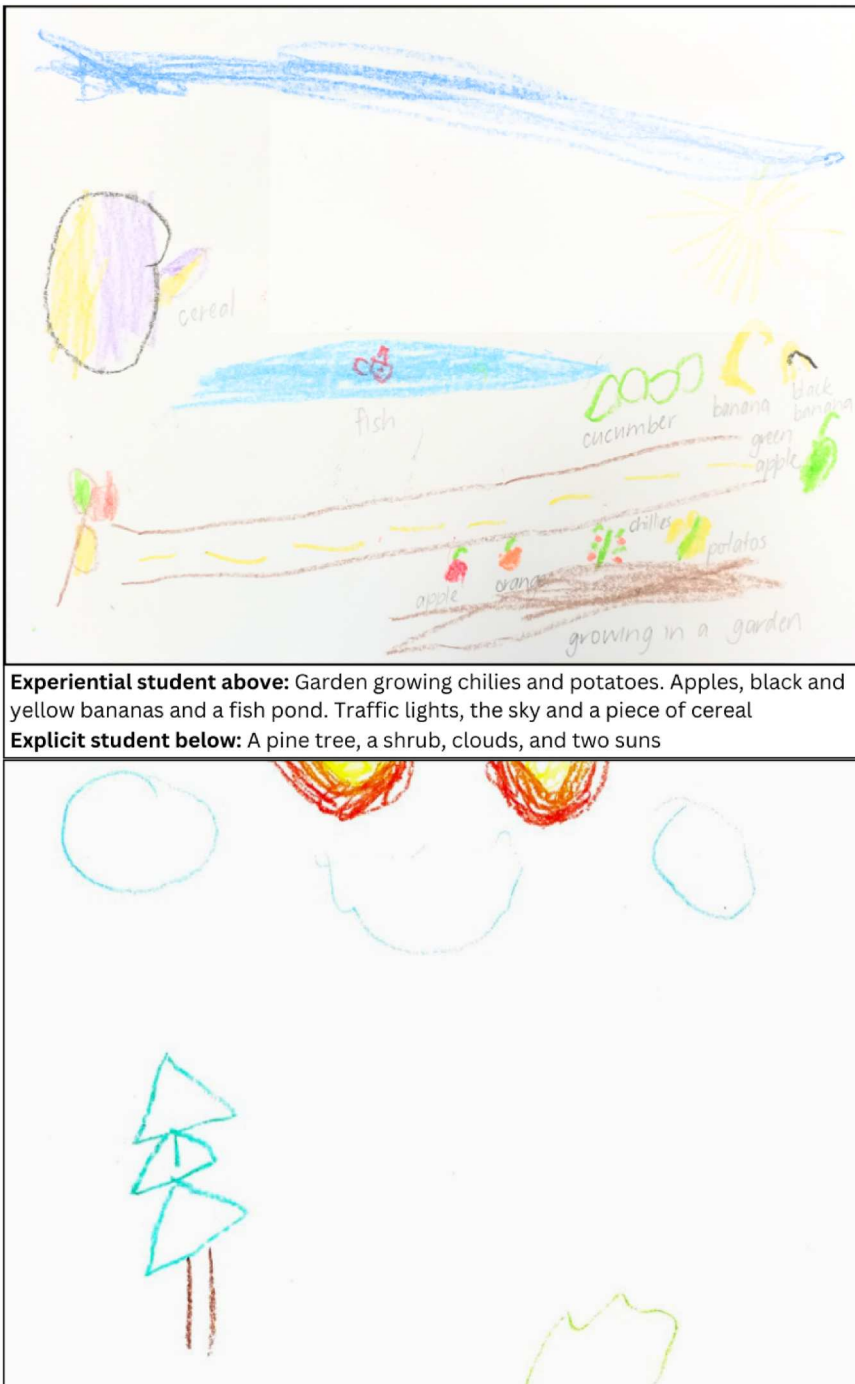
Our data and visual observations suggest that different pedagogical approaches do result in significant differences in children's food awareness. Children who learn under experiential/place-responsive pedagogies (utilising gardens) tend to associate the word 'food' with more fresh fruits and vegetables than those who do not engage in experiential and place-responsive garden-based learning. This highlights the potential importance of gardens as an essential component of effective food education. In the next section, we delve deeper into the types of food provided by the children and explore the varying presence of place-specific foods in their drawings.

### Knowing place through gardening

The Australian curriculum is a national policy document adapted by schools and teachers for their local contexts (Australian Curriculum and Assessment Reporting Authority 2023). Our analysis so

**Table 1.** Food types and average number of drawings per student.

Stream	Processed food total	Natural food total	Average no. of items drawn per student
Experiential	19	87	4.24
Explicit	38	41	2.07894737



**Experiential student above:** Garden growing chilies and potatoes. Apples, black and yellow bananas and a fish pond. Traffic lights, the sky and a piece of cereal  
**Explicit student below:** A pine tree, a shrub, clouds, and two suns

**Figure 3.** Drawings from the experiential stream (top) and explicit stream (bottom).

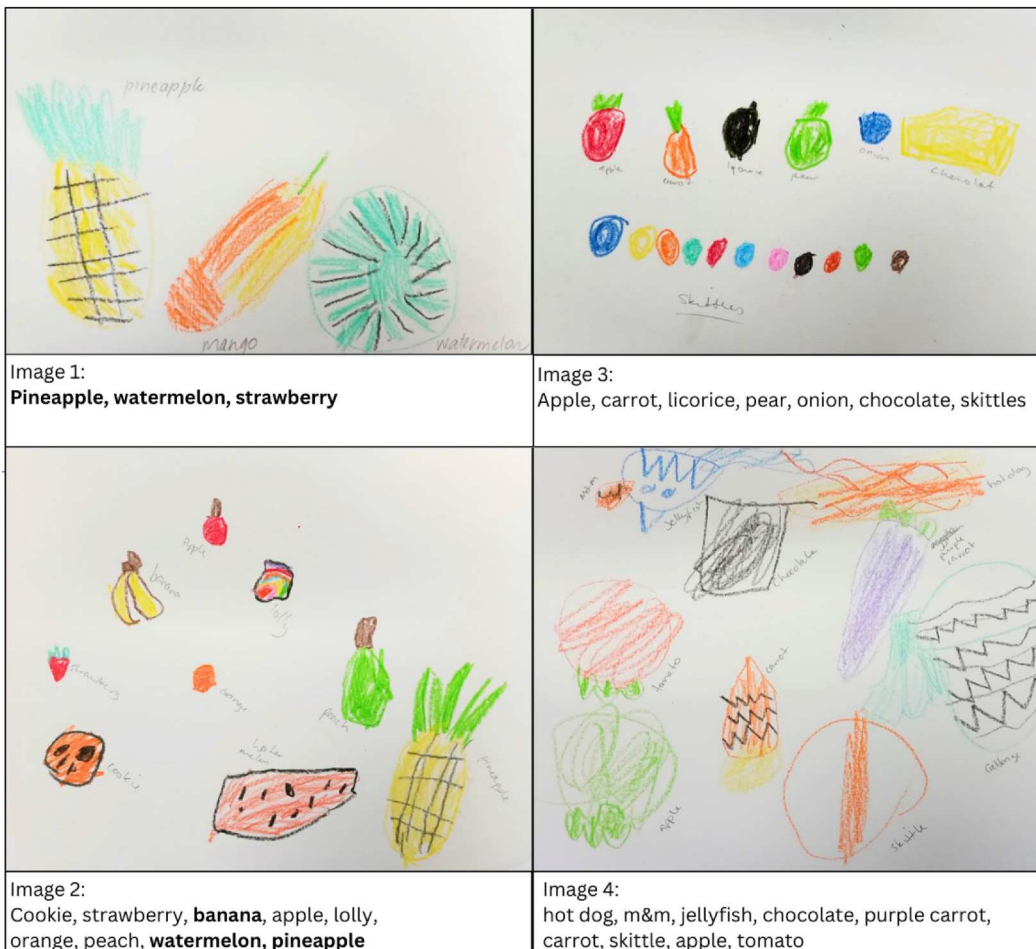
far suggests the effectiveness of experiential/ place-responsive pedagogical approaches in engaging children with their local environment, particularly concerning food. The drawings provided by the children in the experiential stream highlight the power of experiential pedagogies linking children with local produce and demonstrates the importance of place-responsive approaches in building

**Table 2.** Tropical place-specific fruits and vegetables drawn by the students.

Drawing	Experiential	Explicit
Avocado		1
Banana	7	2
Coconut		1
<b>Dragon fruit</b>	<b>2</b>	
Eggplant		2
Mango	4	
<b>Pineapple</b>	<b>3</b>	<b>1</b>
Strawberry	6	5
<b>Watermelon</b>	<b>5</b>	
Total	<b>27</b>	<b>12</b>

local (food) resilience (Renshaw and Tooth 2017; Somerville 2010). As illustrated in Table 2 below, the drawings from students in the experiential stream included specific fruits and vegetables cultivated in their school garden (highlighted in green and bolded), and on average drew more place-specific fruits and vegetables.

We observed notable differences across the drawings by students in the experiential and explicit instruction streams. The former predominantly featured local fruits and vegetables, whereas the



**Figure 4.** Drawings reflecting different local and exotic foods.

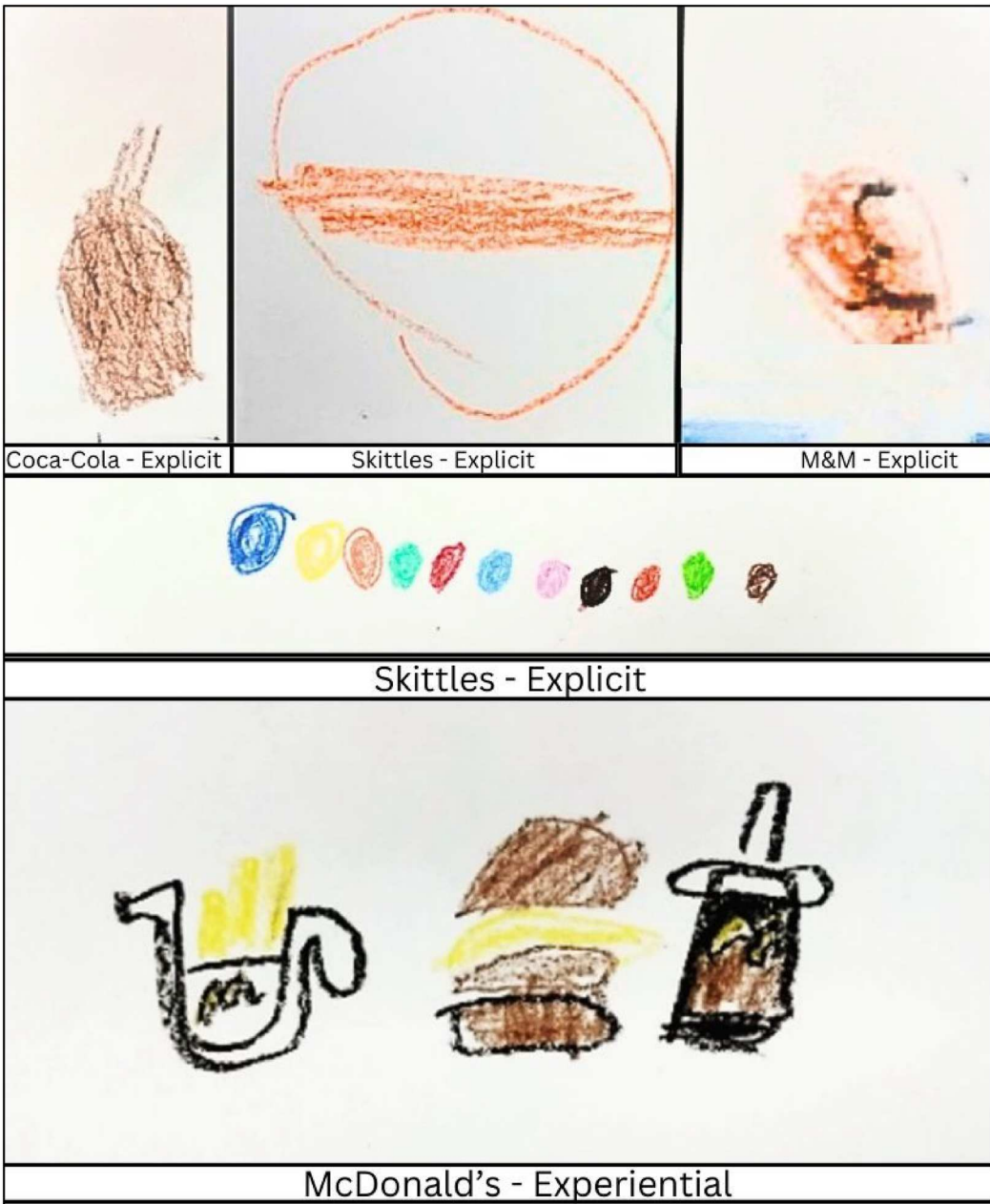
latter depicted temperate foods like carrots and apples (see [Figure 4](#)). This distinction is noteworthy and reflects the influence of place exposure. Students in the experiential stream included illustrations of the tropical foods they had grown as part of their learning, which are specific to their climatic location. This suggests that their engagement in gardening activities may contribute to a more meaningful comprehension of local tropical seasonality, a concept extending beyond the traditional European seasons typically emphasised in the Australian curriculum. This reflects findings from similar studies of children and youth undertaking garden-based learning, who graphically depicted their local environment (inclusive of food, water, and other agricultural elements) in their drawings (Aragón, Ortega-Cubero, and Eugenio-Gozalbo 2023; Eugenio-Gozalbo, Aragón, and Ortega-Cubero 2020). Furthermore, in the drawings from the explicit instruction stream, we observed the prevalence of out of place foods, such as pears, onions, apples, and carrots. In fact, no child in the experiential stream drew carrots or onions. These foods, typically associated with temperate climates, are consistently available throughout the year in large supermarket chains. They often constitute children's initial encounters when visiting these stores, with the 'produce' section serving as their primary point of introduction. This observation underscores the exposure we have to a globalised food system.

We thus argue experiential/place-responsive pedagogies help bolster children's food origin awareness, joining scholars who argue for pedagogical approaches appropriate to the subject content (Jayanandhan 2009; Mannion, Fenwick, and Lynch 2013; McNamara & McNamara 1993). Place-responsive pedagogical approaches to food education ensure children have a deeper understanding of 'place'. The drawings presented here, including tropical foods, suggest that time spent engaging with local ecologies shapes a locally relevant food awareness. Experiential/place-responsive pedagogies facilitate a smoother transition for educators seeking to tailor their curriculum to local contexts (Mannion, Fenwick, and Lynch 2013). This helps give children a well-rounded understanding of food origins, given the amount of processed and globalised foods that all children are exposed to – and indeed drew as part of this exercise.

### *Exposure to media and a globalised food system*

A dominant theme across all children's drawings at TNSS was the prevalence of processed and/or branded foods. There was no statistically significant distinction between the two streams in terms of the amount of processed food depicted (59 drawings with processed food across 22 categories). This suggests that children tend to draw what they are familiar with, given their exposure to processed foods at ages 5 and 6 (Bland 2018; Deguara 2019). The drawings from both streams provide compelling evidence that children associate food with a globalised and placeless identity (Nelson, Knezevic, and Landman 2013). We suggest this is due to the exposure to big-brands and other food with no geography, reflecting a disconnect between food and specific cultural or geographic origins (Banks and Overton 2010). An illustration of this is children's portrayal of big brands in [Figure 5](#). Exposure to the globalised and placeless food economy is perhaps most strikingly depicted through children's 'brand-food' associations, evident in the drawings of Coca-Cola, Skittles, M&Ms, and the iconic Golden M of McDonald's. These drawings express our exposure to globalised food economies that remove us from place (Goodman 2003). They are placeless and known even to children at a young age.

The prevalence of McDonald's across both streams drawings (two in Experiential and six in Explicit) reinforces arguments concerning children's exposure to big brands. The children clearly enjoy processed foods, which will be of no surprise (many of us do), but the brands themselves are simply an exposure-based association. There is widespread consensus that heightened familiarity with McDonald's (and other transnational brands) leads to a reduced connection to distinct localities. Regardless of one's location, McDonald's persists as an unwavering presence. The inclusion of the 'Golden M' on chip packets and beverages unveils the extent of the company's impact on a child's food perspectives and ideologies (Haverluk 2002). By positioning itself as the



**Figure 5.** Coca-Cola, Skittles (x2), M&M's, and a comforting yet placeless McDonald's.

epitome of enjoyable foods globally (Ram 2004), McDonald's underscores its dominance in shaping our food-related responses. Food thus transcends its nutritional role to embody traits of branding, capitalism, speed, and convenience (Frankelstein 1999; Hobin et al. 2012; Ritzer and Miles 2019; Robinson et al. 2007). McDonald's omnipresence and 'placeless' nature thus symbolises our receding cultural landscapes (Graus 2017). If our early food associations are shaped by transnational brands we foster this sense of placelessness.

The powerful influence of media foodscapes in shaping children's mental associations was also revealed through the unexpected inclusion of three dinosaur drawings in the TNSS collection



**Figure 6.** A Dinosaur in a Broccoli Forest drawn by an explicit instruction student.

(Figure 6). Media foodscapes result from the interplay of place, space, and various elements within the food realm to create associations (Brembeck et al. 2012). The dinosaurs, as seen below, are depicted walking around a forest amongst giant blue mushrooms. When doing the follow up questions, the student highlighted that the forest was a broccoli forest. After querying why the dinosaurs would be interacting with vegetables, the teacher suggested it could relate to the Australian television show called *Ginger and the Vegesaur*s; an animated series about vegetables and dinosaurs that was streaming at the time of data collection.

In the context of our broader argument, gardening serves as an effective avenue for bolstering childrens natural food awareness against the impact of the globalised food and media landscape. While media often promotes branded and placeless foods as appealing, experiential/place-responsive pedagogical approaches, like gardening, foster a deeper understanding of food origins within local ecosystems. The inclusion of dinosaur drawings (and big brands) serves as an illustration of how the media, through television shows and similar outlets, can influence mental associations in seemingly unrelated contexts. This contrast underscores the potential for curriculum development to counterbalance the media's influence, encouraging children to engage critically with their food choices, embrace local food systems, and make informed decisions in a media-dominated world.

### Conclusion

Exploring the interplay between children, food, and their environment unveils the significant impact the media, global brands and food with no geography have on children's perceptions and their connection to the world. These influences, portrayed in the drawings at TNSS, reshape children's relationship with the origins of their food, prompting a critical examination of educational approaches. Although exposure to this globalised food system cannot be prevented, schools can offer educational experiences that enhance a child's understanding of the origins of food and the

role their local place plays in the food system. The research presented here suggests experiential/ place-responsive pedagogical approaches could be a potent force. Through tangible experiences and immersive gardening activities, these pedagogies reintegrate children with their sustenance and surroundings, which can enhance food education beyond explicit pedagogical approaches in Science, Technology, Engineering and Maths (STEM) subjects.

Although home gardening and interest in local food systems has increased in the post-COVID-19 context (Kingsley et al. 2023), this study intentionally did not consider children's experiences with food and gardening at home. Instead, we focus solely on the role of schools and pedagogy in addressing the need for a more interconnected food system. While exposure to globalised food systems is evident in various ways outside school, this study focuses on the school experience and what might be done to combat these placeless images. We emphasise the importance of hands-on experiences in food education – evidenced in our research through the tropical items drawn by the experiential stream. Understanding the constitutive role of home environments is potential way forward for future researchers. Future research exploring students' comprehension of place through pre/post garden programme comparisons could also provide a more nuanced understanding of the effects of different pedagogical approaches on food knowledge and sense of place.

The two pedagogical streams at TNSS offer a unique opportunity to understand the impact of each approach on food education. The analysis presented here suggests that explicit instruction is less able to impart local food knowledge and instil a sense of place in comparison to the experiential/ place-responsive alternative. However, an experiential/ place-responsive approach does not provide the opportunity to conduct isolated and finer-grained observations like growing a singular plant. Balancing the significance of close observations with diverse and unscripted experiences within the garden setting emerges as a promising path. A hybrid approach, rooted in a comprehensive understanding of the importance of both pedagogies, could offer a more nuanced approach to food education within school curricula. It could enhance food awareness through STEM thinking as well as an understanding of the cultural and social values of growing food.

Garden-based learning plays an important role in children's awareness of place. We argue a more well-rounded approach to food education in schools that draws on both pedagogical practices as needed. By weaving plants and food into the curriculum in different ways, schools can nurture the bonds between children, their environment, and local foods in ways that help reduce food vulnerability. Introducing more experiential, hands-on experiences enhances food experiences and encourages dynamic left and right brained thinking. While programmes like the Stephanie Alexander Kitchen Garden Program do use gardens, augmenting resources for experiential and place-responsive teaching can mitigate urban food vulnerability and amplify a sense of place. Our data suggests that integrating experiential and place-responsive pedagogies into schools can foster a locally attuned, nature-centric perspective on food, acting as a counterbalance to the influence of the pervasive globalised food system.

## Notes

1. This data was extracted from the Australian Bureau of Statistics 2021 census data for PUR1P and PUR5P and is anonymised data.
2. Under ethical approval from James Cook University Human Ethics Committee (#h8512) and the Queensland Education Research Inventory.

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