TE TĀHUHU O TE MĀTAURANGA AOTEAROA
Ministry of Education New Zealand

Modern Learning Environments to support priority learners

Te Kāwanatanga o Aotearoa

Mātauranga Māori
Te Pūrongo Rangahau, a, Aromatai

Report:
Modern Learning Environments to support priority learners

Author:
Dr Gabrielle Wall
gabrielle.wall@minedu.govt.nz

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This publication is one of a series of publications relating to Modern Learning Environments. The series is made up of the following publications, each of which is available in report and factsheet form:

1. Modern Learning Environments: Impact on student engagement and achievement outcomes
2. Modern Learning Environments: Open learning spaces
3. Modern Learning Environments to support priority learners
4. Modern Learning Environments to support learners with special education needs or disabilities
5. Furniture, fittings and equipment in a modern learning environment

He Whakamārama
The kōwhaiwhai design on the cover is featured in Te Wāhanga, a meeting room in the Ministry of Education's Head Office dedicated to te ao Māori. The kōwhaiwhai symbolises the journey from one generation to the other. The continuous line indicates the passage of time. The pattern in red depicts the generations of today and the black represents those who have passed on. The triangle is a symbol regularly used in tukutuku, raranga and tāniko designs to depict strength and determination. The cover, then, is symbolic of the challenge

that education has offered and continues to offer those who have passed on and those of today.

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Executive Summary

Literature on Māori and Pasifika student outcomes emphasises that effective teaching involves valuing (and being seen to value) students' cultural backgrounds (Alton-Lee, 2003). *Ka Hikitia – Accelerating Success 2013 – 2017* builds on the achievements of *Ka Hikitia – Managing Success 2008 – 2012*, and continues progress towards the vision for Māori students to enjoy success as Māori. *The Pasifika Education Plan 2013 – 2017* builds on goals of the earlier *Pasifika Education Plan 2009 – 2012*, and is aimed at raising Pasifika students' participation, engagement and achievement.

This report should be read alongside the guiding principles of *Ka Hikitia* and the *Pasifika Education Plan*. It provides a starting point for schools to develop the cultural inclusivity of their physical environment, and focuses on the features of school design that demonstrate to Māori and Pasifika students the value placed on their language, identity and culture. The physical environment can only support cultural inclusivity to the extent to which this is also reflected in effective teacher-student relationships and culturally responsive pedagogies. Schools are therefore encouraged to use these guidelines in conjunction with reviewing the current knowledge levels of teachers and leadership. Professional development that addresses identified needs and allows teachers to maximise the cultural responsivity potential of the physical environment should be implemented alongside physical changes.

Meaningful consultation with whānau and community from the conceptual design phase is essential for developing a culturally responsive design. This consultation should be based on the principle of ako, in which the school and its community are both teacher and learner. Open and robust consultation allows the school to learn more about the story and history of the school and its local community, as well as reaching a shared understanding of whānau and community vision for students. Consultation is also an opportunity for the community to learn more about different possibilities for modern teaching and learning pedagogies and environments, and to negotiate any tikanga adaptations within the design.

Ongoing whānau and community involvement is extremely important for supporting students' learning. For Pasifika families in particular, the respect accorded to teachers in Pasifika culture can mean that parents may feel hesitant about involvement. Whānau can be supported to engage with the school on a less formal basis through whānau rooms where families can meet with teachers, wait for their children, have a cup of tea or coffee, and access the internet.

The visibility of culture throughout the school is an important signal for conveying to students and whānau that their culture is acknowledged and valued by the school. This includes the design of the buildings themselves, the presence of cultural artwork throughout the school, and the incorporation of cultural symbols or patterns in multiple media. The increased visual transparency in modern learning environments causes a reduction in solid wall space for displaying artwork, and so the design process should consider the appropriate balance between the two.

Artwork, along with names given to learning spaces and buildings, should link the school to the history of its community and the local environment. These names should be displayed on signage around the school. Other areas should have signs showing their functional name (office, reception, etc) in Māori and Pasifika languages. Photographs of students, tipuna (ancestors), and Māori and Pasifika role models can also be used as visual symbols of culture and identity.

Table 1 shows design considerations for different spaces within the school, including their location in relation to each other, and on the school site.

Table 1. Cultural considerations for school design

Space	Impact on outcomes
1. Learning spaces	• Open learning spaces provide flexibility to work in different groupings • Students can learn collectively, and can easily come together in larger groups for activities such as karakia and waiata • Open learning spaces support tuakana-teina relationships between students and between teachers

Space	Impact on outcomes
	• Multiple groupings within open learning spaces support different teacher locations within the room and increase discursive teaching practice, which is linked to higher Māori student achievement • Spaces should be oriented so that they receive good sunlight. Natural light is linked to increased student achievement, and Rā (the sun) is an important element within Māori culture
2. Breakout spaces	• Visual transparency is important for supervision, but also supports students within these spaces to maintain their link to the rest of the group • Students working in small groups in these areas can provide feedback or support to other students, encouraging Māori and Pasifika students to feel comfortable taking risks in the main learning space by asking or answering questions in front of a larger group • When sited near a large multi-purpose space, these spaces can be used for smaller whānau hui, sharing kai, or as a safe place for younger children while whānau take part in an event in the multi-purpose space
3. Language space	• The location of this space signals the value accorded to the language, and so classrooms for Māori or Pasifika language learning should be located in a place on the site that demonstrates the mana of the language
4. Multi-purpose space	• While this space may be used for kawa and tikanga such as pōwhiri, it is more flexible if the space is not tapu • It is best located at the front of the site, as it mirrors the placement of the wharenui on a marae, provides a visual indicator of cultural inclusivity, and is easily accessed by visitors • The choice of floor covering is important, as the space may be used for diverse activities ranging from performances to sleeping • Storage is important to support flexibility in usage, and built-in bench seating with storage underneath may be an easy way to provide both seating and storage • Mattresses should be stored so that they are not used for sitting on

Space	Impact on outcomes
	• Sufficient showers need to be provided to cater for groups sleeping over at the school • If the multi-purpose space, kitchen and eating areas are standalone and have access to toilets, this can make it easier for the community to use these facilities outside school hours • A veranda in front of the multi-purpose space provides shelter during ceremonies, an overflow area for larger groups, and can be used for less formal activities
5. Kitchen and eating areas	• The kitchen or food preparation facilities should be located near the multi-purpose space • A contemporary way of providing kitchen facilities is to site the food technology area so it can be used for this purpose • In some cases the multi-purpose space will also be used for eating, but if a separate space will be used, this should be located near the kitchen and multi-purpose space to encourage easy flow • Toilets should be located away from the kitchen and food preparation facilities • Laundry facilities should be located so that kitchen laundry is not washed with washing that has been used for the body
6. Furniture, fittings and equipment	• Moveable furniture will increase the flexibility of the multi-purpose space • Consideration should be given to making sure furniture is suitable and comfortable for students and visitors of a range of different heights and builds • Different types of seating should be provided for students, including mats, soft seating, and seating that can be used outside • If cushions are used for sitting, their size and shape should make it apparent that they are for sitting upon, so that they will not be mistaken for pillows for resting the head upon • Floor coverings should be carefully considered if students will be removing their shoes, or will be spending time sitting on the floor while learning
7. Outdoor spaces	• Visual transparency connects students with the outdoors even when they are inside

Space	Impact on outcomes
	• Glass doors, decks and verandas make the outdoors an extension of the interior learning space • Plantings should reflect the local flora and fauna, and should incorporate plants such as harakeke that can be harvested for weaving, and trees that can have the bark stripped for dyeing or other artworks

Introduction

Scope and content of this report

The intention of this report is to reflect current applied and academic knowledge in the area of physical design to support Māori and Pasifika students. This report includes guidelines for those involved in the visioning and design process of any schooling facility, and it talks particularly about physical design features that we would consider part of creating modern learning environments.

However, all schools should be striving to create a culturally responsive learning environment for their students, and many of the recommendations in this report could equally be applied in schools which are not undergoing a renovation or rebuild. Schools may instead use the findings of this report as part of their self-review toolkit when examining the extent to which Māori and Pasifika students at their school are able to learn and achieve in an environment that recognises and supports and reflects the value of their language, identity and culture.

Terminology

Pasifika is a collective term used throughout this report to refer to people of Melanesian, Micronesian, and Polynesian descent or heritage or ancestry who have migrated to or have been born in Aotearoa, New Zealand. While identifying themselves as Pasifika, this group may also identify with their ethnic-specific Pacific homeland. Pasifika people are not homogenous and Pasifika does not refer to a single ethnicity, nationality, gender, language, or culture.

Many of the sections in this report use kupu Māori or tikanga Māori concepts. This use of vocabulary does not directly either include or exclude Pasifika vocabulary or concepts, it simply reflects the terminology used in the literature and interviews. Where recommendations relate specifically to Māori or Pasifika students, this is indicated.

The majority of source information was based on the compulsory schooling sector. However, findings would be equally applicable in other educational settings, and so while 'school' is used throughout this report, this should be considered to include

other educational facilities such as early childhood centres. These guidelines are also applicable to Kura Kaupapa Māori, but will not themselves be sufficient to create a physical environment that fully meets the principles laid out in *Te Aho Matua*.

Methodology

Secondary Data Collection

The literature used in this study was sourced from keyword searches of a number of education and health-related databases, and a search of government publications. The education and psychology databases that were searched were:

- Australian Education Index and British Education Index
- Education Resources Information Center (ERIC or EBSCO)
- Index New Zealand
- PsycINFO

Keywords used were those referring to student ethnicity, and keywords relating to school building and facility architecture, design, construction and location. Terms were searched in English, with some relevant terms searched in te reo Māori and Pasifika languages also.

The reference lists of the resulting publications were then searched for relevant additional source material. No limitations were placed on timeframe and country of origin, however resulting publications dated from 2000 and were either published in New Zealand or related to a New Zealand context. Much of the literature informed the structure and thematic content of this report rather than being directly cited, and for that reason this report is followed by a selected bibliography of relevant readings rather than only a list of cited references.

The majority of sources were published by the Ministry of Education, the Education Review Office (ERO), or the New Zealand Council for Educational Research, and others were commissioned by the Ministry of Education though published by other bodies. There was a lack of quantitative studies that related to physical design directly, and so quantitative studies in other areas of teaching and learning are

sometimes cited where physical design can be inferred to impact upon these findings.

Most studies rely almost solely on qualitative data such as interviews with students, whānau and educators. To a lesser extent, observation is used as a data collection technique, although this is generally the reported observations of classroom teachers, rather than structured observations by objective researchers. It is important to be aware, therefore, that the guidelines contained in this report are reliant largely on the experience and judgment of subject matter experts, rather than on quantitative research relating these findings directly to student engagement and achievement.

Primary Data Collection

The findings from the literature were triangulated with data from semi-structured interviews and focus groups conducted with subject matter experts. A breakdown of the participants is included as Appendix 1. Culturally appropriate research methodologies were used to conduct this qualitative research where possible.

Kaupapa Māori research protocols included using participative processes by introducing interview and focus group topics as guides for the discussion, rather than as a prescriptive list of questions. It is recognised that the kaupapa of this research goes beyond the immediate subject matter, and that the knowledge and perspectives shared are based on a wider principle of taonga tuku iho and the vision and aspirations of participants for their students and communities. Participants were invited to comment on the draft of this report, to ensure its accuracy and support the principle of Tino Rangatiratanga as it relates to kaupapa Māori research (Bishop, 1999). The Pākehā researcher acknowledges her cultural limitations, and thanks participants for their willingness to share mātauranga Māori.

The focus group with Pasifika participants aligned with some components of a talanoa methodology (Vaioleti, 2006). The focus group participants were given some topic areas and questions, but it was made clear that these were to guide the discussion rather than prescriptive in nature. The potential power differential between researcher and participants was further lessened by the participants guiding the

discussion rather than the researcher, and by the participants providing feedback on the draft version of this report. The discussion was oriented towards exploring and defining knowledge, opinions and aspirations relating to the focus group topics, and constructing a collective understanding based on participants sharing their own opinions and supporting, extending or challenging the opinions of others. Talanoa research recognises that opinions given are not subject to traditional concepts of test re-test reliability, as opinions and ideas on the topic will change over time, and may change as a result of the talanoa discussion. Again, the researcher acknowledges her cultural limitations, and thanks focus group participants for sharing their knowledge.

Participants discussed the consideration given to the core, moderate and advanced features of MLE (as evaluated in the Ministry's assessment tool), in addition to their perspectives on the impact of building and facility design on Māori and Pasifika student achievement and engagement outcomes. Participants also discussed the impact of vision on the design and building process and the varying contributions of the experts who assisted them in the visioning and design process, principally the Ministry-assigned project manager and their self-selected architect. A number of these areas were explored in the context of reciprocal interdependence, such as whether the school's vision for Māori and Pasifika students influenced the design pre-occupancy and, conversely, how the buildings then changed or influenced the school's vision and pedagogical approaches post-occupancy.

The interviews and focus group were recorded and transcribed, and constant comparative analysis of the qualitative data from the transcripts was used to identify and categorise recurring themes (Krueger & Casey, 2000; Merriam, 1988). Inductive analysis of the transcripts showed a number of themes that aligned with the core, moderate and advanced features of MLE, as well as themes relating to spaces and physical artefacts that support language, identity and culture for Māori and Pasifika students. There were also themes that related to tikanga Māori, pedagogical approaches, and viewpoints on the involvement of whānau and community.
Coding revealed 46 separate themes, which are itemised in Appendix 2 along with the frequency with which they were coded and the number of sources from which they were drawn. Extracts were coded multiple times if they related to more than one

theme. A diagram of the clustering of themes by similarity in the words contained is shown in Appendix 3. This shows which themes were most likely to overlap in actual transcript extracts, or to include different extracts that contained similar words.

Case study methodology is appropriate for this type of investigation, particularly when multiple-data subjects and sources are used so that comparisons can be made between individual participants' viewpoints (Bogdan & Biklen, 1992). This also facilitates triangulation with secondary sources. However, it is important to exercise caution when considering the extent to which these findings can be generalised to different contexts, due to the small sample size, and the context-specific nature of the participants' responses. Furthermore, the same concerns exist as for the secondary literature that described the findings of perception-based studies with regard to participant subjectivity.

Vision and consultation

Oku ‘auha ‘a e kakai ko e ‘ikai ha visone

Without a vision, the people will perish

Tongan proverb

Participants emphasised the importance of consultation with whānau and the community from the conceptual design phase. This consultation should be based on the principle of ako, in which the school and its community are both teacher and learner. Open and robust consultation allows the school to learn more about the story and history of the school and its local community, as well as reaching a shared understanding of whānau and community vision for students. The consultation process should take place at the student, whānau, hapu, runanga and iwi levels.

This was viewed as an opportunity to inform the community and to secure buy-in for the project. There was a perception that communities tend to be influenced by the school environments that they themselves were familiar with. Participants therefore believed that consultation achieves more effective outcomes when communities are given an opportunity to learn about different possibilities for modern teaching and learning pedagogies and environments. ERO’s evaluation framework for Māori student success also recognises the importance of whānau involvement in school design (Education Review Office, 2012).

Consultation is particularly important where spaces were designed or located in a way that required the adaptation of traditional tikanga or kawa to better fit within the school or education context, such as the glassing-in of the veranda of the wharenui, or the location of the toilets in relation to other spaces.

The selection of the architect was emphasised by participants as being of central importance. The role of the architect included the physical creation of the spaces and functions required, but also involved capturing a number of less tangible concepts in the design. Participants described the architect’s design needing to capture the

history or story of the school and its community, as well as concepts such as aroha, whakapapa and manaakitanga.

Some of these concepts were difficult for participants and other stakeholders to describe in specific physical terms, and many participants described wanting the spaces to feel or function a particular way, or have a particular wairua (spirit). Successful projects were those where the architect spent time listening and translating the concepts and ideas being discussed, which usually involved a period of consultation with students, staff, whānau and community. Some architects learned about the desired functions of the spaces by observing or participating in events at the school or in the community.

Whānau and community involvement

Ia ifo le fuiniu I le lapalapa

As to each coconut leaf belongs a cluster of young nuts, so each individual belongs to a family

Samoan proverb

Participants recognised the importance of whānau and community involvement with more formal aspects of school life, such as attending ceremonies, hui and performances. However, participants emphasised the importance of whānau supporting their children's education by being present and involved in less formal ways also.

Pasifika participants believed that the respect accorded to teachers in Pasifika cultures meant that parents often felt hesitant about being involved with the school. Parents were more likely to be involved if there were spaces that encouraged their involvement by being culturally supportive and easy to access within the school site. One participant gave the example of schools in Samoa where the school buildings were surrounded by open-sided fale where parents and community members could meet and socialise, and share food with students during meal breaks.

Participants suggested that a whānau room expresses manaakitanga, as well as offering a less formal way to engage with the school. There were different concepts of a whānau room, and some participants saw it as a space with some visual privacy where whānau members could meet with teachers. It was suggested that naming the space 'whānau room' and having frosting or film on the glass to provide some privacy would remove the stigma about coming into the school, and would have fewer negative connotations for whānau than meeting in an office or other formal setting.

Other participants saw this as a more relaxed space, where whānau could wait for their children and have a cup of tea or coffee. ERO's evaluation framework for Māori student success considers how whānau can feel a sense of connection or belonging

within the school (Education Review Office, 2012), and this type of space may be one way for the school to demonstrate manaakitanga to its whānau and community.

Participants spoke about the enthusiasm with which Māori and Pasifika students embrace new technology, but were also aware that some whānau may not have internet access at home. It was suggested that schools may be able to engage whānau by offering free internet access in the whānau room or the school library.

ERO also recognised whānau or home rooms as features of schools that had successful outcomes for Māori students (Education Review Office, 2010), although it did not specify whether these spaces were for whānau, or were a culturally inviting space that students could visit for study purposes. A study of tertiary outcomes for Māori students found that a space for study and internet access was an effective contributor to Māori student outcomes (Taipapaki Curtis et al., 2012).

Schools may wish to consider whether a single space will be suitable for these joint purposes, or whether it would be more appropriate to have a space for whānau specifically. Other learning spaces within the school may already be suitable for Māori and Pasifika students to study and access the internet.

Cultural visibility

> ***"we can't 'be' if we can't 'see ourselves'"***
>
> Ferguson, Gorinski, Wendt Samu, & Mara (2008)
> interpreting Nakhid (2003)

Participants emphasised the importance of visual symbols of culture being displayed throughout the school. This was key in conveying to students and whānau that their culture is acknowledged and valued by the school, and that they will not have to shelf or conceal their cultural identity to participate and achieve within that school. Nakhid (2003) likened a lack of cultural symbolism to being given a school photograph, and students looking for themselves and noticing their absence from the photograph.

Cultural visibility included the design of the buildings themselves, such as having buildings that had a roof like a fale, or with a veranda area that echoes the veranda outside the wharenui on a marae. It also included the presence of cultural artwork throughout the school, such as carvings, raranga (weaving), lavalava, tapa cloth, tukutuku panelling, and other forms of traditional and contemporary artworks. Many participants described the importance to their school of students and community being involved in producing the artworks, such as by whānau gifting artworks, or by student work being displayed.

Participants also spoke about the importance of integrating cultural symbols and adornment in many different visual mediums throughout the school. For example, kowhaiwhai and other cultural patterns and symbols could be used as logos for the different house groupings, in window films, and as borders on walls and around boards.

One potential drawback of increased visual transparency within modern learning environments is that it reduces the solid wall space required for displaying artworks. One participant described using a display screen to scroll through a selection of student artwork, so that multiple artworks could be displayed in a single space.

However, for many cultural artefacts and artworks, a temporary display medium would lessen the mana of the artefact. The design process should explicitly consider the balance between visual transparency and permanent display space for cultural symbols and student work.

It is important to acknowledge that visual symbols of culture convey a sense of belonging and cultural safety to current and prospective students, and provide concrete reminders that their culture is valued by the school. However, this is also an opportunity to extend understanding of identity and cultural connection by using artworks and symbols that tell the story of the school community, and link the students to their tipuna (ancestors).

I feel a sense of belonging when I enter this place. Why? Because we have got cultural tools that I can connect [with]. I am going to make the most of my learning because I can connect, I can use some of these cultural artefacts to share my thoughts and my thinking and my insight when we're having discussions and dialogue.

Pasifika participant

These symbols also show the connection of the students and the school to its local environment, and should reflect the location of the school in relation to flora, fauna and places of cultural significance. Visual symbols of this could include artworks, logos or patterns connected to the local river or mountain, and plantings could echo the traditional fauna of the area.

The naming of spaces within the school should also reflect this connection with history and location, and schools are encouraged to talk with their community and local runanga or iwi about names for learning spaces or buildings that represent the history and location of the school, local flora and fauna, or whakatauki (proverbs) that support the school’s vision for its students. These names should reflect the mana whenua or tangata whenua of the school’s locality. One publication referred to the incorporation of history as ensuring that the design ‘looks to the future from the past’ (Ministry of Education, 2000, p. 4).

Where learning spaces or buildings have been named, this should be shown on signage. Signage in Māori and Pasifika languages throughout the school creates a feeling of inclusivity and belonging. In addition to named spaces, this should include functional names such as 'taupaepae' (reception area). Signage at the entrance of the school could include a welcome in different languages, which was described by participants as being an important initial indicator to students and whānau that their culture and identity will be valued by the school. Māori and Pasifika languages can also be made visible around the school by having values, mottos or whakatauki displayed in learning spaces (Hill & Hawk, 2010). This usage of Māori and Pasifika language needs to be supported by teaching practice, and schools should ensure that the names and language on signage are used and understood by students, teachers and school leadership.

The presence of photographs of people of their own ethnicity also sends a message to students about their place within the school community. One participant spoke of visiting a reception area within a school with a large Māori and Pasifika roll, and not being able to find photographs of any Māori or Pasifika students among the display of student photographs within the area. For her, this sent a powerful message about the relative importance of Māori and Pasifika students within the school community. Schools could work with their community to incorporate photographs of tipuna who have passed on within the multi-purpose space (the form and function of this space is discussed in a subsequent section). Some schools also have photographs of prominent Māori and Pasifika role models in their learning spaces (Hill & Hawk, 2010).

Interior spaces

This section discusses cultural design and usage considerations for buildings and interior spaces. Where relevant, the relationships between spaces, and the positioning of spaces on the school site is also discussed.

Learning spaces

Mā te whakaaro nui e hanga te whare; mā te mātauranga e whakaū

Big ideas create the house; knowledge maintains it

Whakatauki

Participants who had experience of larger learning spaces appreciated the flexibility that they provide to learn in different student groupings and through different activities. Some participants believed that learning collectively was an effective pedagogy for Māori and Pasifika, and that larger learning spaces allowed this type of learning more easily than smaller cellular classrooms. Learning spaces were generally designed and furnished so that there were spaces and areas where students could work individually or in small groups. Larger learning spaces also supported larger numbers of students coming together for activities such as karakia and waiata without having to move students to a hall or wharenui space. Larger spaces also allow for whānau to be more easily involved in student learning.

These spaces also supported tuakana-teina (learning interactions between more and less knowledgeable), particularly where there were students of different ages within the same learning spaces. While we generally think of such relationships as involving direct interaction, participants also recognised the tuakana-teina relationship as being of value when students were simply able to occupy the same space as other students who offered them support. For example, being able to see or make eye contact with an older sibling or friend, which provided reassurance and increased wellbeing. For older siblings or friends, being able to provide kaitiakitanga (guardianship) over younger siblings, friends or whānau members by seeing them within the learning space helped to build a nurturing learning environment.

This concept of tuakana-teina also applied to teachers within the learning space. Participants spoke of the professional development and learning needed to teach confidently within larger learning spaces, but they also acknowledged the unexpected development of informal tuakana-teina relationships between teachers. With teaching practice being more visible to other teachers within the space, it becomes more straightforward to recognise when a teacher needs additional support, or when their knowledge or practice in an area can be used to inform other teachers.

One of the guiding principles of *Ka Hikitia* is ako, which recognises that the teacher can be both teacher and learner. Participants whose schools had moved from a more traditional cellular design to more open learning spaces have appreciated the collaborative teaching and planning practices that are supported by these spaces, and believed that this also positively models collaborative learning for the students. In addition to tuakana-teina, they believed that this collaboration encouraged ako between the teachers sharing a learning space.

One of the indicators of student-centred discursive practices measured as part of the Te Kotahitanga project was the amount of time the teacher spent at the front of the learning space (Bishop, Berryman, Wearmouth, Peter & Clapham, 2011). More culturally responsive teaching styles led to the teacher spending less time at the front, and more time interacting with students at various places within the learning space. By creating multiple potential points for instruction, in addition to multiple configurations for different learning groupings and activities, open learning spaces are viewed as supporting teachers to move to more discursive teaching styles.

Research recognises the importance of natural lighting to student achievement and engagement outcomes, and this was reiterated by participants discussing the importance of orienting learning spaces so that they face the sun and receive lots of natural light. This also supports the importance of Rā (the sun) in Māori culture, and creates links between students and the natural environment outside the learning space. It is important to remember to balance this with considerations of glare and of excessive solar heat gain.

Breakout spaces

Breakout spaces were often used for individual or small group work also, such as if a student required further support, or needed to work individually. Breakout spaces were seen as useful for a number of purposes, and it was the second most commonly coded theme from the qualitative data (see Appendix 2).

Participants felt that visual transparency was important so that students in breakout spaces were not visually cut off from students in the larger learning space. This was important for teacher supervision, but also so that the student continued to feel part of the collective. Participants talked about the importance for Māori and Pasifika students to feel connected to the group, and to be part of the collective experience of learning.

Breakout spaces were also used for small groups, and participants spoke about many Māori and Pasifika students enjoying working cooperatively with their peers. Students working in a breakout space could tautoko (support) one another, which increased their confidence and academic self-belief. Participants felt that Māori and Pasifika students participated more effectively in some wider class activities when they had first had the opportunity to receive support in a smaller group environment. This could be through asking questions or seeking further explanation in the smaller group, or through having the opportunity to rehearse a speech or receive feedback on a piece of written work before sharing it with a larger group.

The literature suggests that students may feel uncomfortable or whakama (ashamed) taking risks by asking or answering questions in a larger classrooms setting, and so working with a smaller group in the learning space or a breakout room allows students an opportunity to take risks in a more culturally safe environment (see Fletcher, Parkhill, Fa'afoi & O'Regan, 2009, for a discussion of risk-taking in learning by Pasifika students).

Language spaces

Where te reo Māori or Pasifika languages are offered within a particular learning space, the location of this space signals the value accorded to the language. It is

important, therefore, that consideration is given to integrating the space with other learning spaces, and by adorning the space to demonstrate the value placed on language. While existing schools will have space restrictions on their sites, a Maōri or Pasifika learning space should be placed in a location that reflects the mana of the language.

Multi-purpose space

> ***Our whare had to look like a Māori place so all these kids knew when they came, when they walked up the driveway, this was a Māori place and so you didn't have to leave your Māori-ness at the door***
> Māori participant

Participants used multiple terms to refer to a large space or building that can be used for multiple cultural purposes, including hui space, marae, virtual marae, whare, fale and wharenui, with the common theme of flexibility as a key requirement of that space. While this space is used for tikanga practices, participants recognised that the space was more flexible if it was not tapu, so that students, whānau and other visitors could eat and drink within the space.

Similar to a marae, it was suggested that this space is best located towards the front of the school, where it has the dual benefits of visually conveying the idea of cultural inclusivity, and of making it easy for visitors and whānau to access the school. If the same space will be used for manaakitanga (showing hospitality) and the sharing of kai, it should be located in close proximity to the kīhini (kitchen) or food preparation facilities. If another space will be used as a wharekai (eating area), then this should also be located nearby. The space is more flexible in its usage if there are smaller breakout spaces located nearby. During events as hui, pōwhiri (welcomes) and poroaki (farewells), they are able to be used for smaller meetings of whānau, the sharing of kai, or as a safe place for younger children while whānau were involved in the hui or event in the multi-purpose space.

Post-occupancy research suggests that consideration must be given to the floor covering within the space. The space may be used for such diverse activities as sport, performance, and sleeping, and so the floor covering should be hard wearing enough to support more active activities, but still soft and comfortable enough to be suitable for laying down mattresses to sleep on. Underfloor heating could also be considered as a heating option to provide a more comfortable sleeping area.

Because the space will be used for multiple purposes, storage is very important. Built-in bench seating with storage underneath is an easy way to provide both seating and storage. If the space will commonly be used for sleeping, suitable storage should be provided for storing mattresses, pillows, and any other bedding. It should be ensured that mattresses are stored in such a way that they are not used for sitting or any activity other than sleeping. Sufficient facilities for showering need to be provided when students or visitors will be staying at the school. These should be located so that they can be easily accessed from the multi-purpose space.

Participants spoke about the importance of their schools to their communities, in addition to the importance of community involvement in the school. This involvement was easier to facilitate if the access points to the school are more apparent to a visitor, such as encouraging the natural flow from the multi-purpose space to the wharekai, and then onwards into the rest of the school if appropriate. A standalone multi-purpose space with kitchen facilities, space for sharing kai, breakout spaces, and access to wharepaku (toilets) also makes it easier for the community to use the school facilities outside school hours, as this area can be self-contained.

A veranda in front of the multi-purpose space supports its use for tikanga practices such as pōwhiri. Some participants spoke of adapting tikanga by glassing-in this space, which meant it provided shelter, and could act as an overflow for large groups or for less formal activities. Depending on the location of the multi-purpose space within the school site, it may be possible to include an outdoor space at the front of the space to act as a marae ātea (courtyard).

Kīhini and wharekai

It is important that there is easy access to kitchen or food preparation facilities in order to demonstrate manaakitanga. Participants recognised that this may be done in a more contemporary way, such as by locating the food technology area in close proximity to the space that is used as a wharekai area, and close to where manuhiri (visitors) are welcomed and brought into the school.

Some schools will use the multi-purpose space for eating, while others have a purpose-built wharekai. This is used for manaakitanga when welcoming manuhiri to the school, but is also used for expressing whanaungatanga (building relationships) and manaakitanga among students and teachers. The tumuaki of one kura kaupapa Māori explained that students and teachers are encouraged to eat meals in the wharekai together, so that the students are able to interact with teachers in a less formal, more whānau-oriented setting. The same kura kaupapa Māori uses the wharekai for students to learn about and practise manaakitanga, and students take turns preparing and serving morning tea, and cleaning up the wharekai after meals.

Consideration needs to be given to the tikanga around food preparation and wharepaku, with toilets located away from the food preparation and service areas. Participants recognised the need to adapt tikanga for a school setting, so that while toilets were traditionally located in a separate building, it may be impractical for students to go outside in winter, or in bad weather, if toilets could be more conveniently located inside the building.

Laundry facilities should be located so that washing from the kitchen, such as cloths, tea towels or table cloths, are not washed with washing that has been used for the body, such as bedding from the sick bay or dirty clothing.

Furniture, fittings and equipment

While furniture, fittings and equipment (FF&E) is dealt with in more detail in another publication in this series (*Furniture, fittings and equipment in a modern learning environment*), there were some principles of FF&E that related to student culture more specifically. Moveable furniture will support the flexibility of spaces to be used

for different activities, such as being able to easily move seating within a multi-purpose space to make it suitable for a performance, or being able to configure seating for a ceremony such as a pōwhiri.

Part of manaakitanga is making sure that visitors are comfortable, and so participants suggested making sure that the seating provided is suitable and comfortable for adults of a range of heights and sizes. This is particularly important where they will be expected to be seated for a long time. It is important that classroom furniture is also able to comfortably accommodate students of all different sizes and builds (Research New Zealand, 2010).

Within the learning spaces, different areas support different student preferences for learning, such as soft seating for individual reading or group discussion. This may include mats for students who prefer to sit or lie on the floor. Where cushions are used for students to sit on when working on the floor or outside, it is important that the shape and size of these make it apparent that these are cushions for sitting upon, and could not be mistaken for pillows for resting the head upon.

Visually, participants expressed a preference for FF&E that conveys cultural symbols, such as chair backs in a koru shape, or furniture that can be configured into kowhaiwhai patterns. However, it was also acknowledged that there were multiple practical considerations for the form and function of FF&E, and that the visual aspect needed to be balanced with these other considerations.

The floor coverings are more important where students will remove their shoes before entering a space, or where some learning activities will take place on the floor. If students will remove their shoes, then underfloor heating could be considered as a suitable form of heating. Where students will be sitting on the floor, the quality of the carpet or of mats should be considered. This is also important from a maintenance perspective, and if higher quality carpet will be used because it is going to be sat upon for learning activities, it should not then be used in a main thoroughfare, or where spillage is a possibility.

Outdoor spaces

> ***We learn holistically and through all our senses. It's important to be able to sense and be a part of nature. That's where having a lot of area where you can see outside, you can see nature and it brings it into your learning environment, is really important.***
>
> Māori participant

Outdoor spaces was the most commonly coded theme, and while participants wanted to create visually attractive outdoor spaces, there was a consistent focus on making this primarily a culturally meaningful space for engagement and learning.

Visual transparency in the form of interior and exterior windows was viewed as very important by participants for supporting student learning, as it emphasised students' connection to one another, and to the natural environment. Many participants talked about creating an indoor-outdoor flow visually and functionally by having glass doors or walls that open the learning spaces up to the outside. Teachers in these schools tended to regard the outdoors as an extension of the interior learning space, and students could work outside on the veranda or deck. The furniture in these spaces had been chosen to be easily portable and suitable for outdoor use, so students could take bean bags and other seating outside.

Participants also spoke about using native plants and trees to reflect the interaction between culture and the natural environment. A further connection can be made between student culture and the environment by using plants such as harakeke that can be harvested for weaving, and trees that can have the bark stripped for dyeing or other artworks. Cultural symbols can also be visually signalled in the outdoor spaces, such as kowhaiwhai patterns in the concrete or other hard surfaces, or in the shape of garden areas and pathways.

Conclusion

This report lays out a number of design guidelines to assist schools to build a culturally responsive learning environment. These guidelines should be implemented with regard to the individual school context, and the aspirations of that school community.

To achieve a truly culturally responsive wairua within the school, stakeholders are recommended to embrace the tikanga concept of ako. Stakeholders, particularly those from a majority culture background, may need to put themselves in the position of learner, and be prepared to act as visitors within the cultural space of their Māori and Pasifika whānau and community (Glynn, Walker, Berryman & O'Brien, 2001).

These recommendations, if implemented in partnership with the school's Māori and Pasifika community, provide tangible evidence to students and whānau that their culture and identity are valued. They provide a culturally nurturing backdrop against which schools can form positive relationships with Māori and Pasifika students, and effectively implement culturally responsive teaching pedagogies.

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Appendix 1: Interview and focus group participants

Participant number	Participation medium	Participant description
Participant 1	Interview	Tumuaki of a kura kaupapa Māori
Participant 2	Interview	Tumuaki of a kura kaupapa Māori
Participant 3	Interview	Kaitiaki of a kohanga reo
Participant 4	Interview	Principal of a secondary school
Participant 5	Interview	Mātauraka Mahaanui representative
Participant 6	Interview	Mātauraka Mahaanui representative
Participant 7	Interview	Mātauraka Mahaanui representative
Participant 8	Focus group	Pasifika Advisory Board representative
Participant 9	Focus group	Pasifika Advisory Board representative
Participant 10	Focus group	Pasifika Advisory Board representative
Participant 11	Focus group	SME - Ministry Pasifika Regional coordinator
Participant 12	Interview	SME – School Property Project Advisor
Participant 13	Interview	SME – Regional Property Advisor

Appendix 2: Themes coded during analysis of the primary data

Name	Number of sources	References coded
Fale	1	1
Wet areas	1	1
Corridors	1	2
Cultural 'feng shui'	2	2
Floor coverings	2	2
Spaces for te reo	1	2
Wharepaku	1	2
Marae ātea	2	3
Spaces for teachers	3	3
Teacher collaboration	2	3
Technology	3	3
Vision	2	3
Window film	3	3
Display space	3	4
Tuakana teina	2	4
Architect and project manager relationships	3	5
Artwork	4	5
Flexibility	4	5
Kīhini	3	5
Lighting	3	5
Colour	3	6
Location	3	6
Plants	3	6
Signage	4	6
Wairua	3	6
Hui spaces	3	7
Learning spaces	4	7
Naming	4	7
Storage	6	7
Whakairo	5	7
Wharekai	5	7
Community involvement	4	8
Manaakitanga	4	8
Spaces for whānau	4	8
Consultation	6	9
Tikanga	4	10

Name	Number of sources	References coded
Cultural symbols	6	12
Whānau involvement in learning	5	12
FF&E	7	13
Multi-purpose spaces	7	14
Pedagogy	4	14
Site layout	5	14
Breakout spaces	7	17
Visual transparency	7	17
Wharenui	8	17
Outdoor spaces	7	25

Appendix 3: Diagram of word similarity of primary data themes