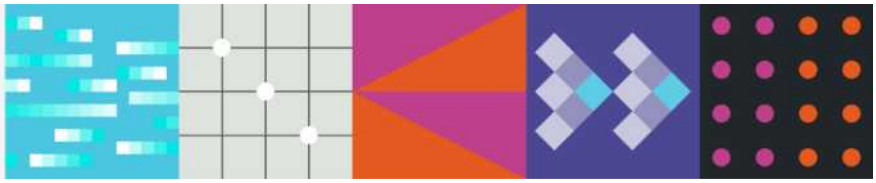
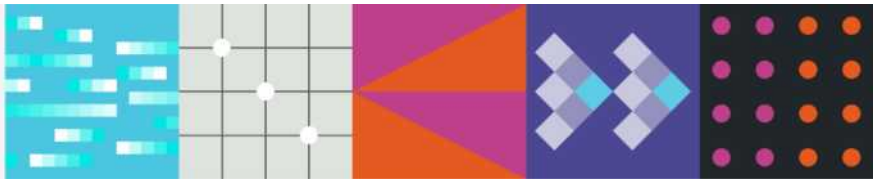
2019 RARANGA MATIHIKO
BY THE NUMBERS
70,077+ STUDENT LEARNING HOURS
Student engagement hours
These hours are for face-to-face contact with students. It excludes teachers, whānau and other visitors learning or any ongoing learning as a result of participation in the Raranga Matihiko programme.
6,821 STUDENTS
From 250+ classes
Decile 1-3 schools and Kura located in Northland, Auckland, Hawkes Bay and Wellington.
250+ TEACHERS
Learning alongside their students
Learning about the new digital technologies and Hangarau Matihiko curricula content along with how to integrate this across the curriculum.
740+ WHĀNAU HELPERS
Learning alongside their tamariki
Everyone is an active learner in the Raranga Matihiko programme. Whānau are gaining new skills, taking knowledge and creating with their own whānau.
45,070 KM'S TRAVELLED
Across the four regions
Students travelling via bus to visit their local Museum as well as facilitators visiting the students in their class
Thanks to Tranzit Group and their partners for safely transporting our students.
4,799 LUNCHES
Provided to students
Thanks to our sponsor EAT MY LUNCH for providing lunches to students in Wellington and Auckland.
518 SECONDARY STUDENTS
From 20 classes
Year 9 and 10 students from colleges and wharekura in Northland, Auckland, Hawkes Bay and Wellington.
www.rarangamatihiko.com





E kore e taea e te whenu kotahi ki te raranga i te whāriki
kia mōhio tātou ki ā tātou.
Mā te mahi tahi ō ngā whenu,
mā te mahi tahi ō ngā kairaranga,
ka oti tēnei whāriki.
I te otinga
me titiro tātou ki ngā mea pai ka puta mai.
Ā tana wā,
me titiro hoki
ki ngā raranga i makere
nā te mea, he kōrero anō kei reira.

The tapestry of understanding
cannot be woven by one strand alone.
Only by the working together of strands
and the working together of weavers
will such a tapestry be completed.
With its completion
let us look at the good that comes from it
and, in time we should also look
at those stitches which have been dropped,
because they also have a message

Nā Kūkupa Tirikatene

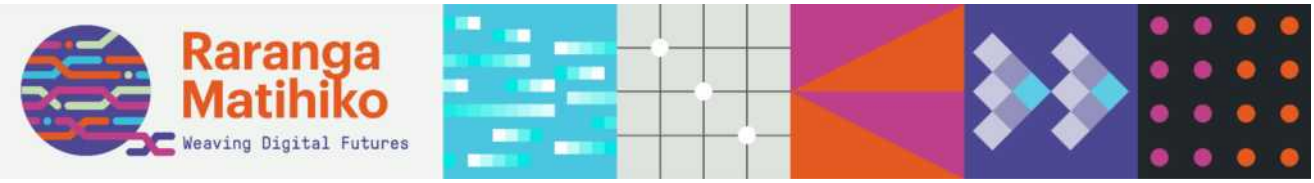
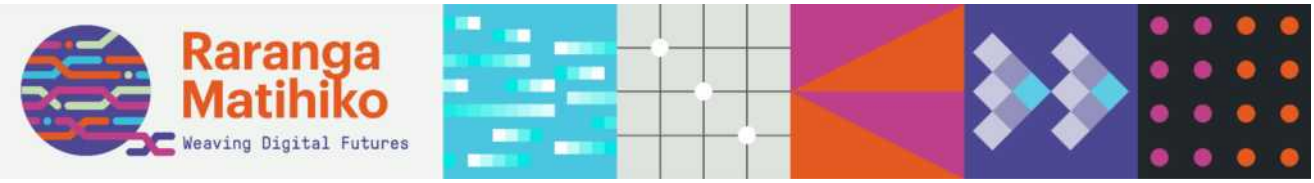


Table of Contents

Annual Report 2019 1
Executive Summary 7
Programme Aims 8
Programme Delivery 10
Delivery to Year 9 and 10 ākonga 10
Disruption to delivery 10
Returning schools 11
Extended Outreach 12
Localised curriculum 12
Wellington Region Update – Delivered from Te Papa Tongarewa 12
Northland Region Update– Delivered from the Waitangi Treaty Grounds and Museum 14
Hawke's Bay Region Update – Delivered from MTG Museum 15
Auckland Region Update – Delivered from Auckland museum 16
Māori Medium Settings 17
The Raranga Matihiko Team 18
Kaiako Professional Learning 18
Resource development 20
Highlights from the 2019 Raranga Matihiko programme 21
Support for Wairoa Schools and Kura 21
Raranga Matihiko Ākonga exhibition 22
Royal visit to the Raranga Matihiko programme 23
Highlights from evaluation 24
Benefits for Ākonga 24
Benefits for Kaiako 27
Benefits for Whānau 29
Recommendations from Evaluation 30
Looking forward to 2020 31



Executive Summary

In 2019, the second year of the Raranga Matihiko | Weaving Digital Futures programme, delivery continued across all four regions – Wellington, Waitangi, Auckland and Hawke's Bay. Facilitators, located in each regional museum, worked with kaiako to design and develop bespoke programmes of learning for each class.

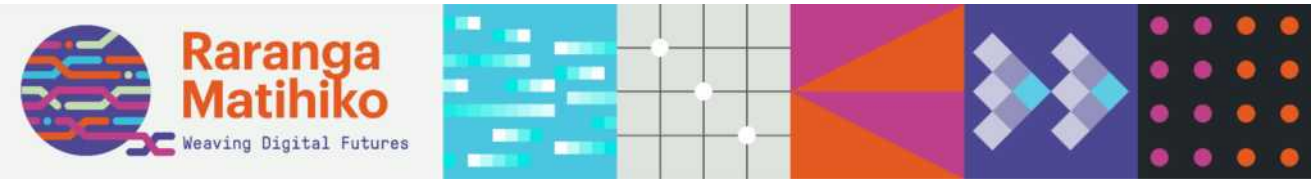
With the kaupapa of providing equity of access to rich digital technology learning, each programme is linked to the revised Hangarau and Technology learning content thereby providing opportunities for ākonga, kaiako and whānau to learn more about digital fluency and computer science, so they become digitally confident and capable thinkers, producers and creators. The programme draws on the rich content that museum learning offers and weaves through existing classroom learning and a cross-curricular approach to support kaiako understanding of curriculum integration.

In-depth and co-facilitated, the Raranga Matihiko programme works with schools from decile 1-3 schools and all kura, within a 100-120km range of the museum. During the year, 6,821 ākonga from 248 classes took part in the programme. The face-to-face component of the learning has totalled over 70,077 ākonga learning hours reflecting the deep learning opportunity offered through this programme. In 2019, 108 schools returned for the second year of the programme; the benefit of developing kaiako learning over this time was evident with a noticeable increase in kaiako and ākonga confidence demonstrated in understanding of the revised learning areas as well as conceptual thinking.

Throughout the year, there have been some highlights that have promoted ākonga learning from the programme. A visit from the Duchess of Cornwwall gained international coverage of the programme; the ākonga exhibition at Waitangi Treaty Grounds and Museum showcased ākonga work; the development of the Decoded for Learners series has provided learners with additional support, and the community support for Wairoa schools and Kura have enabled their participation.

We welcome Waikato Museum into the Raranga Mathiko whānau in 2020. This new partnership has arisen from Auckland Museum's reluctant withdrawal from the programme at the end of 2019, due to major building renovations undertaken at the museum. We are thrilled with the opportunity to partner with Waikato Museum and extend the reach into Waikato and look forward to sharing stories from their ākonga during the year.

Digital technology, capability and equity are at the heart of this programme. The team are delighted that not only has Raranga Matihiko met the contractual intentions but that social impact and equity has extended the learning experience for ākonga, kaiako and whānau enabling them insights into future vocational pathways, ways to access knowledge through the museum and new life experiences.



Programme Aims

Funded through the Ministry of Education Digital Technology for All Equity Fund, the programme delivers innovative digital technologies learning to ākonga and their kaiako, and in doing so helps address the inequality of access to digital technologies. The programme, led by the Museum of New Zealand Te Papa Tongarewa, is delivered at Te Papa and the three partner sites, Waitangi Museum, Auckland Museum and MTG Hawke's Bay. This is the second year of the programme all museums worked with both new classes and classes returning to participate in the programme for the second year.

Through the programme, ākonga are supported to participate, solve real-world problems and enhance and enrich their identities. They access the rich national and local collections that the network of museums holds in the public trust and co-create and curate their learning using digital technologies. The programme is responsive to different individual and community contexts. Tailored to each class, the programme of learning is designed specifically to enable each class to develop digital fluency skills in a cross-curricula approach – for learners in both Māori and English medium contexts.

Concurrently, we work with kaiako to build their confidence and knowledge in the revised learning areas of Technology and Hangarau as well as ways to integrate this learning throughout the curriculum. In addition, whānau helpers are gaining knowledge of digital technologies as they engage and support the learners in the programme.

The programme is in-depth and comprises of:

- a kaiako only day where kaiako learn more about the revised learning areas as well as explore digital technologies (first-year classes only)
- a two-day in museum visit where the ākonga and kaiako learn alongside each other (one-day for returning classes)
- a four-hour outreach programme where our facilitators take the technologies to the kura and schools to extend the in-museum learning programme.

The contract requirements are:

(a) provide increased access to rich technology learning opportunities for priority learners who have had limited learning opportunities to date in the strengthened digital technologies content;

(b) create opportunities to open DT&HM pathways for students and ākonga by inspiring and motivating them and increasing engagement with the strengthened digital technologies content;

(c) increase teachers and kaiako confidence in teaching the new curriculum content by including them in the programmes where possible.

The programme, provided at no cost to the schools, includes transportation to and from the museum. The travel and time learning at the museum provides rich content and new experiences.

Tranzit Coachlines delivering ākongas to the Te Papa Raranga Matihiko Programme

> "*This is great, all of my kids are engaged. The free bus is a blessing. This programme creates equity and opportunity for my kids*".- Auckland kaiako

Lunches

During 2019, 4,799 lunches were provided to ākonga attending the in-museum aspect of the Raranga Matihiko programme in the Auckland and Wellington regions. While lunches sit outside our contract with the Ministry, they are an important part of our manaakitanga. As many of our ākonga are coming to us from low socioeconomic communities, we wanted to provide lunches to these ākonga to ensure they had a nutritious meal and were ready to learn.

The lunches are provided by the team at Eat My Lunch, which have Auckland and Wellington operations. Despite our best attempts, we have been unable to find sponsors in the Hawke's Bay and Northland regions to support lunches in these areas. Our sponsorship team continues to look for support for lunches in these two regions.

We are very appreciative to the Eat My Lunch team for their generous support of the programme

> "*The accessibility for low decile schools is amazing. Without this programme we wouldn't have access to the technology which has allowed not only the children, but kaiako to explore DT" – Wellington based kaiako*[1]

Programme Delivery

In 2019, we delivered Raranga Matihiko to 148 new classes across all four sites, and 100 classes who were returning for the second year building on what they had learnt in 2018.

Over the year, we delivered to a total of 6,821 ākonga, who experienced over 70,077 ākonga learning hours.

Delivery to Year 9 and 10 ākonga

In 2019 we commenced delivery of the programme to include year 9 and 10 ākonga and their kaiako. Towards the end of 2018, our team worked with an experienced Computer Science facilitator with a focus on designing the programme for secondary ākonga. We targeted our invitations to secondary schools to form groups/homerooms or subject-based classes e.g. English, History in order to reach those ākonga who may not be exposed to digital technologies. This approach would have highlighted to kaiako how the revised learning areas is not subject-specific and can be woven through the full curriculum. Despite this approach, the majority of the year 9 and 10 ākonga who attended the Raranga Matihiko programme in 2019 were classes who were already participating in digital technologies. In saying this, we have been able to support and strengthen their learning programmes and their integrated learning of digital technologies and hangarau matihiko curriculum. We recommend that the Ministry considers a communication approach to secondary schools that encourages all kaiako to engage with ways of embedding this learning within their curriculum in order to grow digital fluency.

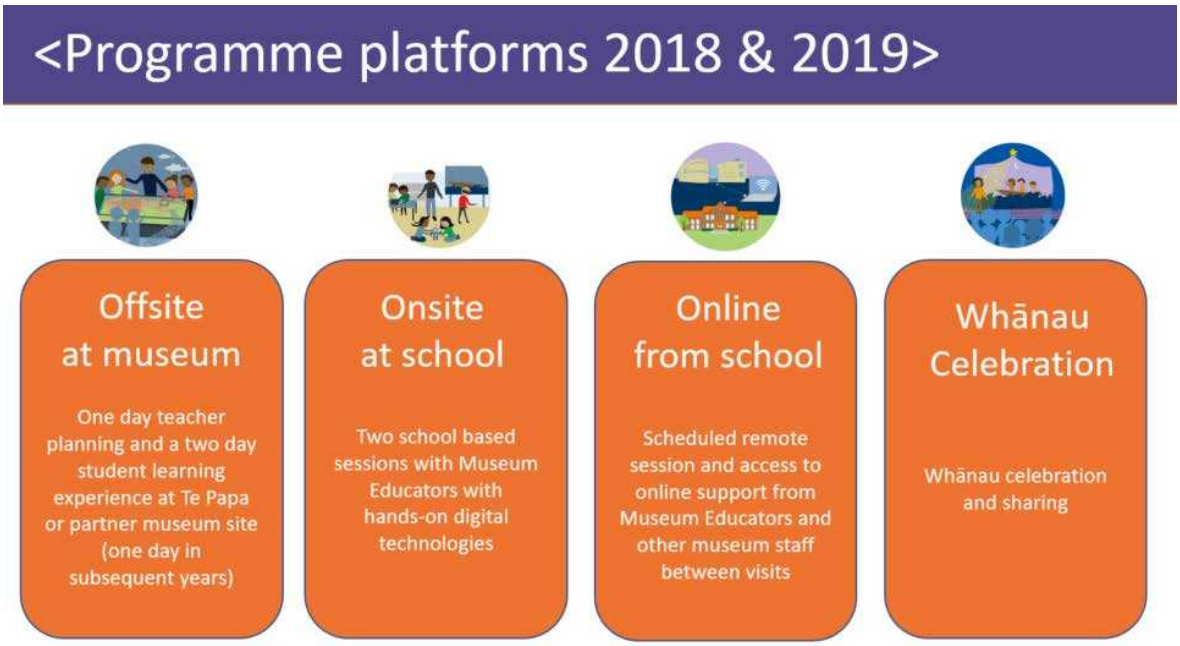
Disruption to delivery

During 2019, 15 classes needed to cancel due to staff illness, the outbreak of measles and kaiako strikes. One Hawke's Bay school was closed at the end of 2018. Due to the delivery schedule and short notice of cancellation, we were unable to fill these cancelled dates with new classes. We were able to rebook six of these classes later in the year. For the classes we were unable to rebook, we supported the kaiako with email support and sharing relevant resources. We will continue to work with these classes in 2020.

Ākonga and kaiako engaging in digital technologies.

Returning schools

In 2019, we had 100 classes who had also participated in the 2018 programme. Our facilitators noted, on the whole, the confidence and knowledge of these kaiako had grown with most building upon their learning from the first year of the programme. An example of this development is a Wellington kaiako, who was very reluctant to participate in the 2018 programme and had little knowledge of, or confidence using digital technologies. Through the kaiako only day and class participation, this kaiako had changed her approach and understood the benefit to her learners through the integration of technology into the curriculum. When the facilitators visited her on outreach in 2018, there was clear evidence of her enthusiasm in how devices were being used and in the ākonga work shown. Her continued participation in the programme in 2019 deepened her understanding of curriculum integration. When her class attended, she was confident with the language of digital technologies, and her class were also using this, showing lasting impact. Many of the ākonga that attended in 2019 Raranga Matihiko programme were not the same ākonga that attended in 2018 however the kaiako had worked with the ākonga to ensure they had the knowledge and they, and their kaiako arrived ready to extend on their learning.



Extended Outreach

As per the 2018 programme, the Extended Outreach programme was part of the overall Raranga Matihiko programme. The purpose of the Extended Outreach is to ensure delivery to the contracted number of ākonga as the contract tracks both class numbers and numbers of ākonga, which is averaged at 27 ākonga per class. While we met our class target, smaller class sizes (some classes have 10-12 ākonga) meant that we were under our target ākonga number for 2019 by approximately 340. To address this, we organised an outreach programme to work with full schools to engage and support full-school learning while ensuring delivery to students numbers.

Extended Outreach Programme.

Depending on the number of ākonga at the school, the programme is delivered over one or two days. It is facilitated in-school with classes rotating through sessions lead by our facilitators. The schools selected for Extended Outreach were schools that already had a class participate in the programme and were identified by our team as a school that would benefit from extended support.

Localised curriculum

We are continuing to see evidence of the importance of having local facilitators delivering to their regions. This localised knowledge enables our team to co-design a specialised programme for each class and is a key aspect of Raranga Matihiko. Local facilitators ensure that digital technologies and hangarau matihiko learning is connected to what ākonga are learning in class, while also relevant to their community. Recent examples include:

- Hastings Girls High from the Hawke's Bay region explored the impact of phosphate on farming and the disruption of phosphate mining on the land. Using Stop Motion Animation tools, ākonga illustrated aspects including the mining of the land, aerial top dressing and a comparative consideration of impact of mining on the Banaban peoples of Kiribati.
- Awanui School in Northland, focussed on their local whakatauki and the pioke travelling up the river to Rangunu harbour and out to the sea. Ākonga used stop motion animation, augmented and virtual reality, as well as programming robots to show the journey of the pioke.
- Rangikura ākonga in Wellington learnt about Awarua, the Porirua Taniwha, using stop motion animation to create digital stories about the Taniwha and 3D design to build a waharoa into Porirua Harbour.

Ākonga Created 3D Waharoa entrance to Porirua Habour

Screenshot image of a ākonga created Virtual Reality scene of the River of the pioke journey

Wellington Region Update – Delivered from Te Papa Tongarewa

It has been a full and incredibly rewarding second year of the Raranga Matihiko programme at Te Papa. The team delivered to 68 classes, 17 of these being Kura Māori and reo Māori immersion classes. The beginning of the year saw a new facilitator join the RM team, more professional learning at the team hui and lots of new and return kaiako to the programme. The team report it has been a privilege to work with so many wonderful tamariki from the wider Wellington region and also to be able to work in so many different and incredible classrooms.

The second year of Raranga Matihiko has enabled the Te Papa facilitators to continue to grow capabilities within schools. Technology Online will feature the ākonga work form Naenae Intermediate where the ākonga designed and created a new community centre in response to the closure of their local pool**.**

Throughout the year, the Wellington Raranga Matihiko team have had requests for additional support and where possible, the team were able to accommodate these. This included working directly with leadership teams, staff and kaiako as well as facilitating three Raranga Matihiko PLD days. During Term 4 Chris Arcus, the contract manager from the Ministry of Education and one of his colleagues attended the kaiako workshop day for kaiako participating in the Raranga Matihiko programme, learning alongside the Raranga Matihiko kaiako. The kaiako appreciated the Ministry presence and the Wellington Raranga Matihiko team enjoyed being able to talk about their work.

The Wellington Raranga Matihiko team presented at uLearn19, sharing their learning, experience, knowledge, and skills with kaiako who don't have access to Raranga Matihiko in their area.

All of the workshop was amazing, I can't wait to try combining apps and getting the children to work on their mihi digitally"

Feedback from a Wellington Kaiako following a Kaiako Learning Day

Northland Region Update– Delivered from the Waitangi Treaty Grounds and Museum

Ākonga and kaiako from classes who had taken part in the Raranga Matihiko at the Waitangi Treaty Grounds have spread their excitement not just through their schools, but also with their peers from other local schools, so the Waitangi team has been very busy all year and are already fully booked into the beginning of Term 2 2020. It has been very reassuring to see the increased confidence in ākonga and their kaiako for classes who have returned for the second year, with some kaiako even stepping up into curriculum leadership roles in 2019.

As in 2018, the programme for schools in the first year with Raranga Matihiko has focused heavily on Designing and Developing Digital Outcomes, with many collaborative projects created in Virtual Reality worlds. The second year of the programme concentrates on Computational Thinking; building on the DDDO skills ākonga and kaiako developed in 2018, ākonga coded Scratch projects to share the learning about their inquiry topics, using their own backgrounds and their own 'sprites'.

Unplugged Activity at Waitangi

One of the highlights for this year has been the Waitangi Raranga Matihiko exhibition which Waitangi facilitator Kerry Leaf curated with the support of the Waitangi Museum Curatorial Manager. They were very proud of the quality of work ākonga created, and there were many visitors to this exhibition including HRH, the Duchess of Cornwall, who also observed ākonga from Ahipara School in action in the Waitangi learning classroom.

The team have built strong relationships with local Manaiakalani clusters (Kaikohekohe and Te Hiku), and once a term, support the local facilitator with her work with kaiako (Digital Fluency Intensive). In preparation for the implementation of the new DT HM curriculum content from 2020, the team co-facilitated a Leadership day during November, which was very well received by the attending principals. After discussion with the principals and the cluster convenors, it was agreed that it would be most beneficial for the schools to work together in 2020, thereby avoiding double-up, overlap and confusion of leaders and kaiako. This additional work with Manaiakalani clusters will start at their January cluster ToDs. The Waitangi team intend to build a similar relationship with a different cluster of schools based in Whangarei.

> *"Excitement in my class is growing as we anticipate our class participation in Raranga Matihiko. As part of the Ministry of Education Digital Technologies for All Equity fund, the programme delivers a range of innovative technologies, as well as allowing our class to access the Waitangi Treaty grounds and Museum, as part of our ākonga' learning about their local history and heritage."*
>
> - Deputy Principal from Northland

Hawke's Bay Region Update – Delivered from MTG Museum

2019 has been another amazing year delivering the Raranga Matihiko digital programme. Each term has been full of new and returning classes either at the beginning of their digital journey or looking to extend their digital expertise even further. The team were able to make visits possible for four Wairoa classes by organising overnight accommodation at the National Aquarium as well as organising food. Details of this are provided later in the report.

One of the schools that the team worked with in 2019 was Richmond School and their story is now featured on Technology Online.

Ākonga creating digital stories at MTG Hawke's Bay.

The MTG Hawke's Bay team note that the great part of delivering Raranga Matihiko is the excitement from the ākonga and the kaiako as they realise their own digital potential. It's even more pleasing when the facilitators hear about the impact that Raranga Matihiko has had back at the schools. One school, in particular, Otane school, a small semi-rural school down in Central Hawke's Bay, took part in the programme earlier this year.

Below is the feedback from Tracey Turfery, Kaiako at Otane School:

"Otane senior school, approximately 30 tamariki, attended the Raranga Matihiko in term 3. The tamariki and adults were engaged for the entire time. Steve and Tash were well received by our ākonga and as a result, we came away with a kete full of resources and practical applications, that the tamariki still use.

On the follow-up session we were able to share what we had learned and extend our skills once again.

Feedback from our tamariki has been positive. Every child clearly articulated their satisfaction with learning a new game, being introduced to the broad meaning for an algorithm and how that knowledge relates to our digital curriculum. They are using and extending upon all that they were introduced to daily.

Our ākonga have continued to create animations to share what they have learned at school. They create images using the ipads. We play lightbot and think about the coding required and the algorithms. This integrates well with our coding on Scratch. Our tamariki are creating as opposed to consuming.

We attended the robotics event in Napier and once again our tamariki were in their element using their knowledge and sharing it with other ākonga.

Our digital journey began with the visit to Steve and Tash and as a result we have immersed ourselves into the digital technologies with confidence.

Kia ora Steve and Tash mo o korua tautoko ki a matou."

Ngaa mihi, Whaea Trace

Auckland Region Update – Delivered from Auckland museum

Year two of the Raranga Matihiko Programme in Auckland has seen successful engagement with 22 Kura kaupapa, wharekura and rumaki reo classes and 37 mainstream classes. A total of 16,473 learning hours were delivered and a total of 2337 lunches, donated by Eat My Lunch, were eaten by ākonga attending!

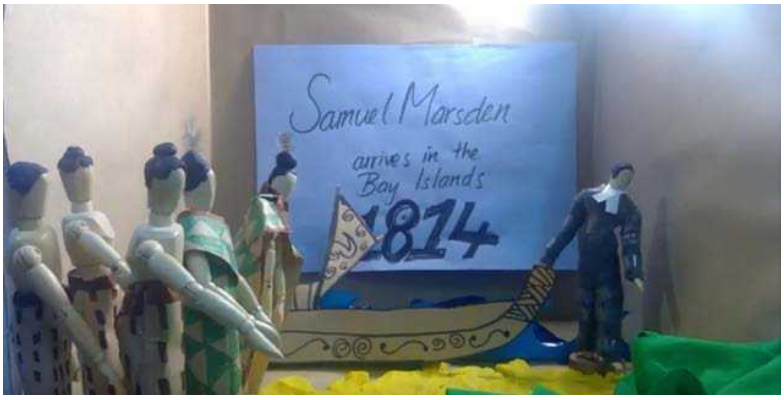
Ākonga utilised digital technologies to share their learning of a diverse range of topics such as infectious diseases, our oceans, space and materials technology.

Kaiako Professional Development days introduced kaiako to a range of technologies and encouraged conversation around how to blend digital into a daily class programme. Year two kaiako and ākonga of the programme were able to explore how to connect to the revised curriculum.

Ko te amorangi ki mua ko te hāpai o ki muri. Kua rua tau tēnei kaupapa e haere ake ana ki Tamaki Paenga Hira, tokomaha ngā Kura Kaupapa Māori kua hono mai ki tēnei hōtaka o te Raranga Matihiko. Kua puta hoki tēnei peka o Tāmaki ki ngā awa o Waikato o Kawhia moana, te hāpai ake nei i ngā kaiako ki te tutuki i te marau o te hangarau matihiko. He nui ngā tini kaupapa kua whai wāhi ki roto ki a mātau o te whānau matihiko ki Tamaki Paenga Hira.

> *"We're just so fortunate and thankful for you team and organisers to have been able to give our tamariki the opportunity to experience and extend what some are naturally doing already.*
>
> *I'm sure I speak on all our behalf when I say "Na matou te whakahonore, The honour has been ours.*
>
> Mauri Tau, Mauri Ora" - from an Auckland kaiako

Ākonga creating at Auckland Museum



Screen shot of ākonga Stop Motion Animation

Māori Medium Settings

Delivery to ākonga in Māori medium settings is a priority of the programme. In 2019, we delivered to 43 Kura across all four sites and 70 Māori medium settings including Kura, bilingual and reo Māori immersion classes. The time we spent building relationships and working closely with Kura Māori has enabled us to develop our work with Kura and deliver beyond our minimum contractual requirements. We are looking to further expand this in 2020.

When and wherever possible, and in relation to the classes' inquiry foci, taonga Māori and the concept of mana taonga as taonga tukui iho – alongside te reo rangatira were utilised. A tirohanga Māori approach was applied when suitable.

We developed several resources designed specifically for Kura kaiako and ākonga. These resources included a guide to Ngā Whakatupuranga as well as some how-to videos in reo Māori.

Our team of Māori Medium facilitators, at least one per region, are committed in their work. They work to support ākonga in Māori Medium schools as well as Māori learners in English Medium settings.

In 2020, with the change of focus in outreach visits moving to support Tumaki and Kura leaders, we will be engaging directly with senior leaders and whānau at each of the Kura we work with. We have on our Wellington team, a experienced Deputy Principal, Leslie Hoerara, who will be working with each of the Māori Medium facilitators in each region to deliver this work.

Created by ākonga from Te Kura Kaupapa Māori o Te Ara Rima in Hamilton.

Ko te kaupapa matua mō tēnei kura "Ka ora te reo i ahau", I au e wānanga ana ki te taha i tēnei kaiako mō tōnā kaupapa whāiti ka puta te hiahia i a ia kia aro nui ki te reo Māori. Nā reira i whakaritea kia aro ki ngā piki me ngā heke o te reo Māori, kātahi te whakaaro ataahua i te mea ko te wiki o te reo Māori tēnei karawhiua.!

The video can be viewed at: http://bit.ly/2uU2NVb

The Raranga Matihiko Team

Our experienced team of facilitators are located across our four delivery regions. Each region has two full-time facilitators who are both skilled in digital technologies and hangarau matihiko and project-based learning. Each region has at least one Māori medium facilitator to support the delivery of the programme to both Kura learners and Māori learners in mainstream settings.

Co-facilitation is a key element of the Raranga Matihiko programme. Both facilitators are active in the programme design and delivery, and work in partnership with each other to maximise the group learning experience. This ensures the needs of each class are met and that each learner has the opportunity to engage meaningfully with the facilitators.

The Raranga Matihiko programme is led by Project Director Tara Fagan and assisted by the national coordinator, Helena Botes. Both Tara and Helena are based in Te Papa with Tara travelling to each site regularly to offer support as well as quality assurance and training. The overall project has the support of the wider Te Papa team including Head of Learning Pam Streeter and the then Director of Audience and Insights and now Tumu Whakarae | Chief Executive – Courtney Johnston.

The Raranga Matihiko team meet face-to-face once per year with a focus on training, planning and development and meet virtually every week. The 2019 face-to-face hui was held in Waitangi. Guest speakers included Mark Grams, from the Ministry of Education, leading the team through progress outcomes and Dr Melanie Riwai-Couch, from Evaluation Associates, outlining the evaluation from 2018 and the approach for 2019. In addition to the guest speakers, the team strengthened understandings of the programme and ways of working with years 9 and 10 ākonga and digital technologies.

The weekly virtual hui are also a time for professional learning for the team and in 2019, this included a focus on evaluation, facilitator professional inquiry, working with secondary ākonga and developing resources based on the needs of the kaiako we work with.

The Raranga Matihiko team at January 2020 Team hui.

Kaiako Professional Learning

A strong part of the programme is to support kaiako understanding of the revised technology and hangarau curriculum content with the emphasis being on digital technologies and hangarau matihiko. All kaiako have the opportunity to participate in a kaiako-only day where they engage with the curriculum content, strengthen understandings of progress outcomes and explore the digital technologies that their ākonga will be using in the programme. Kaiako release costs are funded for kaiako who are participating in the programme for the first time, and we are finding that returning kaiako are requesting to attend these days in their second year as well and at their own cost, as they deepen their learning.

A key aspect of the programme is that kaiako, ākonga and whānau learn together. This is proving particularly powerful as the entire class shares the knowledge. Kaiako report they can see the technology capabilities of their ākonga grow and how digital technologies and hangarau matihiko can be woven through the everyday curriculum. In addition to our kaiako only days, we refer kaiako to other Ministry support programmes such as Kia Takatū and Tahi Rua Toru Tech.

Email received from a Northland kaiako. Ākonga work can be viewed at: http://bit.ly/37nfipZ

"I am Annette Wynyard kaiako of Year 9M Social Studies Class and was fortunate enough to come across the Raranga Matihiko program being run through the Waitangi Treaty Grounds Education Centre. I quickly realized what a great opportunity this would be for my 25 ākongas and their digital journey, and so I came back to college and talked to our other two Year 9 SST class kaiako Olivia George and Muritere Apiata to see if they would be interested in trying to get onto the program as well with their Year 9 classes 9R and 9T.

When we all agreed to try, I contacted Tara Fagan at Te Papa in Wellington and fortunately she agreed to our wishes which meant all 75 of our Year 9 ākongas would take this learning opportunity and journey together.

I took my class for their first two days in Waitangi where we laid our thoughts and foundations of what we could create using the digital tools, applications and technologies before coming back to college to carry on with our vision that was connected to what they are learning in SST that is Kiwi Culture. Pretty ground breaking stuff I must say working with Virtual Reality and 3D tools.

This Tuesday just gone Monika Kern, Kerry Leaf and Tara (who flew up from Wellington) came and spent the whole day at college helping my ākonga put their story together. Wow, is one word that quickly comes to mind. We have created a virtual 9M House of Learning which places all of my ākongas inside the house/whare with a carved 3D poupou/post plus their pepeha/connecting story to the land. What experts Monika and Kerry are, they are truly amazing.

All ākonga have received their own short video clip from Kerry and they will use them for Blog Posts to share what they have learnt and created. I would like to put together (with Kerry & Monika's help) a 3 minute video of what they have competed and enter it into the Digital Festival competition here in Northland and who knows it might be good enough to take to the Auckland Manaiakalani Festival.

So this is my short feedback to you the Ministry with our heartfelt thanks for this wonderful opportunity.

Nga mihi nui "

Resource development

The foundations of the Raranga Matihiko programme builds on weaving digital technologies and hangarau matihiko through the existing class curriculum. For this reason, our facilitators work with each classroom kaiako to design a bespoke programme.

This approach continues with the development of resources. Our team identifies what kaiako and ākonga need, and then we develop resources to support their learning. This approach enables us to be responsive to the needs of both ākonga and kaiako.

In 2019, the Raranga Matihiko website was launched. This website contains examples of ākonga work, kaiako resources and news and updates.

Resources on the site include:

- Case study exemplars highlighting how to weave digital technology learning through the class curriculum
- How-to use videos and information sheets in both reo Māori and English
- Reo Māori and English information guides on how the progress outcomes might already be occurring in the classroom and ideas for extensions.

Our Decoded for Learners series, which breaks the progress outcomes into ākonga-friendly language, have been the most popular resource. The decoded for learners tool has been designed as a guide for learners to the language and concepts used in Computational Thinking and Designing and Developing Digital Outcomes. While it breaks the progress outcome into several statements, it is **not** designed to be a checklist to work through, **nor** is it a replacement of the technology curriculum progress outcomes for Computational Thinking or Designing and Developing Digital Outcomes. This resource was developed and tested by our team over several months with a draft version shared with delegates at the uLearn19 conference. The final version was then graphically illustrated. We appreciate the Ministry of Education support and advice, and that of Professor Tim Bell, in their checking of this resource.

The Raranga Matihiko team all presented at uLearn19, with all eight sessions well attended by the uLearn delegates. Through the team's presentations, there were opportunities to share resources and ideas with kaiako from outside the four regions.

In addition to the resource development we undertook, we worked with the Ministry of Education on two key pieces – sharing the Ohaeawai school exemplar and the illustrations; and provided some content and feedback on the Implementation Support Tool. We look forward to continuing to provide this support in 2020.

"Have to say a huge thanks for the work you are doing. I have referred a few of my schools to your website and they are loving the pdf explanation of the DT outcomes. Great document! So succinct and easy for our kaiako to connect with. Thank you!"

Message from a South Island based PLD facilitator.

Highlights from the 2019 Raranga Matihiko programme

Support for Wairoa Schools and Kura

With the organisation of the MTG Hawke's Bay team and the support of the Napier City Council and the National Aquarium, we were able to enrich the programme by providing new and additional experiences. One year 7/8 class and one year 9 class from Wairoa College, and two classes from TKKM Wairoa each participated in the programme during the year. Travel distances meant that travelling to and from the museum in one day was not ideal.

Additionally, many ākonga had not visited Napier before, and because of this, the MTG Hawke's Bay team worked with the community to enable the school to have a broader experience. The ākonga spent the night in Napier with the National Aquarium providing their space for overnight accommodation. Ākonga, kaiako, whānau helpers and our facilitators all spent the night at the Aquarium. In addition to the Raranga Matihiko programme, the class had the opportunity during the late afternoon and evening to swim in the nearby pool, visit Marine Parade as well as have an education visit through the aquarium. Our facilitators cooked the evening meal for the ākonga and their whānau - a bbq on the beach. It was quite a logistical effort for our team, which included moving ākonga, bags and sleeping gear from the museum to the aquarium; however, the responses from the ākonga and whānau made it worthwhile.

Some photos of the class visit from TKKM o Wairoa are below:

Raranga Matihiko Ākonga exhibition

An exhibition of the Raranga Matihiko programme was held at the Waitangi Treaty Grounds and Museum in November 2019. This exhibition was co-curated by Kerry Leaf, a Waitangi Raranga Matihiko facilitator and included ākonga work from all four Raranga Matihiko. Works displayed included print, 3D, virtual and video formats as well as explanations about the programme. A special opening event saw local Northland ākonga and their whānau attend the exhibition to see their work displayed before being open to the public to attend.

Having ākonga work displayed in a museum exhibition is quite significant, and we have been proud of the museum support to be able to do this.

A video of the exhibition can be viewed at: http://bit.ly/2VaDngs

Ākonga and whānau viewing ākonga work..

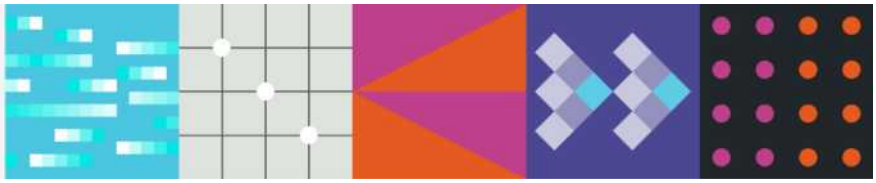
3D carved and printed Pou

Royal visit to the Raranga Matihiko programme

As part of the New Zealand tour, the Prince of Wales and Duchess of Cornwall visited the Waitangi Treaty Grounds. As the Duchess has a special interest in education, she visited the Raranga Matihiko programme on the grounds. Hosted by Monika Kern, the Education Manager at the Treaty Grounds, the Duchess observed the programme in action and met with the Year 5/6 ākonga from Ahipara School. Her Royal Highness also visited the Raranga Matihiko exhibition in the museum and talked with Bryson, an ākonga who had work exhibited. While this visit didn't attract any New Zealand media coverage, the visit did feature in several overseas publications, two links, which are still live, are below.

https://royallifemagazine.co.uk/the-prince-of-wales-and-the-duchess-of-cornwall-visit-new-zealand-day-3/

https://www.dailymail.co.uk/news/article-7705055/Prince-Charles-Camilla-pay-visit-New-Zealand-honour-victims-Christchurch-massacre.html



Highlights from evaluation

Evaluation is a fundamental part of the Raranga Matihiko programme. Dr Melanie Riwai-Couch, Evaluation Associates, is the lead evaluator on the project. Dr Riwai-Couch has worked with the Raranga Matihiko team to design a participatory, formative evaluation to ensure the evaluation helps build an understanding of current effectiveness and to identify ways to strengthen programme design and performance.

The evaluation process is designed to be nimble and responsive, which aligns with the programme structure. All four sites have now had case-studies completed as well as overall programme evaluation and these have all been shared with the Ministry. The full evaluation report will be shared with the Ministry at the end of February 2020.

The impact of the Raranga Matihiko programme is wide-reaching. Some of the effects are below:

Benefits for Ākonga

The programme offers ākonga rich opportunity for curriculum learning, as well as social benefits such as exposure to different adults and facilitation styles, exposure to Te Reo Māori, access to creating with digital technologies and exploring new places and knowledge systems.

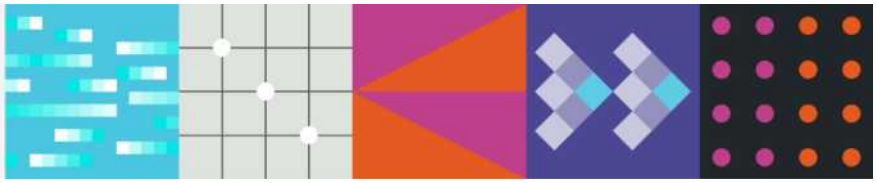
Opportunity for ākonga to try digital technologies that aren't used at home.

Access to digital technologies is limited for many ākonga we work with, and where ākonga have access, the focus on use tends to be one of consumption rather than creation. Furthermore, where there are devices, access to the internet is often reliant on free wifi from public space or eating places.[1] Learning about creating with digital technologies in "such a rich learning space of cultural significance" is of high value to learners.[2]

Farjad, an Auckland based ākonga, reflected that the Raranga Matihiko programme brought technology into people's lives and this was important for kids like him as "*in my family, doing stuff like that was hardly ever done and it was a new experience*"[3]. Farjad expanded to say "*The future of technology is growing rapidly…learning how to use it prepares us*"[4]

An Auckland kaiako noted how the Raranga Matihiko programme provides opportunities for ākonga to use devices as the school has very little equipment and while she complemented the programme with unplugged activities, the opportunity to use devices was of huge benefit to her ākonga.[5] Another ākonga reflected on being able to use Stop Motion Animation to create a story about Maui, which she enjoyed, especially as she doesn't have the opportunity to use the one digital device at her home.[6]

A Wellington Principal said "*The accessibility for low decile schools is amazing. Without this programme we wouldn't have access to the technology*"[7].



Taking a leadership role through being an ambassadors back at school.

Each class that attends the programme is encouraged to share the learning with others in the school. This is, in part, because the programme generally only works with one class per English Medium school (compared with all classes from Kura). It is also to empower ākonga to be leaders in their learning. Since the project commenced, some ākonga have lead workshops for kaiako after school, shared at assembly or worked in other classes on a weekly basis.

A Deputy Principal from Auckland reflects on the impact of this leadership noting the leadership roles that her ākonga took upon returning to the school, sharing their knowledge as well as using specific language related to digital technologies.[8]

A ākonga perspective of being an ambassador is capture by Tysarna, a Year 6 ākonga from Hawke's Bay described how she liked teaching younger ākonga back at school about how to use the technologies "*It felt good you learning something then you take your learning skills to someone else*"[9] Tysarna's kaiako talk about seeing her ākonga lead workshops for the who school based on their learning from the Raranga Matihiko programme and the pride both she and her class had in being able to do this.[10]

Exposure to new careers and possibilities.

Many kaiako are noting that through the programme ākonga become aware of new or different vocational pathways. This not only includes pathways in the computer science field, it includes new opportunities in the museum and service industries. While we are not able to track the impact of this for the ākonga, it is interesting that this is becoming recurring feedback and a side benefit of the programme[11]. Shylo, a Northland ākonga, said that "*working with digital technologies made him want to learn more things about robotics*[12][13]". A year 4 Northland ākonga said he "*loves digital technology because it will help him become a master carver*".[14]

Exposure to the Museum as a place of knowledge and new experiences

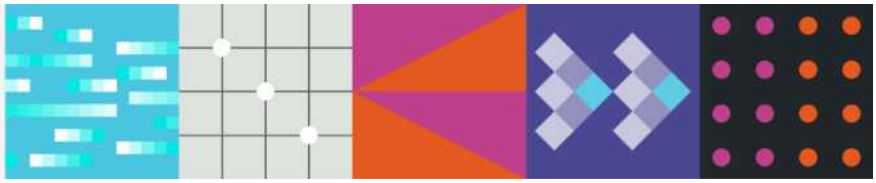
For many ākonga taking part in the Raranga Matihiko programme, the visit to the museum is often their first.

Kim, the Deputy Principal of Avondale Primary School noted the importance of the opportunity for her ākonga. "*People might think those are normal parts of a day but for them, it was pretty special*"[15]. This feeling is reiterated by Dess, a kaiako at Irongate School in the Hawke's Bay who notes "*For them, [the ākonga], going into an actual museum…they don't get the chance to visit those places. They can connect.*" The exposure to the museum enabled learners to make connections between past, present, and future[16]

An email from a kaiako states *"my kids hardly come out to the museum, so being in the environment of the museum is an experience in itself. Thank you a million for catering towards our needs."*

The importance of connecting with the local museum was noted by a kaiako who attended the Raranga Matihiko programme in the Hawke's Bay noted *"Getting our kids out and about and aware of the museum and its resources - life experience! Also access to the digital new technology/apps. Also having a connection between school and the MTG [Museum] - relationship building and the kids feel they belong there*"[17]

The regional museums are reporting that ākonga return to the museum with their families at the weekend, with ākonga sharing their knowledge and experiences of the museum with their whānau.



Opportunity for ākonga to 'shine'

When used well, digital technologies can be an enabler. Often ākonga who might not enjoy success in school or may not engage fully with the curriculum can shine when involved in the Raranga Matihiko programme. One Auckland ākonga reflected that he learnt to be careful and take small steps when using digital technologies rather than do things in big jumps[18]. Another Auckland ākonga reflected that because she wanted to be successful in programming the robots, she needed to listen to the instructions to she could programme the robot[19]. In Wellington, a kaiako noted that the programme could "*give ākonga a chance to shine in ways that aren't 'traditional skills. I had a highly dyslexic ākonga and an ESOL learner who shined during the session about binary. This was positive for their self-esteem*".[20]

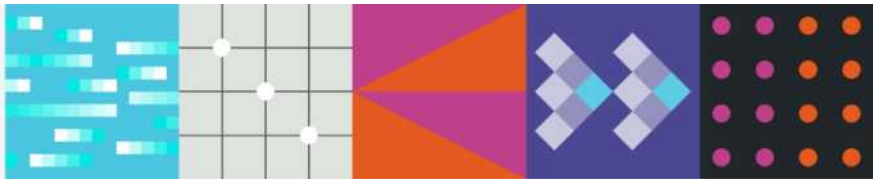
Keana, a year 7 ākonga from Wellington appreciated that she was able to manage her own learning and the programme didn't require her to have to just listen and follow instructions by the kaiako. She felt better at her learning so when she was finished she could help other ākonga with their work too.[21]

Opportunity to connect to culture and mana

The integration of digital technologies in the museum context provides the opportunity for ākonga to engage with culture, taonga and learn more about themselves.

A Hawke's Bay kaiako reflects "*It's our kids' mana. They need to identify who they are and they can see in this experience who they are in a meaningful way … who they are matters …. It uplifts the mana of the child when they feel valued*"[22]

A Northland kaiako reflects *"As well as developing digital tech skills it gives ākonga an opportunity to base their learning around their culture, whakapapa, history of Maori and to see themselves at the heart of their learning"*[23]



Benefits for Kaiako

Strengthens understandings of hangarau matihiko/digital technologies curriculum content

Kaiako are reporting that they have a greater understanding of the revised technology and hangarau learning areas as well as the language and terms that are involved. The confidence to give things a go is a key aspect in understanding the changes.[24][25]

An example of this is Nicola, a Northland kaiako, who had developed a model for her class based on computational thinking so that when ākonga are trying to solve problems or identify next steps, a flow chart helps guide them through so they can work more independently[26].

Further kaiako examples of this include:

> *"They demonstrated how easy it was to integrate digital technology across the curriculum"*[27]
>
> *"Making links to the digital curriculum, practical takeaway skills and ideas that can be used in the classroom straight away, and having access to relevant technologies that's not yet available in schools"*[28]
>
> *"Personally as a kaiako, you guys have given me so much guidance and support to the point where now I believe that in my teaching and in my class we will probably be streams ahead in terms of digital tech."*[29]

A Wellington Principal noted that not only did the programme enable children access to digital technologies but that it enabled "*the kaiako to explore DT, allowing feedback of this information to staff to allow for further development in our school*"[30]

The reach of the work of Raranga Matihiko goes beyond the schools we are working with. The website and resources such as the Decoded for Learners series are available for kaiako across the country.

Understanding of how to integrate and weave digital technologies through the curriculum

As each programme is bespoke and designed to the needs of each class, digital technologies are not taught in isolation; rather they are woven through the programme and linked to the curriculum[31]. The co-design aspect of the programme includes kaiako in the design of the programme, enabling them to strengthen understanding of how digital technologies can be incorporated across subjects. A kaiako from Auckland noted:

> *"I can see the curriculum in action. Also the appreciation of embedding Te Reo throughout the learning process and planning"*[32]
>
> *"It helps kaiako see what they can do to engage ākonga"*[33]
>
> **Another Auckland kaiako recognised well-designed curriculum integration can be "**transferable to any kaupapa we have"[34] and Wellington kaiako wrote "*It made me more aware of what types of technology is needed for ākonga in Year 6 and 7 and what type of experience we need to provide as an educator.*"[35]

Understandings of learner agency

Kaiako strengthened their understandings of learner agency and providing ākonga with choice[36]. Sabrina, a kaiako from Northland noted,

> *"For inquiry…it clearly showed me that kids can come up with that, with the right tools they can do this themselves. With more opportunities kids can decided on that without the kaiako driving it all…it should be ākonga-driven. It was PD to show me now to give kids opportunities and set out the tools and let them come up with what they want to do. It really showed how that you need to be less controlling of how things run"*[37]

A kaiako from the Hawke's Bay now believes that most of her ākonga are able to lead their own learning using computational thinking skills[38]. A Northland kaiako notes that "ākonga [are] exploring more options with the tools provided and coming up with more ways to present their work" as they have more agency of their learning.[39]

Learning from others

As part of the Raranga Matihiko programme, kaiako are observing different approaches to teaching and learning. This includes exposure to different strategies and facilitation techniques, digital technologies integration and planning/co-design of programmes.

Nicola, a kaiako from Northland, uses digital technologies to explore Māori concepts and artwork based on the same strategies that she observed in the programme[40]. Two Wellington based kaiako, who were establishing a Modern Learning Environment, commented on the learning that they both gained from watching co-facilitation in action[41].

Across all four sites, kaiako commented on the way in which Reo Māori was integrated throughout the programme. An Auckland kaiako commented on her "appreciation of embedding Te Reo throughout the learning process and planning"[42]

Opportunity to observe their ākonga in a new setting and with new facilitators

Kaiako have the opportunity to observe their ākonga in a new setting and this can lead them to see ākonga's abilities in a new light. Ākonga known for regularly being off-task are often those most focussed and creative in their work and the quickest to teach someone else.[43][44]

Kaiako become aware that ākonga are more capable with digital technology use than they had previously thought and note that they need to raise their expectations of ākonga's ability.

Purchasing/Using digital technologies

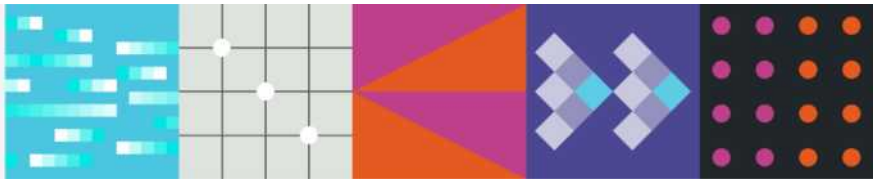
The programme provided kaiako with the opportunity to explore a range of digital technologies before purchasing.[45] [46] Most of the apps used in the Raranga Matihiko programme are web-based and free so rather than purchase a range of paid apps, kaiako have awareness of what they can access. We have found that when kaiako do have money to purchase equipment, they make contact with the facilitators to get advice and in-part this is due to unbiased opinion from the facilitators[47]. Matariki, a Hawke's Bay kaiako, regularly returns to the facilitators to get recommendations for different technologies and resources for her curriculum.[48]

In addition to the purchasing of new equipment, it is about maximising the equipment that a school has. One Auckland base ākonga reflected on how the class now knows how to use the green screen for movie making. She noted that they have one in their class, however, no-one used it[49]. Now they know, they can use it regularly.

Kaiako planning day – exploring the tools and linking to the progress outcomes

Benefits for Whānau

Whānau helpers who attend the Raranga Matihiko programme with the class are also benefitting from the programme. All who attend the Raranga Matihiko programme are to be active in their learning and so whānau support ākonga and learn at the same time. Not only do whānau understand more about creating with digital technologies, they are strengthening their understandings of how digital technologies expertise will help ākonga with future career pathways.[50] There have been several examples where whānau have taken this learning back and used it to capture digital stories from elders, connect networks and families and one group from the Hawke's Bay are approaching iwi for funding to build some Reo Māori apps specifically for their learners.



Recommendations from Evaluation

There have been several recommendations from the evaluation and feedback from kaiako, ākonga and whānau. These are detailed below, along with refinements undertaken by the team.

Extend the programme

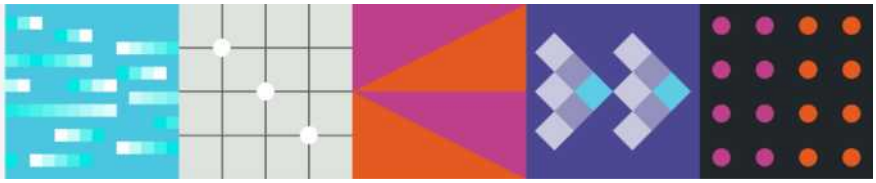
Each of the four case studies provided feedback from ākonga and kaiako that the programme could be longer to enable all ākonga to spend more time in the museum as well as with the digital technologies learning. This is not possible under the current contract however our facilitation team continue to refine efficiencies so ākonga and kaiako get the most out of their visit whether it be two days in the first year of the programme, or one day in subsequent years.

Ensure everyone has the opportunity to use all the equipment

Ākonga, kaiako and whānau noted that due to timing not all ākonga received a turn on all the equipment. These comments refer mainly to the virtual reality tools which generally involve one-two children at a time. Our team has reviewed processes to ensure that if used, all ākonga will receive a turn and not miss out due to timing e.g such as bus arriving to pick them up or the need for the class to come together for a briefing. It is positive to see that ākonga are wanting to engage with all the tools that they can during the experience and we are confident that this will happen in 2020.

Maximising time

The final key recommendation is to ensure that the time we have with the ākonga and kaiako is maximised. Maximising time refers to a balance between introductions as ākonga arrive, which is important to our team, although we need to be mindful that ākonga know each other so need to minimise time with mihi. Additionally, one museum spent time on digital technologies vocabulary before the ākonga engaged with technology. The evaluation found that, as with the other museums, this rhetoric could be successfully integrated as the ākonga used the technologies. The facilitators have adjusted their programme accordingly.



Looking forward to 2020

In 2020, the Raranga Matihiko programme moves into its third and final year of operation under the Digital Technologies for All Equity Fund. Our team continues to look for ways to enhance and extend the learning from the programme.

Our key components of the programme will continue with ākonga, kaiako and whānau learning together in the museum. This year will involve more returning classes to the programme, with each having one day in the museum. As per the trend in 2019, we expect to observe kaiako, who have had the benefit of two prior years in the programme, continue to return with increased confidence, abilities and integration of digital technologies in the classroom.

We are responsive to feedback as we want this to have as strong an impact as possible for all involved. Therefore, with the Ministry's agreement, we have made some alterations to our programme based on evaluation and feedback from schools, detailed below.

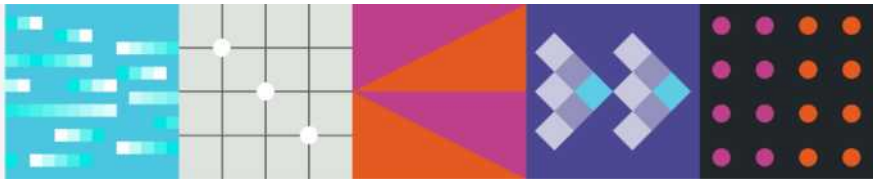
Leadership Support

Our 2018 and 2019 delivery included an onsite visit to the schools to maintain continuity of learning for the ākonga. However, noting the evaluation recommendations to consider how school leaders could be more involved, we have shifted the four hours of outreach visits from ākonga learning to working with the leadership team. Our experienced team of facilitators will work with school leaders and the wider school team, using the change implementation framework, while not detracting too much from the intent of the existing Raranga Matihiko programme. We piloted this approach in late-term 4, 2019, and in January 2020 with school leadership teams. We will facilitate termly leadership hubs per region both for Māori Medium and English Medium. Each hub will focus on the key aspects from the change implementation tool and support Principals, and their senior leaders, to incorporate the revised Hangarau/Technology learning areas into their strategic plan. We believe that this will support the full school in the implementation of these learning areas.

Extending Reach

Recognising that our immediate reach is within the four areas that we deliver too, we will continue to seek opportunities to share our stories of curriculum integration. We will do this through developing more exemplars, presentations and articles to ensure reach through our resource development and website.

In addition, we have undertaken to facilitate five condensed Raranga Matihiko programmes to 10 classes in Otago, Gisborne, Rotorua, New Plymouth and Palmerston North. This condensed programme will work with kaiako from up to ten different schools. As we know that a key aspect of this programme is ākonga, kaiako and whānau learning together, each kaiako will bring three ākonga with them (with whānau invited), and all will engage in a two-day programme delivered by our team and located in the regional museum.



Waikato Museum

In 2020, we are delighted to be working with Waikato Museum to deliver the programme to ākonga in the Waikato region. The team at Waikato Museum are enthusiastic about having this programme for their learners, and we are already booking in schools to commence delivery at the end of term one. The Waikato team attended the full Raranga Matihiko team hui in January and have begun a training programme to support the delivery to this region.

This shift of delivery locations has arisen as Auckland War Memorial Museum withdrew from the third year of the programme due to major renovations at the museum that left no separate space for learning programmes. Our team will continue to support Auckland schools through working with school leaders, facilitating two face-to-face leadership hubs, and two online hubs.

We look forward to sharing stories from the Waikato region with the Ministry throughout 2020.

Integration of curriculum and support for all learners

As we move into 2020, we will continue our work on curriculum integration. The focus of this contract is on digital technologies and hangarau matihiko work. However, as this report, and evaluation shows, we connect and weave through local curriculum and history. With history entering the curriculum from 2022, we will highlight how schools are incorporating this into their programme while weaving through digital technologies learning. We expect to publish, via our website, a series of exemplars to demonstrate this.

We will have 196 classes returning to the programme for their second or third year and 113 classes entering the programme for the first time. As we continue to work with ākonga, we know too, that continued strengthening of kaiako capability will occur. Our Museums, and our team of Raranga Matihiko Facilitators, look forward to continuing to support ākonga, kaiako and whānau learning.

E kore e taea e te whenu kotahi ki te raranga i te whāriki

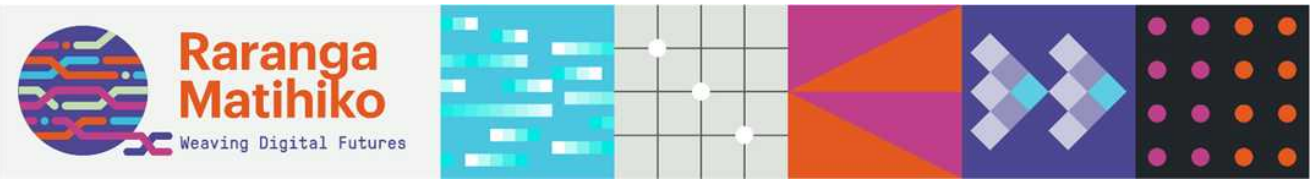
kia mōhio tātou ki ā tātou.

Mā te mahi tahi ō ngā whenu,

mā te mahi tahi ō ngā kairaranga,

ka oti tēnei whāriki.

[1] Te Papa Case Study, p.26
[2] Te Papa Case Study, p. 26
[3] Auckland Museum Case Study, p. 14
[4] Auckland Museum Case Study, p. 15.
[5] Auckland Museum Case Study, p. 17
[6] MTG Hawke's Bay Case Study, p. 15
[7] Te Papa Case Study, p. 16
[8] Auckland Museum Case Study, p. 16
[9] MTG Hawke's Bay Case Study, p.18
[10] MTG Hawke's Bay Case Study, p. 22
[11] MTG Museum Case Study, p. 4
[12] Waitangi Treaty Grounds Case study p. 16
[13] Te Papa Case Study, p. 26
[14] Te Papa Case Study, p. 26
[15] Auckland Museum Case Study, p. 16
[16] MTG Hawke's Bay Case Study, p. 14
[17] MTG Hawke's Bay Evaluation Survey, 2019
[18] Auckland Museum Case Study, p. 14
[19] Auckland Museum Case Study, p. 14
[20] Te Papa Case Study, p. 16
[21] Te Papa Case Study, p. 25
[22] MTG Hawke's Bay Case Study, p. 22
[23] Waitangi evaluation survey, 2019
[2424] Te Papa Case Study, p. 28
[25] Email received from Wellington Deputy Principal
[26] Waitangi Treaty Grounds Case Study p.15
[27] Auckland Museum Case Study, p. 11
[28] MTG Hawke's Bay Case Study, p. 23
[29] Email from Hawke's Bay kaiako
[30] Te Papa Case Study, p. 16
[31] Waitangi Treaty Grounds Case Study; Auckland Museum Case Study p. 11
[32] Auckland Museum Case Study, p.11
[33] Te Papa Case Study, p. 16
[34] Auckland Museum Evaluation Survey data, 2019
[35] Te Papa Evaluation Survey Data, 2019
[36] Waitangi Treaty Grounds Evaluation Survey data, 2019
[37] Waitangi Treaty Grounds Case Study p. 14
[38] MTG Hawke's Bay Case Study, p. 22
[39] Kaikohe School Kaiako feedback, 2019
[40] Waitangi Treaty Grounds Case Study, p.15
[41] Conversation between Wellington based facilitator and kaiako, Term 3, 2019
[42] Auckland Museum Evaluation Survey Data, 2019
[43] Waitangi Treaty Grounds Case Study, p. 18
[44] MTG Hawke's Bay Case Study, p. 22
[45] Auckland Museum Case Study, p. 11
[46] Te Papa Case Study, p. 16
[47] Facilitator reports throughout 2019
[48] Hawke's Bay Case Study, p. 22
[49] Auckland Museum Case Study, p. 14
[50] Waitangi Treaty Grounds Case Study, p. 19



APPENDIX 1 – School Data

Delivery

Student numbers by Region and Term										
	Term 1		Term 2		Term 3		Term 4		Running YTD total and annual target 2019	
	Total Booked	Target	Total Booked	Target	Total Booked	Target	Total Booked	Target	Total YTD	2019 Target
Te Papa	377	459	435	459	589	459	361	459	1,762	1836
Waitangi	405	432	389	432	416	432	314	432	1,524	1728
Auckland	278	405	297	405	415	405	404	405	1,394	1620
Hawkes Bay	371	405	505	405	294	405	350	405	1,520	1620
Extended Outreach	-	-	-	-	295		334		631	
Total	1,431	1701	1,626	1709	2,009	1701	1,755	1701	6,831	6804

Schools and Kura by decile and medium (for all confirmed bookings 2019)				
	YTD 2019			
	Decile 1	**Decile 2**	**Decile 3**	**Total decile 1-3**
English Medium	71	62	44	178 (Paihia school is decile 4 x1 class
Maori Medium/ Kura	17	12	11	44 (TKKM o Kotuku is decile 4 x4 classes)
Dual Medium	8	2		12 (Carterton is decile 6 x2 bilingual classes)
Immersion Units/Rūmaki	3	3	3	14 (Newton School is decile 8 x5 immersion classes)
Total	**99**	**79**	**58**	**248**

2019 Schools/Kura

Schools/kura that have completed 2019 programme (*have seen more than one class group)

Region	School/kura	Decile	Term	Type	Delivery medium	MLP funding level
Te Papa	Randwick School *	3	1	English Medium	English Medium	
	Natone Park School*	1	1	English Medium	English Medium	MLP2
	Maoribank School	3	1	English Medium	English Medium	
	Rangikura School	2	1	English Medium	English Medium	
	Epuni School	3	1	English Medium	English Medium	
	Maraeroa School*	1	1	English Medium	English Medium	
	TKKM o Wairarapa	2	1	Maori Medium	Maori Medium	MLP1
	Lakeview School	2	1	English Medium	English Medium	
	Wainuiomata Intermediate	3	1	English Medium	English Medium	MLP3
	TKKM o te Ara Whanui*	3	2	Maori Medium	Maori Medium	MLP1
	St Anne's School	3	2	English Medium	English Medium	
	Masterton Primary School	3	2	English Medium	English Medium	
	Carterton School*	6	2	Dual Medium	Dual Medium	MLP3

	Holy Family School*	1	2 and 3	English Medium	English Medium	
	Glenview School*	1	3	English Medium	English Medium	
	Porirua College	1	2	English Medium	English Medium	MLP4
	Mana College	2	2	English Medium	English Medium	MLP2, 3, 4
	Ngati Toa School*	3	3	English Medium	English Medium	
	Windley School	1	3	English Medium	English Medium	
	Levin Intermediate School	2	3	English Medium	English Medium	
	North Street School*	3	1, 2 and 4	Maori Medium	Maori Medium	MLP2
	Levin North School	3	3	English Medium	English Medium	
	Fairfield School	3	3	English Medium	English Medium	
	Levin School*	1	2	English Medium	English Medium	
	Postgate School	3	3	English Medium	English Medium	
	Rata Street School	2	3	English Medium	English Medium	
	Te Kura Maori o Porirua*	3	2 and 3	Maori Medium	Maori Medium	MLP1
	Tui Glen School*	2	3	English Medium	English Medium	
	TKKM o Manawatu	3	4	Maori Medium	Maori Medium	
	Koraunui School*	2	3 and 4	English Medium	English Medium	MLP3

	Taita Central School	2	3	English Medium	English Medium	
	Wellington SDA	2	1 and 3	English Medium	English Medium	
	Naenae Intermediate	3	3	English Medium	English Medium	
	Levin East School*	2	4	English Medium	English Medium	
	Avalon Intermediate	2	4	English Medium	English Medium	
	Avalon Primary School	2	4	English Medium	English Medium	
	Corinna School	1	3	English Medium	English Medium	
	Arakura School	2	4	English Medium	English Medium	
	Titahi Bay North School*	2	2 and 4	English Medium	English Medium	MLP1
	Porirua School	2	3	English Medium	English Medium	MLP4
	Russell School*	1	2 and 4	English Medium	English Medium	
	Pukeatua School	2	4	English Medium	English Medium	
	Pomare School	1	4	English Medium	English Medium	
	Naenae College	3	4	English Medium	English Medium	
MTG	Peterhead School	1	1	English Medium	English Medium	MLP4
	Mahora School	3	2	English Medium	English Medium	

	Te Kura o PakiPaki	1	1	Maori Medium	Maori Medium	MLP2
	Kimi Ora Community School	1	1	English Medium	English Medium	
	Meeanee School	3	2	English Medium	English Medium	
	Tamatea Primary	3	2	English Medium	English Medium	
	Maraenui School	1	2	Dual Medium	Dual Medium	MLP1, 2
	Marewa Schools	1	2	English Medium	English Medium	MLP4
	Hukerere College*	2	2	English Medium	English Medium	MLP3, 4
	Terrace School	3	2	English Medium	English Medium	MLP2
	Hastings Intermediate	3	2	English Medium	English Medium	
	Wairoa College*	1	3	English Medium	English Medium	
	TKKM o te Wairoa*	1	3	Maori Medium	Maori Medium	
	Te Aute College*	3	2	English Medium	English Medium	MLP4
	TKKM o Te Wananga Whare Tapere o Takitimu*	1	3	Maori Medium	Maori Medium	
	Te Kura Kaupapa Maori o Te Ara Hou*	1	1, 2, and 4	Maori Medium	Maori Medium	MLP1, 2, 3
	Te Pohue School	2	3	English Medium	English Medium	
	Otane School	1	3	English Medium	English Medium	

	Camberley School*	1	2 and 4	English Medium	English Medium	MLP4
	Hastings Girls High School	3	2	English Medium	English Medium	MLP4
	TKKM o Ngati Kahungunu Ki Heretaunga *	1	1 and 4	Maori Medium	Maori Medium	MLP1
	Tamatea High School	3	4	English Medium	English Medium	
	Parkside Christian School	3	2	English Medium	English Medium	
	Mangateretere School	2	2	English Medium	English Medium	MLP3
	Raureka School*	2	1 and 4	English Medium	English Medium	
	Richmond School*	1	2 and 4	English Medium	English Medium	
	Waimarama School	1	3	English Medium	English Medium	
	Flaxmere Primary*	1	1 and 4	English Medium	English Medium	MLP1, 2
	Heretaunga Intermediate*	1	1 and 4	English Medium	English Medium	MLP4
	Te Awa School*	1	1 and 4	English Medium	English Medium	
	Irongate School*	1	1 and 4	English Medium	English Medium	
	Bridge Pa School*	2	1 and 4	English Medium	English Medium	
	Mayfair School*	2	1 and 4	English Medium	English Medium	
	Ebbett Park School*	1	2 and 4	English Medium	English Medium	

Auckland	Panama Road School	1	1	English Medium	English Medium	
	McAuley High School	1	1	English Medium	English Medium	MLP4
	Royal Oak Intermediate	2	1	English Medium	English Medium	
	Wiri Central School	1	2	Maori Medium	Maori Medium	MLP1
	Ranui School *	2	1 and 2	English Medium	English Medium	MLP1
	Birdwood School*	2	1 and 2	English Medium	English Medium	MLP3
	East Tamaki School*	1	1 and 2	English Medium	English Medium	
	TKKM o Hoani Waititi	3	2	Maori Medium	Maori Medium	MLP1
	Mayfield School	1	2	English Medium	English Medium	
	Wymondley Road School	1	2	English Medium	English Medium	
	May Road School	`1	2	English Medium	English Medium	
	Massey Primary School*	3	1 and 2	English Medium	English Medium	
	Nawton School*	2	1 and 3	Maori Medium	Maori Medium	MLP1, 3
	Avondale Primary *	3	3	English Medium	English Medium	
	Te Kura Kaupapa Maori o Te Ara Rima	2	3	Maori Medium	Maori Medium	MLP1

	Manurewa West School	1	3	English Medium	English Medium	MLP4
	Point England School	1	3	English Medium	English Medium	
	TKKM o Manurewa*	1	2	Maori Medium	Maori Medium	
	Tamaki Primary School *	1	1, 2, and 3	Dual Medium	Dual Medium	
	Newton School (immersion) *	8	1 and 3	Maori Medium	Maori Medium	MLP1, 2, 3, 4
	Papatoetoe East School*	2	3 and 4	English Medium	English Medium	
	Papatoetoe West School*	2	3 and 4	English Medium	English Medium	
	Bruce McLaren Intermediate*	2	4	English Medium	English Medium	
	Southern Cross Campus	1	4	English Medium	English Medium	
	Glenavon School*	1	1 and 4	English Medium	English Medium	
	TKKM o Puau Te Moananui-a-kiwa*	2	3 and 4	Maori Medium	Maori Medium	
	Sir Edmund Hillary Collegiate School	1	4	English Medium	English Medium	
	Manurewa West School	1	4	Dual Medium	Dual Medium	
	TKKM o Kotuku*	4	4	Maori Medium	Maori Medium	
	Haypark School	1	4	English Medium	English Medium	
	Rosebank School	2	4	English Medium	English Medium	

Waitangi	Paihia School	4	1	English Medium	English Medium	MLP4
	Morningside School*	3	1	English Medium	English Medium	
	Whau Valley School	2	1	English Medium	English Medium	MLP3, 4
	Rawene School	3	1	English Medium	English Medium	MLP3
	Awanui School	2	1	English Medium	English Medium	MLP4
	Kaingaroa School*	3	1	English Medium	English Medium	
	Mangonui School	1	1	Maori Medium	Maori Medium	
	Kaikohe West School	2	1	English Medium	English Medium	MLP2, 3, 4
	Kaikohe West School (immersion)	2	1	Maori Medium	Maori Medium	MLP2, 3, 4
	Kaitaia College	2	1	English Medium	English Medium	MLP3, 4
	Kaitaia School	1	1	English Medium	English Medium	MLP2, 3, 4
	Paparore School*	3	2	English Medium	English Medium	
	Kaitaia School (bilingual)	1	2	Dual Medium	Dual Medium	MLP2, 3, 4
	Hikurangi School	2	2	English Medium	English Medium	MLP1, 4
	Kaikohe Intermediate*	1	1	Dual Medium	Dual Medium	MLP3
	Pompallier High School	3	2	English Medium	English Medium	

	Kawakawa School*	2	2	English Medium	English Medium	MLP2, 3
	Raurimu Avenue School	3	2 and 3	English Medium	English Medium	MLP4
	Tautoro School	1	3	Dual Medium	Dual Medium	MLP2, 3
	Bay of Islands College*	2	3	English Medium	English Medium	MLP2, 3, 4
	Oruaiti School	2	3	English Medium	English Medium	MLP4
	Ohaeawai Primary*	3	2 and 3	English Medium	English Medium	
	Kaikohe Christian School	2	3	English Medium	English Medium	MLP4
	Kaitaia Intermediate*	1	3	English Medium	English Medium	MLP3
	Te Kura o Hato Hohepa te Kamura	1	3	Maori Medium	Maori Medium	MLP1, 3
	Totara North School	2	3	English Medium	English Medium	
	Northland College	1	3	English Medium	English Medium	MLP3, 4
	TKKM o Kaikohe*	1	2 and 4	Maori Medium	Maori Medium	MLP1
	Tikipunga Primary School	1	4	English Medium	English Medium	
	Ahipara School	2	4	English Medium	English Medium	
	Manaia View Primary*	1	4	English Medium	English Medium	
	Karetu School*	2	4	English Medium	English Medium	
	Kaikohe East School*	1	4	English Medium	English Medium	

	TKKM o Taumarere*	2	3 and 4	Maori Medium	Maori Medium	
	Oturu School*	1	4	English Medium	English Medium	
	Hora Hora School*	2	1 and 4	English Medium	English Medium	MLP1, 2, 4

APPENDIX 2 – Team Waiata

Raranga Matihiko Team Waiata

Written and developed by Waimiria Tutengaehe, Kerry Leaf, Natasha Hanara, Haley Stewart

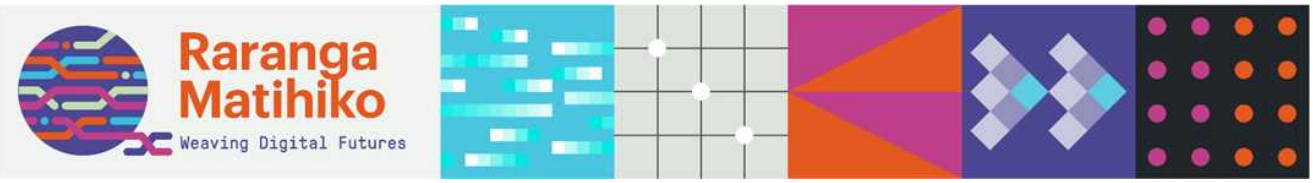
Raranga Matihiko
Raranga Tangata
Raranga Akomanga
Raranga Raukura
Raranga Rohe
Rarangatia te whāriki o te mātauranga

Ka tiro whakarunga ki ngā pae maunga o Te Tai Tokerau e
Ka aro whakaroto ki Tāmaki Makaurau
Tāmaki herenga o ngā waka
Ka piki whakarunga ki te kauae ā Māui
Ngā wai o te Wairoa
Hōpūpū, hōnengenenge, matangirau
Tūtira mai nga iwi, Aue!
Ka tau hā te mauri o ngā motu ki Te Upoko o te Ika
Toa Rangatira!
Ka mate, ka mate
Ka ora, ka ora e!

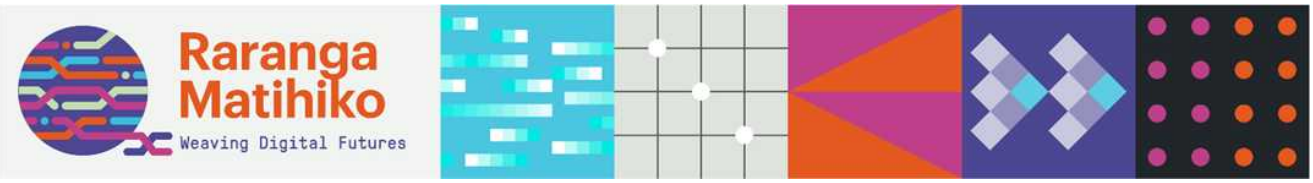
Raranga Matihiko
Raranga Tangata
Raranga Akomanga
Raranga Raukura
Raranga Rohe
Rarangatia te whāriki o te maramatanga

Raranga Matihiko x 3

APPENDIX 3 – Presentation and Articles



Date	Name of Presenter/s	Name of Group	Location	Title of Presentation
15/5/19	Monika Kern	Manaiakalani DFI	Waitangi	Computational Thinking
22/5/19	Tara Fagan, Monika Kern	MEANZ (Museum Education Association of New Zealand)	Wellington	Raranga Matihiko | Weaving Digital Futures
23/5/19	Tara Fagan, Monika Kern	Museums Aotearoa	Wellington	Raranga Matihiko - Weaving Museums, Schools and digital technologies
7/8/19	Monika Kern	Manaiakalani DFI	Waitangi	Computational Thinking
2/10/19	Tara Fagan, Monika Kern	MEANZ Webinar	Online	Raranga Matihiko - Weaving Museums, Schools and digital technologies
9/10/19	Tara Fagan and Monika Kern	uLearn 19 Conference	Rotorua	Learning Communities | Drawing on resources and partnerships to enhance local design
9/10/19	Tara Fagan and Monika Kern	uLearn19 Conference	Rotorua	Raranga Matihiko - Weaving Museums, Schools and digital technologies
10/10/19	Monika Kern and Alisha Spekking	uLearn19 Conference	Rotorua	Beyond watching Youtube and making powerpoints or posters: Integrating digital technology hangarau matihiko across the curriculum
11/10/19	Haley Stewart, Kerry Leaf and Natasha Hanara	uLearn 19 Conference	Rotorua	Get PAID: Purposeful, Authentic and Integrated Digital Activities
15/10/19	Tara Fagan	Toi Ohomai	Rotorua	How technology might influence what we do? Keynote speaker. Te Ohomai Conference, Rotorua, New Zealand.
6/11/19	Monika Kern	Manaiakalani DFI	Waitangi	Computational Thinking
19/11/19	Tara Fagan	National Digital Forum	Wellington	Raranga Matihiko | Weaving Digital Futures
27/11/19	Monika Kern	Manaiakalani combined cluster Principals' Hui	Waitangi	Implementing DT HM in your local curriculum
5/12/19	Tara Fagan	Google Computer Science Summit - Invited Speaker	Sydney Australia	Integration of Digital Technologies and Hangarau Matihiko



Date	Author	Name of Group	Title of Article
September 19	Tara Fagan	CIO Advisor Asia Pacific AR/VR Edition	Bringing learning alive using AR/VR in museum based education programmes CIO Advisor Asia Pacific AR/VR Edition
17/02/19	Monika Kern	The BeLbird blog	Digital Technology Hangarau Matihiko - are we there yet, and how will we get there?
2/06/19	Monika Kern	The BeLbird blog	Digital Technology Hangarau Matihiko: One year of delivering the Raranga Matihiko programme at Waitangi Treaty Grounds
16/06/19	Monika Kern	The BeLbird blog	Computational Thinking in the Junior classroom
23/06/2019	Monika Kern	The BeLbird blog	Computational Thinking for Upper Primary / Intermediate School using Scratch
12/08/19	Monika Kern	The BeLbird blog	Choosing the best tool for the purpose
13/11/19	Monika Kern	The BeLbird blog	Digital Technology Progress Outcomes in Kids Speak
13/11/19	Moniak Kern	The BeLbird blog	Not just Coding for the sake of Coding: Digital Storytelling in Scratch

APPENDIX 4 – Articles

Fagan, T.J. (2019). Bringing learning alive using AR/VR in museum based education programmes. *CIO Advisor Asia Pacific AR/VR Edition*, p. 40-41

Online access: https://augmented-and-virtual-reality.cioadvisorapac.com/cxoinsights/bringing-learning-alive-using-ar-and-vr-in-museum-based-education-programmes-nwid-1853.html?utm_source=Newsletter&utm_medium=email&utm_campaign=cioadvisorapac_weekly

Bringing learning alive using AR and VR in museum-based education programmes

By Tara Fagan, Project Director, Raranga Matihiko | Weaving Digital Futures, Museum of New Zealand Te Papa Tongarewa

AR and VR are changing what it means to showcase learning and while these are technologies that are ever-advancing, these are technologies that can support student learning now. At the Museum of New Zealand Te Papa Tongarewa we are using AR and VR in our education programmes with school-based learners in order to enrich their experience in the museum.

Both AR and VR have their place in education. At this point in time, AR is the more sociable and initially the more collaborative of the two. Once in VR, with the headset on, students are on their own in the virtual world and while there can be collaborations between devices and users, on the whole students are working in the virtual space in isolation of others. This aside, there are many benefits through the use of cardboard viewers to more elaborate set-ups such as HTC Vive which afford students opportunities to learn and to create in the new ways.

VR can take us to new places so we can walk around and virtually experience these locations. Students can be 'transported' to a different country through VR and this virtual exploration adds to what they are learning in class enabling a much richer learning experience. An example of what this looks like in practice is a class of year 4 students who were learning about Banaba Island and were able to visit through VR to view the impact of phosphate mining - seeing the land virtually in 3D really highlighted the devastation of the island.

Augmented reality and apps like HP Reveal enable students to design and create their own guided tour around the museum using exhibition items as markers. Students' record information which is overlaid onto markers for other students and visitors to access through smartphones. Using AR in this way enables users to create and share in spaces that they may not otherwise be able to.

Real richness to learning comes when students use these tools to mix, create and build for themselves. A simple example of how we might use VR and cardboards in our museum-based education programmes is through students creating, either traditionally or digitally, then importing their work into Instamuseum so student projects are curated together in their own virtual exhibition.

One of our programmes draws on our exhibition Gallipoli: The Scale of Our War. Our team leads students through the exhibition and after spending an hour learning in the space, our facilitators talk with the students about the emotions they might be feeling and invite the class create an emotional response to the exhibition. This response is 3D scanned and imported to virtual reality platform Sketchfab so that students curate a virtual exhibition which can be viewed larger than life-sized by using smartphones and cardboard viewers as well as with a Hololens. Learners can add their own narrative by uploading audio recordings to create a fully immersive experience. Through this students are creating and adding to existing narrative and are doing so using these new technologies.

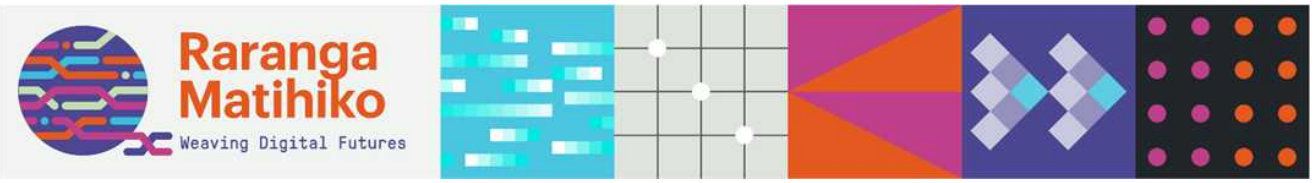
As part of the Raranga Matihiko | Weaving Digital Futures programme, a partnership between the Ministry of Education and four museums, we address student equity and access to using and understanding digital technologies while drawing on a cross-curricula project-based approach. Virtual reality again plays an important part of bringing together student work. During their two day learning programme at the museum students use digital technologies in relation to learning more about a focus area. Over the course of two days, student design using open source 3D design apps and these designs are then imported into the virtual reality app Tilt Brush and into a custom space that has been created by the facilitators such as a wharenui (meeting house) or a local forest. This brings together individual student or group work and locates it in a virtual world which is saved as a movie for students to continue to access. An example of this is Paparore School who had a focus on Maori technology and Arts. Some of the opportunities that the students explored over the two days in the museum, and through the outreach visit were:

- Create a carving using 3D sculpt tools that shows pupu harakeke, or a design that is inspired by the pattern on pupu harakeke
- Movie making using green-screen and digital tools
- Learning about the stories contained in Toi Māori

The students work, developed using a range of different apps such as SculptGL, Tiltsketchcard, and Tiltbrush VR, was assembled into a whare (house) created in Virtual Reality. Being able to design objects in 3D, rather than flat, provided students with different perspectives as they thought about design elements. Student work was brought together in one piece. With VR equipment students could walk through the whare and explore. This was also created as a movie.

AR and VR have many affordances to support the learning process. This includes the element of provisionality - the ability to press the undo button. In AR or VR, you can test ideas, see what might happen if you add on to your design and if it doesn't go according to plan, the undo button returns its previous state. Testing and iteration encourages active learning, risk-taking, and problem solving, all good skills for our young people to have.

We are evidencing real success with learners using these tools as they share their thinking and learning. AR and VR are only part of the rich learning programme that we offer but one that enables students to take different perspectives and create in new ways. AR and VR will be very much a part of our student's future and we need to ensure that these tools are there for them to create with as well as to enjoy.



APPENDIX 5 – Bay of Islands College Newsletter

Waitangi Digital

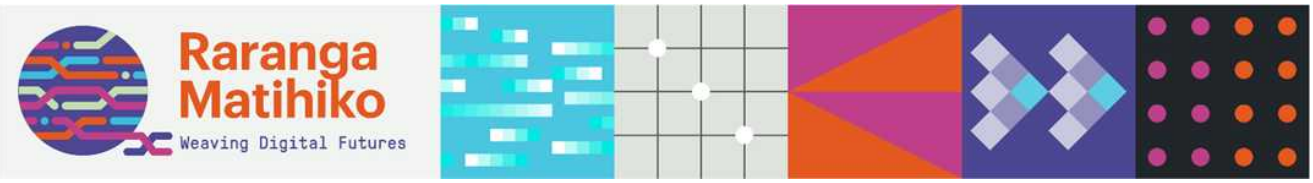
Our Year 9 students had two enjoyable days at the Waitangi Treaty Grounds Educational Centre to take part in the Raranga Matahiko Programme.

Stories wee created using 3D technology that built on their understanding of computational thinking, digital citizenship and literacy.

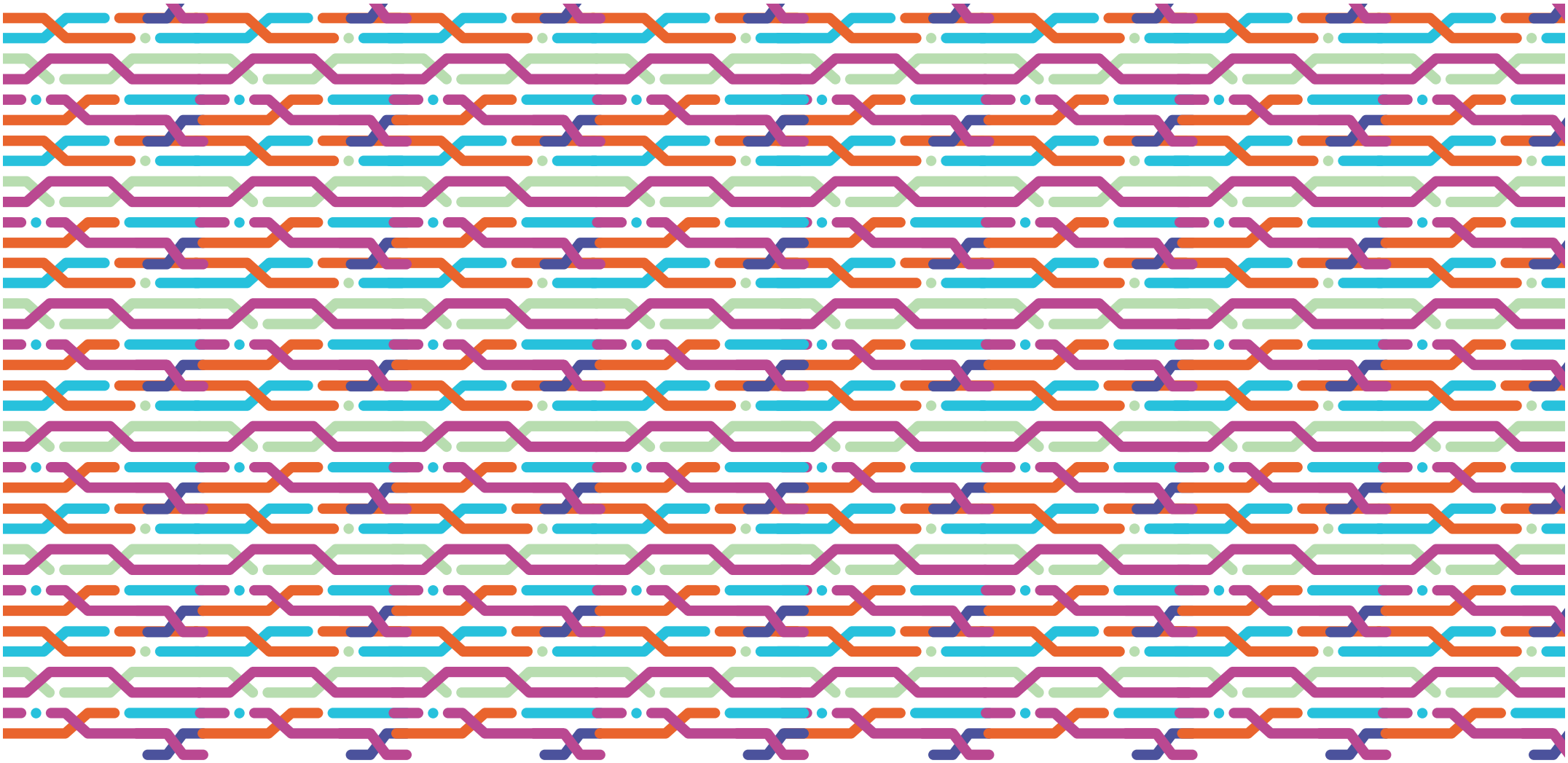
The students enjoyed the interactive digital learning and also ad the opportunity to seethe Treaty grounds and museum.

The programme is linked to Te Papa National Museum and we are grateful for the chance to take part.

Many thanks to the staff at Waitangi for making the experience even more enjoyable.



APPENDIX 6 - Decoded for Learners Resource



Raranga Matihiko

Weaving Digital Futures

Progression Outcomes – decoded for learners

Computational thinking for digital technologies for progress outcomes 1-5

1

Progress Outcome

In authentic contexts and taking account of end-users, students use their decomposition skills to break down simple non-computerised tasks into precise, unambiguous, step-by-step instructions (algorithmic thinking). They give these instructions, identify any errors in them as they are followed, and correct them (simple debugging).

Decoded for learners

- I look at a task and can tell others the order of steps they need to follow (create instructions).
- I can give the instructions to others.
- I can see the mistakes in my instructions when others follow them and I can fix them.

2

In authentic contexts and taking account of end-users, students give, follow, and debug simple algorithms in computerised and non-computerised contexts. They use these algorithms to create simple programs involving outputs and sequencing (putting instructions one after the other) in age-appropriate programming environments.

- I can give instructions.
- I can follow the instructions from other students.
- I can find mistakes in the instructions and fix them (debugging).
- I can use my instructions to create a computer program.

Developed by Monika Kern and Tara Fagan, Raranga Matihiko.

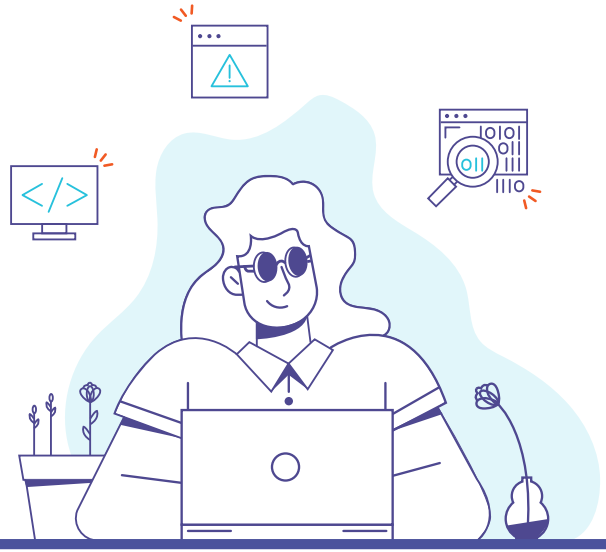
creative commons
Attribution-NonCommercial-ShareAlike

TE PAPA
mtg Hawke's Bay
WAITANGI TREATY GROUNDS
MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA

3

Progress Outcome

In authentic contexts and taking account of end-users, students decompose problems into step-by-step instructions to create algorithms for computer programs. They use logical thinking to predict the behaviour of the programs, and they understand that there can be more than one algorithm for the same problem. They develop and debug simple programs that use inputs, outputs, sequence, and iteration (repeating part of the algorithm with a loop). They understand that digital devices store data using just two states represented by binary digits (bits).



Decoded for learners

I can look at a problem and can figure out the steps to solve it. I use this solution to code algorithms for computer programs.

I can predict what my computer program will do based on the code it receives.

I understand there can be different algorithms that solve the same problem.

In my code I will use inputs, outputs, sequence and repeat loops (iteration).

I debug my computer program so it works correctly.

I know that computers use bits to store data.

Raranga Matihiko
Weaving Digital Futures

Progression Outcomes – decoded for learners
Computational thinking for digital technologies for progress outcomes 1-5
www.rarangamatihiko.com

Developed by Monika Kern and Tara Fagan, Raranga Matihiko.

creative commons
Attribution-NonCommercial-ShareAlike

TE PAPA
mtg Hawke's Bay
WAITANGI TREATY GROUNDS
MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA

4 Progress Outcome

In authentic contexts and taking account of end-users, students decompose problems to create simple algorithms using the three building blocks of programming: sequence, selection, and iteration. They implement these algorithms by creating programs that use inputs, outputs, sequence, basic selection using comparative operators, and iteration. They debug simple algorithms and programs by identifying when things go wrong with their instructions and correcting them, and they are able to explain why things went wrong and how they fixed them.

Students understand that digital devices represent data with binary digits and have ways of detecting errors in data storage and transmission. They evaluate the efficiency of algorithms, recognising that computers need to search and sort large amounts of data. They also evaluate user interfaces in relation to their efficiency and usability.

Decoded for learners

- I can solve a problem by coding simple algorithms. My algorithms use sequence, selection and iteration.
- I use the algorithms to make computer programs that use inputs, outputs, sequence, iteration, and comparative operators.
- To debug algorithms and computer programs I find the mistakes in my algorithms and correct them. I can explain why things went wrong and how I fixed them.
- I know that digital devices use 0s and 1s (binary) to represent information.
- I know that a digital device will check files and recognise when they are corrupted.
- I can look at an algorithm and decide if it is an efficient way to help a digital device search and sort information.
- I can look at user interfaces and check if they help people to complete their tasks quickly and are easy to learn.

Developed by Monika Kern and Tara Fagan, Raranga Matihiko.

creative commons
Attribution-NonCommercial-ShareAlike

TE PAPA
mtg Hawke's Bay
WAITANGI TREATY GROUNDS
MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA

5

Progress Outcome

In authentic contexts and taking account of end-users, students independently decompose problems into algorithms. They use these algorithms to create programs with inputs, outputs, sequence, selection using comparative and logical operators and variables of different data types, and iteration. They determine when to use different types of control structures. Students document their programs, using an organised approach for testing and debugging. They understand how computers store more complex types of data using binary digits, and they develop programs considering human-computer interaction (HCI) heuristics.

Decoded for learners

- I can solve a problem by coding simple algorithms without teacher help.
- I use the algorithms to make computer programs that use inputs, outputs, sequence, iteration, comparative and logical operators and variables of different data types.
- I decide what kind of control structures to use in my code and when to use it.
- I add comments and explanations to my programs so that another programmer could understand them more easily.
- I know how computers store information using binary.
- When I code my programs, I think of how the end-user will use them, and I develop, test and refine my programs to meet their needs.
- When I design and evaluate user interfaces, I follow good practices (heuristics) so my program can be both effective and user friendly.

Developed by Monika Kern and Tara Fagan, Raranga Matihiko.

creative commons
Attribution-NonCommercial-ShareAlike

TE PAPA
mtg Hawke's Bay
WAITANGI TREATY GROUNDS
MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA

Resources

References:
Ministry of Education. (2017). Technology in the New Zealand Curriculum. Wellington, New Zealand: Author.

Additional Links:
Kidspeaking the literacy progressions
Digital Technology Glossary

Additional Support:

Technology online
http://technology.tki.org.nz/

Kia Takatū ā-Matihiko | Digital Readiness
https://kiatakatu.ac.nz/

DTHM for Kaiako
https://www.dthm4kaiako.ac.nz/

About us

Raranga Matihiko | Weaving Digital Futures empowers ākonga/kaiako to think, challenge and create using authentic integrated experiences. We work with NZ schools and Kura to provide opportunities for tamariki through digital technologies. We are based in four locations – Waitangi, Auckland, Hawkes Bay and Wellington and are run through our partnership museums Te Papa, MTG Hawkes Bay and Te Kōngahu Museum of Waitangi.

We currently cater to schools that are decile 1-3 and are within a 100km of the museums and all kura within a 120km radius as part of the Ministry of Education Digital Technology for All Equity Fund.

The resources and information on our website are available to all teachers, kaiako and whānau.

Developed by Monika Kern and Tara Fagan, Raranga Matihiko.

creative commons
Attribution-NonCommercial-ShareAlike

Raranga Matihiko

Weaving Digital Futures

Progression Outcomes – decoded for learners

Designing and developing digital outcomes for progress outcomes 1-3

1 Progress Outcome

In authentic contexts and taking account of end-users, students participate in teacher-led activities to develop, manipulate, store, retrieve and share digital content in order to meet technological challenges. In doing so, they identify digital devices and their purposes and understand that humans make them. They know how to use some applications, they can identify the inputs and outputs of a system, and they understand that digital devices store content, which can be retrieved later.

Decoded for learners

With the help of my teacher, I can create, edit, save and open digital content to solve a problem.

I can name some types of digital devices and what they are used for. I know digital devices are made by people.

I can use some applications.

I can name the inputs and outputs of a digital device.

I know devices save files, and if the files are saved correctly, they can be opened again later.

Raranga Matihiko
Weaving Digital Futures

Progression Outcomes – decoded for learners
Designing and developing digital outcomes for progress outcomes 1-3

www.rarangamatihiko.com

Developed by Monika Kern and Tara Fagan, Raranga Matihiko.

creative commons
Attribution-NonCommercial-ShareAlike

Te Papa
mtg Hawke's Bay
WAITANGI TREATY GROUNDS
MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA

2 Progress Outcome

In authentic contexts and taking account of end-users, students make decisions about creating, manipulating, storing, retrieving, sharing and testing digital content for a specific purpose, given particular parameters, tools, and techniques. They understand that digital devices impact on humans and society and that both the devices and their impact change over time. Students identify the specific role of components in a simple input-process-output system and how they work together, and they recognise the "control role" that humans have in the system. They can select from an increasing range of applications and file types to develop outcomes for particular purposes.

Decoded for learners

I create, edit, save, open, share and test digital content for different purposes. I make choices from options the teacher gives me.

I know that digital devices change over time, and they make a difference to people and to society (positive and negative).

Looking at a digital device, I can identify the parts responsible for input, processing and output, and I can describe how they work together.

I know that people control digital devices.

I can use more different applications and file types to create digital content for a specific purpose.

Developed by Monika Kern and Tara Fagan, Raranga Matihiko.

creative commons
Attribution-NonCommercial-ShareAlike

TE PAPA
mtg Hawke's Bay
WAITANGI TREATY GROUNDS
MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA

3

Progress Outcome

In authentic contexts, students follow a defined process to design, develop, store, test and evaluate digital content to address given contexts or issues, taking into account immediate social, ethical and end-user considerations. They identify the key features of selected software and choose the most appropriate software and file types to develop and combine digital content.

Students understand the role of operating systems in managing digital devices, security, and application software and are able to apply file management conventions using a range of storage devices. They understand that with storing data comes responsibility for ensuring security and privacy.

Decoded for learners

- While focusing on the context and issues, I can follow the steps to design, create, save, test and evaluate digital content.
- I think about my end-user and about social and ethical issues when I create my digital content.
- I can choose the best digital tool and file type for my purpose.
- I can talk about the main points of the applications I choose.
- I can combine content from different applications.
- I understand what an operating system is and what it does.
- I know about security (viruses, malware, hacking etc).
- I can explain what applications are and what they do.
- I can use file management conventions, and I can save my digital content in different places.
- I understand that I am responsible for ensuring that I save data responsibly and this includes considering security and privacy.

Developed by Monika Kern and Tara Fagan, Raranga Matihiko.

creative commons
Attribution-NonCommercial-ShareAlike

Te Papa
mtg Hawke's Bay
WAITANGI TREATY GROUNDS
MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA

Resources

References:

Ministry of Education. (2017). Technology in the New Zealand Curriculum. Wellington, New Zealand: Author.

Additional Links:

Kidspeaking the literacy progressions
Digital Technology Glossary

Additional Support:

Technology online
http://technology.tki.org.nz/

Kia Takatū ā-Matihiko | Digital Readiness
https://kiatakatu.ac.nz/

DTHM for Kaiako
https://www.dthm4kaiako.ac.nz/

Developed by Monika Kern and Tara Fagan, Raranga Matihiko.

creative commons
Attribution-NonCommercial-ShareAlike

About us

Raranga Matihiko | Weaving Digital Futures empowers ākonga/kaiako to think, challenge and create using authentic integrated experiences. We work with NZ schools and Kura to provide opportunities for tamariki through digital technologies. We are based in four locations – Waitangi, Auckland, Hawkes Bay and Wellington and are run through our partnership museums Te Papa, MTG Hawkes Bay and Te Kōngahu Museum of Waitangi.

We currently cater to schools that are decile 1-3 and are within a 100km of the museums and all kura within a 120km radius as part of the Ministry of Education Digital Technology for All Equity Fund.

The resources and information on our website are available to all teachers, kaiako and whānau.