Legends

Program Report

2017–2018

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Front cover: Photo by Rachael Imam

Legends

Introduction

Tonga's human history stretches back 2,800 years, to when the archipelago was first settled. Today it is the last Polynesian kingdom, with a royal family whose lineage dates back 1,000 years. Although visited by the British in 1773, the small island nation never became a colony. But today, Tonga and other South Pacific island nations are suffering from a different kind of outside force that is ravaging people, young and old.

"My son right there, I didn't take him to the store until he was 4-years-old because I'm not showing him candy. It will kill them"

"My son right there, I didn't take him to the store until he was 4-years-old because I'm not [sic] showing him candy," said Pouono Maumalanga, a Tongan farmer. "It will kill them [sic]."

Imported and cheap, easy-to-prepare, nutrition-poor foods, sugary drinks, candy, and more, are replacing the traditional, local ingredients and cuisines of the South Pacific. They are linked to the increase in diabetes, hypertension, heart disease, and other non-communicable diseases (NCDs) present in the region's population. According to the **STEPS Report**[1] published in 2014 and produced by the World Health Organisation (WHO) and the Tongan Ministry of Health, 67.6% of Tongans are obese. Brought upon by an unhealthy diet and lifestyle, NCDs now account for an estimated 83% of all deaths in Tonga, with 24% attributed to cardiovascular diseases (**WHO**[2]).

Words from a Tongan father
https://youtu.be/V0dKAfd47d8

Photo by Ben Kreimer

"As a parent what are you going to do?"

Unhealthy food is in high demand in the Pacific for many reasons. It can be easier and cheaper to prepare than healthier alternatives, and some hold the view that imported foods signify a higher social status than local foods. Fish, yams, taro, and other root vegetables have been replaced by fried chicken, instant noodles, and mutton flaps (an unwanted fatty offcut of meat exported by Australia and New Zealand to island nations around the South Pacific). Maumalanga, who farms watermelons for export, said that it's a struggle to feed his children healthy Tongan foods.

"As a parent what are you going to do?" Maumalanga said, "hit them to eat it?"

Introduction footnotes
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The Interventions

NCDs impose large – but often preventable – health, social and economic costs in the Pacific Islands. They develop from lifestyle choices, such as unhealthy diets, alcohol abuse, and a lack of physical activity. This can result in cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes.

In 2017, Samoa's minister of health, Dr Talalelei Tuitama, speaking at a UN forum on Economic and Social Affairs, **reported**[3] that up to 80% of deaths in Pacific countries are attributed to an NCD. In Fiji, an estimated 84% of deaths are caused by an NCD. Cardiovascular diseases alone account for 34% of deaths, while diabetes accounts for another 22% (**WHO**[4]). In Samoa, NCDs account for 81% of deaths, with 34% caused by cardiovascular diseases.

Image courtesy of Allan Soutaris

Up to 80% **of deaths in Pacific countries are attributed to an NCD. In Fiji, an estimated 84% of deaths are caused by an NCD.**

To address the NCD crisis, South Pacific health and education ministers, schools, community leaders, organisations, and individuals, from fitness trainers to award-winning chef Robert Oliver, are raising awareness and encouraging nutritious foods and lifestyles. Much of the focus is on inspiring healthy lifestyles and nutrition in children, like Maumalanga's son. At its core, it includes increased consumption of local fruits and vegetables in favour of nutrition-poor imported foods high in fat, sugar, and salt.

To support on-the-ground efforts to educate South Pacific youth about healthy eating, **Australia's Department of Foreign Affairs and Trade's innovationXchange (DFAT iXc)**[5], partnered with **SecondMuse**[6]. Together, they began developing an experimental program to explore the application of emerging storytelling technologies to complement and strengthen health and nutrition initiatives in the Pacific.

In October 2016, the iXc hosted the **'Virtual Reality/ Augmented Reality (VR/AR) Hack'**[7] in Canberra. Over 40 food and nutrition experts, Virtual Reality (VR) and Augmented Reality (AR) practitioners, and marketers took part. The hackathon yielded numerous ideas for leveraging new storytelling technologies to address food and nutrition challenges around the world. These are available on the LAUNCH Development Reality Hack **Wiki**[8] page. The momentum generated by the hack resulted in the formation of LAUNCH Legends, a project to promote healthy eating and restore pride in traditional diets in the Pacific.

In November 2016, LAUNCH Legends announced a global request for proposals, calling for programs leveraging the power of storytelling, play-based learning, and VR and AR experiences, to inspire people to eat healthier. Applicants were asked to demonstrate how their intervention had been inspired by the culture, cuisine, and stories of the South Pacific.

Communities addressing NCDs
https://youtu.be/8D8nDeuh_S8

Two innovators were selected to develop their concepts into country and culture-specific pilot programs in Tonga and Fiji. Each pilot was designed with the support of local partners, cultural experts, teachers, and students participating in the program. More than just nutrition and education pilot interventions, both DFAT iXc and SecondMuse saw these programs as an opportunity to test the effectiveness of play-based and narrative-driven technological approaches to education in the Pacific, where primary school teachers rely heavily on rote learning methods.

Tonga's pilot, Our Special Island (OSI), or *Motu Ta'e'iloa*, was conceived by game-based education developer **Millipede**[9] and their founder and managing director, Wil Monte.

OSI is an interactive play-based learning experience that promotes traditional Tongan foods and food preparation techniques to children between the ages of 5 to 7 (grades one and two). It encourages play-based learning via an interactive mobile app game, board game, flashcards, worksheets, posters, and recipes for parents and teachers.

The program's research, development, and implementation in Tonga was led by Sandy Jenkins, Millipede's Lead Learning Designer. OSI received AUD $250,000 in investment from the Australian Government. The program was formally endorsed by the Tongan Ministry of Education and Training and the Tongan Ministry of Health, and received logistical support from Tonga Health and the Australian High Commission in Tonga.

> **"An iPad can be quite an isolating device, but when kids are using it together it becomes this platform that launches conversation"**

The OSI program features three cartoon Tongan children, Kelela and Pulotu, and Maui-Kisikisi, the youngest son of the cultural figure Maui, who discovered the secret of fire and taught people the art of cooking food.

Millipede took great care to make OSI look, sound, and feel Tongan while using the Tongan language for all program content.

Image courtesy of Millipede

"They're so used to having resources that aren't bespoke for their kids," Jenkins said.

The OSI app encourages positive attitudes towards fresh and healthy Tongan foods and cuisine. Gameplay experiences combine open-ended exploration with goal-oriented tasks to keep children engaged.

Through multi-touch support, Millipede designed the app for collaboration, allowing multiple children to engage with on-screen activities simultaneously.

"An iPad can be quite an isolating device, but when kids are using it together it becomes this platform that launches conversation," said Monte. "They need to be able to talk about it, share it, and all enjoy it on different levels."

OSI app activities include fishing and gardening games where players collect healthy, local Tongan ingredients including Feke (octopus) and 'Ufi (yams), with the goal of cooking seven different Tongan meals in the game's kitchen, plus Otai, a traditional Tongan drink. And because songs are commonly used in Tongan early years classrooms, the app also features a Fruit Salad song, sung by Tongan children.

"Delivering something that isn't culturally appropriate or representative of the country's values and traditions in any way, will be immediately rejected," said Jenkins and Sarah Mercer, Millipede's former Lead Learning Designer who helped develop the pilot. "This includes everything from the implementation of the curriculum, to the cultural detail in the art."

The Resources of OSI
https://youtu.be/IiLWPhH5Ams

Millipede also made posters with characters from the game to promote healthy foods and drinks, a set of five classroom worksheets, and a board game named "Tummy". At the request of teachers, Millipede created two sets of flashcards showing healthy and unhealthy foods. Simple and healthy recipes were also included in the resource materials for teachers to prepare in the classroom.

Fiji's pilot, Beyond the Stars (BTS), was developed by creative technology agency Story 1st, Technology 2nd (**S1T2**[10]) and its co-founder, Tash Tan.

BTS is a storytelling and technology-based experience designed for Fijian children between the ages of 8 to 10 (grades three and four). It inspires them to rediscover nutritional values through an explorative journey into their culture and traditional foods, while promoting healthy food and lifestyle choices that are environmentally sustainable.

Image courtesy of S1T2

The program's research, development, and implementation in Fiji was led by Aiyana Merlo, S1T2's Lead Learning Designer and Evaluator. Children experience the BTS story and journey through a narrative that includes a VR experience, graphic novel storybook, student activity book, mobile app game, and lesson plans in an accompanying teaching workbook. BTS received AUD $496,105 in investment from the Australian Government. The program was developed in consultation with Fiji's Ministry of Education, Heritage, and Arts, and Fiji's Ministry of Health and Medical Services. Additionally, the program has been formally endorsed by the Fijian Government in the form of a Cabinet Paper.

S1T2's BTS program was built around an interwoven sequence of story experiences inspired by Fiji's ancient tradition of myths, legends, and oral storytelling. The program also incorporates content from the **Healthy Living, Physical Education, Social Sciences and English curriculums**[11], and educational methodologies from the **Fiji Islands National Curriculum Framework**[12]. The program also included resources from **Pasifika Plates**[13], data from the **Pacific Island Food Composition Table** [14], as well as learning from the **NCD Roadmap Report**[15].

"I love the story, it's been so long in the making. I'm so proud of it"

Children, teachers, and parents are introduced to the story world of Beyond the Stars, created by S1T2, through an oral storytelling experience in the form of an **animated short film**[16]. The film's narration is voiced by Fijian broadcaster and member of Fiji's parliament, Lenora Qereqeretabua. The story takes children on an immersive journey that shows children their ability to influence their world. It empowers them with knowledge and skills to make life-altering choices as they become heroes of their own future. The film was shown to students during the introductory sessions held at each school for the launch of the BTS pilot.

"I love the story, it's been so long in the making," Merlo said after the conclusion of the pilot. "I'm so proud of it."

Next, students are invited to enter the world of Beyond the Stars for themselves. Donning a pair of Oculus Rift VR goggles, they step into the story through a three-dimensional VR experience. Through this immersion, each child is asked to become the hero of their own story.

The Resources of BTS
https://youtu.be/SCZdoL4tVIw

"The ultimate goal of the VR experience was to empower children with a sense of agency over their story and their life, heightening their engagement with the rest of the program through active exploration"

"The ultimate goal of the VR experience was to empower children with a sense of agency over their story and their life," said Merlo, "heightening their engagement with the rest of the program through active exploration."

At the conclusion of the VR experience, children are presented with a physical copy of the BTS storybook that will guide them throughout the rest of their journey. The storybook contains the information they need to "restore health and happiness" to the South Pacific, along with an activity book with worksheets to help them practice what they have learned.

At school, children could continue their hero's quest in the BTS app game on Android tablets. The app reinforced the program's overarching educational objectives by enabling children to practice what they learned in the storybook by playing four mini-games. In their role as the hero, children are tasked with helping communities become healthy while unlocking the secrets of nature to restore the land. Each mini-game gives children different avenues of interacting with food choices, with options including healthy and unhealthy foods. For example, in "FoodChop" players cut flying foods into a cooking pot.

"The whole reason gamification is so powerful is that it allows us to try things, fail in a safe environment, and then learn from the mistakes to become a better person," Tan said.

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S1T2 leveraged the concept of **transmedia storytelling**[17] to develop the BTS program materials. Unlike in a standalone book that tells a story from start to finish, transmedia storytelling involves spreading a story across multiple mediums that work together to communicate the narrative.

The included program handbook and teaching workbook helped teachers tie these elements together. In addition to leveraging a transmedia storytelling approach, S1T2 also developed the BTS program materials to provide a tangential learning experience for participating children. **Tangential learning**[18] occurs when people educate themselves on a topic presented to them through activities, such as video games and other screen-based media and entertainment content, that they enjoy.

"That's our benchmark," Tan said while developing the BTS program in November 2017. "We have to make something that is accessible and as popular and fun as all these other wonderful experiences."

"We have to make something that is accessible and as popular and fun as all these other wonderful experiences"

Photo by Rachael Imam

Our Special Island - An App
https://youtu.be/MaLYbQx0ZHY

Photo by Rachael Imam

To help contextualise the LAUNCH Legends pilots in the broader education, technology, food and nutrition space, SecondMuse hired Quinault Childs, Research Manager in the Food Futures Lab at the **Institute for the Future**[19] (IFTF), as an advisor. For over 50 years, IFTF, a non-profit think tank based in Palo Alto, California, has been helping organisations plan for the long term future. They provide insights into business strategy, design processes, innovation and social dilemmas in different areas of society including health, media, the workplace, and food.

Before the LAUNCH Legends pilots began, Childs anticipated that the technology and game elements of the two pilots would almost certainly enchant the children. However, he was quick to emphasise that technological enchantment alone would not demonstrate a shift in understanding or behaviour. Childs believed that, in order to be truly successful in their design, the LAUNCH Legends pilots would need to generate high levels of human engagement from students, teachers, parents, their communities, and their institutions.

"Given that the environment for Legends is so different from the typical Western system, new insights into how and why those teachers who embrace the program do so could be a huge step forward in learning how to introduce and support similar programs in other cultures," Childs said.

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This potential for technological impact is starting to gain traction around the world. Agencies for sustainable development are becoming attuned to the value of emerging technologies to help galvanise a larger, stronger network of innovators. Technology is seen as a tool for change in the scope of development work on the ground.

LAUNCH Legends is an example that explores this potential for impact at the intersection of development, education, storytelling, and technology, focusing on the South Pacific and the region's NCD crisis.

Considering the rapid pace of technological innovation, some elements of this report may seem dated in time. Still, beneath the technological layers of OSI and BTS are lessons and ideas that will more reliably stand the test of time.

The technology that was deployed in Tonga and Fiji will soon be replaced by the next generation. However, the underlying learnings and findings that came out of LAUNCH Legends - *the hows and the whys* - these will endure.

The OSI Fruit Salad Song
https://youtu.be/B2jKn3BjHqk

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Education + Technology

Technology provides new ways of knowledge sharing and learning by making it easier and faster to create educational experiences tailored to learners. Be it through language, visual cues, or other relevant cultural elements.

This is made possible through technological means of scaling information distribution using hardware and software tools in conjunction with the internet to communicate ideas and knowledge. Put another way, if you want to learn how to play the guitar, fix your washing machine, or study calculus, there are countless online resources at your disposal. They can teach you basic or advanced knowledge in your chosen area of interest. Some resources, such as YouTube, are even available for free.

"One of the most important aspects of technology in education is its ability to level the field of opportunity for students," said John King, former U.S. Secretary of Education, in a **2016 interview with the International Society for Technology in Education**[20].

"One of the most important aspects of technology in education is its ability to level the field of opportunity for students"

The potential for such educational impact in the classroom, and at home, increases as devices such as tablets and mobile phones fall in price and become more accessible. Simultaneously, the volume of available content increases as internet data becomes cheaper, and the cost of device storage space continues to fall. These advances also create educational opportunities for incorporating play and interactivity through lessons that are communicated through engaging experience, not just memorisation.

Emerging technologies, from VR and AR experiences to mobile app play-based interactivity, provide new opportunities for knowledge and engagement in educating people of all ages. Childs sees the immersive 360° video and VR-for-education space stratified into three different types of products.

Photo by Rachael Imam

1

The passive, virtual-field-trip 360° video or 360° image experience

The passive, virtual-field-trip 360° video or 360° image experience, that displays content in a self-guided tour. This allows learners to receive visual or aural information or explore an environment, but does not actually introduce a new method of teaching. An example of this is the **Google Expeditions**[21] app package of virtual field trips presented as self-guided (or teacher-guided) VR tours, consisting of 360° content, and augmented reality objects.

"The interaction isn't very impressive," Childs said.

Educators have also spoken to the lack of impact such experiences have. In a **June 2018 blog post**[22] about VR for Education Week, Sarah Schwartz wrote that teachers say simply touring a digital space in a 360° video does not meaningfully change learning.

"We're just substituting a picture book with technology," said Simon Dudar, a fifth-grade science and social studies teacher at Haldane Central School District in Cold Spring, N.Y. in a quote for the blog post.

2

The lesson-in-VR format

The lesson-in-VR format ports the dynamics of traditional lesson frameworks into VR, taking advantage of the technology to (hopefully) improve engagement. An example of this is **Nearpod**[23], which provides prebuilt lessons, as well as the ability for educators to create their own lessons.

3

The novel learning experience

Making the most of the platform, the novel learning experience presents content and engages learners in a way that is unique to the VR medium. This is exemplified by **Osso VR**[24], a virtual surgery education tool allowing medical students to practice difficult operations without the need for cadavers or live patients. As of June 2018, Osso was deployed into multiple residency programs at universities around the U.S.

Closer to the aim of LAUNCH Legends, the **Habit.at**[25] augmented reality app was designed to encourage children to eat vegetables. Built for the Microsoft Hololens, the app generates a 3D environment, like a diorama, around the child's plate that shows cartoon trees, mountains, a river, birds, elephants, and other child-friendly graphics. These graphics help to bring a positive association to healthy but undesirable foods.

Habit.at was the "Social Good" winner at the **2016 HoloHacks competition**[26] in Los Angeles. As of writing, there is no further information available about the project, or its actual impact on children's eating habits. Similar research in augmenting foods using AR technology by Katsunori Okajima at Yokohama National University has **shown**[27] that altering the physical characteristics of food can modify the eater's perception of taste and texture.

Research is a critical part of advancing these projects. **Foundry10**[28], an education research organisation, has conducted continual **projects**[29] focusing on how technology integrates into the classroom.

Photo by Rachael Imam

Other research includes examining the actual learning effects of using VR.

Researchers at the University of Maryland **recently found**[30] that immersive environments created in three-dimensional VR actually aid memory retention. Another **study**[31] has found that VR experiences can result in autobiographical memories, like the ones humans form during real-life experiences.

Tash Tan and the S1T2 team incorporated a three-dimensional narrative-driven VR experience into their pilot. This enabled children to live and learn from the BTS story in a way that is not possible through any other medium.

"We want to really take a child's imagination and start to ground it in reality"

"The benefit of doing that is that we want to really take a child's imagination and start to ground it in reality," Tan said, adding that VR provides agency, alterity, and immersion to the user. In this case, allowing a child to experience the BTS universe from the first-person perspective.

Play-based learning comes in different analog and digital forms. The antithesis of teacher-led rote learning, play-based learning has students engage in activities involving interaction and play. **Montessori school curriculum**[32] is founded upon the concept that play is a child's work. Montessori classrooms emphasise self-directed, self-paced learning using materials that are often tangible.

Photo by Rachael Imam

For example, students learning arithmetic do so with the Montessori Stamp Game. This involves stamp-size pieces laid out as equations on a rug that are solved without pencil or paper.

Digital classroom interventions and projects have shown that play-based learning, including highly replicable and scalable forms using technology, can lead to knowledge uptake and behaviour change, including around diet and nutrition. One example is **Virtual Sprouts**[33], a play-based tablet app game designed to teach nutrition and gardening knowledge to minority and underserved third through fifth graders in Los Angeles, California. At the conclusion of their three-week pilot, the researchers' data, derived from surveys distributed to the students, **found**[34] that the program led to an increase in the consumption of fruits and vegetables, and self-efficacy to cook.

The impact of play-based learning in the classroom has also been demonstrated by Millipede in Australia. OSI's app, the cornerstone of Millipede's pilot program in Tonga, was built upon a framework inspired by the company's prior experience designing play-based educational apps. These include the **Early Learning Languages Australia**[35] program (ELLA), which was designed to raise Australian preschool children's awareness of and interest in languages other than English. Developed as an Australian Government Department of Education and Training initiative, Millipede led ELLA's learning design, language recording, and app development, plus the system for tracking and displaying the trial data. Millipede has also developed **Infinite Voyage**[36], an educational app consisting of 15 maths games that draw on aspects of the Victorian Mathematics curriculum. Infinite Voyage shows school-aged children how maths is applicable in the real world, with the ultimate aim of reducing 'maths anxiety.'

"We're not saying that the app is the only thing that's teaching the kids, but that it's about engagement and [teachers] being able to build on that," Jenkins said.

"What it is doing is getting the engagement and providing the springboard that otherwise can take teachers a whole heap of time to try and build up, if they ever manage to get it."

This thoughtful perspective and sharing of their earlier work helped Millipede to address concerns around tablets in the classroom. The potential for tablet games to be addictive was a common concern held by OSI stakeholders and teachers in Tonga when they were first approached about the program.

"When we showed them they [tablets] could be used as a really powerful teaching mechanism the mood in the room immediately changed," Monte said.

Based on their past experience, Millipede's Jenkins and Monte understand the role and limits of technology in the classroom, and it's complementary relationship with the teacher or teachers.

In addition to play-based learning, studies also indicate that tangential learning can help people to learn subjects such as chemistry. Researchers from the University of Pennsylvania **found**[37] that high school students demonstrated a "small but significant improvement" in chemistry quiz scores after playing World of Alchemy, an educational video game for high school chemistry students. Crucially, tangential learning research **suggests**[38] that such experiences not only educate but also inspire people, young and old, to seek out knowledge.

S1T2 leveraged the principles of tangential learning while developing BTS, in an effort to encourage children to more deeply explore healthy foods and lifestyle.

"If you make learning fun, enjoyable and engaging, then people will choose to learn of their own accord," Tan said

"If you make learning fun, enjoyable and engaging, then people will choose to learn of their own accord"

There are also studies looking into the effects of technology on people, particularly children. A USD $300 million study by the National Institutes of Health, an agency of the U.S. Department of Health and Human Services, is following more than 11,000 children over a decade to better understand how digital screen time affects children's brain development.

Their initial research, and the results of 4,500 brain scans, as reported on by **CBS News**[39] in the U.S., has found that more than two hours of screen time daily could do damage. It has also shown to decrease scores on language and thinking tests (ages were not given with these statistics).

When designing their programs, both Millipede and S1T2 are cognisant of encouraging appropriate amounts of screen time for children. To date, Millipede has made a point of intentionally designing all of their play-based children's apps to support meaningful, fun play for short periods of time.

Photo by Alana Holmberg

Contributing to the broad range of studies examining the relationship humans have with technology, LAUNCH Legends, and the OSI and BTS pilots, provide further evidence for how digital tools can support education globally and in the South Pacific. The programs also highlight impact opportunities that come with understanding and leveraging emerging technologies along with traditional mediums and educational approaches.

"Research will quickly improve real-world projects," said Childs, "and those projects will quickly define the most important areas of new research."

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Virtual Reality Meets Reality

LAUNCH Legends originated in 2016 during the height of the recent rise in immersive media. The program began with a focus on exploring how story, immersive technologies, and gamification, could address the NCD health crisis in the Pacific.

The request for proposals sought VR and AR storyteller content that would have a positive impact on health and nutrition challenges in the region. Thus the majority of incoming proposals were focused on gamification concepts that leveraged VR and AR technology. But the DFAT iXc and SecondMuse teams were also thoughtful regarding the primary goal around nutrition education for impact, and the aim of trialling technological interventions to support that goal, even if immersive technology was not used. In the end, such technologies played a much smaller role than the request for proposals suggested it would.

Tan and Monte both drastically changed their program ideas after spending time in Tonga and Fiji, essentially starting over from what they had originally proposed.

Photo by Ben Kreimer

"The brief that was put out was quite broad, and not having on the ground experience we were just going off of reports and literature we could find," Monte said.

Millipede's original program proposal included a VR component that they abandoned after visiting Tonga. They realised that it wasn't a sustainable or relevant solution for the Tonga classroom context and their focus student age group. Instead, their revised program focused on the creation of an immersive play-based app game for children.

"Immersion doesn't just equal VR"

"Immersion doesn't just equal VR," Monte said. "Our experience is indeed immersive, it's just not in the same manner as VR."

S1T2 did retain an immersive VR experience for their program in Fiji. A single, one-time use VR experience developed to immerse children in the BTS story from the first-person perspective at the beginning of the pilot.

"The virtual reality element is only happening at the beginning, but it's a really really important element," Merlo said. "It's one of the things most about the program that hasn't been done before, and it's something we really believe in."

Opposite page: Photo by Rachael Imam

"The virtual reality element is only happening at the beginning but it's a really really important element"

Beyond the Stars - A VR Experience

The creators of the BTS VR experience explain what made it so special for the children in Fiji https://youtu.be/Ybhsiy_hO3U

The Program Goals and Assumptions

The goals for LAUNCH Legends as a program, and for the OSI and BTS pilots, have evolved over time. This is both in response to events in the broader world of nutrition research around healthy eating, and to the particular situations in Tonga and Fiji.

LAUNCH Legends originally set out with an elaborate theory of change. It not only intended to instil children with a greater awareness and pride in their culture's culinary traditions and foods but also wanted to measure a change in their eating habits as indicated by a reduction in consumption of processed food. Quite ambitiously, Legends also stated wanting to reduce obesity in the Indo-Pacific by 10% in ten years.

The more time Millipede and S1T2 spent developing their programs and talking with stakeholders, the more it became apparent that their goals were anything but simple. Their intention to generate measurable behaviour change was found to be particularly unrealistic within the scope of the pilots.

"The original goals were unrealistic," said Allan Soutaris, Head of Technical Innovation at SecondMuse. "So, quite rightly, the theory of change and the goals of the program were condensed, and focused on what we thought we could achieve by implementing these education technologies within the classroom."

In late 2017, at about the same time LAUNCH Legends reconsidered its goals, former Cornell food researcher Brian Wansink became news when some of his studies around nutrition interventions and behaviour change in kids' eating habits came under scrutiny. They were then **retracted**[40] due to poor methodology and data manipulation. BuzzFeed News reporter Stephanie Lee **investigated**[41] Wansink's work, and revealed that he would encourage his assistants to analyse data in ways that would yield desirable results.

This is something that Millipede and S1T2 strived to avoid by hiring independent Monitoring and Evaluation (M&E) experts to develop the M&E framework for their programs. Because dietary behaviour change in children is so difficult to measure the goals of OSI and BTS evolved to reflect what was within reach given the limitations of the two pilots.

> **"What we wanted to know was whether teachers and parents found the tools to be an effective method of education, and whether children found them to a more engaging way to learn"**

"What we wanted to know was whether teachers and parents found the tools to be an effective method of education," Soutaris said, "and whether children found them to be a more engaging way to learn, rather than the traditional rote method."

Despite no longer faced with the original lofty ten-year goals that LAUNCH Legends began with, S1T2 continued to develop their short term pilot in the context of their own long term vision for the BTS program, and the impact they intend to have in the years to come. For S1T2, BTS was just the first step towards a larger, financially self-sustaining South Pacific NCD intervention.

"If you look at the pilot context, that [behaviour change and NCD impact] is not going to be achieved in a year or a couple months," Tan said, "but the benefits of a long term vision and achieving that is tremendous."

S1T2's goal for the BTS pilot was for participating children to improve their ability to identify healthy foods and gain an appreciation of the value of nutrition. BTS would inspire them to consciously adopt a healthier lifestyle.

> **"We love this idea of transmedia storytelling, being able to enter a universe at all these different points, and take what you want from it"**

This, S1T2 hoped, would lead to children developing greater awareness about their own health and making better informed dietary decisions. Simultaneously, BTS aimed to demonstrate how transmedia storytelling technologies (the program's animated short film, VR experience, print-based storybook, and interactive game) could effectively communicate nutritional knowledge and inspire healthy behaviours and attitude change in children.

"We love this idea of transmedia storytelling," Tan said "being able to enter a universe at all these different points, and take what you want from it."

Millipede's goal for the OSI pilot was to raise awareness about the value of child-led, play-based and game-based learning using app-based technology along with supporting print-based materials. Through this play-based learning, Millipede sought to increase awareness of nutritious food options, especially those local to Tonga, and to shift children's preferences towards healthy eating.

"That child-led, play-based approach in this digital form is actually a really effective and, truth be told, quite efficient way of doing it as well," Monte said.

While both programs use technology and paper-based materials to encourage fun engagement around healthy eating curriculum, OSI and BTS emphasise different terminology to describe their respective program designs. BTS emphasises how the narrative-driven story that is Beyond the Stars, delivered using the transmedia storytelling process, can inspire tangential learning. OSI emphasises play-based learning using their app and supporting materials, which share common characters, aesthetics, and themes, but not an overarching transmedia narrative like in BTS.

Parents and teachers interacting with the program and children would also change their own attitudes and relationships with the food they eat, while developing an appreciation for the approaches of transmedia storytelling, play-based learning, and emerging technologies as teaching tools.

Both Millipede and S1T2 designed their programs so teachers and parents engaging with OSI and BTS would, as key role models and influencers, support children's participation, and observe children demonstrating attitude shifts around their perceptions of food, and food choices.

"The pilot aims to demonstrate that it's able to teach kids this material, and students are learning, and teachers are liking the program, and people are engaging with it," said Merlo from S1T2, "We're evaluating it as a pilot and prototype."

Photo by Alana Holmberg

The assumption that transmedia storytelling, using hi and low-fi mediums, will impact a child's relationship with nutrition and healthy eating underpinned the design of the BTS program, and was identified as a central focus for monitoring in the post-piloting process. For Millipede, the assumptions that teachers have an understanding of play-based approaches to learning and an existing level of understanding about the benefits of healthy eating underpinned the success of the OSI program.

The Programs Goals and Assumptions footnotes

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Human Relations › Technology

For Tan, the focus on bringing partners, stakeholders, and influencers together under the banner of the program is what makes BTS unique, not the technology.

This BTS community includes Fiji's Ministry of Education, Heritage and Arts, the Ministry of Health and Medical Services, the World Health Organisation (WHO), Pacific Community (SPC), private sector involvement with Vodafone Fiji (who donated free SIM cards), Huawei (who donated free tablets), KPMG, Pacific Island artists, and individuals, including advisors Vanisha Mishra-Vakaoti, Arieta Tora, and Fiji parliamentarian Lenora Qereqeretabua. Their approach enabled BTS to align and complement other efforts working to address the NCD crisis.

"What makes Beyond the Stars so special or so different from other things that may have been tried," Tan said, "is that we are adopting a holistic approach."

"What makes Beyond the Stars so special or so different from other things that may have been tried, is that we are adopting a holistic approach"

When talking about BTS and the effort it took to implement, Tan doesn't describe the program as special because of the technologies used. Rather, he speaks of BTS as a normal development project that happens to use technological tools. As such, BTS was subject to the same implementation steps that any other development project would encounter. In Tonga and Fiji, this meant establishing relationships at all levels, from government officials to school students.

"Any aid project would benefit from this approach," Tan said. "In our case, it just happens to involve emerging technology."

To help develop these relationships, S1T2 worked closely with Fijian cultural advisors Ken Cokanasiga and Amasai Batabua for assistance engaging with communities and schools. They were crucial in creating local affiliation and ownership for BTS.

Photo by Alana Holmberg

"Our [S1T2's] job is to use our expertise in storytelling and technology, but at the same time we understand that we don't know Fiji better than the people living there," Tan said, "and so what we're trying to bring together is this collective of individuals and organisations that care and use our expertise in storytelling with emerging technology, and together be able to really achieve something special."

Despite the clear hierarchy of individuals involved when doing this kind of work, it is apparent that the ultimate success of a project depends on supportive relationships with people at all levels equally, albeit in different ways.

In the case of an education program such as LAUNCH Legends, to get through the classroom door, support from the Ministry of Education is required. Soutaris said that, if you want to get your programs implemented properly in schools, you also need teachers "onboard as the champions of the program."

Soutaris accompanied Tan and Monte and their teams to Fiji and Tonga. He played a key role in helping Millipede and S1T2 nurture relationships with stakeholders, partners and specifically in the case of LAUNCH Legends, teachers.

"They are the steps you need to get right before you can even begin to think about implementing technology for whatever sector or industry," Soutaris said.

"They are the steps you need to get right before you can even begin to think about implementing technology for whatever sector or industry"

Having concluded the pilot, S1T2 now realises that the time they spent with teachers was "absolutely key" to BTS getting used in classrooms. The team also consulted with children about the development of the app and overall program, ensuring it resonated with them, and was fun.

"That's been a really big part of why we've been here," Merlo said during S1T2's second discovery visit to Fiji in November 2017. "We've been polling the students to see what their favourite games are, what kinds of foods they've been eating, and that kind of information we can put into the game to make sure the food is relevant."

No matter how innovative the technology, neither program could have succeeded without earning such support and developing relationships across the social hierarchy spectrum, both inside and outside schools.

"If you don't have buy-in from all levels of influence, including the Ministry of Education or the head teacher, you cannot succeed," Tan said.

OSI had a similar experience in Tonga. Monte described Millipede's first discovery visit to Tonga as a listening journey to better understand Tongan classroom environments and the nature of the local NCD crisis. Only after understanding the situation better did Millipede begin to design their play-based learning and technological intervention, both of which were new concepts for Tongan classrooms.

Photo by Rachael Imam

"We really wanted to make sure that we weren't considered to be flying in with new-fangled technology that's got all the answers to everyone's problems," Monte said.

As is often the case in development work other organisations and projects are working in the same space, addressing the same challenges. Alignment and collaboration with these organisations and initiatives, and other people from the local community is essential for achieving success because of the shared goals and mutual support that follows. These local alignments are especially important for foreign-led initiatives like OSI and BTS that need community support and legitimacy to succeed. More importantly, when large scale challenges are the focus, as is the case with NCDs in the South Pacific, it will take a movement, not a single organisation, to make an impact.

"If you don't reach every single level of stakeholder influence nothing can succeed, and I don't think that's exclusive to technology programs."

"If you don't reach every single level of stakeholder influence nothing will succeed, and I don't think that's exclusive to technology programs, it's integral to all aid and development," Tan said.

In Tonga, Millipede developed a strategic partnership with Tonga Health, the organisation behind the *Mai e Nima* (Give me Five) program. The program encourages students in grades five and six to consume at least five servings of fruits and vegetables per day, while providing participating schools with garden tools and seeds. With the exception of one school (that found out about the program via a newspaper article and requested permission to participate), the strategic partnership between Millipede and Tonga Health resulted in OSI launching exclusively in schools already running the *Mai e Nima* program. This saved Millipede money on research and time finding school partners that would align with and follow through on the OSI external program.

Both OSI and BTS were supported by government ministries in Tonga and Fiji.

S1T2 received support from Fiji's Ministry of Education, Heritage, and Arts, and Fiji's Ministry of Health and Medical Services. Having worked on innovative technology projects with many companies and organisations in the past, Tan recognised and acknowledged the two ministries for their ability to support and engage with BTS on the ground in Fiji.

"The Fijian government was very open to a changing landscape and changes that occurred naturally through design," Tan said, "which is not often the case."

After the OSI pilot, Jenkins expressed appreciation for the supportive relationship between Millipede and Tonga's Ministry of Education and Training CEO, Claude Tupou. Millipede and Tupou were in communication throughout the stages of pilot development. He and the teachers were excited by the work Millipede did in carefully crafting OSI specifically for Tonga and Tongan culture, including the use of spoken and written Tongan language in the program.

"The program was developed to take into consideration the importance of being culturally friendly," Tupou said. "So the words, everything that is there, it's Tongan culture."

In Tonga, Millipede worked with Joanna Bourke to coordinate meetings with stakeholders, partners and schools. Bourke is the director of **CocoNew - The Agency**[42], a Tongan-based, owned, and managed consultancy. Given her Tongan heritage and work, Bourke understands the great importance that Tongans place on human relationships and personal connections. Bourke helped Millipede meet the right people and acted as a cultural advisor for OSI. She also represented Millipede when the team was not in Tonga, by checking-in with classrooms and teachers participating in the OSI pilot.

"Joanna was the backbone of the pilot in Tonga," said Rachael Imam, Communications Associate at SecondMuse, who traveled with Millipede to Tonga and documented the pre- and post-pilot experiences.

Bourke's contribution to OSI demonstrates how invaluable local knowledge and understanding is to foreign-led projects in the Pacific, and her efforts were acknowledged by those within and outside of the pilot delivery team.

"I thank you for her [Bourke] for the right guidance, said Tupou. "If not for her guidance, things were going to go wrong."

A Blessing from Uili Lousi
https://youtu.be/3FSsGa2Dkks

Human Relations › Technology footnotes
42 CocoNew The Agency http://coconewtonga.com/

Opposite page: Photo by Rachael Imam

"The program was developed to take into consideration the importance of being culturally friendly, so the words, everything that is there, it's Tongan culture"

Details, Details, Details

Both the Millipede and S1T2 teams began with a pilot discovery phase, spending time in-country to gather information, challenge their assumptions, and meet with stakeholders. This also included play testing the pilot resources with children.

"In digital game design, there's a balance between replicating a real-world experience and making the experience joyful and playable on a given device," said Mercer, Millipede's former Lead Learning Designer who helped develop the pilot.

Understanding and finding that balance is crucial, particularly when the goal of game designers is to have a real-world impact. Mercer and Jenkins spent time in Tonga observing, photographing, and asking questions about gardens and gardening practices in Tonga. Jenkins said Millipede asked detail-oriented questions during their pilot discovery trips: How do Tongans hoe the ground in their gardens? Is spinach harvested by hand or with a tool? How big does a particular vegetable grow if it's watered properly?

"It's those sorts of questions that can make a big difference," Mercer said. She noted the importance of understanding real-world activities to balance the OSI app's playability with knowledge and exposure that carry real-world significance.

In addition to the two discovery phase trips, Millipede made an additional visit to Tonga during the development of OSI, asking more questions and interacting with students and teachers, before launching the pilot.

"Making sure that we're not making too many cultural assumptions is just unavoidable, but we're doing our best to address that as much as possible," said Mercer. "That's one of the biggest challenges any time you're doing cross-cultural work."

This attention to detail did not go unnoticed by Tupou and Tonga's Ministry of Education and Training.

"I'll put it this way - the people behind the program have done their homework first, so when it gets into the classroom, there is no complaint."

> **"I'll put it this way - the people behind the program have done their homework first, so when it gets into the classroom, there is no complaint"**

Millipede went to great lengths to make the OSI characters, game environments, and food ingredients distinctly Tongan.

Tonga's official languages are Tongan and English. For OSI, the use of the Tongan language in the program instead of English was a major positive point, and Millipede found that it led to a high level of engagement with students. This was in addition to praise from stakeholders, especially teachers.

"I like it when it's in Tongan because most of them [students] are Tongans and because culturally I know that they should speak Tongan fluently rather than... the second language, like the English," said Uaite Mafi, a teacher in Tonga participating in OSI. "For them to improve and to be smarter for them [sic] in the future in any language, they have to speak Tongan first."

Making a bespoke program for Tonga, in Tongan, was challenging for Millipede given nobody on the team spoke Tongan. They relied on connections to Tongan speakers for translation on the ground in Tonga throughout the pilot discovery, development, and launch phases, and for the program's pre- and post-pilot survey and video interview feedback. This commitment to cultural appropriateness, and ensuring the program would resonate with Tongans of all ages, was necessary to gain formal approval at the ministry level, as well as with teachers and students.

"I think for a program to come and participate in schools it has to be looked at very carefully before we implement it because there are lots of landscapes to look at to make sure it's right," said Tupou.

In designing BTS, S1T2 also had to consider the diversity of language, for Fiji has three national languages: English, Fiji Hindi, and Fijian. Fiji was a British colony until 1970, and historically indentured labourers were brought from India, introducing Hindi to the archipelago. Over time, these Indo-Fijian Hindi speakers adopted elements of English and Fijian, the language spoken by Fiji's iTaukei ethnic majority. Yet, as stated by Paul Geraghty, a linguistics professor at the University of the South Pacific in Suva for a **2009 story in Scoop Independent News**[43], within the Fijian language there are at least 300 dialects spoken around the archipelago.

> **"They are the subtle things that you would have missed and would have been completely off the mark if you hadn't spent that time in Fiji"**

English was the default language used in BTS. However, given the diversity of language in Fiji, S1T2 designed the program so that language use was minimised, instead relying on intuitive gameplay, along with audio and music. Additionally, like OSI, a great deal of effort went into the artwork of BTS, capturing the physiques, skin colours, hairstyles etc., of Fiji's diverse population. Those nuances in the design came from extensive observations and much feedback from teachers, stakeholders, and cultural advisors on the ground.

Details, Details, Details footnotes

43 Vakatawa, E & Meciusela, S 2009, 'Many of Fiji's 300 dialects in danger of being lost', Pacific Scoop http://pacific.scoop.co.nz/2009/09/many-of-fijis-300-dialects-in-danger-of-being-lost/

Beginning with their first visit to Fiji, S1T2 was deliberate in empowering the teachers during the design process, both to inspire buy-in with BTS, and to make sure the program would resonate with children and adults alike.

"They are the subtle things that you would have missed and would have been completely off the mark if you hadn't spent that time in Fiji," Soutaris said.

"The whole aim of my first trip to Fiji was talking to teachers and finding out what would help them," Merlo said.

After having those meetings early on, S1T2 strategically designed BTS to integrate "really heavily" with the healthy living curriculum taught in classrooms, as well as elements from the physical education and social sciences curriculum.

"It's been really valuable to not come in at the end with this thing that is already ready and say 'here you go, work with it.'" Merlo said, during S1T2's second discovery field visit in November 2017. "We've been able to build it [BTS] collaboratively along the way."

S1T2 made an intermediate visit with their first BTS prototype, spending time with teachers and gathering feedback that went into the next iteration of the program. S1T2 brought the resources back to Fiji for a second round of feedback, showing teachers the latest version of the pilot that had been developed based on their input.

"It was a process of 'let's create this together,'" Soutaris said, with Tan adding that, "The iterative approach was quite powerful in getting that [teacher] buy-in."

Photo by Rachael Imam

Launching the Pilots

OSI launched in Tonga in April of 2018 and ran for six weeks in eight government public schools and three mission schools. The schools, located across Tongatapu, the biggest island in the archipelago, were in urban Nuku'alofa and surrounding rural areas.

The 285 participating children were of ages 5 to 7 (grades one and two). Parent/guardian participation was voluntary, though materials were created in Tongan and English to provide family members with an overview of the program.

At the pilot launch, teachers received a high-level briefing and notes about how to combine the app and paper-based elements of the program. The teacher notes, written in Tongan and English, provided information on the program aims, learning outcomes and program resources. Suggestions on how to use print resources for offscreen learning activities were included in the app itself, and on paper.

Each classroom received one iPad, requiring Millipede to devise a creative solution that would allow more children to access the device at once. Knowing this from early on in the design process, Millipede built the OSI app for collaborative play by allowing multiple finger inputs at one time. There were no login screens for children, enabling pick-up and play interaction.

"One of the principles in our learning design is that we definitely believe kids learn through collaborating with each other," Jenkins said. "We had seen that play out on some of the previous projects we have worked on, and that reinforced our belief that was an appropriate design philosophy to follow."

BTS launched in October 2018 on Fiji's main island of Viti Levu. Nine pilot schools were selected in the districts of Nausori, Nadroga, Suva and Ra, representing urban, rural, and remote areas.

The pilot also included two schools designated by the Fijian Government as "Inclusion Schools" for their capacity to cater for disability-inclusive education. The 313 participating children were of ages 8 to 10 (grades three and four). Parent participation was voluntary.

The approval of the Cabinet Paper was a significant achievement for the program but came in the weeks leading up to an election.

Given the uncertain outcome and support of the program following the pending elections, it was decided to push forward with the pilot launch within the short time that remained in the term. The decision to launch the pilot was difficult but reflected the political realities of doing development projects with government support. Due to this delay, the pilot was launched towards the end of the school semester, meaning some teachers had already covered the curriculum contained within BTS and were busy preparing for or already giving exams. S1T2's pilot launch was designed to consist of two 45 minute class sessions per week, over a span of 10 weeks. In reality, classes had a maximum of five weeks with BTS.

"Given the amount of other things that were going on during the pilot, the fact that teachers managed to use the program at all shows how dedicated they were to it," said Merlo.

S1T2 visited each school to launch the pilot and assisted students in their VR experience. The team kept the Oculus Rift and laptop but left behind the story and activity books for each student, in addition to a number of tablets loaded with the BTS app at each school. Huawei donated 50 Huawei M3 Lites Android tablets, while S1T2 provided an additional 10 Huawei MediaPad M2s. Vodafone Fiji provided SIM cards loaded with data.

The 60 tablets meant that there was a tablet for every four to six kids in each of the pilot classrooms. Additionally, S1T2 designated and trained student "experts" in each classroom to take care of the tablets and ensure that they remained charged. These students also received troubleshooting lessons.

"Our intention was not just to empower the teacher but also a select group of students to champion the program as well," Tan said.

Opposite page: Photo by Rachael Imam

Teacher Buy-In

The goal of both programs was to make the lives of teachers easier in the classroom, and improve the lives of students. But S1T2 and Millipede were foreign organisations, essentially imposing their outside ideas on a system they were not part of.

"It's like someone coming into your company and for two weeks saying 'alright, you have to do things this way,'" Tan said. "It's a huge cultural change and a huge cost in some instances."

Both Millipede and S1T2 recognised the importance of integrating with and complementing the classroom curriculum, so as not to burden teachers.

This also came down to working closely with teachers to design the programs so that they could see value in what Millipede and S1T2 were creating.

"It's just always about asking people, 'What do you think? What could be better?' And getting that kind of feedback." Merlo said.

"It's just always about asking people, 'What do you think? What could be better?'"

Not surprisingly there was a spectrum of success for both programs, with some teachers leveraging the program materials more than others. Tan said that there were a couple of schools that "fell head over heels" and integrated the BTS program into all of their curriculum and exams during the pilot period. One BTS participant teacher said the program helped the entire school, and not just his class. Most of the other teachers, none of whom were piloting the program, were also photocopying and using the activity sheets. While success is desired, failure provides the greatest opportunity for learning. Both programs had one school that used their program very little, if at all.

Both situations involved teacher changes. For BTS, a head teacher, who was supportive of the program and had developed a relationship with S1T2 over the course of 18 months left the school shortly before the pilot launch, and the new head teacher had no exposure to BTS. Simultaneously, the grade four teacher who would have implemented the program in the classroom did not do so due to time constraints.

Millipede had a similar experience in Tonga, with one school only using the OSI app twice. The teacher Millipede had been working with in the months leading up to the pilot left shortly after the launch. Millipede didn't become aware of this until they walked through the door at the end of the pilot.

"The new teacher actually told us, when we went back in at the end of the program, that she didn't believe in using new technology with young children," Jenkins said. "That was incredibly frustrating for us to be told that when we walked in."

Photo by Rachael Imam

Although the new teacher did use the paper-based materials, Jenkins speculates that the iPad sat on the shelf for most of the pilot with the application data showing only two sessions with total usage of 23 minutes. This underscored the importance of developing teacher relationships while ensuring regular communication and in-person support during the piloting process. More generally, the situation highlights the critical role that human relationships, at all levels, play in the rollout of development projects, and especially those involving new technology.

Other teachers who were sceptical of technology in the classroom changed their minds after engaging with the pilots in their class. Rajesh Lal, the head teacher at a rural Suva district school in Fiji, said that he initially had reservations about the use of technology to impact food and nutrition choices. But having seen the BTS pilot, he now sees its potential as a tool for teaching children.

"I would strongly, before leaving, hint to the management that it can become part of the resources that we have to bring in lifestyle changes," Lal said in a post-pilot interview.

"I would strongly, before leaving, hint to the management that it can become part of the resources that we have to bring in lifestyle changes"

Further illustrating the influence BTS had on Lal, he also said in an interview with S1T2 that he had intentionally deprived his own teenage children of access to technology until they are older and "independent enough and mature enough to use it as a tool."

But after his experience with the BTS app, he began to reconsider his stance on keeping devices out of his children's hands, and began to imagine the potential of the app.

"But maybe, I thought now, second thought [sic], I can give them even in [sic] this one, we can develop this app further to incorporate some food gardens at home and how to plant a simple crop and to look after it and harvest and some [sic] post-harvest processing and translating finally into a recipe that we can enjoy," Lal said. "I see it [the app] as a tool."

The OSI and BTS pilots both experienced instances of teachers going above and beyond the expectations of the program in ways that helped their students to engage deeply with the program materials and messages. OSI's most engaged school had a teacher that went on maternity leave during the pilot. Unlike in some schools where such an event may have triggered a lack of engagement, class teacher 'Elisapeta Vaolupe was enthusiastic about the program. She briefed her replacement who went on to retain the same level of enthusiasm for OSI. When the Millipede team returned, the students gave a 30-minute presentation for the team.

"The classroom was kind of like a shrine to OSI when we went back at the end of the pilot," Jenkins said. "It was really quite overwhelming just how much they engaged with the program."

The classroom had OSI related decorations hanging from the ceiling, and the app data registered 184 sessions with an average of 34 minutes per session, totalling over 104 hours. Vaolupe had embraced play-based learning and had gone on to create her own classroom materials, independent of OSI and the suggestions in the teacher notes.

Maca Vobvola, a rural school teacher in Nadroga, described a parent that came to her in tears of happiness over the positive changes that her son was going through while participating in the BTS program.

9. TEACHER BUY-IN

"He does not want us to get Bongos [baked snack] and junk food for him, and he's telling us, 'get fruits, get fruits, grandma, please just cook boiled food for me," Vobvola said, sharing the parent's story, and adding, "so be thanks to Beyond the Stars for that."

Merlo said that Vobvola and her school created an award specifically for this high achieving BTS child.

Following the pilots, teachers expressed increased confidence in using technology in the classroom. Millipede does acknowledge the potential for bias in these and other post-pilot responses given by teachers that may have felt it best to respond positively to the questions. That being said, eight out of 10 surveyed teachers answered that they were 'Very confident' using an iPad as a teaching tool by the end of the pilot, compared to four out of 10 before the pilot.

"Even though it's for kids, but, I love, I mean I like it more," said Uaite Mafi, a participating OSI teacher. "I always want to have a go before everyone... that's to be honest."

All but one teacher requested more iPads from Millipede at the end of the pilot.

9/10 **Nine out of 10 OSI surveyed teachers agreed there were benefits in using play-based learning and games to support learning compared to five out of 10 surveyed teachers before the pilot.**

"Sometimes I take it home and sit with my grandchildren, and I have to show them what to do - they are still two or three," Mafi said, "but I think that it's not for a particular age."

When Millipede downloaded data from the iPads, they noticed some teachers had been using the devices for personal use. Monte and Jenkins were happy to see this, as it showed a personal desire to become familiar with the technology.

"If we had some new piece of technology that we were using at work [in Millipede's office] we would more than likely try it out too," Jenkins said. "It seems like a positive thing to me."

67% **S1T2 found that all participating teachers valued the program's innovative educational approach, with 6 out of 9 (67%) suggesting it was more effective at inspiring child learning than traditional methods.**

"Instead of that boring blackboard teaching, Beyond the Stars have come to meeting the students' needs in a way they want to be taught," said urban Nadroga teacher Sameeta Sharon.

9/10 **Nine of the 10 OSI teachers highlighted the benefits of play- and game-based learning to support young children's learning, with one-third of the teachers demonstrating a "significant" willingness to create their own offscreen play-based health activities for their students.**

For S1T2 all participating teachers agreed that the BTS program could be expanded to include other subjects and grades, with 79% reporting that they had already begun to implement aspects of the program's educational approach in other subject areas of their teaching. Teachers also saw opportunities to plug the BTS curriculum itself into other subject areas beyond healthy living and health sciences curriculum, including physical education, and social studies.

"Now, I'm in the mode of bringing technology in the classroom, not only for healthy living and integrated Physical Education with healthy living, but other subjects too, like maths and English," said a BTS participating teacher who requested to remain anonymous. "If things go well then obviously we'll be keeping the other activities in the tablets, we can download the activities, especially for maths and English, to improve on."

Vobvola also underscored the BTS program's focus on tangential learning and active participation for engaging children that struggle with traditional rote learning.

"Because some of the children, they have their own ways of learning," said Vobvola. "Some of them [students] are weak, academically they are very weak... it really brought them closer to us as a group."

Opposite page: Photo by Alana Holmberg

Pilot Findings

In addition to implementing their programs, Millipede, S1T2, and SecondMuse conducted the on-the-ground evaluation of both pilots. This was done through interactions with children, teachers, and parents before and after the pilots.

The evaluation included administering pre- and post-pilot surveys and interviews to help understand the experiences of participants in the pilot. It also helped to record children's ability to identify healthy foods, gauge attitudinal shifts around healthy eating, and reveal unexpected outcomes. There is, therefore, a risk that participant and evaluator bias may have impacted both the gathering and analysis of the results.

All participating schools were new to using technology in the classroom in such a programmatic way. While the findings that came from the short OSI and BTS pilots are not indicative of attitude or behaviour change, or long term impact on the NCD crisis, they do provide evidence for the broader potential of technology combined with play-based learning and transmedia storytelling for education in the South Pacific, and globally.

Given that both pilots are program prototypes, it was beneficial for Millipede and S1T2 to evaluate their work internally.

To mitigate bias, both programs hired external measurement and evaluation consultants to develop their theories of change and evaluation frameworks. S1T2 also hired external statisticians as a part of their post-pilot analysis.

Both the OSI and BTS pilots were conducted in a live environment along with other health and nutrition programs for children and adults. In Tonga, select schools were participating in the **Mai e Nima**[44] (Give me Five) campaign, and although designed for children older than those engaged with OSI, it's difficult to gauge its influence. In Fiji, earlier in the term, children completed the "Healthy Living" curriculum that BTS is based on. Additionally, a selection of schools participating in BTS were also participating in the World Health Organisation's **Health Promoting Schools**[45] program. And in interviews, some parents highlighted their own efforts to serve healthy food at home.

"It's not about showing absolute change, just yet, though that, of course, is the goal as we go forward"

"It's not about showing absolute change, just yet," Merlo said, "though that, of course, is the goal as we go forward.

After the BTS pilot, children on average demonstrated an 11% increase in their ability to identify healthy foods. Children also achieved on average a 10% increase in their ability to identify unhealthy foods. The qualitative interviews with teachers and parents also support these findings.

"I was a little bit surprised, but happily so, that there was a finding of there being some kind of change," Merlo said. "In the end, there was so little time that they had with the pilot, and there were so many other things going on. To see that there was a change and that that change was statistically significant, was really exciting."

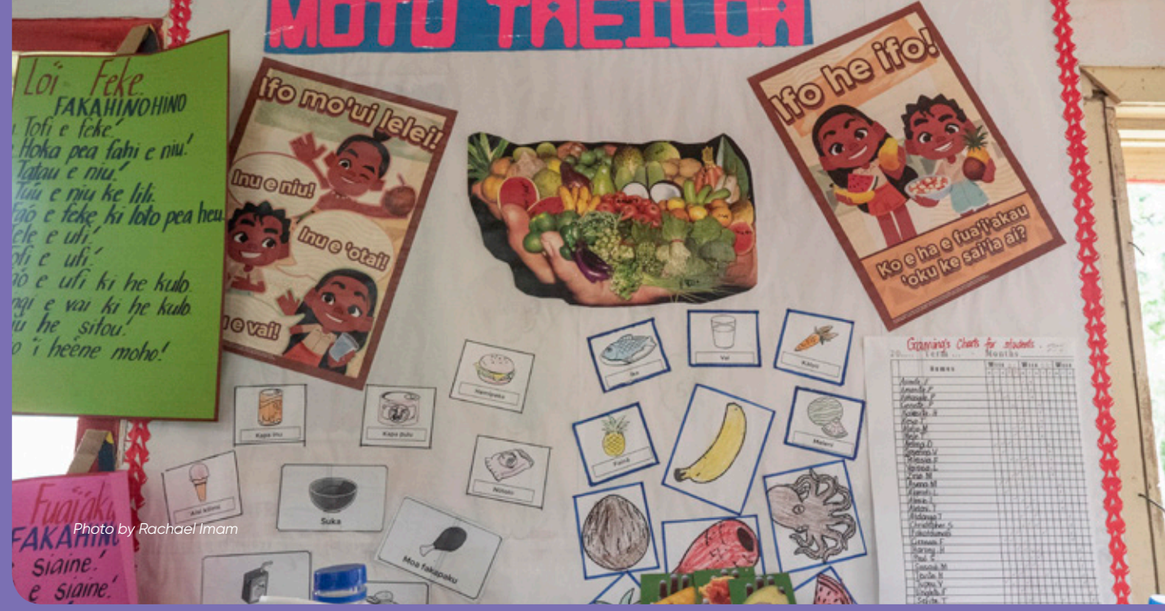


Photo by Rachael Imam

93% **Millipede found that following their pilot 93% of students surveyed could draw two healthy foods by the end of the pilot compared to 54% of students before the pilot.**

81% **And 81% of students could correctly differentiate between examples of healthy and unhealthy foods, compared to only 3% of students before the pilot.**

Millipede sees this as evidence that the play-based approach was effective in supporting students' learning, and is a notable finding given the pilot ran for six weeks. Student engagement with the app also held steady throughout the pilot, with engagement increasing towards the end of the pilot in some cases.

"The awareness of healthy foods is the shining light," Monte said, when talking about OSI's evidence of success.

"The awareness of healthy foods is the shining light"

Regarding app user data, the OSI app did not gather identifiable user data on individual children's use; however, it did record gameplay statistics at the class level. Each device was assigned an anonymous ID for data tracking.

The app was built to track specific data points such as app session frequency and duration, and the relative frequency and success of different player actions within the game. This data revealed aspects such as the most popular recipes in the game, the percentage of recipes completed once started, and the most frequently collected food items from the sea and garden.

S1T2 originally planned to have 300 Android tablets for BTS, so each student could have their own device while playing the BTS app together in small groups. This would have enabled children to have their own personal, individualised learning journey, while having the ability to interact and share what they were experiencing and learning. Despite only having 60 tablets for the pilot, S1T2 stuck to their original plan for single player interactivity with the app. This included individual user profiles for capturing granular data of each student's BTS journey and isolating learning outcomes.

When asked if he would do things differently given how the pilot and access to hardware played out, Tan said he would make the same decision again. His logic comes down to planning for the near future when mobile devices are more accessible and cost less.

"When that happens I want this game to be in a good position to expand and scale," Tan said.

BTS child survey analysis also showed that children were, on average, 14% more likely to express preferences for healthy foods and 37–58% less likely to express preferences for unhealthy foods after the pilot period. Qualitatively, a majority of participating BTS teachers and parents identified a shift in children's preferences towards healthy foods, with 78% of teachers and 44% of parents suggesting that the impact went beyond an attitudinal shift and was more behavioural.

Photo by Alana Holmberg

"Beyond the Stars is the cause of change"

"Beyond the Stars is the cause of change," said urban Nadroga teacher Shameeta Sharon.

"The books, and the gadgets, and all those things would haven't [sic] been there then I don't think there would be any change in the students."

Lavenia Peckham, the mother of a child at a rural Nausori school, said that her daughter "came home with her books and started sharing with the family over dinner on some things she has learned from Beyond the Stars."

"After her coming in with program [sic] I just don't know," Peckham said. "It's like a complete change from that to this."

Ani Marama Koroi, a mother of a child participating in BTS at a rural Nausori school, said that her daughter has become diligent about asking for healthy meals at home.

"She always make sure [sic] and ask me if the three food groups all apply inside our meal," she said.

Tivaini Fonua, the mother of a child participating in OSI, said that although nutritional meals had become a bigger priority in her house, she did notice changes with her daughter's enthusiasm towards healthy eating. After starting the program, her daughter began asking her to buy vegetables, saying she likes having them with meat.

"She always requests to buy vegetables to eat, whether in our cooking or to eat it raw," Fonua said, "she really likes to eat vegetables and fruits."

'Asimaueta Sili, the mother of another child participating in OSI, said she has seen "some big changes" with her son's dietary choices.

"As you may see, this little boy is quite big, and his favourite foods are from the shops," Sili said. "But since the program started, even though he has not fully stopped eating it [junk food] but [sic] he eats less of it."

Millipede found that the name Our Special Island (*Motu Ta'e'iloa*) became synonymous with healthy eating for children and parents. This demonstrates the impact of the program and app on students transferring their digital play interactions with their off-screen world.

"What really makes me happy is that parents are coming and saying, 'Thank you very much, my daughter is not now crying for any junk food," said Uaite Mafi, a teacher in Tonga participating in OSI, "and they will say 'So what is happening?' So that's the change."

Vitolio Ongolea, the father of a girl participating in OSI, said that when his daughter comes across junk food, like lollipops or instant noodles, she would ask if this food is part of the program.

"She always said, 'Is this one of the Motu Ta'e'iloa?' I say 'no' and she is 'oh! This is not the Motu Ta'e'iloa thing.' So she went and put the lollies [back]"

"She always said, 'Is this one of the *Motu Ta'e'iloa*?' I say 'no' and she is 'oh! This is not the *Motu Ta'e'iloa* thing.' So she went and put the lollies [back]," Ongolea said.

Sili also said that the most important part of the program is the name.

"*Motu Ta'e'iloa* is something that my son often speaks about at home," Sili said, "and often tells me that *Motu Ta'e'iloa* has food that is healthy and other food like junk food which he usually cries for from our little shop."

87% **Analysis of S1T2 parent evaluation activities found that 87% of parents said that their engagement with the BTS program through their child had an effect on their own attitudes and behaviours around eating habits and food preparation.**

"Our meals are not like before as we have now followed this program strictly and have seen the impact on our family," said Luisa, the mother of a rural Nadroga student.

Vaulina, another mother of a rural Nadroga school student, described a similar change in her home.

"My child has really taught me a lot about the choice of food we eat," Vaulina said. "Most of the time we eat fried foods, now we are eating less of fried foods."

OSI received similar feedback from parents, albeit anecdotally, during their post-pilot evaluation."We know kids are pretty powerful voices in a household, and if they can become the advocates for healthy eating at home then that's wonderful," Monte said.

Fonua admitted that as a parent, she and other parents in Tonga have failed to teach their children about the foods that are healthy versus unhealthy.

"For us as parents, often we do not tell our children the kinds of food that are good to eat," Fonua said. "This [program] is good for development, as children would talk to us about it."

Sili also shared her new perspective on buying food for her son. "We are used to buying rubbish from the shops that kills [sic] our children," Sili said. "But since the program began, I, as a mother have learned that this is not love to give them so much of these kinds of food."

Ongolea also said that after his daughter came home from school with the iPad and OSI app, she became interested in cutting and peeling vegetables. She also began identifying healthy foods, particularly the local ones.

"As a whole, as a family, I think it's going to save us, she'll make us a bit more healthier, saving [money]," he said. "I think they're the most important parts: saving and being healthy."

Some of the local, healthy vegetables that OSI highlights in the program cost less than unhealthy imported foods. They can even be free, at least for Ongolea, who said that he can get the food from his garden, his parents' garden, and his grandparents' garden. He said that taro and pele are commonly grown in Tongan backyards.

"Every house grows that," Ongolea said. "In every house, backyard."

In her interview, Sili lamented wasting money trying to show wealth for her son by buying foods at shops as opposed to healthier vegetables and meat that are readily available in Tonga, and cost less.

"It is important for parent's time with children that teachers can encourage them to abandon thoughts that their child might look poor for putting manioke in their lunchboxes," Sili said, "but that is what we should give our children to eat because it is healthy, and they will be able to live longer and happier on earth."

Fonua also said that eating healthy Tongan foods costs less than junk food from the shops, but added that there are some expensive fruits her daughter was persistent about bringing to school, even if the family didn't have the money to do so.

"At times we don't have the money to buy apples, but she [her daughter] would say, 'The teacher said to get some apples,'" Fonua said.

Maca Vobvola, a rural school teacher in Nadroga, told S1T2 that most of the children at her school come from underprivileged families. She described how the students with more affluent parents could afford fruits, while the less fortunate ones, "they'll just be looking," she said, before adding, "that really, I got emotion with that."

"They [children] really love the program," Vobvola said. "They really love to take part and that was the only drawback in them… the financial part of it."

BTS parent participation was voluntary, and engagement levels were moderate while reflecting schools' pre-existing relationships with parents. Parents from rural schools had the closest relationship with their children's school, as reflected by much higher parent survey participation compared to that of urban schools in Suva. One of the rural schools even held an event with 15 parents in attendance to meet S1T2 on an earlier trip prior to the launch of the BTS pilot.

Given the relatively low voluntary parent engagement (39 parents or 16% of the cohort), S1T2 sees the responses given by parents as anecdotal and informative of the inherent potential of BTS, but not indicative of the broader parental cohort. That said, transmedia storytelling through technology resonated with all parents who participated in the BTS pilot evaluation. Parents also voiced their support for innovative storytelling in teaching.

"It's like a comic," said Neumi Rawavatu, the father of a child at a rural Nausori school. "It's easy to understand."

Alden Kaloucaua, the father of a child at a remote Suva district school, said that the lessons contained within BTS are similar to what is taught in the normal healthy living curriculum, but are simpler and more engaging.

"I just wish the Ministry takes a cue from your text and your activity book," Kaloucaua said.

Kaloucaua added that he has seen positive change in his son, who now wants to take part in cutting vegetables. His son still doesn't like to eat the veggies, though BTS is helping "a little" when used as encouragement.

"I tell him, 'What did you learn in Beyond the Stars?'" Kaloucaua said, "and then he'll just smile and eat a few more greens."

"I tell him, 'What did you learn in Beyond the Stars?', and then he'll just smile and eat a few more greens."

Pilot Findings footnotes

44 Tonga Health https://www.tongahealth.org/healthy-eating

45 World Health Organization, 2014, 'Fiji's schools teach healthy living', World Health Organization https://www.who.int/features/2014/fiji-healthy-living/en/

Photo by Alana Holmberg

Reflections on Our Special Island

Teachers, parents, and partners share their experiences of the OSI pilot
https://youtu.be/T_xH4W0xgH8

Pilot Experience Takeaways for S1T2 and Millipede

At a high level, both Millipede and S1T2 observed that their programs resonated with teachers, children, and parents. Teachers noticed the excitement in students and responded that they saw a broader potential for leveraging technology and play-based learning to support their traditional teaching methods.

Teachers participating in both programs have said that they want the program to return, and have requested the development of other programs for other curricula.

"The uniqueness of the technology definitely worked," Merlo said. "Children and teachers across the board were super excited to be able to use technology in the classroom."

The BTS paper-based materials were also a hit with participating teachers, who would share and photocopy the program resources with their colleagues, even holding professional development sessions, without planned support or suggestions from S1T2. Teachers in Fiji also appreciated how the program lessons aligned with the existing curriculum, while the addition of the significant experiential components, the VR experience and tablet, left an impression.

"On multiple occasions, I remember hearing children say 'Oh, they can look like me!' They loved that this was a story they could see themselves in"

Photo by Rachael Imam

"But the VR and the tablet, it was for them to really experience themselves, really look and see," said rural Nadroga teacher Maca Vobvola. "It was really, it was really effective, very effective for them."

Both programs got participant feedback that confirmed the importance, and effectiveness, of developing their programs as distinctly Tongan and Fijian.

"On multiple occasions, I remember hearing children say 'Oh, they can look like me!' with relation to the character creation process," said Merlo. "They loved that this was a story they could see themselves in."

A teacher at Ocean of Light International School in Tonga, who wished to remain anonymous, shared with Millipede how her students identified with the OSI characters.

"They [students] named the characters Maui and Moana every time they open the game," the teacher said. "They said they are Tongans for their skin colour."

OSI participating teachers and students were highly engaged and excited about the program during Millipede's six-week pilot. Students would sing the songs in the OSI app, and add their own verses.

Students would sing the songs in the OSI app, and add their own verses.

"It was really rewarding for us to see that kind of engagement with the materials," Jenkins said.

In one school, children were making and eating fruit salad based on the OSI recipe as a hands-on cooking activity. One child spoke to Jenkins in Tongan. A nearby parent translated for her, explaining that the child said: "Yum! I'm going to make this at home!"

"The key thing is that the teachers were aware of how engaged the kids were when they were using the app," Jenkins said. "Teachers can often spend a whole heap of time and effort trying to get kids engaged. They know all too well if you can easily engage kids and they're having fun, and they're learning, then that's a good thing."

"The key thing is that the teachers were aware of how engaged the kids were when they were using the app"

Prior to the pilot, Millipede highlighted the risk of iPads going missing or becoming damaged. To Millipede's delight, all iPads were present and undamaged at the end of the pilot.

As the positive findings and feedback indicate, the OSI and BTS programs had an impact during their short time in schools. Yet these programs were pilots, a first step in testing the effectiveness of play-based and narrative-driven technological approaches to education in the Pacific. This was an opportunity to experiment and figure out what would work best in the classroom.

In addition to the signed Cabinet Paper, S1T2 signed an MOU with Vodafone Fiji, making them an official partner beyond the pilot phase.

This partnership brings S1T2 closer to their long term goal for the program of securing a financially self-sustaining future through relationships with regional stakeholders. In the short term, the partnership with Vodafone Fiji resulted in 60 donated SIM cards, and a relationship with Huawei that brought 50 tablets for the pilot. Future negotiations with Vodafone Fiji could result in BTS coming pre-loaded on all devices sold, with the added bonus of customers not paying for data consumed by the app.

These partnerships, unfortunately, led to short term technical challenges for S1T2.

While their use of storytelling technologies was supported by teachers, and the VR experience worked flawlessly, S1T2 did experience challenges implementing the BTS app.

Due to internet connectivity challenges, Merlo said that the BTS app failed to work consistently, if at all, in four of the nine pilot schools. Meaning that, in these classrooms, children participated more through the storybook and activity book than the app.

S1T2 originally planned for their pilot app to function both with and without internet connectivity. But the partnership with Vodafone, and supply of SIM cards for Huawei's 60 tablets, influenced the team to aim for their longer-term technical goals. S1T2 developed the app to function with internet access, due to the anticipated benefits continuous connectivity would provide for data collection. Tan said that the anticipated preference and attitude microdata recorded by the BTS app, if collected on a national scale, could eventually help other organisations and initiatives make an impact on the NCDs crisis.

"That's why we took the risk," Tan said, "that's why we made the decisions we did."

When launching the pilot, S1T2 realised they had underestimated the availability of internet connectivity in schools, with two classrooms lacking Vodafone network access entirely. The team decided to deploy an offline-only version of the BTS app in those two schools, while the remaining seven schools, all within range of Vodafone network access, received the online-only version of the app. After the pilot, Tan said it would have been easier to develop their BTS app for offline use only, with data exported locally directly from the device.

"Our vision was 10 years out. This was just step one."

The week after launching the pilot in schools, all of the SIM cards had, for unknown reasons, exhausted their allocation of data. This meant the BTS app no longer worked at the schools that had the online-only version. S1T2 immediately began troubleshooting the problem remotely from Australia by instructing teachers how to hack their way around the tablet's child-protection locking system to connect to WiFi, if available. Through their efforts, one school succeeded, leaving the remaining schools to focus on the storybook, activity book, and lesson plans. The cause of the SIM card data loss remained unclear at the time of writing.

"Our vision was 10 years out," Tan said. "This was just step one."

Millipede developed their play-based app to function without internet connectivity, with the game data downloaded at the conclusion of the pilot. The team's struggle lay with their board game, "Tummy". The game was too complicated for children to play alone without teacher support. Because Tongan classrooms usually have one teacher, they would have to balance both running the board game and helping other children, which isn't practical. After observing the challenge teachers and students had during the pilot, Jenkins said that Millipede made the mistake of developing the game with an Australian classroom in mind, where support teachers are present.

Both BTS and OSI had instances where teachers didn't use the programs the way they were designed, with the emphasis on child-directed and play-based learning. OSI had some teachers adopt a teacher-led approach to using the materials, for example, holding the iPad at the front of the class. These unintended methods of using the programs prevented the open-ended exploration and collaboration inherent to play-based learning, and suggested a future need for more teacher training when introducing the program materials.

"The professional development part of it for teachers is really key," Jenkins said. "We can make the resources as culturally friendly and as age appropriate and as fun as we want, but if we have a scenario where the teacher is still holding the iPad up in front of a class, then we aren't going to get the results that we want."

BTS had instances where teachers used their program resources as a reward, particularly with the app.

A teacher from an urban Nadroga school said the BTS storybook was a useful way to "control" the class and engage students in silent reading time because the children themselves wanted to read the storybook. Despite being unable to use the app due to the SIM card fault, the teacher described the potential effectiveness of using the program, and the app concept, to reward good behaviour.

Merlo thinks the BTS app was potentially overcomplicated for a classroom context. This, she thinks, could have been handled by having a more realistic understanding of what works on the ground, in the hands of students, and remaining focused on that reality.

"It was disappointing to not be able to provide schools with something more stable," Merlo said. "And that instability meant we also lost the opportunity to really test what the game itself, rather than the idea of it, could do."

Still, Merlo thinks that the pilot results show that there is potential to this approach of "having a transmedia story told through these kinds of low and high-tech materials." She quickly followed this by emphasising that a longer pilot is needed to thoroughly evaluate the impact of such a program.

Discovering, and addressing implementation challenges are important reasons projects like LAUNCH Legends exist. These pilots are especially useful for trying untested methods and tools, such as the technological interventions deployed by Millipede and S1T2. Both teams are now in a much stronger position for scaling their work, and today all participating BTS schools in Fiji have fully functioning versions of the BTS app.

Opposite page: Photo by Rachael Imam

Reflections on Beyond the Stars
Teachers and parents share their experiences of the BTS pilot
https://youtu.be/udvUlpIX6VU

Moving Forward

Internationally, Beyond the Stars and Our Special Island have already left their mark.

Soutaris, Monte, and Tan presented on LAUNCH Legends at the 2018 **Games for Change**[46] festival in New York. BTS also became an official partner of the **United Nations Sustainable Development Goals**[47]. Tan said he hopes such global awareness and support at a political level will lead to long term financial sustainability beyond the pilot, something he is actively working towards.

When the BTS pilot ended in November 2018, teachers and schools were eager to continue using the program materials after the term break. Each child got to keep their storybook and activity book, while teachers were given additional samples of these materials, along with the pilot's training and supplementary resources.

Both Tan and Soutaris have been sharing the preliminarily BTS pilot findings with private sector organisations, including Fiji Water, with the intent of expanding the program to other parts of Fiji.

Tan has also been sharing with potential partners including the **Pacific Community**[48], the **United Nations' Small Island Developing States Partnership Dialog**[49], and the Australian High Commission in Samoa, to scale the program around the Pacific.

95% **Tan said that potential partners have told him that BTS is "95% appropriate" for deployment in other South Pacific cultures.**

Monte said that Millipede has been communicating with government organisations and non-governmental organisations in New Zealand to secure financial support for the next phase of OSI.

The OSI iPads and other resources are also still in Tongan schools. Jenkins said that since the end of the pilot in June 2018 one teacher has emailed her with questions about the program.

To help teachers get the most from the program resources, and to better understand how to implement play-based learning, both teams intend to place a greater emphasis on teacher training during the next phase of their programs. Both S1T2 and Millipede also want to significantly improve parent engagement.

Moving Forward footnotes

46 Games for Change http://www.gamesforchange.org/

47 United Nations Sustainable Development Goals Partnerships Platform, 'Beyond the Stars' https://sustainabledevelopment.un.org/partnership/?p=27622

48 Pacific Community https://www.spc.int/

49 United Nations Sustainable Development Goals Knowledge Platform, 2018, 'Strengthening the capacity in developing, monitoring and reviewing durable Partnerships for Small Island Developing States', United Nations https://sustainabledevelopment.un.org/sids/partnerships2018

Opposite page: Photo by Alana Holmberg

Education + Technology in the Pacific

Although it began as a call for immersive tech solutions, the LAUNCH Legends project ultimately became an experiment in technology for education in the Pacific.

Both grounded by an authentic inclusion of local culture, the Our Special Island and Beyond the Stars pilots have shown that technology has a meaningful place in Pacific classrooms. In the context of the region's NCD crisis, the pilots also demonstrate how technology and storytelling can impact the way children and adults think about food and nutrition. Though short, participants from both pilots showed a measurable change in attitudes on these subjects.

Technology, in and of itself, however, is not enough. In the case of both programs, the resources used extended well beyond the app games and VR experience to include non-digital materials such as workbooks, storybooks, flashcards and posters. The success of both pilots must be attributed to the entire suite of resources thoughtfully designed by the Millipede and S1T2 teams.

The strength of the technology - the app games and the VR - is its ability to engage, inspire, and create agency among the students, teachers and parents who experienced them. The strength of the pilots as a whole, however, is the way the tech worked with the non-digital materials. Both elements, complimented and contributed to one another to create a holistic, engaging and informative learning experience.

"Most of the time when we do story readings, you read the story and then they summarise through writing... but this is a new way" said rural Nabaitavo teacher Veveniki Sautumagei. "This is a really a [sic] boost, a very good idea of teaching children how to go about using technology during their class time."

The focus S1T2 and Millipede have on expanding the human engagement of their programs underscores the importance of people in the successful implementation of technological interventions. In the end, LAUNCH Legends would not have been possible without such a high level of human engagement from students, teachers, parents, their communities, and their institutions.

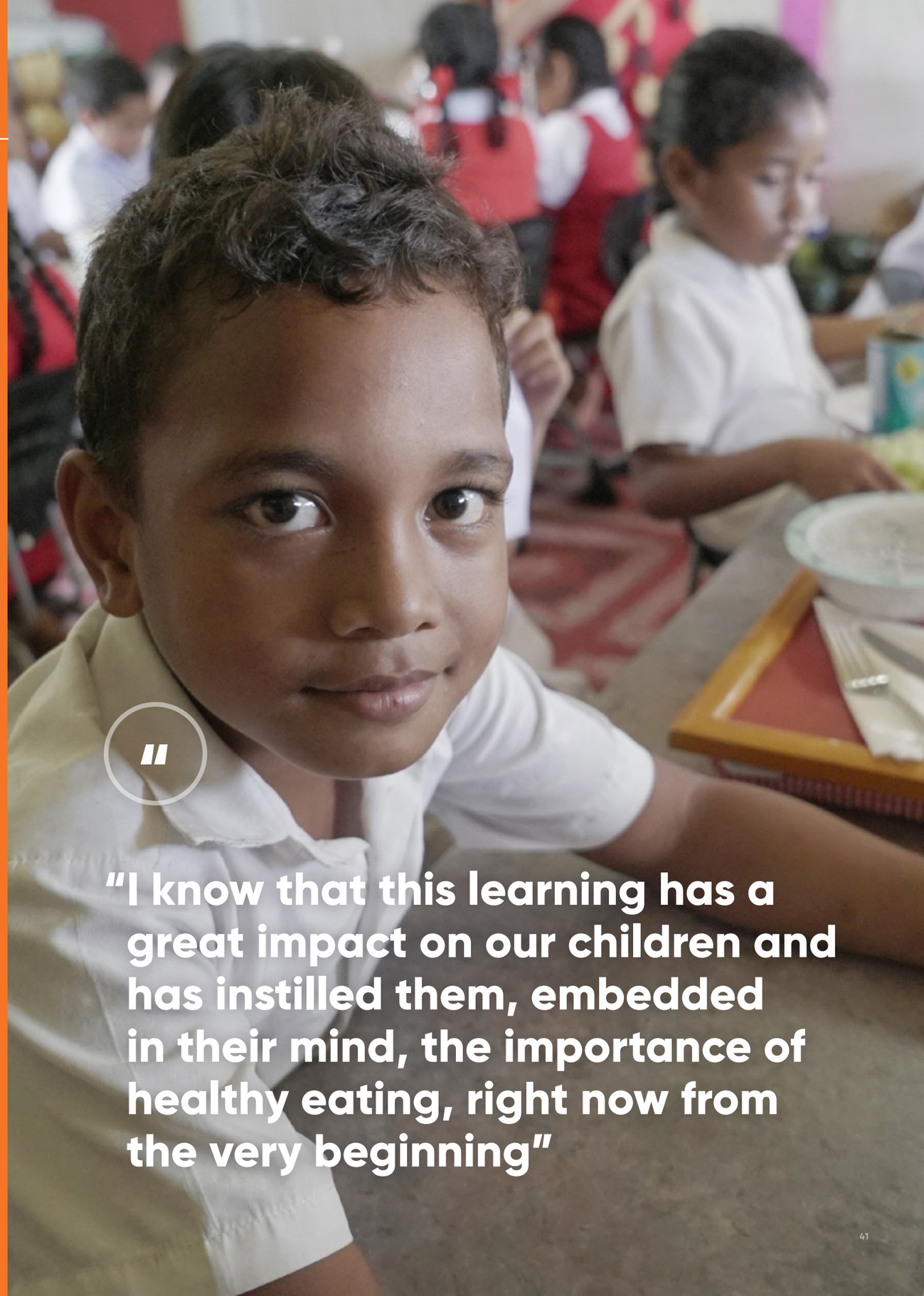
"Most of the time when we do story readings, you read the story and then they summarise through writing... but this is a new way"

Technologies like virtual reality and app games are ultimately just tools. The engagement level of people that come together, from across the social spectrum, to support and take ownership of a program remains the determining factor as to whether that technology will have any meaningful impact. The agency for change resides not only in the innovative technologies used but more so in the collective action of people engaging with and leveraging that technology to make the change they want to see.

When harnessed for educational and development projects, technology's potential is as limited, or as boundless, as the minds of those who wield it. In the case of LAUNCH Legends, Our Special Island and Beyond the Stars were supported and championed by communities and institutions dedicated to creating a healthier, more prosperous future for the children of the South Pacific - a future that embraces new ideas and technologies, while staying true to the culture and the stories that have shaped them.

"I know that this learning has a great impact on our children and has instilled them, embedded in their mind, the importance of healthy eating, right now from the very beginning," said rural Nabaitavo head teacher Arvind Chand, "in order to have a healthy future for them and for the coming generation."

Opposite page: Photo by Rachael Imam



Acknowledgements

Although technology is at the centre of LAUNCH Legends, the project would not have been possible without the dedication and generosity of many people from across Tonga and Fiji, as well as in Australia.

LAUNCH Legends was originally conceived by Davar Ardalan, formerly of SecondMuse, and David Kelly, formerly of the Australian Government Department of Foreign Affairs and Trade's innovationXchange (DFAT iXc). Management of the project was continued by DFAT iXc. The design and implementation of the LAUNCH Legends project was managed by SecondMuse. Technical support was provided throughout the project's implementation by Ben Kreimer.

The Our Special Island (OSI) pilot was led by the team at Millipede, while the Beyond the Stars (BTS) pilot was led by the team at S1T2. Both pilots were conceptualised with great help from passionate artists, teachers and storytellers during the design and implementation of the programs. Both teams worked tirelessly to develop and improve their pilot programs, and their dedication to providing an enjoyable and beneficial experience for the participating schools is worthy of commendation.

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OSI Pilot Schools
ACTS Community School
GPS Atele
GPS Ha'alalo
GPS Ha'amonga
GPS Lapaha
GPS Longolongo
GPS Lotolu
GPS Mu'a
GPS Popua
Ocean of Light International School
St Francis of Assisi Primary School

BTS Pilot Schools
Bayly Memorial School
Namosi Catholic Primary
Nabaitavo District School
Nabitu District School
Saivou District School
Sigatoka Methodist Primary
Stella Marist Catholic School
Waiqanake District School
Wai District School

This report has been authored by Ben Kreimer.

Opposite page: Photo by Rachael Imam

Photo by Rachael Imam

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