# Project Based Learning Focused on Numeracy and Literacy Skills with Māori Second Chance Learners

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MATAPUNA TRAINING CENTRE
Whakamanatia Te Tangata | Empowering People

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# Introduction

Matapuna Training Centre (MTC) is a small Māori Private Training Establishment (PTE) based in Gisborne. MTC offers training opportunities including the Youth Training programmes and the Intensive Numeracy and Literacy programme.

The aim of this study was to create two integrated Project Based Learning (PBL) lessons that will engage Māori second chance learners. The project includes a strong numeracy and literacy focus as this is the major barrier stopping our learners gaining a qualification. The created projects include:

1. *The Waka Project:* this project explores iwi approaches to waka designs, history and uses.
2. *The Stream Project*: this project explores the ecology of rivers and can be applied to any local and convenient stream or river.

These projects were designed to be easily sharable or replicated by others organisations.

## Approach

This project involved the creation of two PBL projects that involved 5 integrated stages or cogs of planning and implementation:
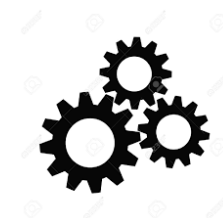
Phase 1: Topic chosen

Phase 2: Identify Units that fall out of the topic included on integrated unit planning sheet

Phase 3: Pre-teaching

Phase 4: Activity

Phase 5: Post work

Learners at MTC then participated in these projects. Their experiences, the observations of MTC tutors, and the impact on the learners' Records of Achievement (RoA) are recorded in this report.

## The PBL projects

Two projects were created. These are described below.

### The Waka Project

For this project we were trying to carry on with the theme that included our Whakapapa and Powhiri Units. We needed to include more numeracy activities in our teaching. In this project the students initially carry out research about the history of the waka, types of waka and their different uses. They then choose one to use for their model. The initial aim was to build one to scale on the beach out of sand and flotsam. They also needed to learn about length, scale drawings, the tides, sand castle techniques etc. These covered numeracy skills like measure, conversion and estimation. The brief was to work in groups and plan the activity. In this way units were covered that met this criteria. (see attached teaching sequence), including samples being gathered for literacy evidence like speaking and listening, reading and writing. The groups

planned their waka design, group roles and building plan. Then they were ready for the build. The first time we did this project, weather did not play along and we carried out the practical activity in the hall using newspaper. Observations were made of team work and listening and speaking, as well as practical measurements and estimations.

### The Stream Project

The stream project tied in with our sustainability theme at the time. Again this was designed to harvest numeracy and literacy evidence. Again, if a new student was enrolled they could pick up on the group units as well. This project also involved pre-teaching which included instruction in the use of the NIWA kit and all its measuring gear, stream ecology, science concepts and a trip to the museum to gain a better knowledge of the atua and their role in Maori conservation ethics. Once all the background learning had been done we embarked on a field trip to a local stream, collected our data and used this back in the classroom to complete our worksheets. Again, if needed be there are opportunities for research writing, reading and other computer units.

## Learner profile

Nineteen learners took part in both the projects. All of these students identified as Māori, 11 were females, 8 were male. Seventeen students were 18 years or younger and 2 were 19-21 years old. Three of the 19 students already held a level 1 qualification prior to the project starting.

## Results

Evidence that the projects benefited learners can be seen on a number of levels. Gain reports in numeracy and literacy surpassed the centre-wide results with an average gain in Numeracy of 37.5 with 32% making significant gains and an average gain in literacy of 17.8 with 11% making significant gains.

From undertaking the projects the evidence was compiled:
- 17 students achieved Level 1 Statistics 26626
- 9 students achieved Level 1 Number 26623
- 15 students achieved Level 1 Measurement 26627
- 15 students achieved Level 1 Listening and Speaking 26625
- 8 students completed their NCEA Level 1

In addition to the achievement of unit standards the learners also:

- Gained skills related to using scientific equipment – for every student it was the first time they had actively engaged with scientific equipment. Students needed to complete PH test, conductivity, water clarity, compass, magnifying glass tasks.
- Really enjoyed their project work – tutors received very positive feedback from students and staff that students were engaging better around the centre.  Many felt it was due to the group work and the positive experiences they had shared together.
- Made vocabulary gains – the active learning also led to discussions using the correct scientific terms that were at least Level 2 standard and some Level 3.

Both projects have been confirmed as centre-wide projects for 2015 and beyond.

## Student achievement

*Figure 1: Numeracy Gain Report – Ako Group, Matapuna Training Centre*

Summary: Below shows the overall gain in numeracy achieved by the co-hort.  15 of the 19 or 79% of students made a gain in numeracy with 6 of the 19  or 32% making statistically significant gains, which are very pleasing results.
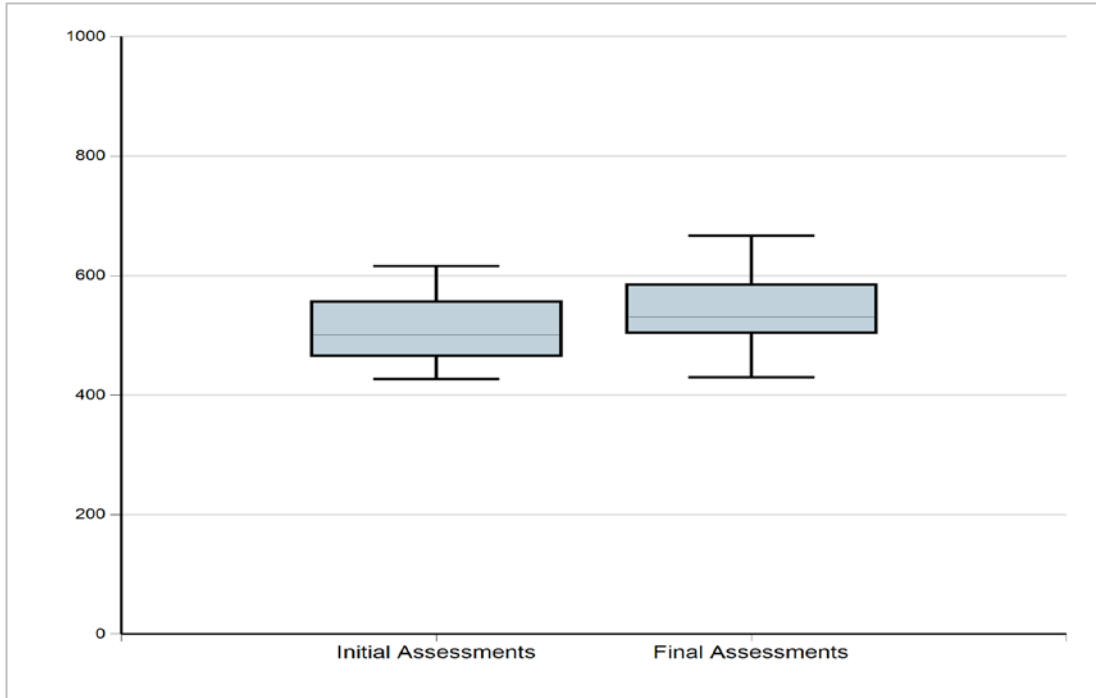
*Figure 2: Reading Gain Report – Ako Group, Matapuna Training Centre*

Summary: This graph demonstrated that achievement in reading for the cohort made a small gain. 10 of the 19 students or 53% of students made a gain in reading with 2 of the 19 or 11% making a statistically significant gain in reading.
 Note: reading gain statistics are reduced by one student's score that regressed by 120 scale points which is an anomaly.
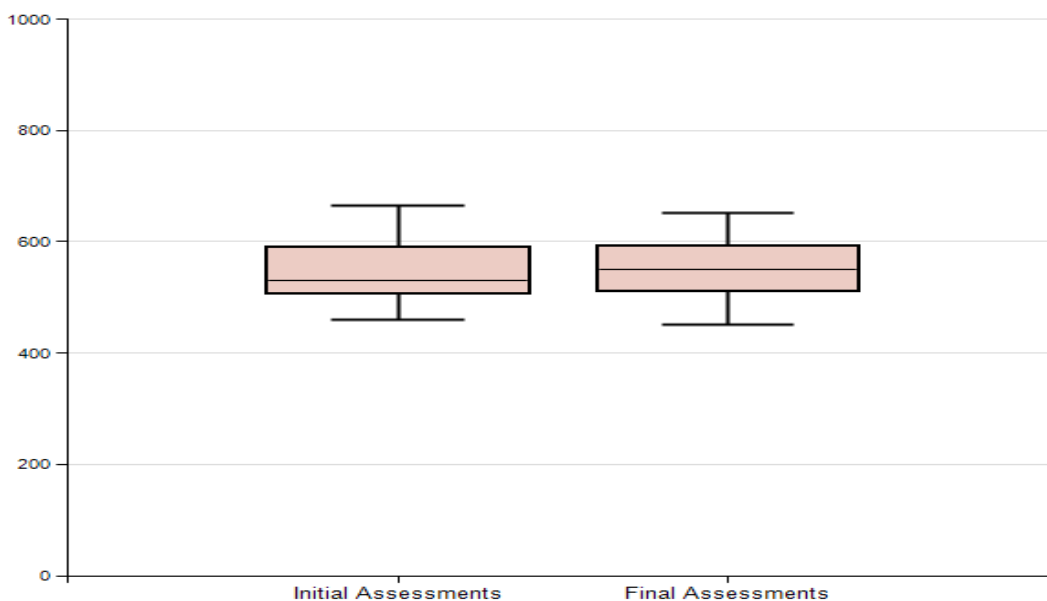


### LAT Results

Annual overall LAT results for the Youth Guarantee 2014 cohort are detailed in Appendix 1. This demonstrates that in both reading and numeracy the cohort started the year with an over representation of students at the lower end of the spectrum, i.e. achieving within steps 2 and 3. By the end of 2014 the cohort was demonstrating results much closer to a typical bell curve with more students achieving at steps 4, 5 and 6.

## Findings

From undertaking the projects it was evident that there were six principal factors that supported the students' success:

1.  Making the learning relevant to the learner
2.  Focusing on your goals when designing the project content
3.  Including practical activities and group work to engage students
4.  Celebrating student success
5.  Including Māori perspectives and tikanga, e.g. the role of the atua in ecology
6.  Including Māori pedagogy such as tuākana-tēina and ako

## 1. Make the learning relevant to the learner

There was a clear intention to make the content of interest to the learners. Previously most of the introduced learning material was generic in nature and paper based, and failing to engage the learners. The first project was the easier to choose as waka have a strong presence in Māori culture. For the second project we wanted to take a little greater 'risk' by exposing students to new experiences. Feedback from the waka project told us that the students enjoyed the tactile experience so we combined this with learning new things to become 'scientists' in the Stream Project.

## 2. Focus on your goals when designing the project content

Although the projects needed to be relevant and engaging, they also needed to meet the qualification requirements. The literacy and numeracy (LN) standards do have the benefit of being flexible in delivery but they also have strict requirements. These requirements had to be embedded into the activity. This was a time consuming task as we wanted the project idea to come first and not be compromised in order to meet the standards.

Both the authors are experienced in Project Based Learning (PBL) and embedding learning outcomes. This approach does require imagination, flexibility and a sense of faith that you cannot plan for everything and in fact you don't actually want to. We believe this experience is key in PBL as one develops a sense of 'letting go' once the framing planning has been done.

A major goal was to have built in freedom; freedom to adapt and change depending on the situation. This was absolutely apparent in the Waka Project when weather conditions stopped us building the waka at the beach. We could have delayed the task but the students were ready and excited so we needed to act. They compromised by building the waka out of newspaper. We believe this major change worked because the preparation was the most important factor. In fact, a handful of tutors doubt the project could adapt so seriously, and it was the students that were all keen to give it a go.

This raised the question on whether the inability to adapt and be flexible is something we were previously unconsciously teaching our young people. These were second chance learners yet they were still up for a new challenge.

We knew we could be more challenging with the second project as the tutors were adapting and embracing this new style of learning. Our goal for the second project was to allow the students to learn new skills and take on new concepts. This goal was deliberately left for the second project so the tutors and students were comfortable to try new things.

## 3. Include practical activities and group work to engage students

It was evident from prior work that the Māori students were more inclined to work as a group which really suits the PBL style. Due to most students joining the college with differing credits on their Record of Achievement (ROA) it can be 'easier' to let each student work on the credits they require which leads to an individual approach. Using LN units which every student requires in some way supports the group work strategy.

From the onset we knew we would face challenges with group work as the students lacked the necessary communication skills that group work requires. Without these skills a group is soon divided and would give those doubting this approach a reason not to carry on. This made it even more important that we tackled this area. We spent two weeks concentrating on verbal and non-verbal communication and reinforcing this around the centre at break times. The results were astounding as the students began to appreciate each other more. It even became a centre joke to over emphasise greeting each other in the morning. This light hearted

approach enabled students and tutors to correct each other if they felt a more appropriate response was necessary.

## 4. Celebrate student success

It was common feedback from students to hear that this was the first time they had actively engaged in an 'education' group activity since primary school.  There are obviously many reasons that contribute to this feedback that are out of the scope of this report but we knew we had to make a point of celebrating this successful engagement.

We used a variety of ways to celebrate success:

- Personalised certificates were distributed that celebrated "most creative", "best team player", "most humorous to work with", "best boss" etc.
- We made a special lunch on the days of the activities and celebration meals when work was completed.
- Informal comments from staff out of class such as "Hey Mana, you were a great leader in the waka activity, I saw how you led by example in getting the team motivated"
- The students also received the satisfaction of completing units.

## 5. Including Māori perspectives and tikanga e.g. exploring the role atua play in Māori ecology

We included a trip to the museum focusing on atua and the role they play in nature. Other concepts explored included Māori perspectives on sustainability and conservation. These included biotic and abiotic factors, food webs, water cycles, habitats and checks and balances. We also covered traditional Māori food sources.

## 6. Including Māori pedagogy such as tuākana-tēina, ako and using korero, titiro and whakarongo

The concept of tuākana and tēina were incorporated in the teaching with students acting as group leaders and tutors. The teaching included practical group work in which the students had the opportunity to act as leaders and each member had a role to play. The philosophy of ako was shown by tutors and students learning together through the discovery process and enquiry learning. It was an activity project which focused largely on whakrongo (listening), kōrero (speaking) and titiro (looking).

## Areas for future development

The overwhelming factor for future development is investment in staff development.  We can see that the PBL approach is effective and can be duplicated by experienced staff. However, the approach does present challenges for staff in terms of being open to the challenges PBL brings. Effective PBL starts with an idea.  Ideas from the whole staff rather than only two of the staff will have obvious benefits.  The will exponentially increase the roll out of PBL at MTC and increase its impact.

## Conclusion

The primary goal of this study was to create two PBL projects that engage the learners at MTC. If this was measured in terms of student achievement towards their qualification then the study was a success. All students improved in their LN results and gained valuable credits towards their NCEA. If this was measured in the skills learnt from a PBL approach then the study was also a success. From scientific skills to leadership skills the students all improved. If the study was measured on the positive reaction of students then it was also a success. The atmosphere in the MTC was transformed to a place where learning is 'cool' and being successful at learning is something that can be shared and celebrated.

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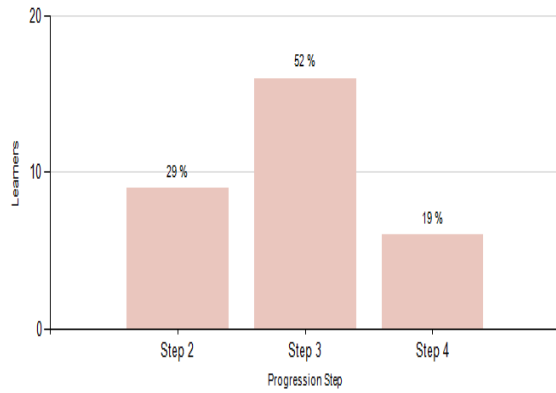
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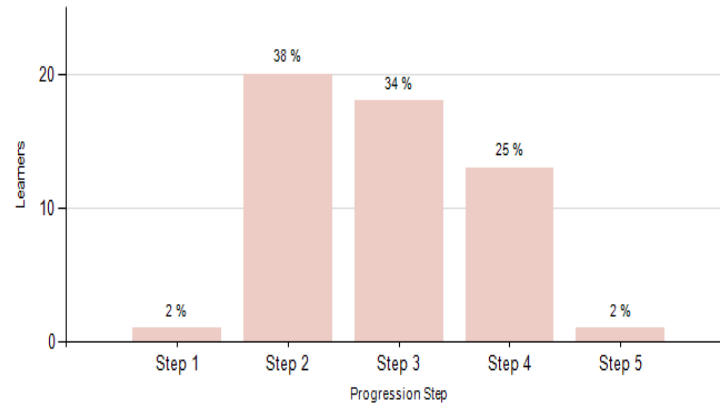
## Appendix 1: 2014 LAT Results Graph

# 2014 LAT Results Graphs

April 2014 | September 2014 | December 2014



Latest Learner Results Report, Reading
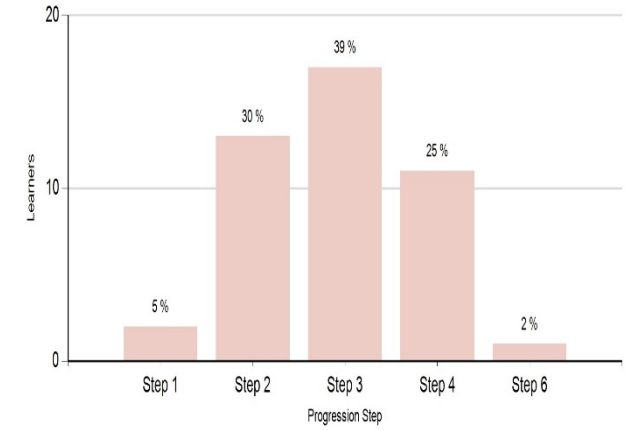
# Latest Learner Results Report, Numeracy

| SCORES AVAILABLE (SELECTED) | AVERAGE SCALE SCORE |
|:---:|:---:|
| **31 (33)** | **555** |