



Report

Guidelines for supporting foundation/bridging ākonga to evaluate and utilise Gen AI to improve writing and reading

Dr Selena Chan, Tricia Lewis, Rory Collins,
Christine Beker, Jo, Fox, Robyn Peterson,
Dr Amit Sarkar, Chris Lotter and Alex Stewart

June 2025



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www.ako.ac.nz
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info@ako.ac.nz

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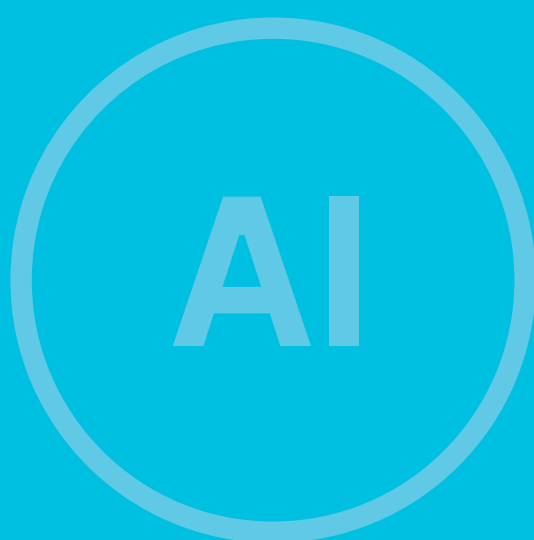
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He waka kōtuia, e kore e tukua ngā mimira.

A waka that is expertly lashed together will not come undone in rough seas.

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Success is not the work of an individual, but the work of many.



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The project team



Project lead – Dr Selena Chan

Te Puna Wanaka Te Reo Māori programmes – Stan Tawa, Manager with Manu Whata and Te Kurawhiti Hitchens, kaiako.

NZ Certificates in Study and Career preparation (Levels 3 and 4) – Tricia Lewis and Rory Collins, kaiako.

Bachelor of Information and Communication Technologies (BICT) – Dr. Amit Sarkar, industry and technical support for ākonga and kaiako – Christopher Lotter and Alex Stewart, chatbot developers.



Manager – Jo Fox with Robyn Peterson

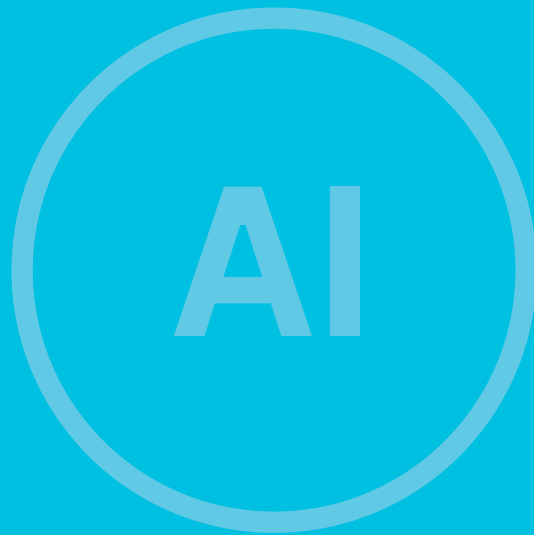
Foundation Pathway to Literacy and Workplace literacy and numeracy – Gisele Aynsley, kaiako (youth programme); Khadra Alazrak, kaiako (workplace programme).



Manager – Judy Magee

Certificate in Study and Career Preparation (L3) – Christine Beker, kaiako.

Introduction



“Gen AI is a type of AI able to produce multimodal outputs (i.e. text, images, sound) based on ‘prompts’ provided by users in ‘natural’ or normal language.” (p. 12, para 4).

The project’s main purpose was to identify authentic ways to integrate Generative Artificial Intelligence (Gen AI) tools/platforms into courses for foundation and bridging programmes. The project collected, collated, and analysed data from a series of participatory action research (PAR) studies. The data gathered was then used to inform the development of a bespoke Gen AI chatbot. The chatbot was built to be contextualised, authentic and localised to support the learning of writing and reading literacies for foundation and bridging programmes.

The participating programmes were:

- Level 2 Te Reo campus/face-to-face/kanohi ki te kanohi foundation courses at Te Pūkenga/Ara Institute of Canterbury (Ara).
- Level 1 and 2 Foundation Pathway to Literacy and Workplace literacy and numeracy programmes at Hagley Adult Literacy Centre (HALC) offered through campus-based or workplace-based delivery. Workplace literacy ākonga were attaining competency in English as other Language (EOL).
- Level 3 bridging programme (NZ Certificate in Study and Career Preparation) at Te Pūkenga /Otago Polytechnic offered as a blended-learning programme. Ākonga completed learning activities online and convened weekly for a campus/face-to-face/kanohi ki te kanohi tutorial.
- Level 3 and 4 programmes in Study and Career Preparation at Te Pūkenga/Ara with a large cohort of ākonga enrolled in the campus/face-to-face/kanohi ki te kanohi programme.

The report is organised into FOUR distinct parts. Each summarises and discusses on a project phase. We would recommend a skim read of the report and then focusing on the part of most relevance to your own mahi.

Part ONE – The *rationale and literature informing* the project are presented and discussed.

Part TWO – The three *research methods* are introduced and described. These are –

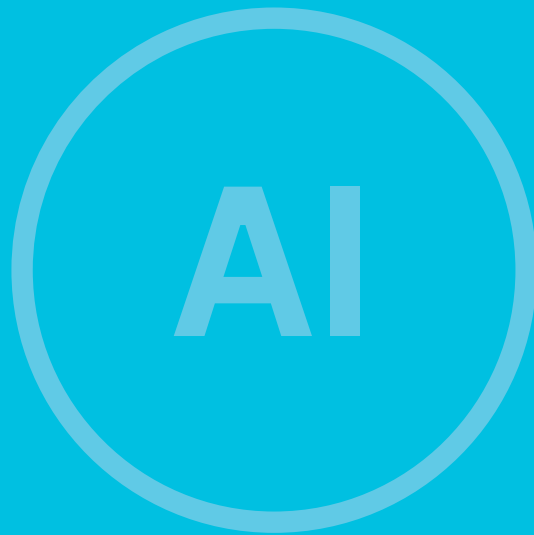
- Participatory action research (PAR) that framed the conduct of the Gen AI introduction and integration;
- Q-methodology used to identify and prioritise actionable recommendations for the development of a bespoke chatbot to support the attainment of academic writing skills
- Case study theory building methodology of process tracing to ascertain the themes used to construct the project's guidelines, recommendations and framework.

Part THREE – Presents the *findings from the PAR* and the *in-depth analysis of data using Q-methodology* to inform the construct of the bespoke chatbot of the project. Details of the chatbot development are also provided.

Part FOUR – *Presents the guidelines, framework and recommendations derived from undertaking the project.*



Part One



“It is important to be able to utilise Gen AI in a measured and targeted way, to support ākonga learning but not replace the required learning to become proficient writers.” (p. 13, para 1)

Project overview

In this first part of the report, a project overview, the rationale for undertaking the project, along with the literature review undertaken to inform the project are presented and discussed.

In this project, we integrated Generative AI (Gen AI) tools or chatbots into foundation/bridging programmes between levels 1 to 4 on the New Zealand Qualifications Framework (NQF). The purpose of introducing Gen AI was to support ākonga to attain competencies in academic literacies.

In the first months of 2024, we undertook professional development with the kaiako and programme leaders/managers involved in the project, to develop relevant AI and digital literacies that would support their work with Gen AI integration. Kaiako undertook to explore a range of generic Gen AI tools (or chatbots/platforms) exemplified by ChatGPT – <https://chatgpt.com/>, Google Gemini – <https://gemini.google.com>, and Claude – <https://claude.ai>, along with more specific Gen AI chatbots/platforms exemplified by Research Rabbit, – <https://www.researchrabbit.ai/>, Grammarly – <https://www.grammarly.com/> and Quillbot – <https://quillbot.com/>. In doing, the advantages and relevance of these Gen AI tools and their possibilities for supporting foundation/bridging ākonga were debated. Important issues related to ethical (privacy, indigenous sovereignty etc.), institutional policies on the use of Gen AI, and the logistical challenges related to accessing and utilising Gen AI were also discussed. Some preliminary planning was also achieved to enable the project to proceed.

By March/April, we began introducing AI literacy in the form of learning activities to explore what was AI and how these may be useful to ākonga study. The use of Gen AI tools/chatbots was then initiated to support various learning activities which would lead to specific learning outcomes. A variety of Gen AI tools/chatbots were introduced into learning sessions. Each Gen AI tool was matched to support learning activities which would lead to learning outcomes. The work of Sharples (2023) was drawn on to assign Gen AI tools a role to play as a social constructivist tool. As the Gen AI were introduced and experienced, the participatory action research (PAR) approach, ensured that utilisation of a Gen AI tool/chatbot, yielded data on ākonga and kaiako perspectives as to the relevance and efficacy of the Gen AI integration. At the end of each 'inquiry cycle' informal or formal surveys were conducted to gauge what worked well, the difficulties encountered and what follow through could be undertaken at the next iteration of Gen AI use. A series of focus groups and interviews were conducted at the end of the semester to collect user experiences. The PAR research methodology is detailed in Part 2. The findings from this phase of the project are reported in Part 3.

In the second semester, we appointed two third year Bachelor of Information and Communication Technologies (BICT) ākonga, to develop a bespoke chatbot that would support the attainment of academic writing skills for foundation/bridging programme ākonga. The chatbot would be a support tool and provide feedback on ākonga writing but not rewrite or provide the finished writing. The perspectives of ākonga and kaiako collected from the first semester, was analysed using Q-methodology, to inform the parameters, requirements and goals for the development of the bespoke chatbot. Details of the Q-methodology are described below in Part 2. The progression levels of the Tertiary Education Commission's (2008) learning progressions or the literacy and numeracy for adults assessment tool (LNAAT) were used to help 'train' the AI underpinning the bespoke chatbot. The results from the Q-method analysis are presented in Part 3. Documentation supporting the chatbot development process are collated in Appendix 4.

Finally, a series of guidelines, a framework, and recommendations were distilled through the case study theory method of process tracing. The methodology is detailed in Part 2 of this report and the guidelines are reported in Part 4.

Rationale for the project

The advent of Gen AI has challenged all sectors of education (see Bozkurt et al., 2023 and Hamilton, William and Hattie, 2023 for discussion). Gen AI is a type of AI able to produce multimodal outputs (i.e. text, images, sound) based on 'prompts' provided by users in 'natural' or normal language. The most recent iterations of Gen AI draw on large databases to generate text in 'natural language', write software code, produce images/video/audio and are now used across many industries to support job tasks. Examples of Gen AI include the large language model (LLM) chatbots (ChatGPT, Microsoft CoPilot – <https://copilot.microsoft.com/>, Google Gemini, Claude, Facebook Meta – <https://www.facebook.com/Meta/> etc.), text-to-image AI (Midjourney – <https://www.midjourney.com/home>, DALL-E 2 – <https://openai.com/index/dall-e-2/> etc.) and derivatives of these drawing on similar databases that perform more specialised functions (e.g. Grammarly, Quillbot, Elicit – <https://elicit.com/>, Perplexity – <https://www.perplexity.ai/>, etc.)

However, the main objectives of foundation/bridging programmes are to enhance writing and reading literacies and to prepare ākonga with tertiary-level academic skills. Therefore, the introduction and use of Gen AI with foundation and bridging programmes must be more circumspect and focused. Otherwise, ākonga become dependent on Gen AI to 'do the writing for them' instead of attaining skills that enable them to be able to write and communicate within the academic genre or for day-to-day interactions or work task. Hence, it is important to be able to utilise Gen AI in a measured and targeted way, to support ākonga learning but not replace the required learning to become proficient writers. A further challenge with Gen AI tools/apps is that for the moment, they require sufficient competencies in text reading and comprehension to access the Gen AI written outputs. Foundation ākonga, learning reading and writing, have found it challenging as the level of reading comprehension and responses required to understand Gen AI outputs, is often above their current capabilities. Additionally, Gen AI chatbots were not formally developed to support non-English input and output. However, Gen AI chatbots will generate outputs in Te Reo or other languages when requested and these have been found to be inaccurate. Leveraging Gen AI to understand its capabilities for foundation learning of Te Reo contributes towards an effective means to utilise the technology. This will help alleviate the digital equities regarding English as the predominant language for accessing Gen AI potentialities.

At Te Pūkenga/Ara Institute of Canterbury (Ara), a project (AI@Ara) started in semester 2 of 2023. Five disciplines – computing, graphic design, construction management, hospitality, and nursing – participated. All these programmes are between Level 4 to 7. The lecturers/researchers undertook the study as part of their allocated workplan for research. One of the findings from this project, was the need for ākonga to be prepared with academic literacies which include components of AI literacies BEFORE they enrol in courses at Level 5 and above. Hence, this current AI for foundation/bridging project, is to afford opportunities for foundation and bridging tutors, teaching between levels 1 to 4, to carry out a deeper study as to how to introduce and integrate Gen AI into appropriate learning activities. Gen AI can then be deployed to help ākonga attain the requisite study skills and AI literacies before they graduate into higher-level programmes.

Although the project will be able to draw on work undertaken in the formalised school sector and from interim findings of the AI@Ara project, the specialised nature of foundation and bridging programmes, including the demographic profile of enrolled ākonga, requires study. Learning outcomes for vocational education are also different from those achieved at school. Hence, this project contributes to comprehending better, the specific challenges, impacts, and potentials of utilising Gen AI to support the learning of reading and writing for foundation and bridging ākonga in Aotearoa New Zealand (NZ).

The guidelines, framework, and recommendations derived from this study, will therefore support foundation and bridging ākonga not only in the project's participating programmes, but many other bridging programmes across Aotearoa and internationally.

Literature review

A literature review was conducted in February 2024 to help guide the approaches that can be undertaken through the project. The review was updated in July and in October 2024 to encompass some of the large corpus of emerging literature on AI in education. The focus of the literature review is to summarise how AI can be used to support ākonga who are enrolled in foundation programmes.

AI in education

Artificial intelligence (AI), if defined as using a tool or appliance to enhance human cognitive capacities, has been utilised for hundreds of years (Mitchell, 2019). Hence the term AI refers to technologies, currently mainly digital, that can carry out complex tasks which have been the domain of humans, including the ability to reason, make decisions and problem solve (Coursera, 2024). The advent of digital technologies saw AI becoming a branch of computer science which very early on, began the development of contemporary forms of AI (Mitchell, 2019). Since the 1950s, the application of AI in human activities has waxed and waned through cycles of over hyped capabilities and broken promises (Tegma, 2017). In the last three decades, rapid progress in digital technologies and the accompanying software to run the technologies has shifted societies into the 'digital age' (Bozhurt et al., 2023). By the early 2000s, work in computer science on AI could draw on increased computing power and access large databases of knowledge to improve 'machine learning' (Mitchell, 2019). AI-based algorithms could also work with multimodal communication processes, leading to the development a decade ago of virtual assistants (e.g. Siri on IOS devices and Alexa by Amazon), autonomous vehicles, and diagnostic tools to support the health sector (Mitchell, 2019).

The form of AI utilised across the projects reported here is Generative AI (Gen AI). It is a type of AI that draws on extensive large language models (LLM) to interpret inputs and reply to these in text using 'natural language', computer programming code, images, videos, and music. Gen AI is different from other forms of machine learning (ML). ML is able to generate new data that is similar to data it is trained on by learning the patterns contained in the training data and applying the learning to the creation of new content (Lamb, 2021). This approach to creating AI utilises concepts of Deep Learning which relies on building neural networks based on current understanding of human thought processes. Deep Learning can be deployed as discriminative, whereby the dataset is trained on data that has been tagged or labelled and in turn, able to predict outcomes. In contrast, Gen AI has the capability to create new data by modifying the data it is trained on. From this, the algorithms underlying Gen AI can 'predict' the next word in a sequence of text and form sentences, visual images, audio representations etc. and produce a response that is human or natural.

Within education, the main approaches, before the advent of Gen AI was to support personalised learning. The adoption of Gen AI education brings with it many possibilities. However, many challenges must also be addressed. These include the need for all users to attain a good understanding of Gen AI's potentials and disadvantages along with understanding the ethical issues around using AI (See Daellenbach, 2025 for AI considerations in Aotearoa vocational education sector). In a pre-ChatGPT/Gen

AI context, Zawacki-Richter et al. (2019) conducted a systematic review of research between 2007 to 2018 of the use of AI in education. From the review, they propose that AI be used to support higher education by providing the tools to profile learners and predict their learning trajectory; support assessment/evaluation platforms; underpin adaptive systems to provision personalised learning; and be the foundation for intelligent tutoring systems. The role of AI in intelligent tutoring systems could include the teaching and delivery of content; the provision of diagnostic activities to help identify strengths and gaps in student knowledge; curate resources and materials and provision these based on student learning needs; and facilitate collaborative learning (Zawacki-Richter et al., 2019).

What is now availed through Gen AI, is the possibility to customise some of the above 'personalised learning' approaches through either the creation of customised Gen AI chatbots, or through ākonga prompting of Gen AI to act as a 'learning buddy'. The skill to be able to use Gen AI as a 'coach' or 'personalised tutor' is therefore one promising outcome for supporting foundation/bridging ākonga. In effect, access to 'personalised learning environments (PLEs)' created through ākonga and Gen AI partnership, with support and guidance from kaiako, is now possible. Before this possibility, 'intelligent tutoring systems' usually ran on subscription models, requiring payment for its use either by the learner or the institution they were enrolled in. Therefore, access to Gen AI, help to address issues of equitable access to education. However, access is only one aspect. The promises of Gen AI are also reliant on learners' access to the hardware, software and infrastructure required to use these tools, along with the pre-requisite digital literacy, information literacy and academic capability to utilise and make the most of the technology.



Using AI to support literacy development

Ensuring AI does not replace the need for critical thinking and ākonga attainment of key literacy skills is an important consideration across our project. The time-tested processes to teach ākonga the essential skills for academic reading are based on theories of behaviourism and cognitivism (Reiser, 2010). A ‘top-down’ (Harmer, 2015; Scrivener, 2011) approach draws on adult learning precepts to begin learning activities with what the learner is familiar with and knows. Learners are taught how to survey or overview and skim the text to obtain the essence of the reading, before they work through the details of the text. With the teaching and learning of academic writing, emphasis is placed on moving through three stages of writing, these are the product, process and genre approaches (Harmer, 2015; Scrivener, 2011). Hence, there is an established pedagogy on how bridging and foundation learners, are supported to learn and hone the skills of academic reading and writing.

However, the orthodox need and objectives for literacy education have been challenged for many years (see for example Campbell & Olteanu, 2024). The concept of multiliteracies has been proposed to prepare all people for the multiplicity of ways information can now be accessed. Cope and Kalantzis (2015) have established a corpus of research into the various modalities all humans have to utilise when they engage with the variety of and an increased volume of information and communication protocols in present-day life. Instead of an emphasis on text and language-centric pedagogies, there also needs to be a shift towards encompassing the multimodalities inherent in understanding communications and messages based on images (both still and moving) and soundscapes. Following on Cope, Kalantzis and Sears (2021) provide some guidance on knowledge and its assessment, and how these are impacted by AI-enabled learning ‘ecologies’. This is an area for future exploration. For the moment, the expectation placed on foundation/bridging programmes is to prepare ākonga for further academic study. The discipline areas many foundation/bridging ākonga aspire to pathway into, require traditional academic literacies (i.e. the ability to work confidently in a text-privileged context). Hence it is prudent to keep within the boundaries of traditional academic literacies preparation across the various sub-projects.

Guidelines derived from the recently completed studies at Ara (see Chan, 2025 a) propose that in a vocational education and training (VET) context, integration of AI should:

- Mirror how AI is being used across specific industries, disciplines or occupations.
- Have a pedagogical purpose.
- Support the attainment of academic literacies.

In the collated principles from recently completed projects (refer to Chan, 2025 a), we used the assignation of a role for AI, as proposed by Sharples (2023), to frame how AI can be used to support learning. Sharples suggests using AI to take on the role of ‘possibility engine’ to help generate various ways to express understanding of ideas, concepts or processes; ‘Socratic opponent’ to encourage ākonga to develop robust and substantiated arguments; ‘collaboration coach’ to help ākonga find and solve problems; ‘co-designer’ in various design processes; ‘exploratorium’ to explore and analyse data; and ‘storyteller’ to help create narratives. Each role requires careful structuring of ‘prompts’ to AI chatbots

exemplified by ChatGPT, to ensure that AI does not just provide answers to ākonga but instead coaches or challenges ākonga to identify the areas requiring improvement and to carry out changes to develop their learning.

In doing so, the depth at which AI plays its role can then be understood as creating an interrelationship between machine (AI) and human (Lodge et al., 2023). AI can be used as a form of cognitive offloading, as exemplified by using a calculator; help extend human minds through amplifying what ākonga are able to do (e.g. both AI and ākonga could codesign, each adding to the other and ending up with a design ākonga may not have got to on their own); be a co-regulator of learning through the use of adaptive AI systems; or participate in a hybrid learning relationship, whereby cognitive and metacognitive aspects of learning are supported (Lodge et al., 2023).

Chancey and McKenna (2023) provide examples of how 'prompts' are used to instruct Gen AI (e.g. ChatGPT 3.5 or CoPilot) to take on a role (i.e. as proposed by Sharples (2023)). The allocation of a role to AI, along with providing sufficient framing and parameters for the Gen AI to support cognitive offloading or move towards being a hybrid relationship, help to provide structure as to how to deploy AI to support rather than replace ākonga learning efforts. Ou, Stohr and Malmstrom (2024) suggest that the introduction of Gen AI to support academic writing will help learners develop spatial and personal linguistic repertoires. Spatial repertoires refer to feedback provided by AI or teachers on grammar and vocabulary development. Personal linguistic repertoires imply that learners will attain higher levels of language structure due to exposure to examples of written work. How AI is used to achieve spatial and personal linguistic repertoires and scaffold emergent academic literacies have therefore been an important focus of our project.

AI in foundation/bridging education

In this current project to integrate Gen AI into bridging and foundation-level programmes, the integration of AI as proposed above for vocational education are relevant. However, the learning objectives for foundation/bridging programmes place stronger emphasis on both the pedagogical use of Gen AI and the support of academic literacy attainment. At the very early stages of the advent of Gen AI chatbot ChatGPT, Hamilton, William and Hattie (2023) wrote about the need for all educators to be conversant of the promises and threats represented by Gen AI. They stressed the importance of ensuring that there is regulation to control the reach of AI as presently, there were few policies on how, when and where AI could be integrated into education. They especially warned of the need to not introduce AI at primary school level as these are the years when humans gain their academic literacy skills. Therefore, the same may be applied to bridging/foundation programmes. A clear learning objective must always be the aim, when AI is introduced and integrated into programmes of learning. Importantly, when the key goal of these programmes is to support ākonga to acquire and practice the skills required to be literate and numerate members of society, AI integration must be accomplished in a planned and structured approach.

AI and education – the role of teachers

Given the above discussion, whereby Gen AI agents may play many roles to support teaching and learning and that the goal of individualised or personalised learning may now be achievable through the deployment of Gen AI ‘tutors’, it is important to consider the future role of teachers. Selwyn et al., (2023) propose that automation in education could assist with aspects of teaching that are now the domain of teachers. These tasks include aspects of educational judgement, automated student relations, automated shifts in the timings and spaces of education and the automation of educational governance. Therefore, Gen AI represents a ‘double-edged’ sword, whereby technology drives the end goal of education, rather than education informing and leading the ways technology is used to support learning (Tennant & Sligo, 2021).

Eaton (2023) proposes a post-plagiarism society, given the future ubiquity of AI into all aspects of human society and individuals’ lives. In a post-plagiarism society, six ‘tenets’ are proposed to describe the future interrelationships between humans and AI. These are that hybrid human-AI writing will become normal; in doing, human creativity will be enhanced; language barriers between humans and also between AIs will disappear; humans may relinquish control of the writing process but not the responsibility of the content and implications arising from what is written; attribution of who has contributed to the writing process remains important; and the ways plagiarism has been understood and defined will no longer apply. Hence, it is even more crucial that humans attain the abilities to be able to critically evaluate information and be the arbiters of content created by humans, AI or human-AI hybrids.



Following on, it is important to ensure that kaiako are provided the necessary professional development to attain the skills and knowledge to navigate the growing complexity and volume of Gen AI tools/chatbots/platforms. Gander and Shaw's (2024) study of Aotearoa New Zealand educators, predominately from the school and higher education sectors, indicate that many educators (76%) use AI daily. However, 75% of schools lacked AI policies to support and guide teachers and their students, and 55% of educators have had no professional development on AI. Therefore, it is crucial to ensure that all educators, have opportunities to upskill as they are the people who will prepare the future generation for a society which is permeated by AI.

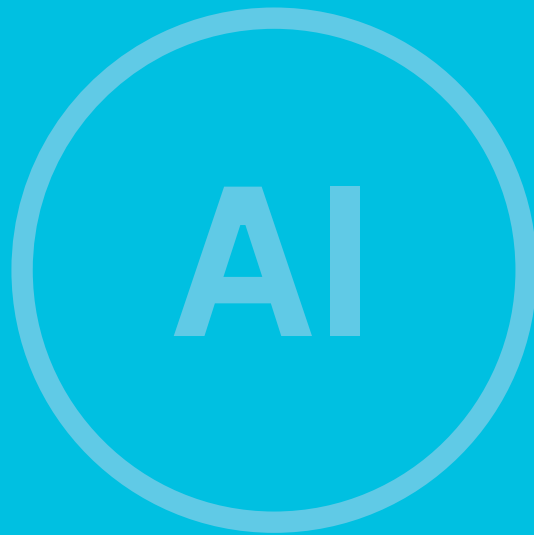
Academic literacies and AI literacies

AI literacy is NOT digital literacy. Instead, AI literacy is better aligned to information literacy, especially the critical thinking and information literacies required to evaluate the responses constructed by AI. Hence, academic literacy, that is the ability to comprehend and evaluate information and to be able to articulate queries for AI, are pre-requisites for AI literacy. Digital literacies are still a pre-requisite to the use of AI tools, given that digital access is required. Learning how to use AI tools therefore requires guidance from the digital literacy point of view but evaluating the information AI tools provide, requires academic and AI literacy skills.

MacCallum, Parsons and Mohaghegh (2024) propose a framework for AI literacy which they call the Scaffolded AI literacy (SAIL) framework. An accompanying AI literacy design analyser (<https://davidparsons.ac.nz/Alanalyser.html>) has also been developed to find out where a course sits on an AI literacy scale. The SAIL framework is comprehensive and has many levels and steps. It is also intended for generalised use, across all levels of education from primary to tertiary levels. The framework proposes four levels of capability for AI literacy. These are firstly, to know and understand what AI is; secondly, to be able to use and apply AI to support learning or other human endeavours; thirdly, to evaluate AI, its relevance and utility, and to create AI for specialised usage; and lastly to be able to move beyond current AI capabilities literacy, and to be able to develop and train AI systems (MacCallum, Parsons & Mohaghegh, 2024)

Therefore, the attainment of AI literacies, in tandem with academic literacies must now be considered an important aspect through all sectors of education. The key academic literacy skills to understand, evaluate and triangulate information, must be foundational to using AI due to the current unreliability of AI. Even if the efficacy of AI improves, there is a need to ensure that all humans maintain the critical thinking skills required to have oversight of content, decisions and other actions undertaken when digital agents exemplified by Gen AI and/or its future representations are used.

Part Two



“We used ‘spirals of inquiry’ to engage ākonga and kaiako in reflecting on the integration of AI tools into their learning, along with helping them understand better, the implications for adopting Gen AI tools to support their learning.” (p. 23, para 2)

Research methods

Overview

In this section, the three main approaches to collect and analyse data are detailed.

Key research question:

How can Gen AI be integrated into foundation and bridging programmes to improve ākonga writing and reading literacies?

Sub questions:

- What Gen AI tools can be used?
- How can identified Gen AI tools be used?
- Is Gen AI able to effectively support the learning of beginners’ Te Reo?
- What critical digital and academic literacies are required for ākonga and kaiako to use Gen AI tools ethically?
- What impact would the introduction of Gen AI have on aspects of the digital divide, equity of outcomes and improved writing and reading literacies?
- What are ākonga perspectives on using Gen AI to improve their writing and reading literacies/Te Reo?

To find out some answers to the above and to apply our learning to the development of a bespoke chatbot to support foundation/bridging ākonga and their kaiako, we undertook three distinct research methods. These are summarised on page 22 and in Figure 1. Steps taken are numbered, although the process is not totally linear as there is movement back and forth between steps 4 to 8 as data may require re-organisation as themes emerge.

- Participative Action Research (PAR) was the foundational method underpinning the introduction of AI tools into the various participating courses. This part of the project was able to find some guidance for the above key and sub-research questions underpinning the project.
- Q-methodology was used to prioritise the needs of ākonga and kaiako to inform the parameters around the development of the chatbot that would be useful for bridging/foundation programmes.
- Case study theory building through process tracing was undertaken to provide validity to the thematic analysis of data collected through PAR and from this, the guidelines to inform the integration of Gen AI tools to support foundation / bridging literacy development were derived.

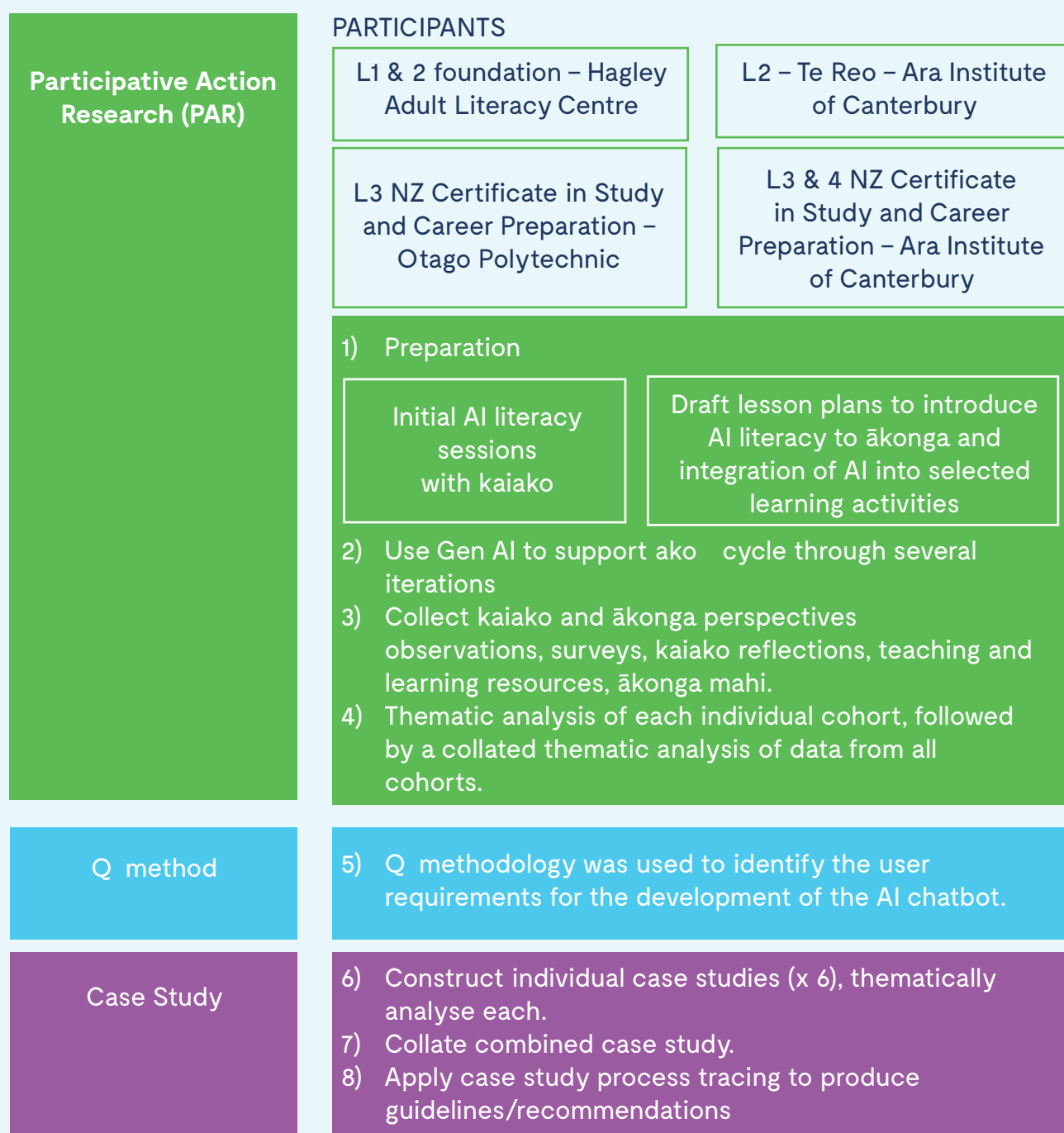


Figure 1: Overview of the research process.

Participative Action Research

The project used Participatory Action Research (PAR) as an overarching research approach. Ākonga, kaiako and researcher/s along with the ICT ākonga team developing bespoke Gen AI tools/apps, worked through ‘spirals of inquiry’ which require reflection to initiate, work through and evaluate lived experiences as they are enacted.

Through the application of PAR, ākonga become co-creators of data as the study progressed. We used ‘spirals of inquiry’ to engage ākonga and kaiako in reflecting on the integration of AI tools into their learning, along with helping them understand better, the implications for adopting Gen AI tools to support their learning. Participation was achieved through kaiako discussions with ākonga on the rationale for the introduction of AI integrated learning activities. Both ākonga and kaiako undertook several cycles of introduction to AI tools, engaging with and evaluating these tools for their match to the learning outcomes to be achieved, and providing reflective feedback to inform the next cycle of AI tool utilisation. AI tools selected beyond the initial kaiako selected tool, were sometimes based on ākonga suggestions.

Surveys and formative observations formed the predominant approach during and after each ‘spiral’ to ensure the integration of Gen AI would contribute to ākonga learning outcomes. Data from the surveys and formative observations were analysed for ākonga perspectives on what worked for them, the challenges ākonga faced whilst undertaking AI tool-based learning activities, and their suggestions for improvement. These informed the next introduction or extended use of AI tools to support learning. Comparisons of ākonga assignments or learning outputs helped to identify learning outcomes with and without Gen AI support. The efficacy of using AI could then be deduced by the experienced kaiako participating in the project, with modifications made to learning activities.

At the end of the study, summative focus groups and interviews with some ākonga deepened our understanding of the impact of Gen AI on ākonga learning. The data from these were thematically analysed. Firstly, individual cohort data were analysed, yielding themes around acceptance of AI, capability with AI, supporting factors which helped increase confidence in using AI, the need for whole programme policies on the use of AI, and an understanding of the ethics and limitations of AI. Themes were then compared across the project participants (i.e. level 1 – 4 courses) to gauge commonalities and differences.

Q-methodology

The objective of the Q-methodology was to inform the development of the chatbot by third year Bachelor of Information and Computing Technology ākonga. We used Q-method or Q-methodology systematically to record and trace subjective perspectives of participants through factor analysis (Stenner, Watts & Worrell, 2008). Q-method uses a combination of qualitative and quantitative processes to define and sort a range of responses for similarities and disparities, leading to the ability to prioritise various factors of relevance to a research question (Akhtar-Danesh, Baumann, and Cordingley 2008). Similarities are found using consensus statements when statements exhibit similar themes.

Phases of q-method include formulating the research question; generating the Q-set; selecting the P-set or participants; collecting the data; analysing the Q-sort data; and interpreting the Q-factors (Watts & Stenner, 2012).

In this part of the data analysis process, the research question was ‘in the context of bridging/foundation academic literacy development, what is the most important feature that a Gen-AI tool/app should have to help ākonga learn or kaiako teach?’ This focused research question connects with the main research questions of ‘What Gen AI tools can be used?’ and ‘How can identified Gen AI tools be used?’

The Q-set included the following – user-friendliness of the tool/app; relevance/appropriateness of the tool to the learning/teaching being undertaken; effectiveness of the tool/app; the accuracy and relevance of the outputs provided by the tool/app; the effectiveness of ways to interact with the tool (i.e. text, voice, video); and the time invested to learn how to use the tool/app effectively.

The p-set or participants were ākonga and kaimahi. Through analysis of the data collected from surveys, focus groups and interviews, the various ranking of ākonga and kaimahi responses were categorised into very important, important, somewhat important, neutral, somewhat unimportant, unimportant, very unimportant.

The q-factors or product of the above analysis was essentially a ‘gap analysis’ to identify the features of a Gen AI tool/app or process for using Gen/AI that would be most useful for ākonga and for kaiako.

Development of the guidelines using case study theory building

Following on, case study theory building was undertaken to work through the data collected from the PAR, along with the data collected through feedback and usability tests conducted to finetune the chatbot developed to support foundation/bridging programmes. As discussed in Chan (2025 b), the deployment of case study theory building as a method for data analysis when a variety of data is collected through PAR, provides the thematic analysis process with greater validity. Through case study theory building, the origins of themes, and their nuances, can be traced.

In this project, the various data were organised into narratives. These narratives collated the many learning activities undertaken by each cohort of ākonga as Gen AI was integrated. Narratives included brief demographic information along with the learning outcomes being achieved, the types of learning activities selected, the ‘role’ of Gen AI (as per Sharples, 2023) towards supporting the learning activity, the Gen AI tool/s trialled, the efficacy of various tools, the types of learning artefacts produced by learners, the perspectives of ākonga and kaiako, and reflective statements from the kaiako and researcher.

To establish ‘cause and effect’ process tracing was undertaken with each narrative. In this procedure, narrative statements – for instance the connection between the learning outcomes required, the learning activity selected, and the Gen AI tool matched to support the process, are identified. The efficacy of the ako involved is also categorised.

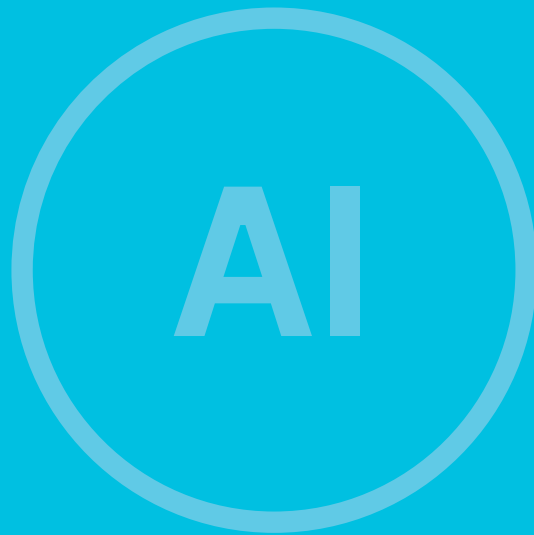
From this, the 'process tracing' ascertains the patterns for alignment of the pedagogical decisions made and what factors may be associated with supporting or not supporting the effectiveness of the ako.

As an example, Level 4 foundation/bridging 'ākonga' require support to learn how to read and understand academic articles. A Gen AI tool can be used to summarise articles and to question the chatbot/tool to find out more about the article. Kaiako evaluated three possible tools i.e. a generic chat (e.g. ChatGPT), an article summary tool (e.g. ChatPDF) and a research tool supported by AI (e.g. Research Rabbit). The summary tool is selected and a learning activity is planned to introduce the tool and to help ākonga use the tool reflectively. Prompt writing exercises are included to help ākonga interrogate the AI tool to extract concepts, key literature, findings etc. from the 'reading'. Ākonga reflection and perspectives are collected to find out how they found using the tool. The responses are collated and summarised in a survey indicating ākonga found the tool to helped them understand complex texts, increased their reading confidence, and agreed that AI assisted reading could be useful for their academic studies. From this, we derive that pre-selection of an appropriate tool to match learning outcomes to be achieved is an important requirement. We also can perceive that scaffolded and guided instruction is required to support ākonga to use the tool and that after 'learning by doing' and deliberate practice the ākonga were able to obtain the main advantages from using AI supported reading.

The commonalities across each of the narratives was then collected, to form the main sub-themes to inform the construction of the guidelines.



Part Three



“As Gen AI access is through digital hardware, digital competencies are a pre-requisite to its use. This is especially important for ‘second-chance’ or adult ākonga (work-based and some L3 and L4 ākonga) who may not have acquired digital competencies at school or use desk-based hardware at work.” (p. 33, para 1)

Findings

Reporting the PAR findings

Before Gen AI was introduced to ākonga, three activities were completed to ensure all kaiako were conversant and confident with Gen AI technology. These included:

- Establishing AI literacy across the research team. This was undertaken through face to face and virtual meetings with kaiako, managers and researchers where the precepts of Gen AI tools were discussed, the foundation for AI literacies were established and resources shared on a Microsoft Teams site set up for the project.
- Ensuring information on aspects of ethics and digital sovereignty (including Māori data sovereignty (Ruckshtuhl, 2023) were made available and discussed.
- Identification of the following:
 - a) key ‘research question’ (see Appendix One for ‘research question identification’ reflective questions used by kaiako participating in the project).
 - b) appropriate Gen AI tools/apps for integration with learning activities.
 - c) learning outcomes and learning activities that would be part of the project.

Establishment of AI literacy for ākonga before using Gen AI in learning activities included the following:

- Introduction to AI – what is it? And how is it different from using Google?
- The importance of prompt engineering, using recommendations from Mollick and Mollick (2023) ākonga are scaffolded to used structured prompting. This includes providing the chatbot with its role, the context, the objective, and style or level or tone of reply.

- Weigh up the advantages and disadvantages of using AI including the need to triangulate the information to ensure its validity and reliability.
- Awareness of the sources and biases inherent in Gen AI and its implications on indigenous data sovereignty (See Ruckshtuhl, 2023 for background in the Aotearoa NZ context).

Below, a summary of the learning activities and goals of the programmes, as Gen AI is integrated, is provided.

Activities with ākonga

NCEA L 1 / HALC Pathway to Literacy – Youth, and Workplace literacy and numeracy (WLN)

Te Puna Wai o Waipapa/Hagley College, one of the oldest high schools in Otautahi, is unique in its provision of innovative and creative education through its range of programmes of learning, pathways and approaches to learning. It has a high number of adult students and a diverse student population. The Hagley Adult Literacy Centre recently celebrated its 30th year and provides community-based literacy education programmes for Kiwis, migrants, and workplace learners.

Cohort	Number of ākonga	Gender	Age range	Ethnicity
Pathways to Literacy – Youth	11	7 male, 4 female	16 – 19	pakeha =10, Māori/NZ European = 1, Māori/Fijian = 1
Workplace ESOL ākonga	2	1 male, 1 female	Both over 40	Asian/Japanese = 1 Indian = 1

Table 1: Demographics of the Pathway to literacy (youth) class and workplace ākonga from Hagley Adult Literacy Centre.

The classroom-based Pathways to Literacy group of 11 ākonga were introduced to AI (ChatGPT 3.5) to help write short ‘essays.’ They were supported by teacher Gisele Aynsley. Other tools used included:

- Twinkl – <https://www.twinkl.co.nz/> – (for kaiako lesson planning and resources),
- evaluations were also undertaken of TextBuddy – <https://textbuddy.com/>, WordTune – <https://www.wordtune.com/>, Prowriting Aid – <https://prowritingaid.com/> and Writers Toolbox – <https://www.writerstoolbox.com/> (NB: some of these are paid access only and several are now used in primary/intermediate schools in Canterbury).
- Grammarly

Workplace-based ākonga who attended one-on-one sessions with kaiako Khadra Alazrak took place at a local library. Chat GPT 3.5 was used to support literacy work required for various job tasks. For example, to write notices for ‘clients’ and to improve conversational skills with workmates and customers. Google Bard and Claude were also trialled. Multimodal prompts using Google Gemini and ChatGPT4o (the paid version) were introduced in June, to assess the efficacy of using these tools to support oral language practice or improve conversational competencies.

L2 Te Reo Māori

Ara Institute of Canterbury/Te Pūkenga offers a range of programmes to learn Te Reo Māori. Beginners begin with a Level 2 programme and may then pathway to a level 6 (Upper intermediate Te Reo Māori) qualification. Our target cohort for this project, was the Level 2 beginner Te Reo Māori programme. However, although several AI tools/apps (TalkPal - <https://talkpal.ai/>, ChatGPT 3.5, CoPilot, Google translate - <https://translate.google.com/?sl=auto&tl=en&op=translate>) were evaluated, all were found to be inaccurate for Te Reo. Therefore, kaiako Manu Whata and Te Kurawhiti Hitchens used ChatGPT to generate teaching resources. Gen AI was found to be useful as an 'ideas generator'. The responses provided by Gen AI had then to be corrected by the kaiako to ensure that the Te Reo was correct before the responses could be used. This approach allowed kaiako to provide up-to-date or topical scenarios for their ākonga learning activities.

Through the project, the AI literacy competencies for the kaiako and their manager, Stan Tawa was increased. Going into the future, as the capabilities and accuracy of Gen AI translational abilities increase, the development of a Te Reo Māori chatbot to support the learning of Te Reo will be a priority for Ara. The plan going forward would be to augment the chatbot developed in this project, to have a Te Reo Māori version.

L3 Certificate in Study and Career Preparation

Otago Polytechnic/Te Pūkenga offers a range of pathway programmes between levels 2 to 4 to support ākonga seeking entry into higher programmes of study. In its Level 3 and 4 programmes, the curriculum prepares students for entry into specific fields, either to obtain entry level work in related occupations, or to progress into Diploma or Degree level programmes.

A cohort of Level 3 ākonga participated in this programme. This programme was offered in a blended delivery mode. The majority of learning was completed through on-line activities and study. This cohort convened for one morning a week for a kanohi ki te kanohi session to consolidate the online learning and undertake deeper discussions into the course content.

Cohort	Number of ākonga	Gender	Age range	Ethnicity
L3	14	All female	17-33 – majority under 21	pakeha = 5, Māori = 6, Asian = 2, MELAA = 1

Table 2: Demographics of the L3 ākonga from Otago Polytechnic.

Kaiako Christine Beker introduced ākonga to the use of the following:

- AI literacy to ensure ākonga used Gen AI appropriately with integrity.
- Gen AI (Chat GPT 3.5, Google Bard/Gemini) was used to help start writing tasks and provide initial ideas for structuring writing tasks.
- Research Rabbit was used to support information literacy-based learning activities. Ākonga were supported to triangulate the information obtained with established scholarly databases and learn the important information literacies required to evaluate academic readings.

L3 and L4 Certificate in Study and Career Preparation

Ara Institute of Canterbury/Te Pūkenga offers foundation, bridging, and study and career preparation programmes for levels 2 to 4. The cohorts participating in this project are Level 3 and Level 4 ākonga enrolled in study and career preparation pathway programmes. These programmes prepare students for entry into a range of occupationally focused programmes at level 5 and above including pre-health (i.e. mainly into nursing), business and information and computing technology, social work and engineering, etc.

Cohort	Number of ākonga	Gender	Age range	Ethnicity
L3 & L4	119	69% F – n = 82 34% M – 34 and 3% non binary – 3	Range – 16 – 58 but median of 20 15% aged 30 +	Pakeha 63 53% Māori 12 10% Filipino 14 12% Pasifika 9 8% Other 21 18%

Table 3: Demographics of L4 cohort from Ara Institute of Canterbury.

In addition to the demographics reported above, 10% of participant ākonga reported having a learning disability.

Ākonga at Ara attended ‘traditional’ classroom ako sessions. Kaiako Tricia Lewis and Rory Collins introduced and worked through the following:

- AI (ChatPDF) to help with reading/comprehension of articles. ChatPDF is able to summarise articles. Ākonga are also able to question the AI to provide specific items on the content of the articles.
- AI (ChatGPT 3.5, Grammarly) was used to support initial writing tasks, and to evaluate and provide feedback on ākonga writing.
- AI was also used as ‘coach’ to help ākonga revise content for discipline-based exams. The skill of prompt engineering was introduced and practiced to enable ākonga to obtain relevant responses from AI.

This section provides an overview of findings from the above.

Three surveys were conducted to investigate different applications of Gen AI in an academic skills classroom. There were 119 responses with some overlap between participants. Responses were recorded using Likert scales, with averages calculated from the data. Limitations include small sample sizes, the use of ordinal data imposed

on a numerical scale, and the multiple testing approach. While further investigation is needed to draw firm conclusions, the data indicate the following areas for future research.

- Older students showed slightly more favourable attitudes to Gen AI use. Female participants viewed Gen AI as more useful than male participants did and male students considered Gen AI to be more reliable. Male students also found AI more useful for writing support. Pasifika students had more favourable attitudes towards Gen AI than other ethnic groups, followed by Māori, Pākehā, and Filipino. Students with learning disabilities were considerably more positive about the use of AI for brainstorming and planning.
- Students who took part in this research had slightly higher grades in their final assessment than students who did not take part. They were also less likely to be investigated for academic misconduct for unethical use of AI in assessments.
- Future research directions include more in-depth exploration of perceptions and of Gen AI within different age groups, genders, cultures, and learning disabilities. Research should also examine practical classroom-based activities for learners and teachers with actionable strategies to integrate AI effectively to improve learning outcomes, encourage creativity, and maintain academic integrity.

See Appendix Two for teacher guide written to support ongoing integration of AI in these courses.

Overview of the learning activities and AI tools used

In Table 4, we use Sharples (2023) to organise how the various sub-projects used AI tools to support ākonga learning.

Pedagogical approach to AI integration	Sub project using this approach	Learning activities	AI tools used
Possibility engine	L3 and L4	Brainstorm topic ideas	ChatGPT Google Gemini Research Rabbit
Socratic opponent	L4	Study buddy	ChatGPT
Collaboration coach	Not trialled		
Co-designer	L3 and L4	Provide structure to a report or essay	ChatGPT Google Gemini Research Rabbit
Exploratorium	L3		Research Rabbit
Storytelling	All levels	Writing reports, essays	ChatGPT Google Gemini Grammarly

Table 4: Overview of the pedagogical approaches and AI tools used.

From table 4, examples of the types of learning activities, matched to relevant Gen AI tools is summarised.

Overview of the findings from the first phase of the project:

- Reconfirmation of the importance of kaiako's digital and AI literacies as being essential to ensuring that AI integration aligns with learning activity outcomes. (evidence from kaiako reflections, survey feedback (Level 3 and 4 at Ara) and focus groups (HALC youth and L3 Otago).
- Level of learning (i.e. level of ākonga literacy) must be considered when using AI tools. Both prompt engineering and evaluation of AI outputs require 'intermediate' literacy skills. Gen AI often generates 'walls of text' which is intimidating and difficult for ākonga to work through. (evidence from kaiako reflections, survey feedback (Level 3 and 4 at Ara) and focus groups (HALC youth and L3 Otago).
- Multimodal interaction with Gen AI tools is now possible with ChatGPT4o and Google Gemini. However, communication using voice and then trying to remember the replies, places a high cognitive load on ākonga (HALC kaiako feedback and workplace learner interviews).
- Gen AI tools which allow ākonga to archive their interactions with the tool were found to be useful for later referencing. For example, when using multimodal interactions with ChatGPT4o, transcripts of the conversation can be a useful as these can then be drawn on for reflective learning and as a reference for revision. (HALC kaiako feedback and workplace learner interviews).
- Contextualisation of learning in foundation/bridging programmes is challenging. There are often difficulties in bringing authentic disciplinary-based learning activities into a class when individual ākonga have different focuses for their learning journey. (Ara L3/4 kaiako feedback/reflections and survey results from L3/4 Ara ākonga).
- Very few Gen AI tools/apps support Te Reo Māori. Those that do are inaccurate. At the moment, it is prudent not to use Gen AI tools/apps with ākonga, especially at foundation/beginner level. This is because Level two ākonga have limited Te Reo capability and are unable to evaluate Gen AI outputs for accuracy. (Te Reo manager and kaiako feedback and interviews).
- A similar premise may be made with Level 2 English as Other Language (ESOL) ākonga. Text-based interaction with Gen AI tools/chatbots require sufficient language to be able to type in prompts which the AI will understand and respond to. Using the voice feature may be useful for Level 2 ākonga. However, the message still needs to be worked out before it can be articulated orally. Oral responses from the AI can also be very fast. For non-native English speakers, both the accent of the chatbot and the speed of its responses can be difficult. (HALC youth and workplace kaiako feedback/reflections and ākonga focus group/interviews).
- For kaiako, Gen AI presents many opportunities to support the agile development of ākonga relevant/contextualised/contemporary learning resources. Several 'popular' teaching resources sites have incorporated AI into their offerings. Therefore, although Gen AI may not be integrated into Level 1 and 2 programmes, kaiako teaching on these programmes will still benefit from attaining AI literacies to support their ako. (Kaiako and manager feedback/reflections from all the cohorts).

See Appendix Three for evaluation of AI tools/apps form.

Findings from the Q-method analysis – informing the development of the chatbot

The main items identified by the Q-methodology are detailed in this section.

Digital literacy and English competency a pre-requisite

As Gen AI access is through digital hardware, digital competencies are a pre-requisite to its use. This is especially important for 'second-chance' or adult ākonga (work-based and some L3 and L4 ākonga) who may not have acquired digital competencies at school or use desk-based hardware at work. Additionally, younger ākonga (Hagley Adult Literacy Centre Pathway to Literacy – Youth programme and some L3 and L4 ākonga) did not have access to desk-based hardware or software at home. Their main digital device would be a mobile phone.

With regard to academic literacies, workplace-based ākonga were working on the lowest progression levels of the Tertiary Education Commission's (2008) learning progressions or the literacy and numeracy for adults assessment tool (LNAAT). Hence, ākonga require scaffolds to enter appropriate text or voice prompts to obtain relevant results. The 'wall-of-text' phenomenon was brought up at all the focus group sessions as one challenge faced by bridging/foundation ākonga. A short prompt may yield hundreds of words. This 'wall of text' is made more daunting when accessed on a mobile device as scrolling through multiple screens is required to view the entire AI-generated responses.

Therefore, the TWO recommendations from this section informing the development of the Gen AI app/tool or chatbot are:

- Provide a straightforward mobile user interface.
- Ensure the output from each prompt is at an appropriate level of English, the outputs are kept short and to the point, and formative learning language is used.

Identifying and matching the tool to the learning outcome

A variety of Gen AI tools and ways to use them to support ako and the development of academic literacies was introduced, utilised and evaluated (See above for the range of AI tools used by the various sub-projects).

Across the sub-projects, we used these tools to support ako with:

- Idea generation – all the sub-projects introduced Gen AI to help generate ideas for writing. One student (L3) described it as '*enhanced Google*'. Hagley Adult Literacy Centre Pathway to Literacy ākonga used Gen AI not only for 'school' but for entertainment. They used Gen AI to generate jokes and riddles and to speak a different language.
- Revision of study content – L4 ākonga were guided to use Gen AI to help them revise the content from their other courses. Many of the ākonga at L4 were studying towards gaining entry into degree programmes. Health programmes require a large amount of content to be learnt. Ākonga appreciated the use of Gen AI to generate quizzes and questions, to help them revise for upcoming assessments.

L4 ākonga found this a useful way to use Gen AI as evidenced by statements:

‘AI was really helpful. I was a bit sceptical at first but after some guidance found it amazing’ (L4 ākonga)

‘Very useful for quizzing me on subjects I’m studying. I usually make flash cards, and they take a lot of energy and effort.’

‘Using AI in this way removes some of my workload.’ (L4 ākonga)

‘It was very useful. It also explained and gave detailed information about the things I didn’t know.’ (L4 non-pakeha ākonga)

‘I used AI before studying measurements and algebra and it is really useful because I receive good results (in the final assessment for the course).’ (L4 non-pakeha ākonga).

Academic and information literacies supported included:

- Using AI to help summarise ‘readings’. Ākonga at L 3 and L4 appreciated these capabilities but struggled with phrasing prompts that would interrogate readings to give them the right information. Scaffolding of prompts is an essential skill set when using AI tools or apps.
 - Triangulation or cross-checking of the AI-generated responses produced by Gen AI. L3 and L4 ākonga were shown by their kaiako how to evaluate the responses from Gen AI. Gen responses could be checked against search results from Google Scholar, Research Rabbit (another Gen AI tool) or the readings provided by the kaiako.
 - Checking their writing for grammar, spelling and structure of their writing.
- 3) The main recommendation from this is the importance of ensuring that the AI app/tool or chatbot being developed, has a clear pedagogical or academic literacies learning purpose.

Gen AI tool preferences

Workplace-based ākonga and their kaiako, tested out the main Gen AI tool/apps. These were ChatGPT3.5, ChatGPT4o (4 omni), Google Gemini, Claude 3.5 Sonnet and Microsoft CoPilot. There were functions within each Gen AI tool/app that were preferred as a support for learning English.

One ākonga stated –

‘I find Gemini suits my study needs best. When I’m talking, I can see Gemini typing on the screen, which help me identify words and pronunciations that aren’t understood properly. This allows me (to) have smooth conversation by typing to correct them. I think Gemini is suitable for beginners.’ (workplace learner).

The one quirk of Gemini is that it does not respond until the prompt is submitted, unlike other app/tools exemplified by Copilot or ChatGPT4.o.

The workplace kaiako was impressed with the context awareness of ChatGPT4.o but found that it spoke too fast and did not slow down sufficiently. Even when the AI agent was asked several times to slow down, it did not slow down sufficiently for the conversation to be easily followed by ākonga learning English at a beginning level. For this form of AI to be useful for beginning English ākonga, finer control of the AI agent will be required. There was also no transcript of the conversation as it progressed, making it more difficult for ākonga to follow the conversation when ChatGPT4.o speech went too fast. They also could not review the transcript later as a form of self-revision.

- 4) A recommendation from this section is to ensure the AI app/tool or chatbot being developed, is well tested by the end users.

Findings incorporated into chatbot

From the above data analysis, a project brief was developed with two Bachelor of Information and Communication Technologies (BICT) year three ākonga to provide direction for what an AI app/tool or chatbot could do to support foundation/bridging ākonga.

The following principles were formulated to advise the BICT ākonga on how an AI app/tool or chatbot could address the FOUR recommendations presented above.

- 1) The app/tool or chatbot would be founded on principles of Universal Design for Learning (UDL). UDL seeks to provide ākonga with opportunities to engage with resources which are accessible through principles of good design. See CAST (2018) for principles and examples (*meeting recommendations 1 and 2 from above*).
- 2) The level of English expected for inputs and outputs from the app/tool or chatbot should match the literacy skills of the ākonga who will be using it. See below for the use of the Tertiary Education Commission (TEC, 2008) learning progressions or the literacy and numeracy for adults assessment tool (LNAAT) to guide the training of the Gen AI tool/app or chatbot (*meeting recommendations 2 and 3 from above*).
- 3) The main purpose of the app/tool or chatbot would be to help ākonga check their writing and coach them towards improving their writing based on appropriate criteria (*meeting recommendation 3 from above*).
- 4) The app/tool or chatbot would be evaluated by ākonga and kaiako to ensure that the user experience (UX) is fit for purpose (*meeting recommendation 4 from above*).

In doing, the above are aligned to the research question established to underpin the Q-methodology. That is, in the context of bridging/foundation academic literacy development, what is the most important feature that a Gen-AI tool/app should have to help ākonga learn or kaiako teach? Which in turn is connected to the main research questions of 'What Gen AI tools can be used?' and 'How can identified Gen AI tools be used?'

Details of the process for developing and building the AI chatbot for supporting foundation/bridging ākonga are collated in Appendix Four).

Part Four



“Gen AI use to support academic literacy development must be carefully planned, structured, supported and scaffolded and the AI tools selected must be well-matched to ākonga academic capabilities and learning levels.” (p. 38, para 1)

Guidelines

In this section, the guidelines derived through the project are presented. PAR activities were systematically analysed using the case study process tracing method to report the following guidelines or recommendations. We also propose an AI literacy framework for foundation and bridging ākonga, given the specific needs of these programmes, to enable ākonga to attain academic literacies for future study and employment. Guidelines, recommendations and frameworks were informed by the data collated from the study and collated through PAR thematic analysis and case study process tracing.

Guidelines for the integration of Gen AI into foundation/bridging programmes/courses

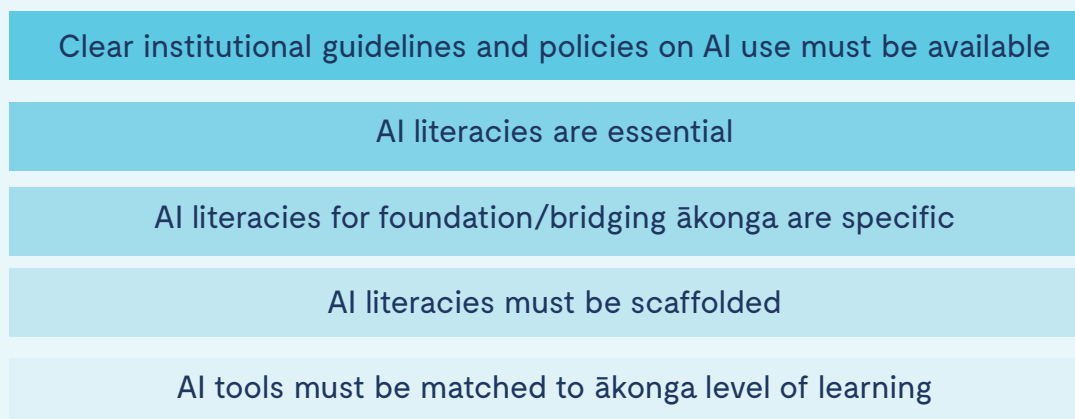


Figure 2: Guidelines for integration of Gen AI to support foundation/bridging ākonga.

As summarised in Figure 2, the guidelines include firstly, the overarching need to establish clear, visible and communicated policies and guidelines for the institutional use of Gen AI. Following on, a pre-requisite to the introduction of Gen AI into learning activities, is the need to ensure AI literacies are introduced and then scaffolded as Gen AI use is extended. It is also important to understand that the AI literacies for foundation/bridging programmes and ākonga are specific in that Gen AI must be used for pedagogical support, and not to replace the important learning objectives of attaining academic skills and literacy. In turn, Gen AI use to support academic literacy development must be carefully planned, structured, supported and scaffolded and the AI tools selected must be well-matched to ākonga academic capabilities and learning levels.

In the section below, the data informing the identification of the guidelines is presented.

Clear institutional guidelines and policies

Clear direction from institutions is required on how, when, who and what Gen AI is used. Many educational institutions, focus on the misuse of AI, especially about the assessment process and issues of plagiarism. However, our project was aimed at finding relevant, authentic and useful ways to integrate Gen AI into learning activities which would support the development and practice of academic reading and writing.

Statements from ākonga indicate that clarity around using AI is confusing. Some courses require 'no AI' to be used for assessments. Some courses allow the use of AI but only for certain types of learning activities, and others use AI (as with our project) to support teaching and learning.

Consistency across programmes and clear institutional policies were requested by ākonga:

'AI can be helpful to some students as long as the limitations and risks are very clearly explained. There is potential for using AI in academic programs to cause more harm than good if students are not aware they need to thoroughly check all information as AI is not a reliable source and information can be skewed. (Level 4 ākonga – survey)

'I think it's weird we are told not to use any of this stuff and then we are given lessons on it... (Level 4 ākonga– survey).

Furze et al. (2024) have recommended the adoption of a five level AI assessment scale to help categorise the ways AI can be incorporated into assessment activities. These are from level 1 with no AI, to AI assisted idea generation and structuring, AI-assisted editing, AI task completion with human evaluation and level 5 with full AI. Therefore, clear guidelines and policies, can be helpful to ensure ākonga understand the implications of adopting and using AI to support their learning.

AI literacies are essential

The data shows that an introduction to AI is a first step for all kaiako and ākonga BEFORE they actually begin using AI to support learning. ChatGPT was the main Gen AI tool used by kaiako and ākonga, prior to participation in the project. ChatGPT was used as an 'enhanced Google' and once the first AI literacy session was conducted, kaiako and ākonga began to see the capabilities of AI and the differences between using a Gen AI tool (e.g. ChatGPT, Gemini, Claude), searching an academic database and using a browser (Google Chrome, Google Scholar etc.)

Statements from ākonga (Level 4 – survey) included:

'The lesson on prompt writing was effective in terms of learning to be concise and specific with what you are asking the AI to do'; 'a prompt with more detail is generally more likely to get a helpful response'. 'It's (Gen AI) not very good at following prompt instructions sometimes.'

AI literacies for foundation/bridging ākonga are specific due to the need for these ākonga to attain academic literacies. Reliance on Gen AI to provide answers, does not encourage ākonga to undertake the deliberate practice and cognitive training to attain essential academic skills. Hence, bespoke or customised AI is recommended to target the learning outcomes that are AI supported and provide learning opportunities instead of provisioning 'answers'.

One Level four ākonga commented on the survey form:

'They can provide any information I asked about and can summarize any texts but the challenging part was that they don't actually provide information from the text/link I provided so I had to read the text.'

AI literacies must be scaffolded to enable ākonga to reap the main benefits from Gen AI by using AI tools to support learning. Obtaining the best results from AI tools require the learning of skills specific to AI utilisation. These include prompt 'engineering' and critical evaluation and judgement of AI responses.

As level 3 and 4 ākonga reiterated in the survey:

'Today I learnt that if my question did not give me the answer, I wanted I have to rearrange the question in a more targeting way to get the answer I wanted'. 'I found even when giving the generative AI a specific document to work from it still hallucinated information that was not in the document. Therefore, I think it is more useful to search directly in the original document as you will need to fact check the AI anyway'.

Matching AI tools to ākonga levels of learning, learning goals/outcomes and digital capabilities is required. There are many Gen AI tools, each with specific advantages and disadvantages for various learning needs.

Level 4 ākonga comments from the survey included:

'I think it was useful and it was good to compare different AI software. Some are more powerful than others and require different specificity of prompts.'; 'They put the answers in bullet point so it makes it easier for me to understand.'

Data from the Q-methodology reported in the previous section supporting recommendation 4 – to ensure the developed chatbot was evaluated by ākonga-, also support the need to provide opportunities for ākonga to try a range of tools and for them to decide on the tool most suited to their learning needs.

AI literacy framework for bridging/foundation programmes

As summarised in the literature review, there is a difference between academic literacies and AI literacies. Both forms of literacies are supportive of each other.

As an output from our project, we propose a framework (Table 5) specific to supporting the AI literacy for foundation/bridging ākonga. Elements of the Scaffolded AI literacies framework (SAIL) as proposed by MacCallum, Parsons and Mohaghegh (2024) are present through the proposed framework derived from our project. However, the emphasis of the proposed framework, is to use Gen AI to help raise ākonga competencies with academic and information literacies.

In the framework summarised in Table 5, the three aspects of AI literacy – understanding AI, critical and ethical evaluation of AI and practical skills for using AI – have learning outcomes which are organised into the appropriate levels of learning used in Ara's Poutama/academic literacies framework. In the Ara Poutama, the scaffolded development of core academic literacies is described as moving from 'informed', towards being 'empowered' and 'engaged' and as 'active participants'. In essence this means that the attainment of academic literacies begins with ākonga being guided and supported towards independence in being able to critically evaluate information and their own work and write in the genre specific to their academic discipline.

The learning outcomes align with the SAIL framework (MacCallum, Parsons & Mohaghegh, 2024) of know and understand AI, evaluate AI and use and apply AI. The framework then details the learning outcomes for levels of emerging AI literacies at Level 2, developing AI literacies at Level 3, Proficient at Level 4 and Expert at Levels 5 to 7. Again, these levels of learning correspond to the SAIL framework's informed (Level 2), empowered (Level 3), engaged (level 4) and active participant (Level 5-7) designations.

The AI literacy framework is, like the Ara Poutama, a tool for kaiako to plan and develop ako strategies which will support ākonga AI literacy development. Therefore, some courses, for instance at degree first year level, may need to shift ākonga from informed to active participant rapidly whereas in foundation/bridging programmes, the process may be structured across a longer time span with greater guidance from kaiako along the way.

Addressing issues of digital literacy and equity

AI is an outcome of digitisation. Hence, the pre-requisites for using AI are access to hardware with sufficient specifications to enable AI software to run and bandwidth to allow for internet access through wired or WIFI systems. Digital literacies required to support AI use include basic ability to utilise PCs or mobile devices. As stated above, academic literacy to be able to input prompts and to comprehend the responses generated by AI are also important skills.

Therefore, equitable access to digital hardware and infrastructure, along with individuals' digital skills are requirements for engagement and participation in an increasingly digital and AI world.



AI competencies and progressions framework for academic skills

	Emerging (Level 2) SAIL informed	Developing (Level 3) empowered	Proficient (Level 4) engaged	Expert (Level 5-7) Active participant
Understanding AI and Its Applications: Introduce students to AI basics, various technologies like machine learning, and real-world applications, setting a foundation for understanding AI's impact. (SAIL – know and understand AI)	Recognise the basic concepts of AI and its presence in everyday technology. Describe the simple functions AI performs, like automating repetitive tasks.	Explain AI technologies, such as machine learning. Discuss the role of AI in enhancing learning and academic productivity.	Apply AI tools to support and improve academic tasks. Evaluate the effectiveness and limitations of AI in academic settings.	Analyse and discuss the broader impacts of AI on academia and beyond. Innovate or contribute to the development of AI applications that enhance complex academic activities.
Critical and Ethical Evaluation of AI: Equip students with the skills to critically assess AI technologies and their outputs, emphasising the recognition of biases, ethical implications, and the accuracy of AI-generated information. See page 43	Recognise the importance of critically assessing AI technologies. Explain basic concepts of biases and ethical concerns related to AI. Recognise the specific AI issues on indigenous data.	Identify biases in AI outputs. Discuss ethical implications of using AI in academic settings. Discuss the implications of AI on indigenous data and language.	Evaluate the accuracy and reliability of AI-generated information. Apply critical thinking to assess the ethical use of AI in academic work. Discuss relevant issues on AI's impact on indigenous data and language.	Discuss the critical the broader ethical issues of AI technologies. Critically review ethical guidelines for AI use in academia. Apply understanding of the effect of AI on indigenous data to aspects of academic work.

Table 5: AI competencies and progressions framework for academic skills (note table flows across pages 42 and 43).

(Adapted from Programme Document for Foundation/Bridging Skills (Level 3 / 4) Ara Institute of Canterbury

	Emerging (Level 2) SAIL informed	Developing (Level 3) empowered	Proficient (Level 4) engaged	Expert (Level 5-7) Active participant
... continued Foster robust critical thinking to ensure responsible and effective integration of AI into their academic work. (SAIL – evaluate AI).				
Practical Skills for Using AI Tools: Provide hands-on experience with AI tools relevant to academic skills. This could include training on how to use AI for research, such as data analysis tools, AI-based writing assistants, and AI-driven study aids. Ensure students understand how to leverage these tools to enhance their learning and research capabilities. (SAIL – use and apply AI)	Attain basic familiarity with AI tools relevant to academic tasks. Identify how AI can assist in simplifying and automating routine academic processes.	Use specific AI tools for academic research and writing. Integrate appropriate AI tools into daily study practices effectively.	Apply AI tools independently to enhance research quality and learning efficiency. Critically assess the effectiveness of AI tools in supporting academic goals.	Rationalise the selection and use of AI tools for academic enhancements. Utilise advanced AI tools and techniques for academic tasks.

Recommendations arising from the project

The project sought some resolution to a range of questions. Below, we provide some recommendations as they align to the findings on the project's research questions.

The specificity of Gen AI tools and the importance of matching learning outcomes to the utilisation of Gen AI must be attained

As a first research question, we asked “What Gen AI tools can be used? “In the context of this project, we have found Gen AI tools to be effective for supporting a range of learning outcomes, associated with the ako of foundation/bridging programmes. Gen AI tools can be deployed to help ākonga in a range of ways including helping them find academic articles; read, summarise, understand and evaluate academic articles; encourage critical thinking through the need to triangulate the information provided by AI; support attainment of academic writing skills etc. (see Appendix two for examples).

Related to the above research question, we asked “How can identified Gen AI tools be used?” Here we found that besides using Gen AI to support academic literacy acquisition and practice, Gen AI tools are also useful as ‘study buddies’ whereby Gen AI is able to provide revision questions for ākonga or clarify difficult concepts. Kaiako also found Gen AI useful for the creation of resources including worksheets, marking rubrics and lesson plans.

We also wanted to find out if Gen AI can effectively support the learning of beginners’ Te Reo? At the moment, the databases Gen AI draws on, seem to have insufficient accuracy when trying to respond to prompts in Te Reo Māori. This seems to not only be a challenge limited to Te Reo Māori but to many other languages. This finding reveals the bias of the Gen AI tools, largely developed in North America, and drawing most of their data from a westernised or European knowledge corpus. The algorithms which underly Gen AI are also not linguistically framed but based on pattern recognition systems. Languages with less data available digitally, will mean that Gen AI will struggle to provide accurate responses in the ‘lower resourced’ language (see as an example for discussion, a paper by Alluru, (2024)).

Of importance here is for kaimahi to be confident and familiar with a range of Gen AI tools which can be usefully deployed to support ako in their discipline.

Need to ensure prerequisites for effective utilisation of Gen AI with foundation/bridging ākonga are supported

Three important research questions established the prerequisites for integrating Gen AI into foundation/bridging programmes of learning

Firstly, we asked “What critical digital and academic literacies are required for ākonga and kaiako to use Gen AI tools ethically?” Both digital and academic literacies, including information literacies are pre-requisites to maximising the advantages provisioned by Gen AI. Hence, the need to be structured and planned when introducing and integrating AI into foundation/bridging programmes, as ākonga studying in these programmes, may not have sufficient academic literacies to engage with Gen AI. AI literacies, which build on foundational information literacies, are therefore crucial.

Secondly, we wanted to find out “What impact would the introduction of Gen AI have on aspects of the digital divide, equity of outcomes and improved writing and reading literacies?” Gen AI could provide unlimited personalised learning opportunities to all. However, to utilise AI requires access to hardware, software and infrastructure. Recent work undertaken (van Gorp, 2025) support the notion that Gen AI is useful for neurodivergent ākonga as Gen AI can be used to organise and summarise large volumes of text. However, to leverage off Gen AI at the moment, still requires intermediate levels of literacy to be able to interact with the AI and to understand and critically evaluate the responses it provides.

Thirdly, it was important to establish “What are ākonga perspectives on using Gen AI to improve their writing and reading literacies/Te Reo?” Through the PAR process, we found a majority of ākonga to be engaged with using Gen AI. Different cohorts found differing reasons for why Gen AI could be useful. For Level 1 and 2 ākonga, using Gen AI to provide initial structure and ideas for written work, was found to be effective. AI was used to help ‘brainstorm’ topic ideas, providing a starting point for ākonga to work from. Gen AI also helped ākonga by providing suggestions as to how to structure reports or essays, again helping to scaffold the writing task into manageable steps. Level 3 and Level 4 ākonga found the self-directed use of AI to help them undertake revision (i.e. using AI as a study buddy) to be most useful.

Overall, the project has established the utility of Gen AI to support foundation/bridging ākonga and their kaiako. The most important aspect is to ensure that there is adequate preparation on AI literacy before Gen AI is introduced and utilised and to match the relevant Gen AI tool to the learning outcome/s to be achieved.

Going forward into the future

We have established foundational work to inform our mahi going forward into the near future. Implementation of key aspects of the guidelines presented above are prerequisites for the effective utilisation of Gen AI technologies to support bridging/foundation programmes. In particular, attention is required to ensure AI literacies form the foundation from which AI utilisation is based and that institutional policies support the integration of AI to support pedagogical approaches to provide for individualised ako and academic literacy attainment.

The integration of Gen AI into the ako of foundation/bridging programmes, requires careful learning design. The main goal of these programmes is to ensure ākonga attain the academic literacy skills necessary for further study or work. Therefore, the following are necessary follow ups to this project, to ensure that Gen AI supports academic literacies ako without compromising ākonga engagement with the deliberate practice required to attain the literacy skills.

- As Gen AI will likely be utilised for individualised and personalised study, in-depth investigation into ākonga perspectives based on demographical (age, gender, ethnicity) and academic capability (level of literacy, digital literacy, neurodiversity etc.) needs to be better understood. In doing, we will be better able to engage ākonga, many of whom have not enjoyed formal schooling or are returning to study.

This will allow Gen AI ‘coaches’ to be customised to the needs of individuals by increasing intrinsic motivation to learn and providing sufficiently spaced scaffolds for effective ako.

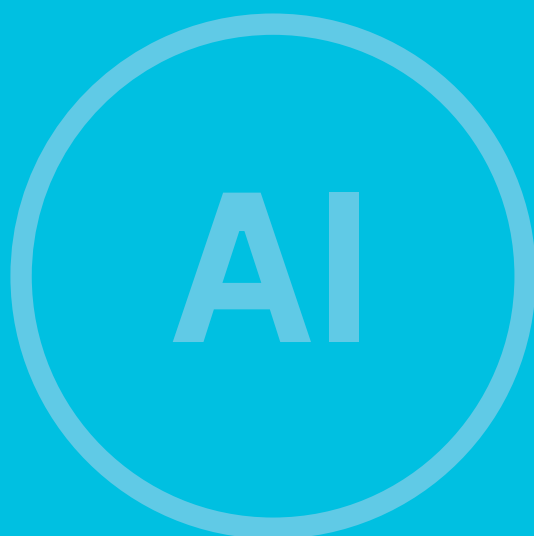
- Learning analytics which are visible to ākonga and kaiako are a key component of individualised learning (see Dawson and Siemens (2014) for overview). Gen AI tools developed to support ākonga must have the capability to store the history of ākonga interaction. This archive of learning interactions must be visible to both ākonga and kaiako. Ākonga must be prepared with sufficient feedback literacy skills (See Carless and Boud (2018) for foundational information) to evaluate and act on the feedback they receive, producing sufficient ‘feed-forward’ themselves, to learn from each learning interaction. Feedback literacy is more of a challenge when ākonga are developing academic literacies to comprehend feedback, and therefore, must be carefully scaffolded. For kaiako, the information from learning analytics provide important information on ākonga progress and help kaiako to develop appropriate interventions to assist ākonga progress.
- The specific pedagogies which will support the integration of Gen AI into bridging/ foundation programmes also require further study. The field is nascent and it is important to evaluate what ako activities are most effective, engaging and logistically feasible for inclusion. In doing so, the findings will inform better formulation of learning outcomes that not only lead to the attainment of academic literacies, but also, encourage ākonga creativity whilst maintaining aspects of academic integrity.
- As signalled above in the discussion on findings from the Te Reo Māori segment of this project, Gen AI tools language can respond in different languages. However, for Te Reo, the Gen AI translations from English to Māori are inaccurate. As Gen AI capabilities increase, its translation competencies will also improve. This makes any AI tool, able to support ākonga who are multi-lingual, assisting development of another language, through access to coaching in their primary language. This aspect of using AI for individualised coaching to enhance language learning, has important implications on language development and learning, and the pedagogy for this, requires further exploration.

Some of the above, may be achieved through further enhancement of the Ako AI chatbot developed as part of this project. Supporting resources accompanying the Ako AI personalised learning coach, should provide information on how to best utilise the chatbot to support the specific pedagogies built into the tool and how to customise the tool to individualised ākonga needs and goals.

Conclusion

In this report, we have presented the rationale, research processes, findings and details for the development of an AI chatbot to support the attainment of academic writing skills by bridging and foundation ākonga. In doing so, the perspectives of foundation/bridging ākonga and their kaiako, have been drawn on to inform the parameters for the design of a bespoke chatbot which will provide feedback on ākonga writing, but not provide them with ‘finished’ answers. As discussed in the above section, Gen AI provides many opportunities, when used appropriately, for supporting bridging/foundation ākonga and their kaiako. We see this project as a start towards informing how Gen AI can be utilised to underpin the shift towards more ako and ākonga-centred learning.

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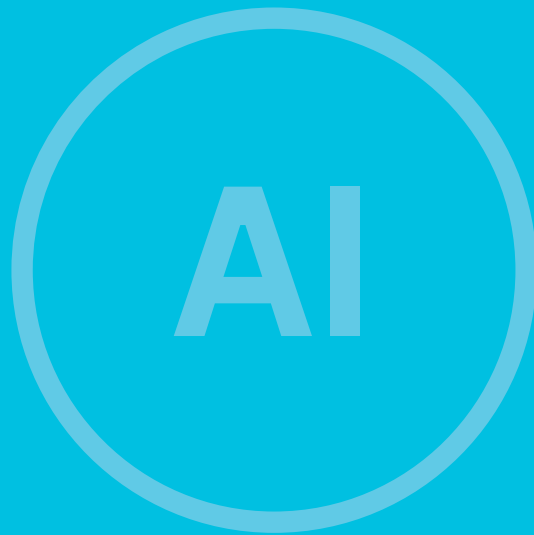


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Appendices



Appendix One

Inquiry Plan

AI in “Foundation Studies” project

1. What is the learning challenge you would like to address? Or What do ākonga find difficult to learn which could be improved using AI?
2. What can be done to help solve the learning challenge? Or What can be done to help make it easier for ākonga to learn?
3. What are some possible AI tools that could help with 2)??
4. When in the course would the introduction of the AI tool take place?
5. What aspects of AI literacy would ākonga need to know before they begin using the AI tool?
6. How would ‘prompt engineering’ be introduced to ākonga?
7. What ethical issues will we need to have in mind across the project?
8. How will we know if what we have introduced, has helped improve things for our ākonga?

Appendix Two

Practical Applications

Section 1: Practical Activities for Teachers

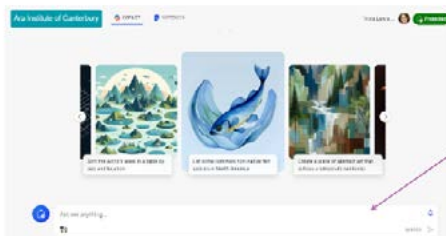
This section provides ideas for teachers on how to teach Gen AI basics to your students.

Teaching Prompt Writing

Prompt writing is a fundamental skill for Gen AI use. Like any new skill, it takes time to learn. Show your students what a prompt is and give them guidelines on how to write these. Refer back to these guidelines when problems arise. If you are not getting the right answers, it is because you are using the wrong prompts.

Sample prompt writing slides

Prompts




What you type here is called a **prompt**

Prompt Writing Tips

Prompt writing is a skill that takes practice
The answer you get is only as good as the prompt you write

1. Be clear and direct
2. Give context
3. Limit the scope
4. Specify tone
5. Experiment and rephrase
6. AI hallucinates. Check your answers.



AI as a Personal Tutor

Gen AI is useful for exam revision. This was by far the favourite Gen AI activity with students and it is a great introductory activity after prompt writing. Open an AI model in class and ask the students which subject they need to revise. In your prompt, tell the AI model the subject and the level. Instruct it to ask you ten questions, one at a time, and evaluate your answers. As a group, students can call out answers while you type. Once students understand, they can work individually, revising what is most relevant to them. They can also ask for further explanation on difficult topics. This activity only works if the Gen AI model you are using does not use predictive text.

Sample 'AI as a personal tutor' slides

Prompt: Test my knowledge of cell structure. Ask me ten questions, one at a time, and evaluate my answers.

Great! Let's begin testing your knowledge of cell structure. Please answer the first question, and I'll evaluate it for you.

Question 1:
What is the function of the cell membrane?

The cell membrane controls what goes in and out of the cell.

Correct! The cell membrane does indeed control what goes in and out, acting like a protective barrier.

Question 2:
What is the main role of the nucleus in a cell?

The main role of the nucleus is to make proteins.

Not quite. The main role of the **nucleus** is to store the cell's DNA, which contains the instructions for making proteins and controlling cell activities. The **ribosomes** are responsible for making proteins, based on instructions from the DNA.

No worries, let's keep going!

Using AI for Brainstorming and Planning

Gen AI can be used to generate ideas for tasks and assessments. Select an activity that is relevant to your students and experiment with suitable prompts before the lesson. Create an example of prompts and Gen AI outputs to show and analyse in the class. Show students how to focus in on ideas that they like or ideas that need further clarification.

Sample brainstorming slides

<p>Sample Prompt</p> <p>I am writing an essay. "Describe some of the advantages and disadvantages of living in a city." Can you give me some ideas?</p> <p>Evaluate this answer</p>	<p>Advantages and Disadvantages of Living in a City</p> <p><u>Advantages</u></p> <ol style="list-style-type: none">1.Convenience: Easy access to transport, shops, and services.2.Cultural Opportunities: Museums, theaters, restaurants, and events.3.Economic Opportunities: Higher employment rates and salaries.4.Educational Resources: Numerous schools, universities, and libraries.5.Diversity: Culturally diverse communities promoting broad perspectives. <p><u>Disadvantages</u></p> <ol style="list-style-type: none">1.Cost of Living: Higher expenses for housing, food, and services.2.Noise and Crowds: Frequent noise and crowded public spaces.3.Pollution: Increased air and water pollution affecting health.4.Limited Space: Smaller living spaces and limited access to nature.5.Crime Rates: Possibly higher crime rates due to density	<p>Cultural Diversity & Social Opportunities in Cities</p> <p>Sample Prompt</p> <p>tell me more about Cultural Diversity & Social Life.</p> <p>Evaluate this answer</p>	<p>Cultural Diversity & Social Opportunities in Cities</p> <p>Diverse Communities: Cities bring together people from different backgrounds, offering chances to learn about various cultures through events and festivals.</p> <p>Arts and Entertainment: Access to many museums, theaters, and live music shows.</p> <p>Social Life: Great places for meeting new people, enjoying a lively nightlife, and trying different foods.</p> <p>Overall Impact: Cities are bustling places where you can enjoy diverse cultures and make new connections easily.</p>
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Gen AI can also be used to organise and structure ideas. This activity was particularly popular with students who identified as having learning disabilities. Show students how to paste in task specifications from assignment instructions or rubrics to help them organise their ideas.

<p>Sample Prompt</p> <p>My essay must have an introduction, two to five main body paragraphs, and a conclusion. Suggest a way to organise it.</p> <p>Evaluate this answer</p>	<p>Essay Outline: Advantages & Disadvantages of Living in a City</p> <p><u>Introduction</u></p> <p>Hook: Quick insight into city life allure.</p> <p>Thesis: Discuss benefits and drawbacks.</p> <p><u>Main Body</u></p> <ol style="list-style-type: none">1.Opportunities<ol style="list-style-type: none">1. Job prospects, educational resources.2.Cultural & Social<ol style="list-style-type: none">1. Diversity, entertainment, social venues.3.Challenges<ol style="list-style-type: none">1. High costs, limited space, health issues. <p><u>Conclusion</u></p> <p>Summary of key points.</p> <p>Balanced perspective on urban living.</p> <p>Reflect on lifestyle implications.</p>
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Sample planning slide

AI-Assisted Reading

Gen AI can be used to assist students to understand complex reading texts. There are programmes available for this such as ChatPDF. More general AI models such as ChatGPT or Copilot can also be used. There are three stages to this lesson. It is a more complex skill, so it is best to introduce this once your students have a basic mastery of Gen AI use. Firstly, familiarise the students with a text using conventional comprehension and discussion questions. Then show the students how to feed the text into the chosen AI model. This will be done by uploading a document, supplying a link, or cutting and pasting text, depending on which AI model you use. Show the students how to 'have a conversation with the text' using appropriate prompts. It is important that the students know to refer to 'this text' in their prompts as Gen AI wanders off into other data to find answers. Finally, encourage critical thinking by showing students how to evaluate

examples of AI models giving poor answers. They can then compare their initial, analogue reading of the text with the AI responses.

Prompts to try with reading texts

- Summarise this text.
- According to this text, what are the benefits and risks of... ?
- According to this text, what are the positive and negative impacts of...?
- What does this text say about?
- I don't understand..... Explain it to me.
- What does mean?
- Give me a quote from the text about



Remind AI in every prompt that you want answers from your text.

Evaluating AI Responses



Make notes to address three key questions:

1. Which parts of the text does Gen AI **make clearer**?
2. Which parts does Gen AI **misrepresent or leave out**?
3. What are the **pros** and **cons** of using Gen AI in this way?

Compare and discuss with your classmates

Sample 'AI-assisted reading' slides

AI-Assisted Writing

Gen AI can be used to provide feedback on writing. Show the students a piece of writing that contains errors you would like them to work on. Ask them to evaluate this and then compare their feedback to the feedback given by a Gen AI model.

What feedback would YOU give?

With the growing advances in AI technology companies and business are turned to it for a more effective and cost friendly approach replacing some manual jobs with AI to achieve the same result but should we rely on AI to flood our networks and outsource human input? (Brain, 2023) stats that how can we be sure that AI integration reflects the best of human characterises and not the worst?" There is growing concern that when given a task that Ai can selfie learn and even expand on that task which then could bring up safety concerns. There has been integration with Doc wildlife conservation where they have started to use Ai to become predator free by 2025.

Prompt: Give me feedback on language accuracy.

1. Use "AI" consistently: Make sure you use "AI" the same way throughout your paragraph. This helps keep things clear and looks more professional.
2. Use the right terms: Change informal or incorrect terms to the right ones. For instance, "selfie learn" should be "self-learn."
3. Check your grammar: Watch your grammar to make your points clearer. For example, "companies and business are turned to it" should be "companies and businesses are turning to AI."
4. Fix punctuation and typos: Look out for any missing spaces like in "outsourcehuman" and make sure your punctuation is right, especially around things like citations (for example, (Brain, 2023)).
5. Keep the language formal and precise: Use a formal style that fits with academic writing. Avoid casual language to keep your writing appropriate for school or university work.

How useful is this feedback? Is it similar to yours?

Sample writing feedback slides

When prompted to give writing feedback, Gen AI will rewrite text into generic, grammatically perfect prose. Clear guidelines are important in some subject areas. For example, if you are assessing the students' ability to write grammatically correct sentences, it may not be appropriate for students to submit an assessment where Gen AI has corrected the work. When Gen AI rewrites poorly written texts, there is no guarantee that it retains the student's intended meaning, and this can lead to assignments where the content is not the student's own work.

How useful is this feedback?

Here's a revised version of your paragraph:

Businesses are increasingly turning to AI for cost-effective solutions, replacing some manual labor jobs to achieve the same results more efficiently. However, the reliance on AI raises ethical questions about whether these technologies truly embody the best human characteristics (Brian, 2023). Concerns also arise regarding AI's ability to learn and potentially expand on assigned tasks autonomously, which could pose safety risks. For example, in wildlife conservation, AI is being employed to help New Zealand become predator-free by 2025, demonstrating its potential for positive environmental impact. Yet, this integration necessitates rigorous oversight to ensure that AI's capabilities are not misused or detrimental to societal and ecological welfare.

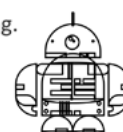
Not useful: You are being assessed on language accuracy, so this is unethical.

Try out these prompts.

I am writing an academic essay.

1. Give me feedback on language accuracy and range.
2. Give me feedback on cohesion and coherence.
3. Give me feedback on paragraphing.
4. Give me feedback on citations/ referencing.
5. Give me feedback on...

Use the rubric in your coursebook



Sample writing feedback slides

Appendix Three

AI in foundation programmes

Gathering impressions on AI tools/apps

For each tool/app, consider the following.

Tool/app:

If used to support ākonga/learners –

- What learning outcome was the tool supporting?
- What learning activity was the tool used in?
- How did the tool/function support the learning activity?
- Is there a mobile version of this tool? If there is one, did it have all the functions available on a desk or laptop PC?
- What are the advantages of using this tool/app?
- What are the challenges of using this tool/app?

If used to support the mahi of kaiako/teacher –

- What teaching admin or resource development activity was supported by the tool/app?
- Did the tool/function support the mahi/work?
- What are the advantages of using this tool/app?
- What are the challenges of using this tool/app?

Examples of tools/apps:

For “general support of learning” – ChatGPT, Microsoft Copilot, Google Bard, Claude (see if Claude prompt library has any relevant applications – <https://docs.anthropic.com/claude/prompt-library> (e.g. the perspectives ponderer)

For ‘reading’ or ‘research’ – ChatPDF, Quillbot, Jasper (summarise articles/websites using AI)

For teaching – twinkl,

To find more apps/tools – <https://www.futurepedia.io/>

Appendix Four

Chatbot development

Background of AI Ako App project team

From a pool of eight ākonga recommended by the BICT programme team, we selected Christopher (Chris) Lotter and Alex Stewart to undertake the development of an AI app/tool or chatbot for this project. Both Chris and Alex are Year three BICT ākonga completing the software development project as part of their work-integrated learning/capstone project (course code BCIS309). The course is a Level 7, 45 credit course.

Learning outcomes for BCIS309 are:

- Evaluate and apply professional practice in terms of ethics, risk, quality assurance, sustainability, communication, compliance and the Treaty of Waitangi.
- Evaluate, synthesise, adapt and utilise knowledge to plan, manage and complete a project.

The course utilises a ‘work-based’ project, to help ākonga attain work-readiness through ‘learning by doing’. In this BICT project, with the proposed name of AI Ako project, the project leader, Dr. Selena Chan was the ‘company contact person and lead client’. Dr. Amit Sarkar, BICT senior academic, was the technical expert advising the development team (Chris and Alex). To meet academic requirements of the course, ākonga had to prepare a project proposal and a final report. These had to be signed off by the ‘company’ contact person (Selena) and technical expert (Amit) before the project commenced. The project proposal was drafted, refined, negotiated and signed off at the end of August 2024.

Course assessments included the project proposal, progress reports and final reports. These were assessed by the course academic supervisors (Dr. David Weir and Dr. Dipendra Ghimire). As the proposal was being worked on and then marked/graded and signed off, both Chris and Alex also spent most of August, undertaking a series of self-directed learning activities, assigned and negotiated with Amit, to ensure they had the necessary skill sets and knowledge to carry out the software development tasks to be undertaken. Both ākonga had weekly meetings with Selena to report on progress, along with making contact when required to obtain relevant resources (i.e. samples of foundation/bridging ākonga work, marking rubrics etc.), and to clarify items regarding the chatbot’s function. Amit met with ākonga twice a week to provide support for the technical aspects of the software development process. Both ākonga were assigned a workroom, set up to replicate a software development office along with access to hardware, and cloud hosting services and Gen AI datasets which have been paid for through the project funds.

The project proposal was to develop a chatbot called AI Ako. Chatbots or ‘robo academic advisors’ (Thottoli, Alruqaishi, & Soosaimanickam, 2024) are not unusual or new. These forms of chatbots provide individualised advice. However, the advent of Gen AI affords ease of access and better contextualisation opportunities.

The chatbot developed by our BICT ākonga development team allow for text input. The text is checked for academic conventions. The chatbot does not provide a revised/correct text. Instead, it provides feedback for the improvement of the inputted text. The ākonga using the chatbot then has to make the required corrections, through interpretation of the chatbot's feedback

Chris worked on the 'back-end' software development to 'train the selected AI' which would allow the chatbot to provide appropriate and relevant feedback to foundation/bridging ākonga. Alex developed the 'front-end' of the chatbot with an emphasis on applying universal design for learning (UDL) and localisation of the look and feel of the app to provide an engaging user experience (UX). The localisation included the training of the AI to recognise and respond to Aotearoa NZ placenames in Māori and a collection of 'common' Māori words.

An Agile software development process (Cprime, 2024) was undertaken to develop the AI chatbot. Agile is an iterative development process based on the principles set out in the Agile manifesto ([Agilemanifesto.org](https://agilemanifesto.org)) which has an emphasis on meeting client or customer needs, delivering working examples of the development frequently to seek user feedback, working with the client and having regular meetings, reflective cycles as the development progresses, and an emphasis on sustainable development. As such, these principles align well with the research framework and philosophy of the overall project, whereby participatory action research draws on the reciprocal relationships between ākonga, kaiako and kairangahau (researcher).

Through several meetings and discussions in August between the project leader (Selena) and our subject-matter experts (Jo Fox, Christine Beker, Tricia Lewis (with extra support from Rory Collins) and Stan Tawa), the parameters for the project were confirmed. We used the data from the q-sort summarised in Part 3 of the report, to establish the priorities for the AI chatbot development. The various rankings of ākonga/kaiako responses, from very important to very unimportant were collated. These rankings were interpreted into software development processes and transposed into a list of 'deliverables' required to assure the AI chatbot would match the needs of our foundation/bridging ākonga and their kaiako. These requirements or deliverables were then distilled through the must do, should do and could do (MoSCoW) prioritisation method (See appendix Four A for the list). Must Do items are aligned to the recommendations from the Q-method. These include the need to provide a straightforward mobile interface (Must do – accessible website interface on browser window for AI interaction; provision of a video demo for user training); ensure output from each prompt is at appropriate level of English, outputs are short and to the point and formative language used (Must do – writing tutor function); main purpose is to help ākonga check and coach them to improve writing (must do – writing tutor function); and evaluation of tool by ākonga and kaiako to assure UX (assessable website interface – see Appendix four B for evaluation form).

A timeline for Agile computing software development processes was then overlaid onto the deliverables (see Appendix four B). The BICT ākonga then worked to the best of their abilities to complete the development of the AI chatbot/s by the end of October.

The first 'wire-frame' prototype was shared with the development team on September 13th. The draft working model for user interaction was presented for feedback on September 27th. An action list for ongoing mahi was produced after each feedback session. A working prototype was trialled and evaluated between October 27th and November 8th. User evaluations of the chatbot/s by foundation/bridging ākonga and Kaiako were carried out between November 4th and 14th. These evaluations informed the refinement of the chatbot/s to meet the project specifications (see Appendix Four C for the evaluation checklist).

The underlying framework for setting up and training the chatbot was from the learning progressions underpinning the literacy and numeracy for adults assessment tool (LNAAT) established to support literacy and numeracy development by the Tertiary Education Commission (2008). LNAAT resources are archived by Ako Aotearoa - <https://ako.ac.nz/knowledge-centre/learning-progressions-for-adult-literacy/the-literacy-and-numeracy-assessment-tool>

The main principles summarised in learning progressions were used to form prompts to train the chatbot. We used the progressions from:

Read with understanding - <https://ako.ac.nz/knowledge-centre/learning-progressions-for-adult-literacy/read-with-understanding-learning-progressions-strand-chart>

Write to communicate - <https://ako.ac.nz/knowledge-centre/learning-progressions-for-adult-literacy/write-to-communicate-learning-progressions-strand-chart>

Speak to communicate - <https://ako.ac.nz/knowledge-centre/learning-progressions-for-adult-literacy/speak-to-communicate-learning-progressions-strand-chart>

Listen with understanding - <https://ako.ac.nz/knowledge-centre/learning-progressions-for-adult-literacy/listen-with-understanding-learning-progressions-strand-chart>

As the needs of ākonga at steps 1 to 3 on the learning progression are different to the ākonga at steps 4 -6, two chatbots were developed, one for 'basic' (L1 chatbot) and another for 'standard'. (L2 chatbot) Each has a word entry limit of 500 words, to ensure that the formative feedback provided, is not too complex or long.

The manual for the use of the chat bot is found in Appendix Four D. This includes screen shots of the chatbot and instructions on how to use the chatbot for both kaiako and ākonga. A separate 'config' manual was also produced for the chatbot administrators to set up the chatbot for each cohort of ākonga.

Conclusion

The data collected on the effectiveness of various Gen AI tools/apps/chatbots carried out in semester one were then analysed using q-methodology. This analysis informed the development of the Gen AI chatbot to support the development of academic writing literacies.

References

- agilemanifesto (2021). Manifesto for Agile software development. <https://agilemanifesto.org/principles.html>
- CAST (2018). Universal Design for Learning Guidelines, version 2.2. <http://udlguidelines.cast.org> 23/08/2020
- Cprime (2024). What is Agile, What is SCRUM? <https://www.cprime.com/resources/what-is-agile-what-is-scrum/#:~:text=Agile%20software%20development%20refers%20to,%2Dorganizing%20cross%2Dfunctional%20teams>
- Tertiary Education Commission (TEC). (2018). LNAAT resources <https://ako.ac.nz/knowledge-centre/learning-progressions-for-adult-literacy/the-literacy-and-numeracy-assessment-tool>
- Thottoli, M. M., Alruqaishi, B. H., & Soosaimanickam, A. (2024). Robo academic advisor: Can chatbots and artificial intelligence replace human interaction? Contemporary Educational Technology, 16(1), ep485. <https://doi.org/10.30935/cedtech/13948>

Appendix Four A

MoSCoW prioritisation

MoSCoW Prioritisation	Requirement Number Prioritisation (#)	Project Deliverable
Must do	1	Writing Tutor Function – AI corrects user English grammar input via prompt response option
Must do	1	AI hosted on cloud platform within S257
Must do	1	AI responds ethically to user input
Must do	1	AWS uses temporary RDBMS (standalone)
Must do	1	Accessible website interface on browser window for AI interaction
Must do	1	Video demo user training
Must do	2	AI protected from prompt injection engineering attacks
Should do	3	AI cloud platform integrated with Ara Moodle userbase

Could Do	4	Writing Tutor Function - AI corrects user Māori grammar input via prompt response option
Could Do	4	Chat Buddy Function - AI can talk in reo Māori only to user.

Appendix Four B

List of 'deliverables' #1

A	B	C	D	E	F
Week	Starting Date	Sprint	(Requirement Achieved) Best-Case Scenario		
6	26/08/2024	1	Onboarding - Initial development for next week requirements		
7	2/09/2024	2	Writing Tutor Function - AI corrects user English grammar input via prompt response option	AI hosted on cloud platform within S257	AWS uses temporary RDBMS (standalone)
8	9/09/2024	3		AI cloud platform integrated with Ara Moodle userbase	
9	16/09/2024	4			
10	23/09/2024	5	Accessible website interface on browser window for AI interaction	AI responds ethically to user input	AI protected from prompt injection engineering attacks
11	30/09/2024	6			
12	7/10/2024	7		Take 2nd break week off	
13	14/10/2024	8	Writing Tutor Function - AI corrects user Māori grammar input via prompt response option	Chat Buddy Function - AI can talk in reo Māori only to user.	
14	21/10/2024	9			
15	28/10/2024	10			
16	4/11/2024	11	Video demo user training	Final documentation, transfer over IP / software materials to Ako Aotearoa	

Appendix Four C

Feedback form on usability of chatbot

Your Name:

Please fill in the table with a suitable character to indicate your answer. (e.g an X or Y).

All feedback is greatly appreciated, and no criticism will be taken personally. Below the table is an extended feedback area for writing some personal feedback which would be greatly appreciated.

L2 AI is defined as using steps 4-6 and is a more standard approach to grammar checking.

Test Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The L2 AI is outputting an appropriate response which will be useful for students					
The Usability of the page is good, and I think that the students will be able to easily navigate the page					
The 'send' button which is now inside of the input box (where students place their writing) is a better place for it to be and improves the tools usability. (Strongly disagree if you think it should be placed in the middle where it originally was).					
The L2 AI prefilled prompt boxes are appropriate					
Submitting text for feedback / grammar checking was an easy process.					
There are no apparent errors or problems while navigating through the web page.					
The feedback provided by the grammar checking tool is clear and helpful.					
The features of the tool are beneficial for students.					

The L2 AI's behaviour did not have any errors during the showcase					
I liked how the AI's output was structured, and I think it is appropriate given the nature of the tool.					
The AI did not appear to go off topic and stayed relevant to the context of what is required.					

Please provide any additional feedback or suggestions below

Personal feedback:

Appendix Four D

Ako AI User manual

Manual for using the Ako AI chatbot

Versioning

Version	Note	Date	Author
v0.1	First version of user manual finalised.	15/11/2024	Chris Lotter

Introduction

This is the user manual for using *Ako AI*, a web application that hosts an AI for learning NZ English according to business standard fluency; please keep in mind that *Ako AI*, is a minimum viable product and is not reflective of final release.

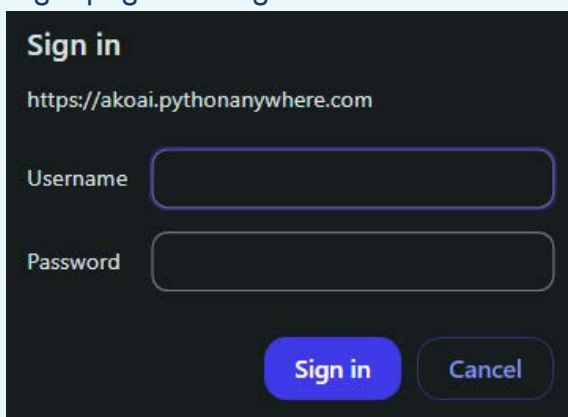
Sections

Logging past PythonAnywhere

Note: Your login page will look different based on what browser you use; this does not affect the login at all, so don't worry.

To log in:

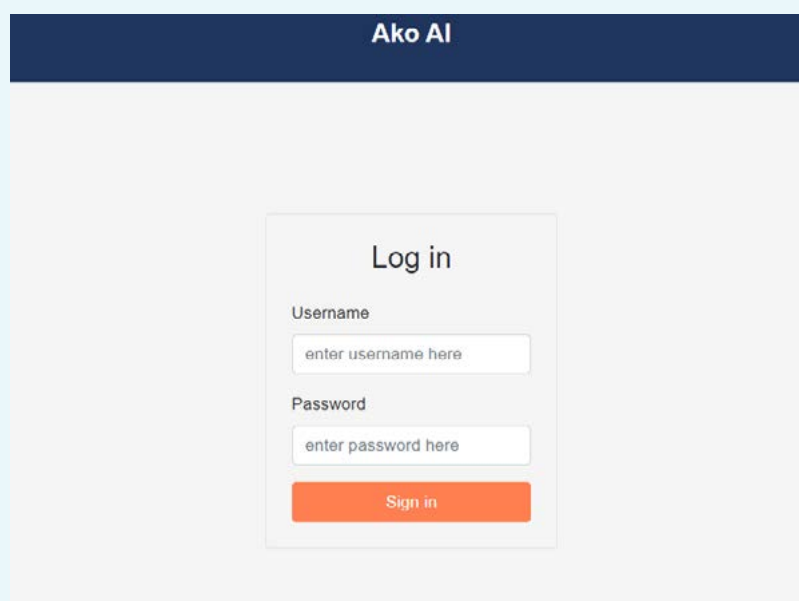
1. Enter the following URL into your browser: [AkoAI.pythonanywhere.com](https://akoai.pythonanywhere.com). You will get a login page looking like this.

A screenshot of a web browser showing a dark-themed login page. At the top, it says "Sign in" in white. Below that is the URL "https://akoai.pythonanywhere.com". There are two input fields: "Username" and "Password", both with white borders. At the bottom, there are two buttons: a blue "Sign in" button and a grey "Cancel" button.

2. Enter the username: AkoUser
3. Enter the password fastfish
4. Press *sign in*. Done!

Logging In

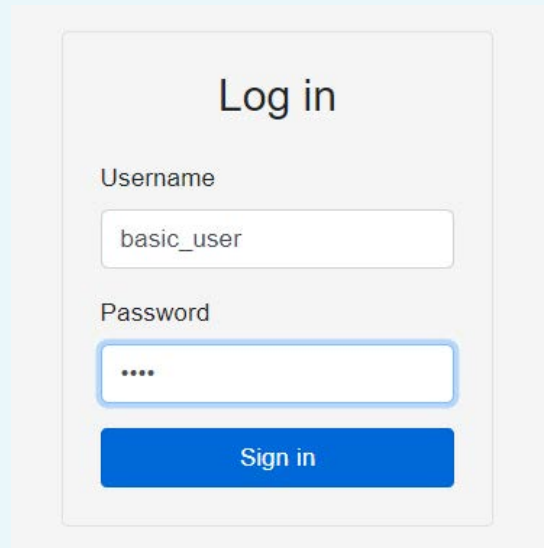
After the first login, you will be on a login page again. You will need to sign in as a user:

A screenshot of a web browser showing a light-themed login page. At the top, there is a dark blue header with the text "Ako AI" in white. Below the header, there is a white box with a grey border. Inside the box, it says "Log in" in bold. There are two input fields: "Username" and "Password", both with grey borders. Below the "Password" field is an orange "Sign in" button.

Enter the following:

- Enter the username: *basic_user*
- Enter the password: *fish*

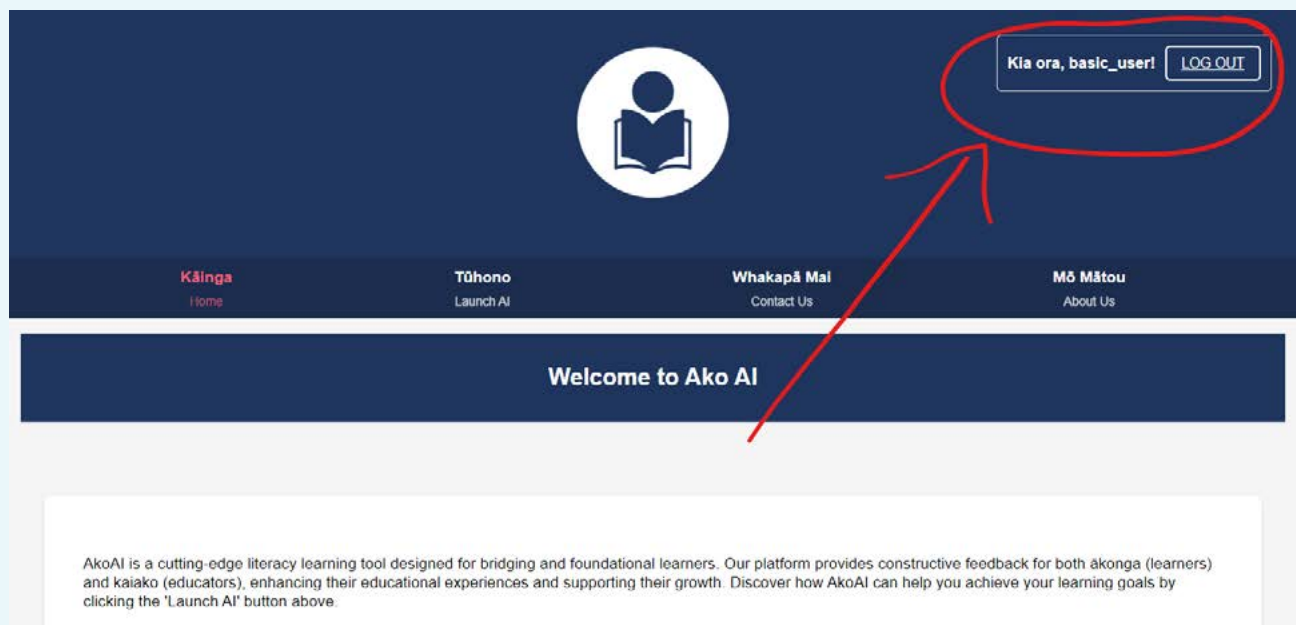
When finished, click *Sign in*:

A screenshot of a 'Log in' form. The title 'Log in' is centered at the top. Below it, there are two input fields: 'Username' with the text 'basic_user' and 'Password' with four dots. A blue 'Sign in' button is at the bottom.

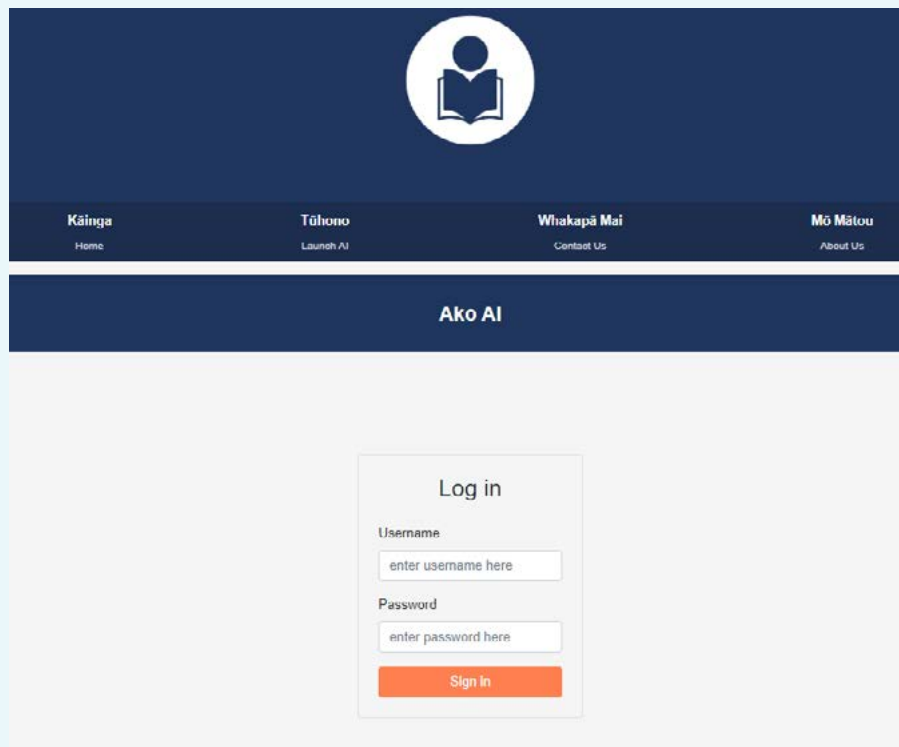
You will then go to the *Home* page.

Logging Out

To log out of *Ako AI*, you need to go to the top right of the screen and click *Log Out*.



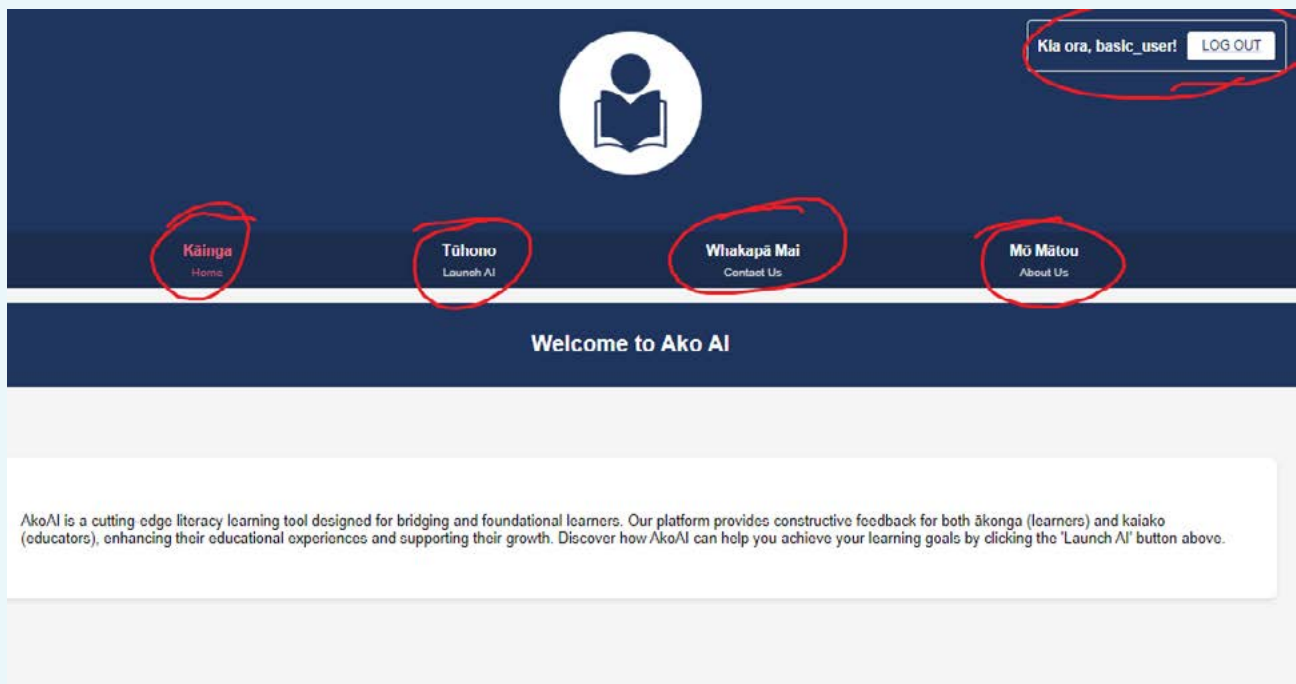
You will then be logged out of the website.



Simply log in again, to get back into the website!

Using the *Home* Page

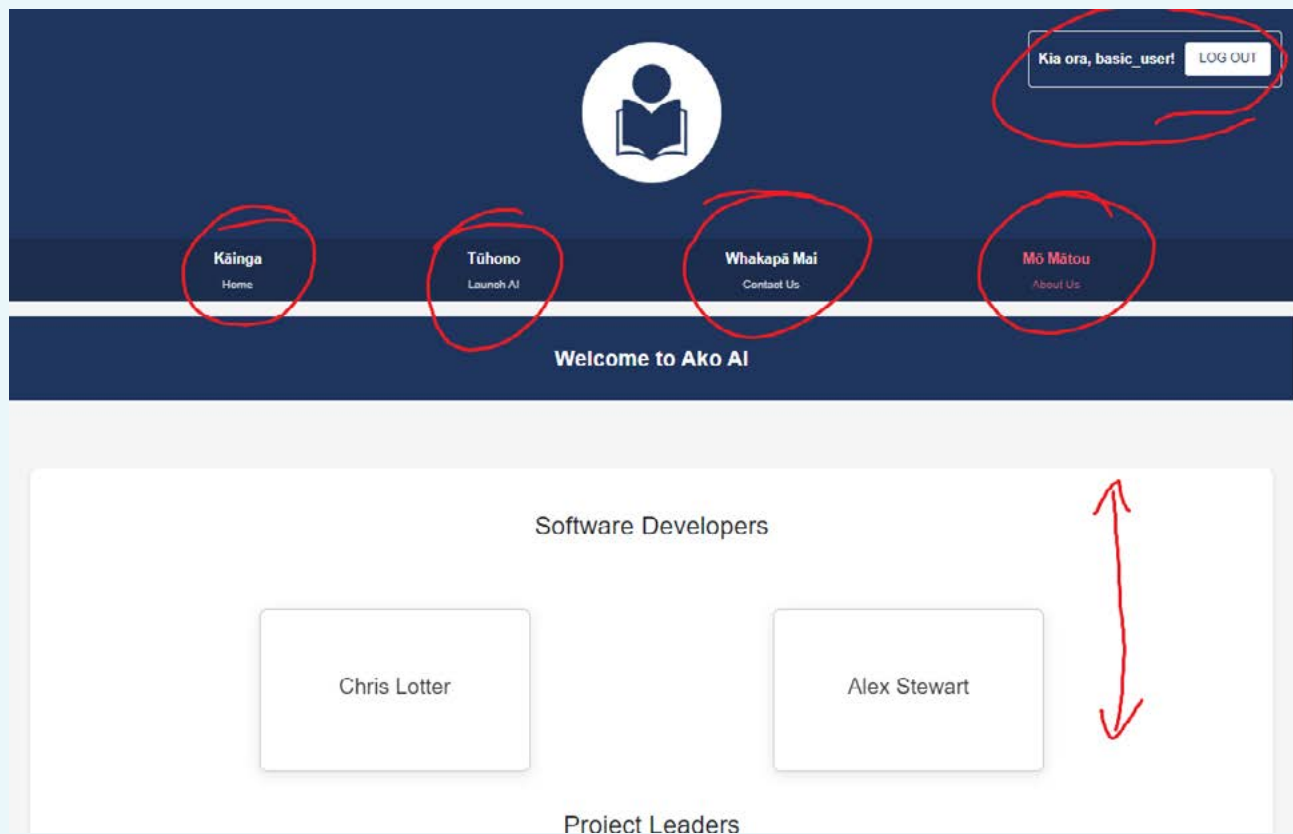
The home page layout is below; take a look at the options:



- *Home* is where you start from when you log in.
- *Launch AI* will take you to the chatbots *L1* and *L2*
- *Contact Us* is a work in progress page – but you can still visit it!
- *About Us* will tell you a little bit about who we are and our involvement with Ako AI.
- Pressing *Log Out* will take you out of the *Ako AI* website.

Using the *About Us* Page

The home page layout is below; take a look at the options:

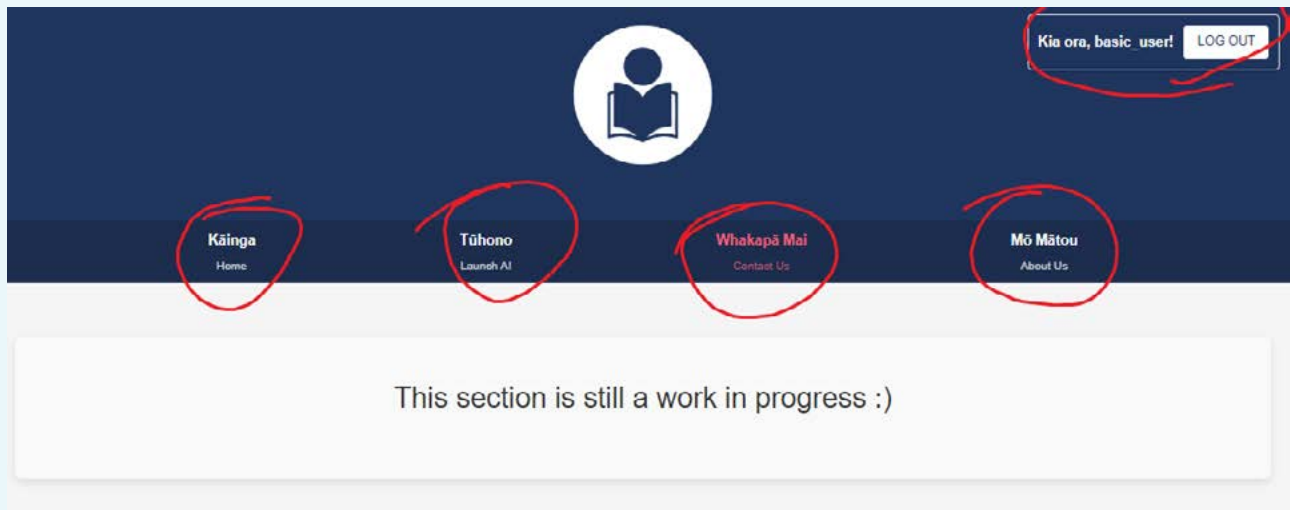


- *Home* is where you start from when you log in.
- *Launch AI* will take you to the chatbots *L1* and *L2*
- *Contact Us* is a work in progress page – but you can still visit it!
- *About Us* will tell you a little bit about who we are and our involvement with *Ako AI*.
- Pressing *Log Out* will take you out of the *Ako AI* website.

Using the *Contact Us* Page

The home page layout is below; take a look at the options:

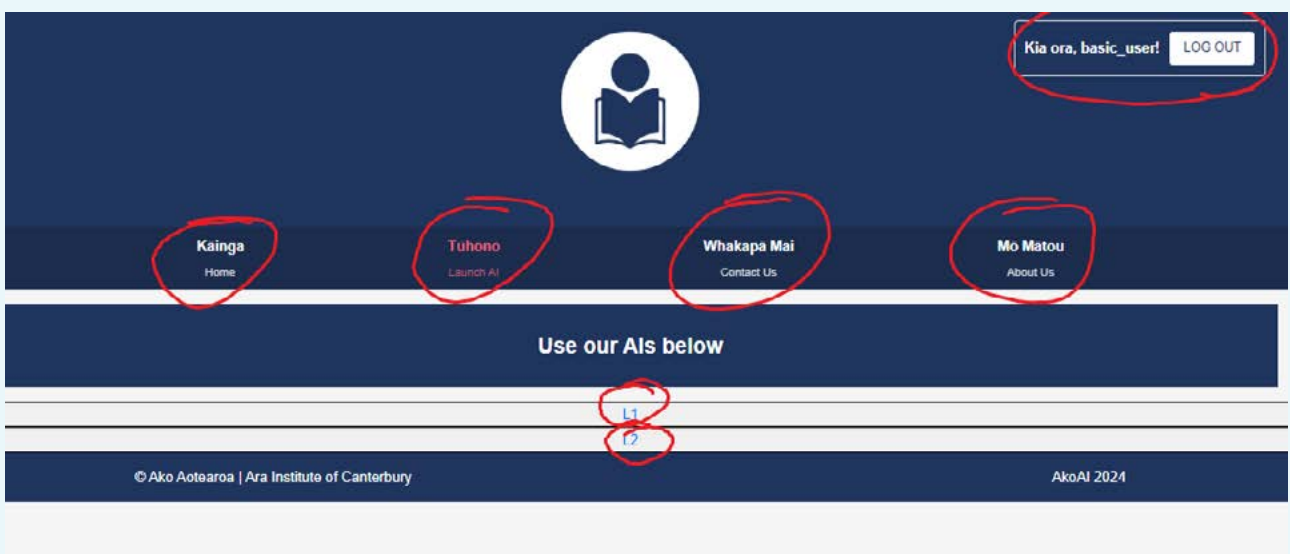
- *Home* is where you start from when you log in.
- *Launch AI* will take you to the chatbots *L1* and *L2*
- *Contact Us* is a work in progress page – but you can still visit it!
- *About Us* will tell you a little bit about who we are and our involvement with *Ako AI*.
- Pressing *Log Out* will take you out of the *Ako AI* website.



Using the *AI Page*

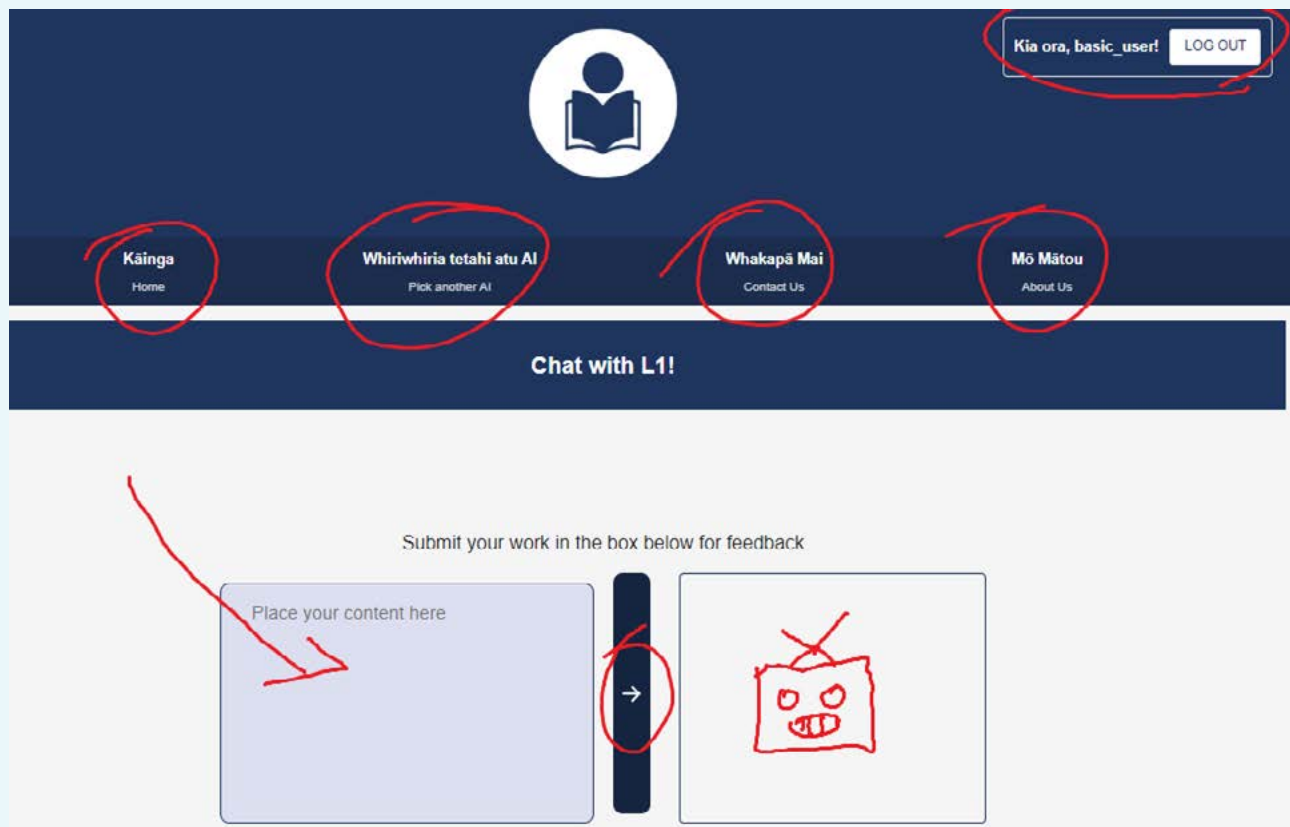
The home page layout is below; take a look at the options:

- *Home* is where you start from when you log in.
- *Launch AI* will take you to the chatbots *L1* and *L2*
- *L1* will take you to the L1 chatbot.
- *L2* will take you to the L2 chatbot.
- *Contact Us* is a work in progress page – but you can still visit it!
- *About Us* will tell you a little bit about who we are and our involvement with *Ako AI*.
- Pressing *Log Out* will take you out of the *Ako AI* website.



Using the L1 Page

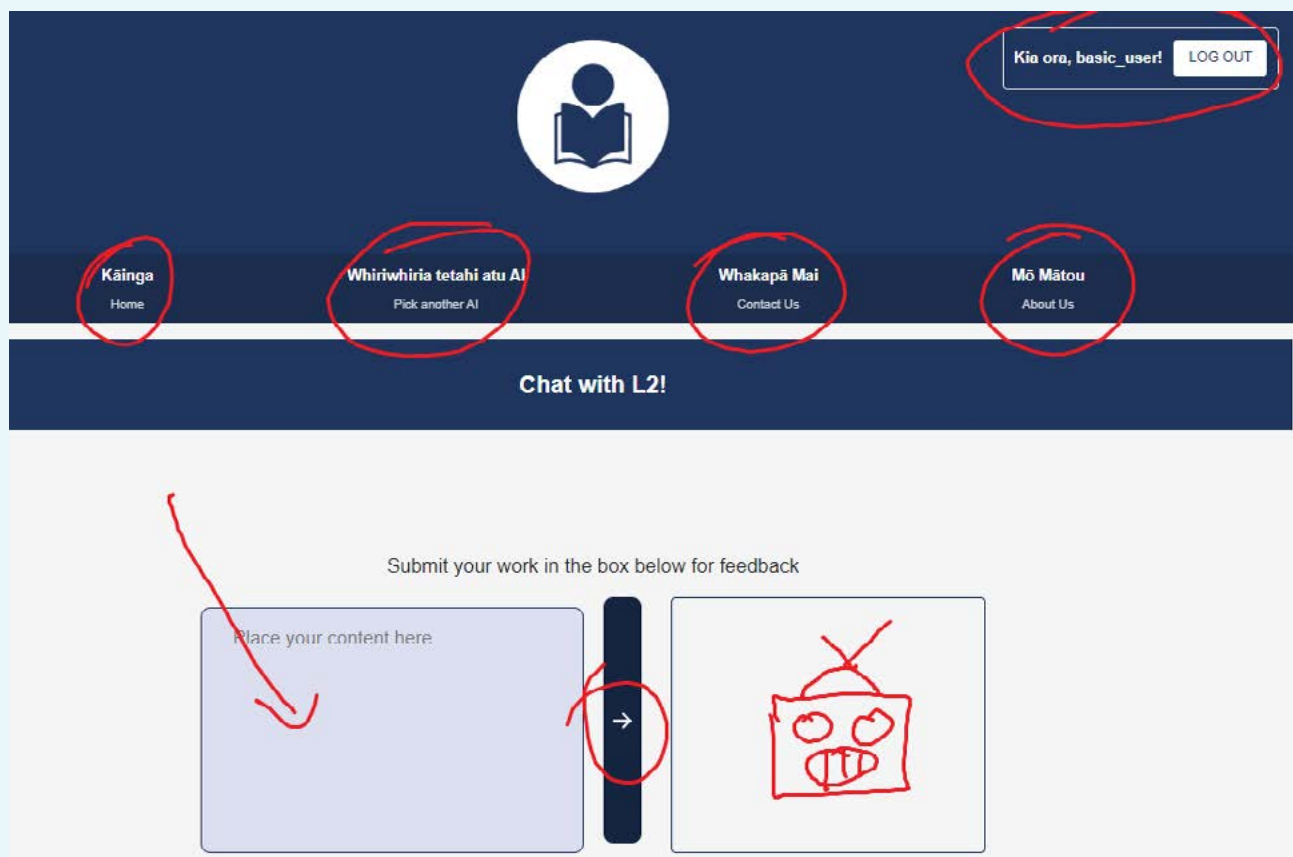
The home page layout is below; take a look at the options:



- *Home* is where you start from when you log in.
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- *Contact Us* is a work in progress page – but you can still visit it!
- *About Us* will tell you a little bit about who we are and our involvement with Ako AI.
- Pressing *Log Out* will take you out of the Ako AI website.
- You can enter your text on the left-hand side box.
- You can press the middle arrow button to send the text to the AI.
- The empty white box on the right-hand side will give you some AI output; have fun!

Using the L2 Page

The home page layout is below; take a look at the options:



- *Home* is where you start from when you log in.
- *Launch AI* will take you to the chatbots *L1* and *L2*.
- *Contact Us* is a work in progress page – but you can still visit it!
- *About Us* will tell you a little bit about who we are and our involvement with *Ako AI*.
- Pressing *Log Out* will take you out of the *Ako AI* website.
- You can enter your text on the left-hand side box.
- You can press the middle arrow button to send the text to the AI.
- The empty white box on the right-hand side will give you some AI output; have fun!

Chatting with L1

To chat with L1, there are three things to do:

1. Put your writing in the left-hand box. It can't be zero words or more than 500 words.
2. Press the 'arrow' button in the middle to send.
3. Wait for output; this could take a few seconds at most.

An image is provided below for help:

Chat with L1!

Submit your work in the box below for feedback

I love to ride bykes!

→

- Consider the spelling of "bykes." - Think about the correct spelling of "bikes." - It's good to share feelings. - More details can help your message. - How about adding where you ride?

Enjoy your output! Take a close look at what the AI is saying, it will give you some indirect points on how to improve your writing

Chatting with L2

To chat with L2, there are three things to do:

1. Put your writing in the left-hand box. It can't be zero words or more than 500 words.
2. Press the 'arrow' button in the middle to send.
3. Wait for output; this could take a few seconds at most.

An image is provided below for help:

Chat with L2!

Submit your work in the box below for feedback

I love to ride bykes!

→

- Love to ride bikes! - 'Bikes' is the correct spelling. - Consider varying sentence structure. - Try incorporating a reason why. - Example: "I love biking for fun."

Enjoy your output! Take a close look at what the AI is saying, it will give you some indirect points on how to improve your writing

Conclusion

For a junior developer, *Ako AI* was an excellent learning experience that involved numerous attempts at feature implementation and new discoveries surrounding how to implement an AI in an educational context. We appreciate this product being treated as a minimum viable product.

Chris Lotter

