Moemoea: A digital tool to train secondary school student resilience and motivation for success

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Abstract

Secondary school students in New Zealand have been underachieving in recent years, with one of the largest performance gaps between high and low performing students in the OECD. With an overrepresentation of Māori, Pasifika and low socioeconomic students in this low performing group, this research explores an innovative solution and presents a business case of Moemoea- a digital tool to train resilience and self-motivation to support student success. Disruption of jobs with automation in future workplaces from rapid technological advancement requires workers to be proficient in digital literacy, resilience, and self-motivation. The literature suggests that these skills lead to improved confidence and academic outcomes and were the same capabilities required beyond school, in the new digitally focused work environment.

This research interviewed 14 Māori, Pasifika and low socioeconomic secondary school students, collecting first-hand experiences of resilience, motivation, and resources that support successful academic outcomes at school. The research findings identified an untapped opportunity between high digital skills and access to technology and a lack of student motivation and resilience levels to harness this advantage to improve student learning.

Government ministries are identified as a likely customer because they are the entity currently addressing the performance gap between high and low achievers in New Zealand secondary schools. The findings and business case demonstrate the feasibility of investment in the research and development of both Moemoea and other possible solutions to poor performing students.

Acknowledgements

"E tipu, e rea, mō ngā rā o tō ao, ko tō ringaringa ki ngā rākau a te Pākehā hei oranga mō tō tinana, ko tō ngākau ki ngā taonga ā ō tīpuna Māori hei tikitiki mo tō māhuna, ko tō wairua ki tō Atua, Nāna nei ngā mea katoa."
(Ngata, A.T., 1949, as cited in Walker, 2001, p.397)

Writing this encouraging message to a young schoolgirl was Sir Āpirana Ngata (Ngāti Porou), first Māori to complete a degree (BA) at a New Zealand University (Canterbury, 1894). Safely navigating his Māori identity, tikanga and kawa of his tupuna, Ngata encouraged Māori to harness innovative strategies from te ao Māori with 'tools of the Pākehā' woven into tikanga and kaupapa Māori to create successful opportunities.

Innovation applied to whānau and individuals, combining new concepts in new contexts and combining worlds can empower people to have autonomy over their own lives. Innovating through whakawhanaungatanga (participatory practice), uiui (questioning), whakarongo (listening) and creating a safe space to kōrero (converse) with rangatahi, te ao hurihuri can be navigated and leveraged to improve the potential for achieving success by validating the stories, lessons, experiences and the mana inside of us.

<u>Dedication</u>

This thesis is dedicated to Mrs. J. E. Isaacs, my grandmother and dear friend who died in the final weeks of this project.

"Hapaitia te ara tika pūmau ai te rangatiratanga mō ngā uri whakatipu".
Foster the pathway of knowledge to strength, independence, and growth for future generations.

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List of acronyms

ERO -   Education Review Office

MBIE -   Ministry of Business, Innovation and Employment

MoE -   Ministry of Education

MGI -   McKinsey Global Institute

MVP -   Minimum Viable Product

NCEA -   National Certificate of Educational Achievement

OECD -   Organisation for Economic Development

PISA -   Programme for International Student Assessment

SEC -   Social, Emotional, Noncognitive (skills)

TPK-   Te Puni Kōkiri

WEF -   World Economic Forum

Chapter 1: Introduction

1.1 Opening

This projects necessity comes from the declining rates of academic achievement amongst secondary school students in New Zealand (OECD, 2016). Student underachievement is occuring in a time of significant technological advancement. The disruption of traditional jobs throughout all industries from the forces of automation and digital integration (MGI, 2017) mean students will need to be resilient and self-motivate themselves in a rapidly expanding, digitally focused work environment (WEF, 2016). A balanced set of social, emotional and noncognitive skills (SEC) alongside technological proficiency will be required for school students to navigate the increasingly competitive and digitally focused employment environment (OPMSCA, 2018). The practice of SEC skills for the workplaces of the future could be the dual key which unlocks an improvement in student academic success in school today.

The prediction of workplace success has moved beyond the historic tests of IQ and cognitive ability, with research highlighting the value and efficacy of success prediction methods measuring noncognitive characteristics including self-motivation and resilience (Levin, 2012). Evaluation of behavioural traits found that students who practised SEC skills in school resulted in long term benefits in personal health and success in employment (Heckman, et. al., 2013, Heckman & Kautz, 2012). One of the most extensive reviews of SEC skills was conducted by Durlak et al. (2011) with a meta-analysis of over 200 interventions aimed at increasing the SEC skills of students resulting in student participants achieving higher academic outcomes and an associated performance increase equivalent to 11 per cent across most of their grades. These skills rooted in behavioural science and fused with digital pedagogy could when applied effectively within students socially and culturally relevant contexts might lift current

academic outcomes and additionally prepare a strong, innovative workforce for the future.

This thesis assesses the development opportunities and commercial viability of an innovative solution to the problem of low student achievement in a digital age.

As such, this thesis will not follow a traditional format in advancing knowledge in one particular discipline. Rather this study takes the initiative of applying existing and evolving knowledge in behavioural science and technology in a new innovative way.

For the purposes of the innovation and commercialisation foci of this study, the secondary school student will be referred to as the customer, and the contributing factors to student underachievement and the rapidly developing future workplace will be considered the two key customer problems.

Intended as a social good, this project applies commercial innovation to the social need of improving student's ability to achieve goals and experience academic and personal success through training the non-cognitive behavioural strategies of motivation and resilience. The structure of this thesis is presented below.

1.2 Structure
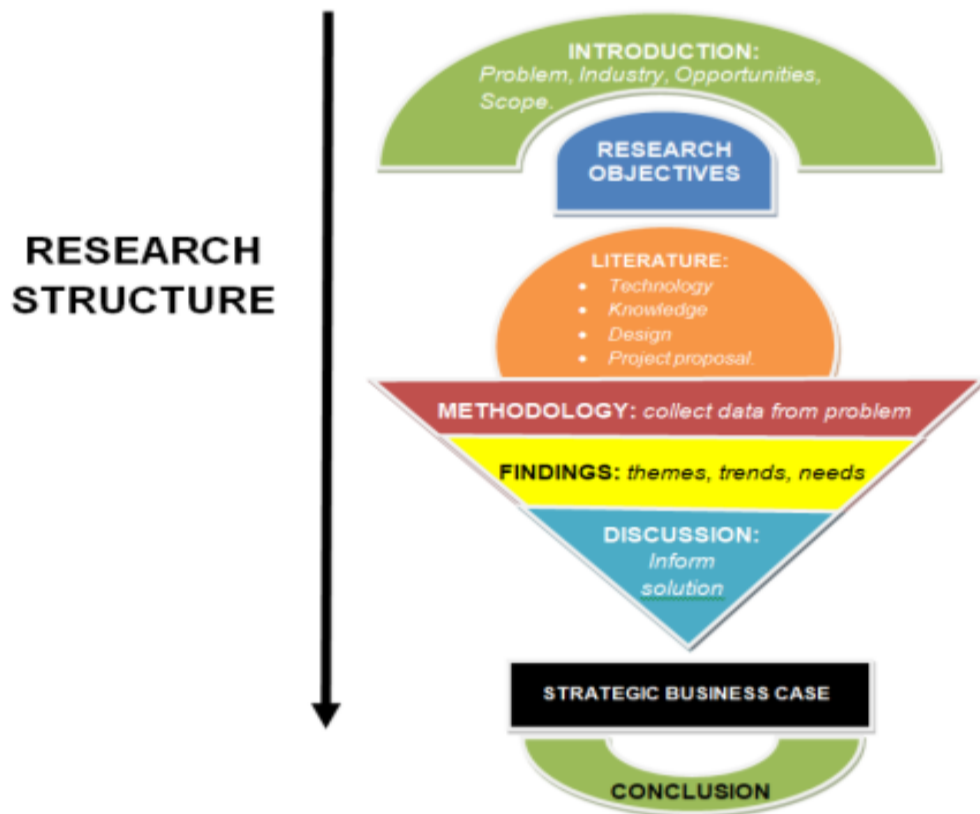
Figure 1: Overview of research structure

This thesis comprises eight chapters and is presented as one whole document. To avoid repetition, the structure of this thesis is designed as follows:

Chapters 1 - 6 attempt to understand the customer problem, including the frameworks which the study builds upon. These chapters are brief and often direct the reader to further readings due to the time and word count constraints of this document.

In Chapter 7 an innovative solution is proposed as a business case in a stand-alone document intended for presentation to potential partners and investors. The strategic business case summarises the key learnings from Chapters 1 - 6 and poses a whole commercially focused and innovative solution to potential partners who may have vested interest in developing a solution for the identified customer.

This thesis is concluded with recommendations for future research direction and next steps in solution development in **Chapter 8.**

- Chapter One: The introduction begins to understand the contributing factors to the customer problem of student underachievement. It explores the industries of education, government and considers future skill requirements that workplaces of the future will demand from these students. Building context to the study, the introduction sets the focus of the literature review.

- Chapter Two: The literature review introduces research across behavioural, technological and educational fields linking innovative concepts to help understand the current environment of the customer problem. A brief working definition of key behavioural concepts from self-motivation, resilience and self-efficacy from relevant studies provide direction to the development of a proposed solution to the customer problem.

- Chapter Three: The project proposal briefly scopes opportunities from current industry trends and from the literature, with a more in-depth analysis of trends and opportunities presented in the Business Case in Chapter Seven. The project proposal outlines the specific research objectives of this thesis and makes assumptions about how the project may develop including an overview of user-design considerations and the scope and limitations of this study.

- Chapter Four: The methodology presents the approach used to validate the project proposal. The methodology outlines the 'how' of collecting meaningful, ethical and relevant data identifying the challenges to the customer problem. The methodology outlines how the project involves the customer in the developmental stage of the proposed solution, and how the line of enquiry has been formed to

- Chapter Five: Findings and analysis present the collected data from research participants (the customer) and analyses trends and recurring themes of the data for

- Chapter Six: Discussion explores the implications of the findings and analysis of the innovative solution proposal.

- Chapter Seven: The strategic business case the second half of this research, presents a business proposal of the innovative solution to a specific investor audience.

- Chapter Eight: Conclusion wraps up the research by summarising key implications, acknowledging existing unknowns and indicates areas for future work.

Whilst the business case is intended to demonstrate a social enterprise model to accommodate the challenges explored in part one, the relevance and potential of the innovative solution may be applied to other businesses and industries and with alternative commercial propositions. For the purposes of this research, a single investor will be identified, yet with the nature of innovative research, the proposal can be, in theory, able to be iterated and pivoted to alternative customers, interested parties and opportunities as the research progresses.

1.3 Background

Working in youth development in high deprivation communities I witnessed rangatahi (youth) having unprecedented access to technology from software, phone apps and laptops in schools to instructional YouTube videos. I was concerned with the lack of achievement these students shared with me, and an apparent lack of self-motivation and incentive amongst both students and educators to explore ways of utilising

unprecedented access to technology resources to improve learning outcomes. Students were easily distracted, unmotivated and unfocused. Seemingly little support was offered to them in planning goals, being resilient to obstacles and managing their studies and commitments. I wondered whether this ease of technological access when employed in a socially-culturally relevant way, could be leveraged to help improve student learning success?

1.4 The problem

The two key problems may have one solution, expanded here as problem one (P1) poor academic performance and problem 2 (P2) changing workplace skill demands.

1.4.1 P1: Poor academic performance

New Zealand as a member of the Organisation for Economic Cooperation and Development (OECD) is academically measured by the Programme for International Student Assessment (PISA) international study every three years. Declining academic success rates for New Zealand secondary school students across the board (PISA, 2015) highlight a gap between a seemingly abundant array of digital and technological resources available online and the lack in ability to them to improve academic results. New Zealand had the wisest achievement disparity of any OECD country (Rubie-Davies, 2015).

From 183 New Zealand schools, 4500 students were randomly selected to participate in the most recently published PISA study with the following concerns identified in the findings summary (Kirkham & May, 2015):

● New Zealand has consistently some of the widest gaps between top and lowest performing students (the gap in science was the OECD's second widest). Often the lowest performing students were ethnic minorities or from high deprivation communities.

● Māori and Pasifika students scored the lowest scores in reading (465 and 450 respectively) below the national average score of 509.

● Overall Pākehā (European) and Asian students scored above the OECD average in science, reading and mathematics. Māori and Pasifika students scored below the OECD average in all three subjects.

The Ministry of Education (MoE) report similar concerns with Māori success in the National Certificate of Educational Achievement (NCEA) marked as significantly lower than the results of Pākehā, where over a third of Māori students left school without any qualification at all (MoE, 2013). These findings perpetuate the discourse around New Zealand's low achieving students correlation of learning outcomes with socioeconomic factors, though literature provides no consensus of the causes of, and solutions for, this achievement gap. Some highlight the socio-economic disadvantage disproportionately experienced by Māori communities (Marie et al., 2008), discriminatory practices and lack of cultural sensitivity of teachers and schools (Alton-Lee, 2003). Nash (2001) posed Māori underachievement was caused by "a deeply institutionalised Anglo-Māori working-class culture with destructive consequences for the aspirations and self-confidence of young people affected by it" (p.1). However, these papers are inconclusive about whether it is the fault of ethnicity, class, politics or education.

Finally, the issue of Māori student underachievement is usually framed by educators and schools within a cultural deficit explanation, locating responsibility for low achievement within the student even if explanations for low achievement are mediated by references to poverty or other background disadvantages. Whilst these statistics portray a real and a negative aspect of academic achievement amongst Māori, Pasifika and low socioeconomic students, the statistics do not begin to capture the complex implications of history, colonisation nor do these statistics evaluate success from te ao Māori (Māoriworld view) or the cultural values of Pasifika (See: Chu et al., 2013).

Underachievement is a discrepancy between a student's intellectual ability and their academic outcomes (Rathvon, 1996). At the end of the day, it is still the student who is required to change in order to succeed. I find research which emphasises the skills of self-motivation and resilience in positive habit development for academic success more compelling. These habits have powerful influences on the psychosocial development of students: their self-esteem, motivations and, in particular, their aspirations and expectations of academic success (Rubie-Davies, 2015).

"Underachievers are, in fact, highly motivated—in directions other than getting good grades. And finding out precisely where their motivation lies is the key to helping them turn around and become achievers at school." (Mandel & Marcus, 1995, p3)

Underachieving students are a niche customer group who require a unique set of support systems and strategies which are culturally, socially and pedagogically relevant and meaningful to them. Thus, whilst the research objectives will apply to any student struggling with the lack of motivation and failing to set effective goals, this project attempts to focus on the groups in our society that have the most urgent needs.

1.4.2 P2: Changing workplace skill demands

Davidson (2013) projects that 65% of children now entering primary school will end up in jobs that do not even exist today. Using robust methodologies (Frey and Osborne, 2013, MGI 2017) have predicted the exponential change that technology and automation will have in workplaces. Digital transformation at work is profoundly impacting all industries as businesses move to capitalise on growth opportunities provided by technological advancement. Automation is one part of digital transformation where computers and robots are able to perform an extensive range of routine physical work more efficiently and cheaper than human labour (MGI 2017). Additional digital advancements continue to improve the automation of computer and robot activities including the ability to accomplish tasks which require cognitive capabilities including

the sensing of emotion, making judgements and even driving vehicles (Pew Research Centre, 2018).

The emerging labour market will require workers to solve unstructured problems and carry out non-routine tasks using noncognitive skills- often referred to as social-emotional noncognitive (SEC) skills (OECD, 2015), including perseverance, conscientiousness and self-control (Duckworth & Yeager, 2015). Workers will need to develop these noncognitive skills to thrive alongside machines (OECD, 2015), and must creatively adapt to challenges and be self-managing in navigating the demands of the transforming job market. Students who are underachieving will likely not be equipped to adapt to this SEC-valued work environment. These specialist SEC skills, particularly self-management are essential in the shrinking of traditional employment arrangements, and a rise in self-employment and contracting (OECD, 2015).

The OECD (2015) forecasted employment trends and its global impact on economies and workers. It urges educators and policy writers to include the teaching of a balanced set of social, emotional noncognitive skills (SEC) skills into national curriculums in order to enable school students to successfully navigate the drastically changing 21st century and competitive employment market. Technology, automation and artificial intelligence is being tested and is likely to be deployed in industries from medicine to education (Pew Research Centre, 2018). There is concern that the education system will not keep up with the demands of the technological workplace and the realities of the skills that this evolving workplace will require from its workers (Sarokin & Schulkin, 2016). Self-managing motivational challenges and maintaining personal resilience in the face of changing workplace operations and technical requirements will be valuable skills students could learn in school now.

1.5 Innovative problem solving

Identifying innovative solutions begins with understanding who the stakeholders are in the problem. Drucker (1994) directs innovators to look at people, look at the customers and the users to see what their expectations, their values and their needs are. Drucker argues "… forcing oneself to respect what looks like irrationality on the customer's part, forcing oneself to find the realities of the customer's situation that make it rational behaviour, may well be the most effective approach to seeing one's entire business from the point of view of the market and customer" (Drucker, 1994, p. 131).

Business literature advocates customer-driven innovation (Patricio & Fisk, 2011, Selden & MacMillan, 2006) enabling a solution is driven by the customer need and aligns with market demand. The following section looks at the stakeholders and industry trends of education and government culminating in setting research objectives for the methodology.

1.6 Industry overview

Secondary schooling in New Zealand generally begins at Year 9 and ends in Year 13 with students aged between 12-19. There are approximately 800'000 school students in New Zealand in state schools and 276,411 secondary students enrolled (Education Counts, 2018). There are also private and state-integrated schools in New Zealand (eg. Steiner or Anglican Schools). The official qualification of New Zealand secondary school students is NCEA which has been in place since 2002. The NCEA qualification has three classes: Level 1, 2 and 3 with students being awarded pre-determined credits toward these levels for completing achievement standards. Achievement standards are devised by schools and teachers specific to subjects, with The Ministry of Education (MoE) and New Zealand Qualifications Authority (NZQA) overseeing the functioning of NCEA.

1.6.1 Digital education

In the past decade, the MoE has prioritised strategic direction toward both at risk learners identified earlier (Ka Hikitia, 2017, SEI, 2013, Te Kotahitanga, 2013) and digital technology education into the national curriculum. Secondary school students studying NCEA have seen an inclusion of digital learning models introduced to the national curriculum by MoE who are encouraging students with vision and aspiration to "seize the opportunities offered by new knowledge and technologies to secure a sustainable social, cultural, economic, and environmental future for our country" (MoE, 2017, p.8). MoE is setting long term strategic direction with the digital technologies curriculum to prepare students to understand principles of how technologies work and how that knowledge can be applied confidently to their futures so that they become "creative innovators of digital solutions" (MoE, 2017 p.3). MoE want highly skilled students to "develop as digitally capable thinkers, producers, and creators" (MoE, 2017 p.3), ensuring a prosperous workforce who with technological confidence will be economically competitive skilled workers.

Recognising potential skills gaps, The MoE in 2017 specifically rolled out a compulsory digital learning curriculum (Digital Technologies and Hangarau Matihiko) to ensure students are prepared for a digital workforce (MoE, 2017). In 2018, the inclusion of digital technologies was introduced to all Year 1 to Year 13 students "to prepare them for a world where digital skills are increasingly valuable to the economy" (MoE, 2017, p.2).

Government backing of digital education comes at a time when access to digital devices are substantially more affordable and student access to free UFB (ultra-fast broadband) and computers at schools, libraries and community centres have increased from government investment (MBIE, 2018). Classrooms increasingly welcome students' phones and tablets with Bring-Your-Own-Device (BYOD) and other technology schemes, digital devices are prevalent in the classroom. Most secondary school

students in New Zealand own a digital mobile device, 81% of 10-year-olds and 91% of 18-year-olds (Pelea, 2016). Beyond schools, a host of freely accessible emerging technology education providers has opened up including Hinatore Lab at Te Papa, The Mind Lab (partnered with Unitec) and Makerspaces in libraries. Digital education infrastructure has been built and is available, with the potential to positively leverage student learning. Much government investment has focused on ensuring equality of access to an opportunity to participate in digital learning.

1.6.2 Future skill requirements

The World Economic Forum (WEF, 2016) in the 'Future of Jobs' report nominates the development of specific noncognitive skills including emotional intelligence, complex problem solving and noncognitive flexibility amongst others as key safeguards for workers against the technological 'fourth industrial revolution'.

Complementing MoE's digital curriculum investment, additional New Zealand government ministries have developed strategic investment into preparing a digitally proficient workforce population. The Ministry of Business, Innovation, and Employment (MBIE) included a "Digital New Zealanders'" dimension in the Government's Digital Economy Work Programme in collaboration with the Department of Internal Affairs (DIA) to nurture capable technologically proficient workers who can "fully participate in the fast-moving digital economy" (MBIE, 2018, p.6). MBIE and the MoE also joint in partnership to launch the "A Nation of Curious Minds" funding initiative, linking a central government objective supporting educational engagement with technology and science and future job skills (MBIE, 2018).

Te Puni Kōkiri (TPK) launched Ka Hao Māori Digital Technology Development Fund in 2016, targeted toward Māori rangatahi. The fund is one of TPK's strategies encouraging rangatahi into high-value digital technology jobs. TPK looks at ways to improve and promote Māori pathways into the digital technologies sector supporting the development

of the skills necessary to participate in these industries (TPK, 2016). The government is also appointing New Zealand's first Chief Technology Officer (CTO) to "drive a digital agenda for the nation and respond to the opportunities and challenges of our changing digital world" (Beehive, 2018, p2).

The government places value in digital skill acquisition through the education system and in the workplace, funded by trans-ministerial initiatives. Whilst the digital world requires technological proficiency, to support this skill acquisition and effective use at work, noncognitive behavioural skills need emphasis and development so that learners will know how to use, and how to employ, the digitally focused knowledge.

The Office of the Prime Minister's Chief Science Advisor (OPMCSA) in New Zealand released a report on the country's digital futures in education urging policy development informing a curriculum to include not only the teaching of digital skills but also of resilience skills to youth in preparation for the changing workplace (OPMCSA, 2018). Although MoE's specific digital curriculum sees a willingness from the government to introduce new opportunities for learning around digital tools, it needs to incorporate resilience and motivation training alongside the curriculum to encourage students to effectively use these digital tools, strategically thinking, planning and creating.

Teaching students emotional regulation through social, emotional noncognitive skills (SEC skills) will help students to deal effectively with motivational challenges, build intrinsic motivation and develop resiliency to persist in the face of difficulty (OECD, 2015). Including a balanced set of SEC skills into national curriculums will be required if students today are to be able to successfully navigate the 21st-century competitive employment market (OECD, 2015).

Following chapters:

Chapter Two: **Literature Review**

Chapter Three: *Project Proposal*

Chapter Four: *Methodology*

Chapter Five: *Findings & Analysis*

Chapter Six: *Discussion*

Chapter Seven: *Business case*

Chapter Eight: *Conclusion*

Chapter 2: Literature Review

2.1 Introduction

This chapter identifies behavioural science which, when applied with educational technology, will inform a solution to the problem of poor student achievement. The introductory chapter one has introduced the industry and environment of the customer problem and identified some key stakeholders such as the Ministry of Education (MoE) and the Ministry of Business, Innovation and Employment (MBIE) who are the leavers which hold the power to greatly impact student achievement outcomes.

This literature review is a very tight introduction to concepts which have much depth, context and meaning beyond these pages. The concepts are significant contributors to global psychological practises, but with a careful and measured application, they may also be applied here to the customer problem P1 and P2.

This is not a detailed critique of the scientific literature on motivation or resilience, rather it is a review of relevant research which could be applied to secondary school students in New Zealand who are underachieving.

2.2 Motivation

Motivation is critical for enhanced learning outcomes of all students (Schlechty, 2001). Motivation can be extrinsic and intrinsic. Extrinsically motivated students are motivated toward attaining a goal for its instrumental value rather than finding the task interesting (Ryan & Deci, 2000), or its link to a tangible result or consequence such as praise from a teacher or parent, as opposed to engaging in an activity based on their own interest. Dev (1997) explains that a student who attempts a task due to intrinsic motivation will not need an incentive or reward to finish the task because they want to engage with the activity eagerly. Intrinsically motivated students are motivated from within, they gain inherent pleasure and satisfaction from participating in the task (Ryan & Deci, 2000).

Discovering and utilising students intrinsic motivation is likely to be the new focus for education (Dweck, 2012) yet few strategies, products, learning services or research is available to develop intrinsic motivation for students. Blackwell et al. (2007) demonstrated some evidence of improved student motivation for learning following the use of a digital resource 'Brainology'. 'Brainology' a web-based learning module program that claims to develop resilience and a growth mindset. The growth mindset is a popular theory developed from over 30 years of research by Dweck and colleagues who devised the term 'fixed' and 'growth' mindset (Dweck et al., 2004) to distinguish between the underlying beliefs individuals have about intelligence and learning.

2.3 Resilience

Resilience, as applied to students, is variously defined as a student's recovery from low performance (Catterall, 1998), the overcoming of academic setbacks and stress from school (Martin, 2002) a combination of toughness, hardiness measured with flexibility and adaptability (Friedland, 2005). Resilient students maintain high motivational achievement (Alva, 1991) and overcome setbacks, positively transform negative situations, and learn from their mistakes (Grotberg, 2003). Resilience has more recently been described as grit (Duckworth & Carlson 2013) an individual's ability to sustain effort, persistence, passion and interest toward achieving a goal (Duckworth et al., 2007). A winning combination for student success according to Farrington et al. (2012) is grit and a growth mindset, both being associated with improved academic outcomes.

De Baca (2010) expands on student benefits of resilience, recording an improved sense of well-being, an ability to set goals, motivation, connections, confidence and stress management. Gluckman (2017) warns that young people in New Zealand are increasingly living more stressful lives in a digital age. "Developing resilience in the face of inevitable stresses of growing up and promoting the development of impulse control is important not only for maintaining an even keel through childhood and adolescence but have broader benefits for educational achievement, employment, family stability and

quality of life generally" (Gluckman, 2017, p.4). The author also recommends "a special need to focus on Māori resilience" (p.5).

Though resilience is not precisely defined, researchers identify the real need to consider specific and practical implications for building resilience within students (Martin, 2000). Building resiliency through school-based strategies results in improved academic outcomes (Walker et al., 2005). Kwek et al. (2013) found that high resilience and self-efficacy in undergraduate students at University resulted in better test scores.

2.4 Self-efficacy

Self-efficacy as a measurement in educational studies is a reliable predictor of performance (Cassidy, 2012). Bandura (1995) conceptualised self-efficacy from his 'Social Cognitive Theory' as "the belief in one's capabilities to organize and execute the course of action required to manage prospective situations" (p2). Increased agency or self-efficacy has been evidenced from digital tools in the classroom, resulting in increased engagement, persistence, independence and less distractibility (Karich et al., 2014). Digital tools and even games have been associated with improvements in student social and emotional skills (Zheng et al., 2016). Technology can increase student self-efficacy by creating mastery experiences. Instead of a teacher instructing students how to succeed, studies by Liu et al. (2011) and Ketelhut et al. (2010) found a digital resource supported the success of student participants by allowing them to see themselves succeed without assistance, increasing self-efficacy.
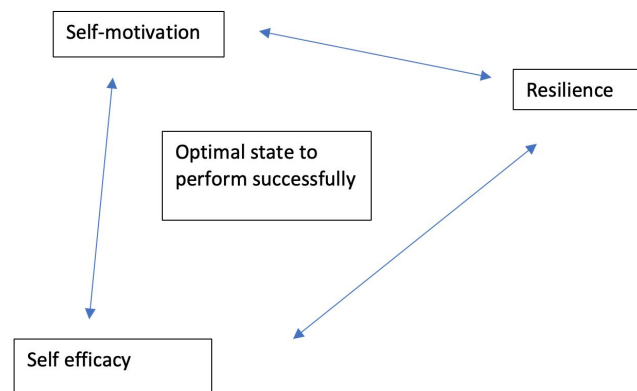
Figure 2: Combining three behavioural science noncognitive skills for optimal student performance state.

2.5 Technology

Technology tools hold enormous promise to help foster 21st-century skills, including the motivational, social and emotional (Stoll 2003, Bolstad and Gilbert, 2006). Technology is only one piece in the jigsaw of improving student performance, but the integration and use of digital tools by students is so vast that the pace of practical research in digital application to non-cognitive motivational-resilience skills must keep up.

Countries look beyond their borders for evidence of effective practices and policies for success. A brief review of trends in education technology is considered here including the informal nature of digital learning and resilience and motivation in education. The Business Case in Chapter Five expands on some of these examples in the competitor's analysis and the Literature Review in Chapter Two unpacks behavioural science for success more comprehensively.

The integration of educational technology is predicted to continuously expand around the principle of "anytime, anywhere' learning (Kozma, 2010) as rangatahi are connected online potentially 24 hours a day. Informal learning can be effective for at-risk students, incorporating elements of flexibility and social relevance to students learning needs.

Edmodo is an online virtual classroom where students can communicate with a mentor or teacher and participate in activities outside of the classroom (Charoenwet & Christensen, 2016). In a study of student users, Edmodo was found to improve self-regulated learning behaviour and ultimately the academic performance of students (Charoenwet & Christensen, 2016). Edmodo's effectiveness lays in its fluidity where lessons can be continued beyond class, the technology being accessible anywhere, anytime (Lara, 2013).

Anytime, anywhere informal education is close to reality with the introduction of Massive Open Online Courses (MOOCs), online learning software like Khan Academy and popular language learning apps such as Duolingo which are free. So popular is this technology that some researchers call it a movement that threatens to fragment education (Daniel, 2012) in the same as the MP3 format had on music (Shirky, 2012). Gsuite, a host of free software, Gmail and Chromebooks are how "Google took over the classroom" according to a high profile October 2017 New York Times article (How Google took over the classroom, 2017). Access means people around the world are taking learning outside of school into homes, libraries, cafes… where they can decide what they want to learn, when they want to learn and how they want to learn" (Collins & Halverson, 2018 p3).

Edmodo's second success factor is its resemblance to Facebook, a site well used by students. Many elements of social media can be adapted to learning as can they form meaning and social-cultural relevance to students lives, "Students live on Facebook. So study tools that act like social networks should be student magnets - and maybe even have an academic benefit", state Parry and Young (2010, p1). Social media practices could be transferred to formal learning in schools considering the interfaces, systems and other factors that make the site socially relevant to students.

Many schools keep digital technology on the periphery, instead of at the core of academic practises (Collins & Halverson, 2018) creating a gap between willing 'digital native' students (Prensky, 2001) and the education environments inability to leverage this technology proficiency in their programming. The gap between policymakers learning intentions and organising supporting technology resources is reflected in a student body with increased technological literacy and a decrease in NCEA results. Technology tools hold enormous promise to help foster 21st-century skills, including the motivational, social and emotional (Stoll 2003, Bolstad & Gilbert, 2006).

The foundational study into "noncognitive factors" for achievement was the 'marshmallow experiment' (Mischel & Metzner, 1962) leading research into grit and the growth mindset (Duckworth et al., 2007, Dweck et al., 2014). Administered in the 1960's the 'marshmallow experiment' found students who could delay gratification by avoiding eating a marshmallow until a later time had huge benefits in adolescence, including self-control and increased academic achievement (Mischel, 2014). Watts et al., (2018) replicated the 'marshmallow experiment' with a much larger sample of over 900 students, which failed. Watts et al., (2018) suggest the failed correlation in this test may signify that educational technology could be unexpectedly helping students, posing students "increased reliance on digital technology...[may] make it easier for them to delay gratification… when they are motivated to do so" (p4) contrary to the original experiment outcome.

Carlson et al., (2017) speculate that some noncognitive skills "associated with screen technologies may have contributed to generational improvements" (p17), meaning students increased use of digital tools may have improved their self-regulation. This is consistent with Green & Bavelier (2003) who reported improved attention and focus skills associated with screen technology. Further research into the causal factors underlying these results is required but there is a basis to consider the benefit of student

educational tools in the development of noncognitive self-regulated, controlled and motivated behaviour.

Utilising noncognitive skills of motivation, resilience, self-efficacy in combination with technological ability can cater to a specific solution to underachieving secondary school students in New Zealand.

2.6 The opportunity

The opportunity to align a behavioural, student-centric product or service within the demands of today's education and workforce climate ties in with a growing body of research which relates academic success to the development of noncognitive competencies or SEC skills. The development of these skills is likely to be invested in and recognised in the future as especially significant in a more demanding employment market which is volatile, uncertain and complex. The New Zealand government is in a prime position to assist students as its digital curriculum is in place and international research continues to shine a light on the importance of investing in student resilience "higher levels of problem-solving skills using digital tools have higher employment rates and receive higher wages" (OPMCSA, 2018, p.3). The problems are summarised providing context for solutions, presented here with specific opportunities in the current education and technology environment.

2.7.1 Summary of problems

● Low socioeconomic, Pasifika and Māori students are underachieving at school (PISA, 2015).

● Whilst technology and digital tech is supported, self-management, self-discipline around it is not – SEC skills motivation and resilience is not widely applied in research to digital education solutions.

● Few schools have adopted ways or employed curriculum to teach students motivation and resilience aligned with goal achievement. Assessment approaches and

learning opportunities to measure noncognitive competencies like motivation and resilience is not measured or emphasised.

● Technology on the periphery of academia, students preferences and proficiency in digital media including social media is a missed opportunity.

● Whilst internet access, technology and devices are readily available this may overshadow the need to prepare teachers to effectively utilize this technology.

2.7.2 Specific opportunities

- Value of technology jobs recognised by Ministries "future digital skills that your child will need" and that "demand for people with digital skills far outstrips supply" (MoE, 2017).

- International and domestic research has identified where the workforce is heading and what competencies and the SEC skills students need to acquire in preparation for successful careers. Ministries are seeking digital initiatives to align with its strategic technology preparedness priorities.

- Behavioural science has advanced to where contextual and preferential factors are able to be identified in supporting successful outcomes, namely motivation and resilience (Durlak et. al, 2011) which can be taught to at-risk learners in an accessible way. Technology provides an opportunity for personalised learning, particularly useful for at-risk students who have a slower learning pace, giving them time to direct their learning.

- Infrastructure established - Specific MoE digital curriculum and access to digital technology and UFB ensuring high-value educational learning opportunities.

- Ownership of personal digital devices and use at home has increased as the cost of purchase (access) has decreased significantly. A rise in 24/7 learning access "anywhere/anytime" demands untaps potential to harness the socio-economic and cultural environmental factors of learners with informal, fluid learning opportunities.

- Intrinsic motivation generally is the new focus of educators to improve student academic outcomes (Dweck, 2012). Ensure intrinsic motivation is explored for students to discover for themselves what they innately want to achieve.

- Teach students self-efficacy (Bandura, 1997) and build an internal locus of control to increase student self-control, awareness of cause and effect of the action (Durlak et. al, 2011).

- Teaching in a culturally appropriate way increases self-efficacy (Rubie et al., 2004)

- Easy to use solution- the easier a user perceives technology to be, the higher the self-efficacy associated with its use (Davis, Bagozzi, & Warshaw, 1989).

- Familiarity builds user competence (Mueller et al., 2005).

Conclusion

For New Zealand to maintain its global competitiveness, for its schools to develop achieving, successful and engaged students, now is the time to weave the required competencies of the 21st century into the learning process. This means learners having the time and space to train their self-efficacy, self-belief, their motivation and ability to be resilient in the face of critical and complex thinking and problem solving (Durlak et. al, 2011).

Following chapters:

Chapter Three:	**Research Proposal**
Chapter Four:	*Methodology*
Chapter Five:	*Findings & Analysis*
Chapter Six:	*Discussion*
Chapter Seven:	*Business case*
Chapter Eight:	*Conclusion*

Chapter 3: Project Proposal

3.1 Introduction

This chapter proposes the creation of Moemoea, a technology-based application to build resilience and motivation in students. A course of research for the target market examines the basis of demand for the Moemoea application. This chapter lists the research objectives, research scope, assumptions and limitations of the project.

3.2 Project Proposal: Moemoea

Moemoea (Te Reo Māori meaning goals, dreams) is intended to be an online-based interactive, multimedia, challenge-based training program and support tool teaching students how to apply motivation and resilience toward improved academic success. The user will be trained in strategies to improve their ability to self motivate, tapping into the largely under-utilised pool of autonomy by building self-efficacy and providing tools to give students a sense of control over their achievement. Moemoea teaches students how to improve habits and skills, bolstering their self-efficacy and improving their resilience in interactive exercises.

Users log into Moemoea to start with an introduction to the kaupapa (purpose and aims) of the training program and the tools available to them in goal achievement (failure busters, motivational tracks, quotes, reflection journal, help section). Users are asked to begin with writing down an inventory of their goals and the challenges that may arise. This creates a space for reflection and to apply relevance of the taught motivation and resilience modules to their own lives. The modules are designed to prepare students for a higher level understanding of themselves and how their self-direction and management of tasks, their goals and their motivations will build greater intrinsic motivation and resilience.

Using educational tools that are tech-based has a pivotal role in fostering noncognitive skill learning efficiently and cost-effectively and Moemoea is a tool that a parent, educator or caregiver can use to complement and extend the learning experience for their child. Historically educators have had limited support in implementing tech-based education resources. There has been a lack of consensus in measuring results from technology resource platforms resulting in poor accountability. Moemoea is student-led, intrinsically motivating the user through involving interest and curiosity.

Motivation is a fundamental concern among teachers as it increases self-efficacy and sustains student curiosity and interest (Linnenbrink and Pintrich, 2003). Sanacore (2008) claim teachers need to challenge bored and unmotivated learners through a combination of intrinsic and extrinsic motivational techniques and by placing power into students hands to increase participation. Using Moemoea, students will be able to self direct their studies and goals and manage external influencers and disruptions more effectively by harnessing their intrinsic and extrinsic motivation. This is important as motivation is the key to academic success as well as promoting lifelong learning (Sanacore, 2008)

Moemoea is intended not to supplant but to complement existing academic resources, starting at the earliest stages of students development and continuing through secondary schooling. Moemoea can help personalize learning, engage the disengaged, complement what happens in the classroom, extend education outside the classroom and provide access to learning to students who otherwise might not have sufficient educational opportunities. Pink (2005) explains that engaging creative thinking to set goals will be the competitive advantage that can differentiate commodities as we grow universally from the information to the conceptual age. This transition will be aided by Moemoea, harnessing the extensive research in motivation, social and emotional learning and goal setting, and drawing on intrinsic and extrinsic motivational techniques to break goals into manageable modules.

Whilst many subjects, knowledge and skills are taught in schools, emphasis must be placed equally on the value of noncognitive, emotional and social skills which will be just as, if not, more important than knowledge in this, the fourth industrial revolution of automation and changing jobs and workplaces. Goal setting metered with effective motivational strategies and employing resilience toward a task to overcome obstacles is an essential lifelong skill that students need. They are indispensable higher order noncognitive skills, especially essential in rangatahi in a digital age of technology consumption.

Figure 3: How behavioural science could interact in Moemoea to improve student achievement behaviour

Moemoea: how a digital tool can build student resilience and motivation
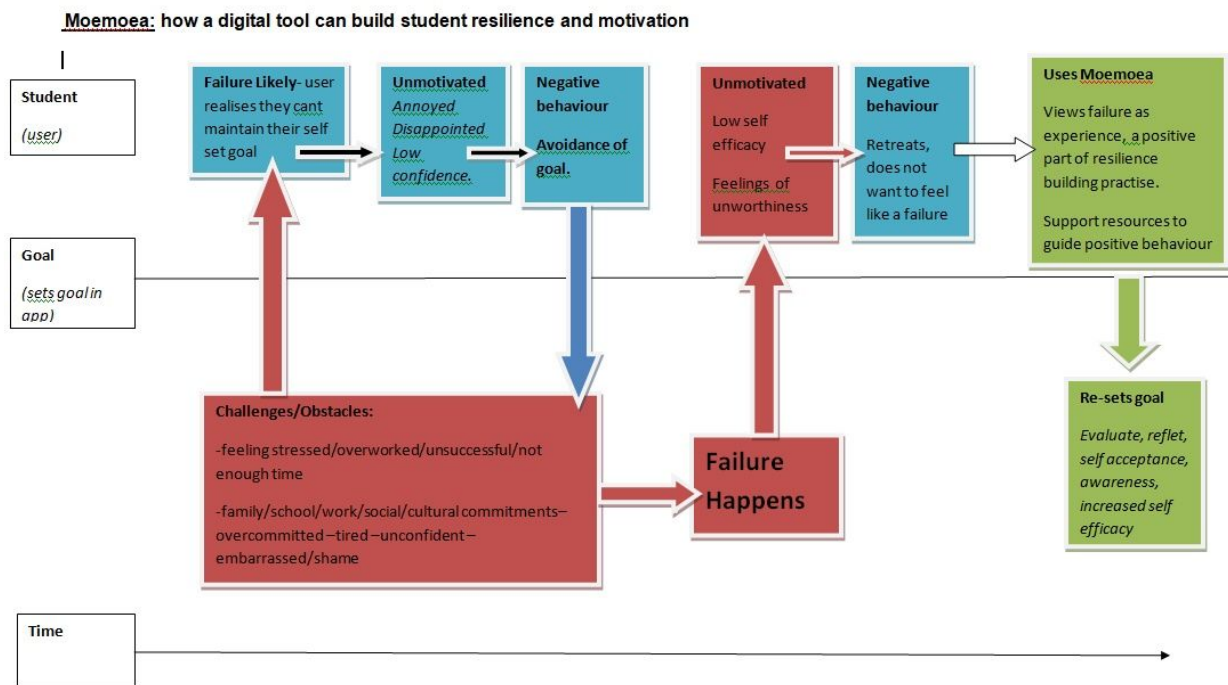
3.3 Design considerations

Moemoea will take principles of universal design for learning (UDL) from Meyer et. al (2014) into consideration. Learning tools need to be accessible for all learners including at risk and low achieving students. This accessibility requires supports to all learners which need to be built into the learning hardware and software, and are guided by three principles of UDL:

1.   Provide multiple representations of concepts and ideas so learners can approach information understanding from multiple ways eg- appropriate language and slang for the user and content which is available for watching, listening as well as reading.

2.   Provide space for multiple modes of response and expression ensuring all learners can express and demonstrate themselves, eg- online journal, voice recording, video recording.

3.   Ensure multiple engagement modes are available to stimulate interest and motivation eg- collaboration and sharing, sharing stories of success, social-cultural relevance.

3.4 Assumptions

This research makes the following assumptions from industry and investment trends listed above:

1. Resilience and self-motivation lead to the improved academic performance of students by building confidence and self-efficacy.

2. Digital tools and technological platforms are effective and efficient methods of delivering learning outcomes to secondary aged students.

3. Self-motivation and resilience can be taught within a digital tool resulting in successful goal achievement at school and beyond year 13 into changing workplaces of the future.

3.5 Research objectives

The first part of the research seeks to interview secondary school students who if they are not the paying customer, they will be the user of the proposed innovative solution. Accordingly, an interview schedule to collect broad qualitative data is devised. The aim here is to understand what students already think about, understand or feel about success and what applications of motivation and resilience have they employed or know about in achieving optimal modes of academic success.

The methodology explains how the research questions were devised in order to test this assumption and to elicit authentic, helpful responses from secondary school students to open the wider conversation of their needs, the support they require and how it may tie into untapped motivational and resilience knowledge. The research objectives have been framed into three central questions which will guide the methodology.

1. To understand what strategies students use currently in achieving optimal modes of success in regard to building resilience and maintaining motivation to complete tasks
2. To identify pain points where students face obstacles in their learning environments, and understand how these can be addressed through resilience and motivation.
3. To gauge students enthusiasm for a technology-based application that will help them build their motivation and resilience.

This knowledge will be used to validate the commercial offering, building a business case for an application that provides motivation and resilience training.

3.6 Research scope

The secondary school student is placed at the heart of this project, seeking to justify and validate a solution for digital workplace preparedness and academic improvement. It explores what skills are essential to all young people's ability to respond to complex problems which will arise in their professional lives (Mandernach, 2006). This research will seek the input of secondary school students who are at the highest risk of underachieving having demonstrated low motivation and low resilience.

3.7 Limitations

This report may be considered a preliminary launch into the development of an innovative solution to at-risk students lack of achievement. Whilst investigation into literature and data collection has indicated an opportunity, a validation for this resource development, the wider complexities of student needs and their cultural-social contexts are beyond the scope of this research and further research is required to address remaining unknowns. This project aims to stimulate kōrero (discussion) around the testing, trialling and incorporating SEC skills into learning at school.

This project is confined to justifying the investment into the development of an innovative solution. Literature, definitions and content are very brief and limited to a single chapter. The intercepting fields of Māori and Pasifika learning models, mainstream educational pedagogy, notions of success, psychological and neurobiological characteristics of motivation and resilience and the wider workings of the education system are extremely complex and their discussion is beyond the scope of this research. Research with a wider sample would provide a greater validation to the project, as would prototype testing, allowing a more conclusive summary of the proposal's efficacy. Final costings of development, implementation and product maintenance are as yet unformalised and will require final investigation to determine product feasibility.

3.8 Summary

Focus on the customer problem - barriers to achieving academic success, in particular, to clarify whether current support resources and systems provide enough incentive to low achieving students to improve academically and if motivation and resilience as success enhancing agents are sufficiently supported in current education curriculums. The ability to motivate oneself and follow through in goal tasks will be important skills for youth to begin learning now as a strategy to improve academic outcomes and to maintain their wellbeing and performance in the future.

Whilst a business case is built in chapter five, the proposal is by no means a definitive solution to the barriers of attaining success, but may provide to government and other groups useful recommendations on how best to consider future research and further investment into assisting low achieving students.

The knowledge generated in this study aims to improve dialogue between educational technologists, policymakers in education, developers and psychological behavioural scientists to further the research into the support required for all students at all levels of study to achieve success. Determining factors of behavioural science which positively influence human success in the accomplishment of goals, this research will provide recommendations about the developmental design of these factors in application to a digital and innovative format.

Following chapters:

Chapter Four:	**Methodology**
Chapter Five:	*Findings*
Chapter Six:	*Discussion*
Chapter Seven:	*Business case*
Chapter Eight:	*Conclusion*

Chapter 4: Methodology

4.1 Introduction

This chapter outlines the methods employed in conducting the research. It specifies procedures for participant recruitment, conducting interviews, school documentation and collecting confidential qualitative data.

4.2 Qualitative data collection

New Zealand secondary school students are the customer for this innovative solution. Collecting data directly from the student customer allows a first-hand account of what real pain point needs solving (Douglas et al., 2015). Qualitative data draws its emphasis on research participants' "lived experiences… and connect these meanings to the social world around them" (Miles and Huberman, 1994, p10). Students are the first-hand witnesses and the daily consumers of educational products and resources as they participate in school. Their thoughts and experiences with success, motivation and resilience can be especially helpful in a business case as they can help to identify where knowledge and practice of educational motivation and resilience may be at odds, and an innovative solution can be proposed. Qualitative data aids the building of an innovative customer-focused product by attempting to understand the voice of the customer (VOC) (Carulli, et. al., 2013). Student voices are valuable to the development and marketing of the solution as the collected data can contain social-cultural contexts like slang which can be used in the promotion and secure placement of the proposed innovation.

4.3 Semi structured interviews

Qualitative research uses a lens that is both deep and wide angled to examine human behaviours and choices (Johnson & Christensen, 2004). I wanted to understand where students were going for support in motivation and in times where they need resilience to complete tasks. Interviews gather hidden facets of human behaviour, allowing the exploration of a phenomenon in depth with unusual responses from interviewees (Merriam, 2001; Qu & Dumay, 2011). Specifically, semi-structured interviews are based on human conversation, allowing the interviewer to shape the interview style and order of the questions to suit the participant (Qu & Dumay, 2011) which is especially helpful when the participants are young school students who may need a conversation style or slower interview pace to allow them to feel at ease and share information freely. Rapport with interview participants is important to build trust so that the respondents' can believe that they can talk freely (Merriam, 2001). Collecting data to inform an innovation, semi-structured interviews are versatile, able to 'probe' interview subjects to explain and to build on to their responses, leading the discussion into areas not previously considered by the researcher.

4.4 Research objectives

This qualitative methodology explores the barriers to student academic success and to understand where and how motivation and resilience contribute to achievement outcomes. Specific objectives are:

1. To understand what strategies students use currently in achieving optimal modes of success in regard to building resilience and maintaining motivation to complete tasks

2. To identify pain points where students face obstacles in their learning environments, and understand how these can be addressed through resilience and motivation.

3. To gauge students enthusiasm for a technology-based application that will help them build their motivation and resilience.

This knowledge will be used to validate the commercial offering, building a business case for an application that provides motivation and resilience training.

4.5 Sampling

A purposive sampling technique was utilised, enlisting secondary school participants from mainstream secondary schools aged between 12-19 in Taita, Lower Hutt.

Lower Hutt in the Wellington region has the fourth largest population (9.7%) of Māori in NZ (Statistics NZ, 2013) and Taita North had Lower Hutt's worst socioeconomic status according to the 2013 Social Deprivation Index (Atkinson et al., 2014). One secondary school in the Taita region had 460 students between Years 9-13 composed of 45% Māori, 34% Pasifika and 18% Pākehā (ERO, 2017). Probability sampling is inappropriate for this qualitative research, as unlike statistical research, the goal is not solely to estimate the incidence of phenomena in the wider population, but rather to capture salient characteristics in an identified community that need priority in sample design. A purposive sample allowed this research to select participant based on suitability to the research objectives (Cohen et al., 2000). This criterion included:

- Socioeconomic status. Participants were sampled from high deprivation communities (e.g., Taita, Lower Hutt, a community in Wellington, New Zealand) because perceptions of success, motivation and resilience are not often collected from lower decile communities. This sample criterion potentially provides alternative perceptions of success, and unique analysis and evaluation of the student information within a high deprivation environment.
- Underachieving, at-risk students who struggle with academic success at school. A range of students who may not be excelling in the traditional academic environment, but who had clear abilities in other areas such as sports, leadership or creativity will be identified and approached. This is hoped to yield responses from participants which are "information rich" (Patton, 2001).

- A broad age range (12 - 19-year-olds) in order to include a variety of experiences and perceptions of success. Secondary school students (years 9 - 13) are more likely to have had experiences related to the research than younger students.
- Willing and available to be interviewed.

This criterion allowed principles and community leaders to recommended potential participants to the researcher based on socio-economic themes and characteristics of motivation and resilience. The size of Taita is large enough for the sample to be considered random, which ensures the generalizability of findings without bias. This sample was selected to understand the personal and environmental circumstances pertaining to their experienced and desired success to assist the proposed product development, providing stories and examples of success that the researcher could apply to an innovative solution with the intent to upscale the solution to serve a wider student market.

4.6 Research participants

I met face to face with community leaders and principals in Taita, Lower Hutt to explain the objectives of the research and to obtain permission and cultural guidance on conducting interviews with secondary school students aged 12-19. They advised that some lines of questioning may cause emotional responses, therefore, support services information for Youth Line and Vibe Youth Services were provided in the form of a brochure at the commencement of the interview and care was taken by the researcher to ensure the wording and delivery of the interview questions was sensitive.

Community Leaders and Principles granted permission to conduct research in their community, suggested students who would be interesting participants, and shared a participant recruitment poster in their schools and community facilities including community houses, libraries, Marae, sports and youth centres. In response to these posters and encouragement from community leaders, 30 participants expressed interest

in the research. Eighteen participants agreed to take part, however, only 14 were able to be interviewed due to conflicting commitments. Fourteen interviews were collected, 9 from males and 5 from females. Three participants were under the age of 16 and Parental Consent Forms were signed for them before being interviewed (see Appendix D and information for parents sheet Appendix C). Seven participants agreed to be audio recorded and 7 participants declined, and a written transcript was kept. The transcripts and audio recordings will be destroyed at the completion of this research.

Table 1: Participants with Pseudonyms

Date	Intr.	Code Name	Age	Gender	Culture	Year
26/3	1	SAM	14	M	Māori	11
27/3	2	DENNIS	17	M	Māori	12
28/3	3	LANEY	16	F	Māori	11
28/3	4	CLAIRE	17	F	Pasifika - Samoan	12
29/3	5	SOLE	18	M	Pasifika - Samoan	13
29/3	6	JAMES	16	M	Māori	12
30/3	7	LEE	16	M	Māori	11
30/3	8	HELEN	16	F	Māori	11
31/3	9	ZAYD	13	M	Pasifika - Samoan	9
31/3	10	JAKE	18	M	Pasifika - Cook Island Māori	13
27/3	11	AMA	16	F	Pasifika - Samoan	11
15/3	12	PAO	15	M	Zimbabwean	11
27/4	13	NICK	17	M	Māori	12

27/4	14	OJAY	18	F	Māori	13

4.7 Data collection procedures

The interviews took place in comfortable, private rooms at a local Taita-based youth centre. There were no other people around to hear the conversation, yet two youth workers were present on site in the main building of the youth centre should participants require support after the interviews. I interviewed each participant separately. The length of the interview ranged from 15 to 55 minutes, depending on the participants' availability and comfort with sharing information. Interviews were scheduled to 1 or 2 a day to ensure privacy and no participant saw another participant take part in the research.

Before beginning each interview, participants were provided with a detailed and accurate description of the study written at an accessible level in an information sheet (see Appendix B & C) and were given the opportunity to ask any questions about the study and the interview and were given the opportunity to not participate. Participants signed a consent form to be interviewed allowing the content of the interview to be used for the purpose of this research. The consent form also included the option to be audio recorded and to receive a summary of the research findings (see Appendix D & E). The consent form also allowed participants the right to withdraw from the study up to one month after the interview occurred at which time the data was anonymized and amalgamated into the dissertation, yet no participants withdrew.

Before commencing each interview, the researcher emphasised that any input is welcome to prevent participants' hesitation in answering questions out of concern that the participants were not saying what they perceived the researcher as wanting to hear. I asked participants if they would mind if I took written (field) notes as they spoke, no participants objected. As students appeared more relaxed and the conversation flowed more freely, the researcher asked increasingly more specific questions from the

interview schedule (See interview Schedule, in Appendix F). The ordering of the questions largely depended on the direction research participants took the conversation in. The semi-structured interview format allows this flexibility, and the interview schedule ensured that questions were not repeated and prevented limitations to participants' responses. Listening actively to responses I was able to adapt to unforeseen circumstances that arose during the study (Patton, 2002) such as re-wording of some questions participants did not understand.

I informed participants that the content of the interview would be used anonymously via pseudonyms, and participants had time to ask what each question meant and were given time to form responses.

4.8 Interview protocol

The interview schedule protocol was divided into three sections to reflect the central research objectives. Section one asks questions such as "tell me about a time that you felt successful" in order to build criteria for what success looks, feels and smells like to participants of the study. Section two questioning opens up space for participants to discuss their experiences with, and interpretations of the concepts of motivation, resilience and grit- and other sensations and phenomena they may have first- hand experience within study at school.

Questions like "are there any people in your life that make you feel motivated?" and "do you use any apps or watch YouTube videos to make you feel motivated?" are asked to gain a sense of context as to where students access motivational material and at what point they access this in their learning journeys. The third section in the interview schedule aims to understand what students, as customers, are likely to use or to purchase. The third section opens up by stating the researcher intends to build a motivation and resilience product and would like the participants' feedback in how the product looked or sounded or was accessed. Questions like "Do you think you would benefit from this service?" and follow up prompts to understand why, or why not, were

used to clarify what a student customer may buy, and what they would not be interested in.

The questions have been structured in an open-ended fashion to allow a naturalistic conversation with participants having the freedom to express their opinions, with the interviewer offering verbal prompting to ensure responses are heard and recorded correctly (Brod, Tesler & Christensen, 2009). Questions such as "Can you tell me about a time that you felt successful?" and "Can you name two people who you think of as successful?" are examples of the care taken in constructing open-ended questions for naturalistic responses so that participants' can reflect and share responses naturally without feeling constrained to questions.

The final question in the interview schedule invites participants to share anything else about success, motivation and resilience, asking "is there anything else you might share that would help us with understanding what real success means to you?". This final question combined with a clause in the information sheet stating that all participants could contribute further thoughts or ideas they make think of later after the interview with the researcher up to five days after the commencement of the interview, gives a scope wide enough to capture all thoughts from students, giving them time to reflect and share again if they wish to, yet none did.

4.9 Statement of Positionality

I have developed over three years of professional practise trusting relationships with rangatahi (youth) in Taita, Lower Hutt. In the case of interviewing young people, it was helpful for the interview subjects to know who the researcher was as rapport and trust have been built up to be able to facilitate a generally candid and transparent dialogue with participants resulting in a higher rate of engagement. Spradley (1979) notes that willingness to participate can result from having a trusting relationship with the researcher which can assist in more articulate and reflective communication of

experiences and opinions. With reciprocity of mana (respect) and longevity of the working relationship with participants felt comfortable to open up to questioning and divulge rich information.

My positionality in this research process is important in the acknowledgement that social research is not separate from the wider society, and that the researchers involvement in the data gathering had the potential to influence participants' disclosure of information. I was cognisant of the production of knowledge and the power role I played as a Youth Worker in this research and tried to manaaki, provide a comfortable space for participants to speak naturally, and not feel as though they have to change their answers to please me.

4.10 Feedback to participants

Participants were able to select a tick box on the Consent Form to be provided with a summary report of this projects' key findings via email once the final research is published. No participants selected this option.

4.11 Human Ethics

This research is approved by the Victoria University of Wellington Human Ethics Committee, approval number HEC0000025664. Informed consent was sought from all participants, with all participants being provided an information sheet and a consent form to sign (see Appendix E). In the case of 3 students under the age of 16, consent was obtained from parents (see Appendix C). The names of all participants is kept confidential to myself and my supervisor. All data will be destroyed at the submission of this thesis.

4.12 Treaty of Waitangi

The Treaty of Waitangi, the forming document of Aotearoa New Zealand was respected in this research as it marked the foundation of the state of New Zealand, formalising a

relationship between the British Crown and Māori - to protect Māori traditions, practices and values.

The Victoria University of Wellington's Treaty of Waitangi Statute is acknowledged in
1. Kawanatanga - all research was performed lawfully and sensitively
2. Rangatiratanga - participants had the right to ask questions of the research, for a copy of the information which was collected from them, anonymity, respect and the right to withdraw from participation at any time.
3. Equality - capability, wording and relevance were considered in writing the interview schedule with community leaders and the research supervisor advising ensuring appropriate dialogue and fair, ethical information exchange occurred without discrimination.
4. Reasonable Cooperation - there was no discriminatory selection of participants, active protection of student participants occurred.
5. Redress - although none occurred, if responsibilities had been breached and prejudice had occurred, appropriate redress and protection of participants and stakeholders in this research would have been undertaken in liaison with the researcher and leaders in the Taita community.

4.13 Limitations

A small sample size of voluntary participants- 14 students, 9 male and 5 female may not have helped assess whether the participants' views represent others. The single research area may have limited the understanding of whether a digital tool is an appropriate solution to assist all students' in Aotearoa with success. Despite these limitations, the responses provided wide ranging and detailed, providing rich information for analysis for an innovative motivation solution.

4.14 Summary

The purpose of this research is to understand how to assist secondary school students (12 -19 year olds) from low decile communities in New Zealand to develop resilience and motivation for improved academic outcomes. This methodology was devised to capture broad, deep authentic responses to the research objectives in a considerate, participatory and respectful way. Advice was sought from community leaders on how best to approach a sample of student participants prior to data collection and care was taken in developing an appropriate interview protocol. Responses from 14 research participants and a literature review will inform the innovative solution to assist students in their achievement.

Following Chapters:

Chapter Five: **Findings & Analysis**

Chapter Six: *Discussion*

Chapter Seven: *Business case*

Chapter Eight: *Conclusion*

Chapter 5: Findings and Analysis

5.1 Interview findings

An interview schedule was devised to collect the thoughts, experiences and suggestions of 14 secondary school students (aged 12-19 years) in New Zealand. Participants answered questions on success, motivation, resilience and what would help them achieve greater academic outcomes in semi structured interviews. The interviews were structurally flexible allowing a broad range of responses and content which was not restricted to the questions. The Interview Schedule can be found in Appendix F.

Interviews ranged in length from 15-55 minutes depending on how much the participant could share. Four interviews were over 45 minutes, six interviews lasted between 15-25 minutes, a further 4 were 25-45 minutes in length. The interviews were transcribed by myself and analysed using NVivo 10. The transcripts were read line by line twice to identify recurring themes and codes. The aim of coding was to develop clusters of category titles or themes which would help articulate the meaning of the conversations recorded. Coding helped to keep the the voice of the participant at the forefront of the research synthesis (Strauss & Crobin, 1990).

Sometimes it was necessary to re-analyse interviews looking for language which would be more consistent with the students interviewed. For example, one of the themes identified was resilience, yet students did not frequently use the actual term "resilience". Qualitative data was re-analysed to include synonyms for "resilience" and such as "go hard", "try-again" and synonyms for "resilient" were re-analysed to include "tried harder". This second analysis allowed more possible references to resilience exemplified where one student was asked "What does resilience or grit do for you when you are wanting to achieve your goals?" he answered, *"It pushes you like in rugby, you twist your ankle,*

you dig in deep and just force yourself through". This response was coded as a definition of resilience although does not use the term "resilience".

5.2 Findings purpose

The purpose of the findings is to address the research objectives:

1. To understand what strategies students use currently in achieving optimal modes of success in regard to building resilience and maintaining motivation to complete tasks
2. To identify pain points where students face obstacles in their learning environments, and understand how these can be addressed through resilience and motivation.
3. To gauge students enthusiasm for a technology based application that will help them build their motivation and resilience.

This knowledge will be used to validate the commercial offering, building a business case for an application that provides motivation and resilience training.

5.3 Identified themes

Recurring themes were strong, well defined and frequently repeated by participants, illustrated with examples from their personal lives. Four major themes are presented below with additional subheadings further articulating the theme's relevance to the research questions. The major themes are:

- Definitions of success
- Motivation strategy
- Resilience and challenges
- Positive response to a motivational product or service.

5.4 Theme One: Definitions of success

Defining success was the strongest theme in terms of the amount of time students elected to speak about aspirations and success compared to other questions. Participants seemed to be more animated, smile more and use physical gestures when they shared what their goals were, and most appeared excited when articulating what their dreams were. Success is an important discussion to the research because the identification of people and objects that students indicated were successful provides context to the aspirations and goals students strive for. Subsections identify subthemes that helped clarify participants' interpretations and definitions of success including providing for family, successful role models and the attributes of successful role models

5.4.1 Providing for family

All 14 participants referenced 'whanau' or 'family' as a unit and individual 'whanau' or 'family' members as being successful throughout the interviews, thus 100% of participants perceived someone within their family or whanau unit to be successful.

Eight (57%) participants defined success as being able to provide for their families financially, with 'taking care of mum' and 'taking care of siblings' being additional definitions of success from 57% and 43% of participants respectively. The type of 'caring' and 'providing' was defined further under three core categories of 'family providing'. (1) Buying large assets (57% participants stated buying homes and cars), (2) paying for resources (43% participants said covering family bills) and smaller gestures (43% participants named buying stationary or sport shoes for siblings) were indicators of success. Providing for the family through large and small contributions was a definitive success definition, a sign that participants had 'made it'.

"(Success is) Looking after my family well, owning our own house and cars and make sure the boys have everything they need as well for their sports". - Ojay

"The best dream in the world, like a perfect day would be first, buy mum a car". - Zayd

A combined total of 34 references to family support occurred throughout the interviews.
"Success would be, and this is cliché I know, but honestly in my heart of hearts I want to be able to take care of my family…" - Nick

"I want to be able to give my family things that they may need" - Sam.

The ability to care for and provide for specific family members including 'mum' and 'siblings' was a recurring shared aspiration and success definition that was related to other discussions points in the interviews indicating a sense of strong familial association.

5.4.2 Successful Role Models

All 14 interview participants identified successful people, referring to them in other sections of the semi structured interviews, providing more context and scope as to why students thought these people were successful. Again, family members were the role models 71% of participants consistently identified. Participants mentioned "mum" as being successful a further thirteen times in these interviews.

Table 2: Most Frequently Identified Role Models

Successful role model	Number of times recorded as a successful role model	Number of participants who mentioned	Percentage of participants who mentioned
Mum	14	6	42%
Sibling	6	3	22%
Other family member	3	1	7%

Additional role models were mentioned throughout the semi structured interviews as the easy flowing conversation enabled reference to additional successful people in the context of the participants' stories. The identification of international celebrities,

musicians, politicians and sports stars as successful role models occured less frequently than mentions of family.

5.4.3 Attributes of Successful Role Models

Participants explained the criteria they used for identifying role models by discussing the things that they liked about them. Nine participants (64%) used variations of the term "role model" or expressed terms of "looking up to" and aspiration to identify with the role model.

Eight participants mentioned that having work or being employed in a job is what made these people successful;

"My mum and my older brother are successful. My mum has a job and my older brother (X) works in Wellington at Taylor Preston's and they both help out the family a lot" - Dennis

One recipient described a direct experience in education where she had witnessed a successful person, her mother, and the situation where she viewed her as successful;

"... my mum she went to uni… I can't really think about a time when I felt successful, but I remember when my mum graduated from uni I felt successful for her as she walked across the stage" - Ojay

Attributes identified in role models that were not family members included strength, standing up for themselves, overcoming hardships, making money and accomplishing dreams. These qualities were attributed to four frequently referenced international role models the politician Hillary Clinton, author J. K. Rowling, comedian Kevin Hart and musician Kanye West.

One participant referred to Hillary Clinton throughout the interviews as an aspirational successful figure because she possessed qualities of strength and confidence in confrontation.

"(Clinton is successful) Because she can defend herself, she's successful as when she stands up for herself and fights for something she believes in even if it's not a popular thing to say I have to admire her, that's success. I wish I could be that confident and stand up for myself and argue and fight for what I believe in." - Helen

Two participants admired J. K. Rowling as a successful role model because she overcame the odds of poverty.

"...J. K. Rowling the author of Harry Potter is a huge role model to me. She wrote a best selling series of books whilst being broke on the dole in a cold flat in England with a son.." - Nick

In response to a question "Why do you think this person is successful?" a participant posed Kevin Hart as symbol of success because he is someone who achieved his dreams.

"Knowing that me or a person has fulfilled their dream and what they want to do (is successful)... everyone told Kevin Hart he was too short, look at him now- selling out stadiums!." - Pao

Kanye West was described as "confident" and "brave" and someone that participants looked up to for his lifestyle, financial success as well as his confidence.

"Yeezy (Kanye West) is the man, he just says what he thinks- he's brave enough to say and do what most wont do even when the world laughs at hjim. That makes him successful and lives the best life with Kim Kardashian" - Leo

The role models and their attributes are broad ranging (for example a sibling with a job at a Meat Packing factory) to the other end of the work spectrum - international celebrities. Although the term resilience is not specifically mentioned in this context, it might be the resilient behaviour of overcoming challenges that students identify as the quality and attribute they admire in their role models.General consensus of the stories shared indicate the defining of the underdog as a definitively successful and inspiring role model, with the attributes of overcoming failure and odds, bravery in confidence

and strength and accomplishing goals as arenas of success that participants recognise, admire and aspire to.

5.6 Theme Two: Motivation strategies

Following on from goal accomplishment strategies, the third theme found was strategies of motivation- the processes, people or resources that the interview participants drew on for their motivation to complete tasks. Overall motivation was identified as a hugely positive state, yet knowledge of how to use it was limited. Four subsections explore the contextual situations where and when students experience motivation.

5.6.1 When motivation occurs

Participants were asked "Tell me about the last time you felt motivated?" and "What did it feel like to be motivated?". Thirteen participants shared responses on their experience with motivation. Positive responses describing motivation expressed excitement and happiness included terms like "feeling like the man". All 14 participants identified easily when motivation occured in their life, 93% responses however were related to out of school experiences. Five participants naming "holidays" as a time of being motivated explained it gave them time to explore new skills and practice their goals. Participants identified practicing sports, time to focus on their own interests including making music and teaching themselves new software as times that they feel motivated;

"I felt motivated at Christmas because we were on holidays and I had spare time to just focus on learning making beats- that's when I taught myself fruity loops" - Dennis

Three participants described situations where they were trying something new and were either "nervous" and "excited" as being highly motivating situations.

"Auditioning for drama was one of the biggest times I was motivated- it felt kind of euphoric". - Sole

One respondent described how being on holiday he experienced great motivation to achieve a sports goal he had wanted:

"Motivation feels like "if you've been awake for 24 hours, you can't think of anything else BUT sleep. I have been away from football for so long that I really enjoy it" - Sam.

Another participant explained when bodybuilding and training he feels motivated, and he goes to this activity of weight training for regular motivation topping-up.

"Training has become a work habit that I just do when i need more motivation. It's something that I can apply all around" - Jake.

Of all the responses where motivation occurs, almost all motivational experiences happened outside of school from intrinsically motivating, self directed activities based on students interests, suggesting that students are not experiencing motivation within school.

5.6.2 What motivates

This section sought to understand what resources, products, videos, services or other things secondary school students go to as a source of motivation. Eight participants were able to describe things that motivate them, however six participants (43%) did not know what motivated them. Participants made frequent mention of visual media as a motivator including TED Talks and favourite films. "YouTube" was mentioned by seven (50% of) participants and 29% of participants mentioned specific YouTube channels and content creators as motivating.

"...I watch videos and movies of people mostly people like Cristiano Ronaldo there's movie about him and all the stuff he has like a house and cars and a good life and that motivates me hard out" - Laney.

"Motivational TED Talks… (have) the amount of stuff that you can learn about something that your stuck on can motivate you to do something different" - Sole.

One participant said that he motivated himself at school by reading inspirational quotes in a book, and two other participants mentioned seeing inspiring quotes on the wall at the library as motivating.

"There's a quote book a big fat book in the library at school and I read it" - Zayd

Most participants (57%) could identify motivational sources predominantly naming visual media both static and animated as a motivating resource for students. It is concerning that 43% of student participants could not identify activities or sources that motivated them. It is hoped they can name people who can motivate them.

5.6.2.1 What does motivation feel like

Participants were asked "What does it feel like to be motivated?". Responses detailed repeated sensations and words describing the feelings associated with being in a state of motivation.

Table 3: What does motivation feel like and when did it happen

Feeling of Motivation	Situation	Who
"Cheering" "self-belief"	When actor told him "I see the talent within you"	Pao
"Euphoric" "powerful, positive sensation" "So hyped"	Auditioning for a play	Sole
"Hungry" "something you love"	When a friend challenges you at school	Zayd
"Good" "Exciting" "hard"	Learning Fruity loops Software and making music	Dennis
"Felt like the man"	Performing music on stage	Lee
"Happiest"	Singing with friends	Helen

"Energy" "Happy"	Playing spike ball	Ama
"Good" "excited"	When waking up early and being "ahead of the game"	Nick

One participant described motivation as feeling like something that you have to because you can't think of anything else;

"Motivation feels like "if you've been awake for 24 hours, you can't think of anything else BUT sleep. I have been away from football for so long that I really enjoy it" - Sam.

Eight participants shared what being motivated felt like and illustrated examples where they felt motivated. Six participants could not answer the question and said, "I don't know".

5.6.3 Who motivates

Most prominently parents, family members and friends were identified as motivators, able to motivate participants in school work, sports and personal goals. Eleven or 79% of participants named "whānau", "family" and specific family members as motivators. Seven participants (50%) identified "Mum" and five (36%) found "grandfather" "grandmother" and "uncle" as key motivators. Four participants (29%) friends as being valuable sources of motivation. Three participants (21%) could not identify a person who motivated them.

Three participants recognised their own ability to motivate themselves, relying on themselves to get back on track toward their goals.

"Whānau is the only reason I am still doing what I'm doing, they keep me motivated to keep going. Just getting a text from Mum is enough to make me want to keep going and she doesn't even live in New Zealand" - Leo

"If I ever feel like things aren't working out or I need to feel more energy to keep going I go talk to my grandma cos she always reminds me to try hard, stick it out boys" - Zayd.

The responses to motivation based questions was concerningly sparse suggesting a lack of motivating experiences, opportunities and resources available for secondary school students. Motivation when it does occur happens out of school (93%) of responses were related to out of school experiences). Whilst whānau-family was definitely the number one motivator identified by 79% of participants of concern is 43% of student participants could not describe motivating resources or things.

5.7 Theme Three: Resilience and challenges

Resilience in this context is finding where students need help to overcome obstacles. All participants shared experiences of feeling overwhelmed in a challenging situation and what they did to overcome it. In an attempt to understand what parts of their academic lives are hard and what help they may need participants were asked "What is the hardest thing that has happened at school the past couple of years?".The responses were grouped into three sub themes (1) a lack of family and teacher support (2), a lack of confidence and (3) overcoming challenges.

5.7.1 Lack of family and teacher support

Nine participants (65%) shared obstacles resulting from a lack of support from teachers and family members resulting in participants feeling "unmotivated" "annoyed" and "upset".

Five participants (36%) shared obstacles when they felt that teachers at school were unsupportive, one participant describes feeling sabotaged.

"The hardest things that has happened the past year was when someone went behind my back and stabbed me in the back. But it was when the teacher got involved that I got attacked on all sides and I didn't know what to do" - Sam

Four participants (29%) described fights with family as obstacles.

"My dad sucks. He always tries to talk to me about reality. He always says bro, your gonna start working with me, your dreams are too big" - Lee

5.7.2 Lack of confidence

Four (29%) participants shared situations where a lack of confidence to perform a task or a lack of ability to speak to an adult about a situation as challenges. Examples shared included not being able to tell a teacher about something they had done, a lack of ability to articulate what kind of help they needed and an inability to approach a difficult conversation with an adult.

One participant described how he did not know how to speak with his sports coach about his lack of attendance as a source of great "unhappiness" and hardship for him:

"My last game of rugby for some reason, I just didn't want to go. I was late, so I didn't want to go at all and didn't want to go to training or another game again. The hardest part of it was that I needed to call my coach and tell him I wasn't playing. I was lucky he didn't pick up his phone and I just left a message" - Sam.

Three participants mentioned feeling "embarrassed" or "ashamed" or "shamed" in retelling stories of hardship at school. Situations which caused the embarrassment were failing a test or falling behind in a subject at school. Two participants mentioned shame around hardship in the subject of "English" at school.

The responses to this line of questioning were very genuine and sometimes invoked emotive responses. One participant cried, and appropriate support through youth workers available on hand was sought.

5.7.3 Overcoming challenges

Understanding student goals and aspirations was the second major theme which indicate what students may want to strive toward and how they plan on achieving it. This theme looks first at the specific small and big picture goals then explores how student participants would strategically meet that goal.

Whilst 50% of participants had a goal with a plan, or at least had developed a cognitive connection between a goal and strategy to accomplish it. Of these respondents, 100% or 7 used variations of the word "motivated" and 35% or 6 identified "working hard" as a strategy to goal achievement.

One participant shared that he was not confident in following through in his goals.

"I would need to set a goal for myself and do it, but I don't usually think I can set goals because I don't always finish what I start" - Nick

All participants were asked if they learnt about goal setting at school, 93% or 13 of participants said "no" indicating a significant skill shortage in students ability to connect an aspiration with a logical follow-through program of how to achieve it.

Whilst all participants were able to share big and small dreams and goals, there was a lack in both practical goal setting strategy and goal accomplishment knowledge. Students were not being supported in or motivated toward goals.

All participants shared a challenge, however only one participant (7%) was able to offer a solution to overcoming the challenge. One participant decided cease communication with his father after a confrontation, and instead speak to his mother overseas which allowed him to focus his energy and time on his goals:

"There was only one way to get back to how I want to be, not talk to him and just my mum instead. She supports me from overseas, and at least there's someone who is supporting me. Not much people support me in my life, except for mum and she's not even here" - Lee

Resilience was identified in the challenges participants shared. Although they did not use the term 'resilience' the way they described their stories, they exhibited resilient behaviours in overcoming an obstacle. The fact that only one participant was able to articulate how he overcame an obstacle is concerning, suggesting that either students can not see their behaviours as resilient or that students require assistance to overcome obstacles. Obstacles with school teachers, family members and a lack of confidence contributed to challenging situations participants faced, providing a useful context to resilience.

5.8 Theme Four: Response to a motivation and resilience product

Eight of the fourteen participants (57%) said they would use a motivational product or service to help them secure greater success at school, six participants (43%) could not imagine using it. This response was lower than expected, some participants stating they would not know how to use it (29%). Feedback from participants includes features and pricing.

5.8.1 Features

The interview schedule opened the floor for a free flow exchange of ideas, and i to participants' that any idea or contribution would be greatly valued, and as such, a broad range of responses to the question emerged. In this section of the findings, results have been condensed to capture as wide a range of participant responses here as possible. 12 responses mentioned an "app" , downloadable for mobile phones. Most suggestions for features that would help students related to having motivational conversations and using technology because of its confidentiality.

One participant suggested a confidential motivational app where you could speak with a motivational speaker would be good as they thought it would be easier so that "*that you don't have to speak with someone face to face"*. The motivational conversation does not need to be with a person you know to "...*give you feedback to help you be more successful in whatever it is you want".* In a similar vein another participant suggested you could call in to the app for a "*pep talk to get yourself confident for something before you do something that scares you".* The participant suggested that you could have various categories for help including "debate with a teacher", "stand up for yourself", "conversation with a teacher", "job interview" and "preparing for tests". One participant suggested you could have the option for a call or text function explaining *"The difference would be that the email/text (is) always confidential in that (users) don't know who they are speaking with*". They went on to explain that it "does not need to be a human voice (on the app)".

These suggestions included goal setting and reminders for specific goals, a focus boosting service for study and a space or directory for "good resources" because "that's what teachers tell us- find good resources". Other features included confidentiality, feedback, motivational pep talks, standing up for yourself, gaming, focus boosting and a directory for good resource.

As participants provided ideas for an innovative solution that was posed at the end of the interview schedule, the suggestions continued in the theme of 'needing help' with motivation and confidence related challenges. Several times participants shared stories of wanting to 'stand up' for themselves (14 times) in the context of school with both peers (10 times) and teachers (4 times). The suggestions participants made will be considered in the discussion chapter.

5.8.2 Pricing

Half or 50% of participants suggested the solution should be free for reasons including price or cost being a barrier to some, and comparing the solution to many other widely used services which are already free (e.g., YouTube, Facebook, Instagram).

Four participants did provide justifications for charging for the product or service suggesting a premium version for the product charged at a subscription rate like other widely used premium versions of products including Spotify. YouTube Red, Xbox and Netflix.

Table 4: Pricing Justification for a Motivational and Resilience Product of Service

Free	Justification
Ojay	Like Instagram/YouTube
Zayd	Not everyone has money to pay for this
Sole	Free and pure like accessing YouTube- needs to be accessible for everyone.
Laney	School Library and teachers should give it to us
Dennis	Because I don't pay for apps I only download the free ones
Pao, Ama	N/A

5.9 Findings summary

The data collected from fourteen secondary aged school students between the ages of 12-19 answered the key research objectives. Four central themes helped structure the recorded data into relevant contexts to inform the analysis and discussion sections. These themes interlocked to answer the three research objectives below.

Research objective 1: understand what strategies students use currently in achieving optimal modes of success in regard to building resilience and maintaining motivation to complete tasks.

Whilst a range of experiences and perspectives were shared on success, the findings revealed a lack of strategies being utilised by students in their academic and personal lives. Whanau was the strongest source of support and utelising family members for motivation was the main strategy students employed in attempting tasks. Participants mostly experienced motivation in various activities outside, not inside of school. Visual media including videos and image quotes were identified as motivational.

Research objective 2 : To identify pain points where students face obstacles in their learning environments, and understand how these can be addressed through resilience and motivation.

Pain points or challenges were identified in students learning environments and outside of them which create obstacles to their learning. These include a lack of confidence and a lack of general resilience in the face of difficulties. Resilience and challenges were shared by all 14 participants, yet thirteen (or 93%) participants could not describe overcoming the problem or hard time. Participants identified a lack of support, lack of confidence and shame as factors that hindered their success.

Research objective 3: To gauge students enthusiasm for a technology based application that will help them build their motivation and resilience.

Participants were mostly responsive to a motivation and resilience training product and shared insights into what they would want in a support tool.

This knowledge will be used to validate the commercial offering, building a business case for an application that provides motivation and resilience training.

5.10 Analysis

Participants did not generally appear to know much about using strategies such as goal setting, motivation or resilience in application to their academic success. Whānau-family was identified as the strongest contributor to achievement, however there was very little positive reflection on achievement in a school setting. The times participants discussed motivation were occurrences that were predominantly out-of-school. The key themes identified in the findings were (1) Definitions of success, (2) Motivation strategy, (3) Resilience and challenges and (4) Positive response to a motivational product or service. The analysis of the findings connects the data collected with wider trends including literature to paint a clearer picture about the themes which are present in the collected data and could be relevant to a wider student populous.

After a third analysis of the raw data, literature and the findings, three analysis threads were identified:

1. Whānau/Family

2. Lack of resiliency and self-efficacy

3. Resources used

5.10.1 Whānau/Family

Strong whānau relationships were an important determinant of success to participants. Whānau as a unit as well as individual members of the family were found to be the theme which most prominently defined success. This is consistent with a body of research (Bosmann-Watene, 2009, Kay, 2008) connecting whānau role models to Maori student success. Family relationships positively affected the participants definitions of success. In the findings whānau as a collective, and individual members of whānau were both the most significant definition of success (100% of participants mentioned a variation of the term family) and source of motivation to students (79%). Motivated by

intrinsic and the extrinsic motivation, Whanau leads to high levels of self-efficacy (Bosmann-Watene, 2009).

Kay (2008) explored a correlation between Māori students motivation and self-efficacy, and the frequency with which a family member would support them. The findings highlight a significant determinant of success and should be incorporated into the proposed solution. Incorporating the context of whānau elements into a solution for students could help build student motivation to stick at their goals. The contexts of whānau influence in relation to motivating a student should be explored further as it may prove to be a valuable key to sustained student achievement. This family-centric motivation source is consistent with international studies. Newman et al., (2000) found in a study of African American secondary school students that almost all participants when asked about who is successful and motivating, they nominated their mother as the primary support for their motivation and subsequent academic achievement.

Connecting whanau and home life with school learning life should be interrelated and reciprocal (Bishop, 2003). A partnership between the home (whanau) and the school could raise student achievement for Maori and connects teachers with students and their whanau where motivation can be leveraged between both sites. This reciprocity of harnessing motivation between home and school connecting a fluid learning and educational experience is a step toward the 'anytime, anywhere' learning movement. The portability of technology allowed participants to access technology regularly. The fluid portability might be a factor which could link family and home life with school life, in a way to combine the motivating influence of family more regularly in school. There is a real gap between learning at home and learning at school which needs addressing (Chu et al., 2013). A digital solution could be the link between home and school learning, a tool which is ever present and available when students need it.

It was surprising to me that sport stars did not trump whānau as identified success symbols and as motivators. Whilst footballer Cristiano Ronaldo was mentioned as a symbol of success by 2 participants, this did not come close to nearly all participants who nominated whānau as motivating and successful. This may be due to a shift in a move to temper students perceptions of sport as success with a more evenly balanced weighting, an outlook which includes academia and other pursuits outside of sport. In a study on Pasifika secondary students, Fairburn-Dunlop (2010) reported that visits by Pasifika All Blacks players to the sample school encouraged some students to study harder instead of the motivation relying solely on sporting outcomes. Participants shared a wide variety of role models including politicians, writers, comedians and musicians. Sports role models were the minority. This reinforces the value of exploring the links whānau can make in assisting student achievement, whether the links are tangible in the forms of the physical presence of whānau, or whether the same motivating effect can occur in a digital format.

5.10.2 Lack of resiliency and self-efficacy

The first research objective was to understand what strategies students use currently in achieving optimal modes of success in regard to building resilience and maintaining motivation to complete tasks. Whilst the findings revealed limited strategies at all, and that family was both a success marker and a motivator, the findings suggested a lack of strategies and also a significant lack of knowledge about motivation and resilience.

Feelings of shame enforced a narrative of lack of self worth amongst some participants. Five participants expressed a strong theme of feeling embarrassed to do something about a problem. This was forthcoming and insightful of the participants to share deep stories, the authentic and deeply personal stories indicated trust of me as the researcher, and a motivation to get things off their chest, like therapy.

When participants shared stories of feeling embarrassed and shamed at school for not achieving at a higher standard, and expressed a lack of confidence in asking for help, notably, expressing the need of help to adults, these factors contribute to a student who has negative self concepts about her abilities. This is consistent with a theme in Pasifika education where students are shy and do not ask for help (Chu et al., 2013).

Whilst some students may instinctively ask for help, some students with confidence may not feel supported or enabled to approach adults for help. Interestingly, it is this very trait which was revealed in the findings about the product where students mentioned 'confidentiality of information' and being able to text or email someone for help instead of having to talk to them like one participant found difficult when he couldn't tell his rugby coach that he couldn't go to soccer training.

Some students did seek help, just not that of an adult or a teacher. They sought YouTube to gain motivation. The only motivation seeking strategies posed were TED and YouTube videos. This is a valid motivation strategy, but was offered by only two participants. Online videos are an easy source to access through a website. This is an indication that some participants made a concerted effort to seek out a motivational resource when they felt like they needed help. This is an indication that the participants were able to identify when they were in a state of need. This response was coded as a sign of resilience, but this is not an example the participants attributed to resilience, they did not see the taking of action in pursuit of their needs to be motivated as a resilient act.

5.10.3 Resources used

The research participants had access to smartphones at home and computers at school and the library which had free internet. The findings and literature found a high number

of mobile and digital devices amongst all young people in New Zealand. Features on a mobile phone such as MP3, internet and camera can support learning outcomes (Jacob & Isaac, 2014), which could help inform an innovative solution with its added functionality.

Recording inspirational messages in video and audio form with family could be motivating for students and a good use of the affordances available in smartphones. Manuguerra & Petocz (2011) studied the use of podcasting and pre recorded learning content amongst first year university students. The findings indicated an increase in learner satisfaction with university content which was able to be downloaded and played in video and audio format on students phones.

Resources which are socially and culturally relevant could be key factors to engaging underachieving students toward successful outcomes. A study by Rubie et al. (2004) found that Maori students were able to improve self-efficacy and a positive internal locus of control by incorporating good teaching in a culturally relevant way. The researchers connected cultural relevance with school lessons which included an expansion of responsibility, setting mastery goals, awareness of the importance of persistence and effort which resulted in improved motivation and increased self-efficacy. Increased motivation occured through making the learning relevant culturally to these students.

Some media access and use could be a reflection of environmental factors. Use of YouTube and TED Talks might be a comparatively poor learning opportunity in comparison to some students who may be using a wider variety of online media to help with achievement. A poorer quality of technology use was a usage pattern identified in Students from lower socioeconomic communities (Jesson et al., 2015) which could lead to poor academic achievement. It will be important then to maintain a high quality of the

tool and consider robust metrics for quality control so that students get god value in the form of quality material from a solution.

The analysis of findings has linked the data collection to wider implications beyond the immediate business case. Understanding the tangible value of whanau, of the impact of low resilience and motivation strategies and an indication as to what resources the target customer has a preference for culminates in an understanding of the world the customer lives in. The next chapter (Discussion) will view this world with an innovative lense in an attempt to draw solutions and innovations, combining ideas, strategies and, worlds.

Following chapters:

Chapter Six: *Discussion*

Chapter Seven: *Business case*

Chapter Eight: *Conclusion*

Chapter 6: Discussion

The intent of this research is to determine whether the service of Moemoea as a proposed concept would assist student users in overcoming challenges of poor academic achievement and whether this service could be feasibly commercialised. The investigation now turns to a focus on the market for a motivational and resilience training product.

Investigation was made into who would pay for this service, to understand the commercialisation potential from the perspective buyers (the student interview participants). It was thought that the service would be made available through a website and application for mobile device through a user account subscription fee for premium users whilst also providing a free-access basic service (freemium). With ongoing use, it was hoped that free access users to the service would in time, convert to premium paying customers.

However it became apparent that commercialisation of a motivation and resilience building product for secondary school students in New Zealand would not serve the underlying issues identified in the research, most significantly, an inequality in academic outcomes due to disadvantages in socio economic backgrounds. There is a clear inequality in the potential academic outcomes between high and low socioeconomic students, and a plan for commercialising a motivational and resilience training product for student is counterintuitive to the issue of inequality.

Beginning with the customer problem, the findings and literature demonstrate a clear need for an improvement in academic achievement, and validation has been sought to develop a solution incorporating behavioural science.

The literature revealed factors contributing to student underachievement and explored strategies rooted in behavioural science to overcome them. Motivation, resilience and self-efficacy have been identified as key noncognitive skills which students need to harness in their approach to boosting academic achievement. Participants appeared open to these concepts and also provided evidence that they did in fact struggle with these non cognitive skills in relation to their achievement.

PIVOT

In the proposal stage of this project I assumed offering Moemoea as a commercial offering to individual students and to school students would be built around a subscription based model. The focus of this business model pivoted when 1) it became apparent that commercialising the solution to student underachievement would not help underlying elements causing underachievement, and 2) study participants predominantly wanted the solution to be free, basing their pricing justification on the widely used apps and sites they used which were free (eg. GSuite, Facebook, YouTube)

BUSINESS MODEL

The findings revealed that the primary concern was cost of the solution. The customer is likely unable to pay for a tool, even at a nominal fee, subscription or low price point. Most participants agreed the tool should be free to download. If the price point prohibited access to the tool, the business model had to pivot away from a premium/freemium subscription model assumed.

Guided by the lean startup model (Reis, 2011) research focus returned to prioritising the customer and understanding the wider context of the customer problem. Focusing on the core customer group reframed the project proposal to developing a solution that

would cater to the needs of the student customer most in need of a solution. If Moemoea is offered at a price this may isolate this identified customer who needs the solution most, and propagate a digital divide enabling an inequality of access. Investigation into setting up a social and not a commercial enterprise should be made.

Most students suggested in the findings that whatever form the solution took, it should be free. Whilst this solution aims to appeal to all secondary school students in New Zealand, the priority was made clear in the introduction that the most urgent needs of underachieving students will be met as the first priority, and successive development of a solution can be expanded to ensure a solution to all students. There is a risk of differential access to technology due to socioeconomic factors impacting on student achievement gaps (Matthew Effect), creating a digital divide', identified in New Zealand by research by 2020 Trust (2014). The research pointed out that in lower socioeconomic communities there was a difference between digital online learning at school, and a reduced amount at home due to cost prohibitive internet access (2020 Trust, 2014).

A business proposal should be made where access to the solution is free for secondary school students, and commercial offerings can be made in the future or considered in conjunction with a working solution to the core customer group. Setting up a social enterprise in the projects infancy to develop the solution with government support, testing and roll out is considered an imperative. Commercial streams of income to sustain the project into self sufficiency could be introduced once the core operations are achieved. This will require strong leadership and a clear structural plan.

FUNDERS

Multiple government agencies have policies and strategies which allocate funding toward key ministerial priorities. The literature revealed that digital inclusion, technology

access, underachieving students, Maori and Pasifika students were all targets of government funding to improve student achievement and also future workplace skills. These policies were a priority for the Ministry of Education (MoE) and the Ministry of Business, Innovation and Employment (MBIE). It is likely that a government agency sitting on the intersection of education and technology would be interested in a solution which which sat across the same industries and was catered toward the very client- underachieving students- the agency is targeting funding toward. Therefore it is the government ministries and agencies which should be identified as the paying customer to the innovative solution. The student will still be a central key stakeholder in the problem as they are the user, and the focus of the innovation.

A DIGITAL PROPOSAL

The findings from the literature suggest an encouraging trend toward the adoption of mobile learning using smartphones and portable, affordable digital devices. This is evidenced in MOOCs and other online programs and software programs which are becoming more prevalent in education. Although the participants were not users of many of these programs or courses, the validation has been made in the literature as to both the commercial viability of online, portable, technologically enabled education solutions as well as its pedagogical efficacy. Learning online and digitally can be an effective learning strategy for students.

A digital tool allows flexibility for the student to participate in learning 'anywhere, anytime'. A digital solution can link home to school and can be used in private or in conjunction with school work. The literature identified trends toward favorability of flexible digital learning tools, suggesting a receptive environment to a digital learning aide.

It would be opportunistic to release an educational technology product or service in this current environment of digital readiness. To do this effectively, the solution needs to

appeal to the user. Where the participants of this study did not often use digital technology to improve their academic standing, the evidence and case has been made for learning efficacy. The gap between that technology and the participants of the study is cultural capital- the products and services are not relevant either socially or culturally. A solution needs to encompass social and cultural relevance to appeal to the at risk secondary school student market.

The findings provided evidenced based recommendations on using a digital product although some findings were unexpected. I expected to hear a broad range of motivational and resilience tools and websites being volunteered by participants. I had assumed secondary school students would have known about Khan Academy, Code.org and other websites and apps that can help student learning. I was surprised that there was very little volunteering of technology as an education tool, yet participants did stress that they enjoyed consuming technology naming YouTube and specific YouTube channels and their content as 'motivating'. WIth the abundance of available sites and apps a fingertip away, I was surprised that participants did not take the initiative to use them when they needed additional support in learning.

SELF-EFFICACY AT THE CORE

The findings identified a lack of confidence in participants, suggesting that the first research objective which focused specifically on developing 'motivation' and 'resilience' may in fact be redundant if, in the first instance, student self-efficacy is not at a high enough level to engage motivation and resilience strategies to complete a task. More attention ought to be placed on building high levels of self-efficacy within school students, as it is self-efficacy which directly regulates emotional wellbeing through motivational processes. Self-efficacy is essential also in the development of resilience - when students believe they will be able to overcome an obstacle they are more likely to reject negative thoughts about their abilities or themselves. A higher self efficacy level in a student user means a higher level of engagement and likelihood of engaging

effectively with the motivational and resilience lessons in the solution. The solution needs to facilitate the teaching of motivation and resilience modules to students, because their knowledge in these strategies and human functioning appears to be sparse. Underpinning these two noncognitive competencies, the solution must at its core ensure the user maintains and builds a consistently high level of self-efficacy. The solution must demonstrate modules which build self-efficacy as well as the interrelated competencies of motivation and resilience.

It was also surprising that self-efficacy and self worth seemed to be the most significant undercurrent in the themes regarding student factors of underachievement. This theme was not picked up at the time in the first analysis of the findings but upon reflection of the data, it appears that participants betrayed signs of low self-efficacy throughout all sections of the interviews. The signs included repeated words "shame" and ":dumb" notions of not being confident to ask for help, let alone stick up for oneself against a teacher they may disagree with. Whilst writing the analysis the theme reared its head now and then, but I was motivated to report on what was in front of me- data which validated a proposal. However upon revisiting the data, the theme is unquestionably there, consistently throughout most of the interviews, weaving a thread of low self-worth and a generally negative concept of self. It is low self-efficacy which effects motivation and resilience, so it is self-efficacy which needs to have resources to develop ways to life students opinions of themselves.

"Students who believe that they are able and that they can and will do well are much more likely to be motivated in terms of effort, persistence, and behavior than students who believe they are less able and do not expect to succeed."
(Pintrich, 2003, p671).

DEFINE AND TRAIN NONCOGNITIVE SKILLS

Students need to understand what motivation and resilience is before they will see the implicit value of using the tool. Analysis of findings revealed that students were already employing methods of resilience and motivation in their academic and personal lives, but they did not know they were as they could not identify it in themselves. Basic introductory content in the form of learning modules would allow students to understand they already have some existing non cognitive strategies up their sleeves including resilient behaviour. Building in capabilities to the solution such as a reflection journal could allow the user to record modules of their goals including setbacks, and in the reflection, apply the definition of resilience to their behaviour and understand its application within the context of their lives.

UTILISE WHANAU IN A SOLUTION

Family and close relationships with siblings and most significantly, mums, appear to be a significant consideration in the maintenance of student motivation and resilience for success. In these findings whanau related to motivation and the findings showed motivation related to whanau in how participants needed support from whanau to be motivated and reciprocally in their definitions of success, wished to support and provide for the family. Reflecting on the participants' stories I see the significance of caring for whanau and how important whanau structure is to some students in maintaining motivated and resilient against obstacles. The solution must incorporate elements of whanau such as audio recordings or video recordings which users can take with a digital tool and build up a database of portable family motivation audio tracks and videos. This could be incorporated into an app or website where a motivation section plays the family recording, an encouraging message or video at a preselected time, or at a self-selected time when users notice that their motivation levels are low.

Similarly, in the findings under role models, participants identified role models such as Hillary Clinton, J. K. Rowling, Kanye West and Kevin Hart as people they identify as successful. In the telling of why these people were successful, it was discovered that participants found parts of these role models motivational, and aspirational.

Consideration needs to be made to the possibility that a role model whom participants have not personally met could be inspiring and motivating to users. Space should be made within the solution in the motivation section to inspire users with their favourite self-elected role models, incorporating inspiring aural, visual and written messages associated with the role model.

VISUAL AND AURAL MEDIA

Following on from utilising recordings from family and role models, findings suggested that visual media was utelised as a motivational strategy. Linking YouTube videos into the motivational section of the solution, including space for the user to share their preferences and select who they want to motivate them on their screens is an important consideration.

VOICE OF THE TOOL

The tone of the instruction and feedback guiding the student toward motivated resilient goal achievement will be gentle and friendly, following e-learning guidelines by Clark & Mayer (2008). Building an authentic conversational style with the user which is relevant, incorporates slang and culturally relevant language such as encouraging Maori expressions "Ka pai!" "Ka rawe!" can engage the user meaningfully with Moemoea. The voice of the digital tool should be a friendly human voice (Clark & Mayer, 2008). Identified role models and successful aspirational figures should be implemented into the solution, their voices or visual images of the user identified role models could guide activities and increase motivation of students with its social value.

CONFIDENTIALITY

Participants suggested benefits to the solution might include being able to feel motivated after having a motivational conversation with someone you knew or you did not know. Three participants spoke about being unconfident to approach an adult to

have a courageous conversation with them. One participant suggested he needed to get 'psyched up' or encouraged to stand up for himself and speak with an adult. He said that getting a 'pep talk' would motivate him to be more confident and stand up for himself. The solution ought to consider ways where users can train and practice doing something that makes them feel uncomfortable. Another user suggested being able to text or email someone within an app when they didn't want to speak with someone face to face or on the phone. He used the example of when he could not make a rugby training and felt so guilty that he refused to tell his coach face to face or speak to him on the phone. He said he left a text. That might be reasonable in some situations but it would be helpful if the solution incorporated the ability to practise doing something that makes the user uncomfortable so that they develop a higher resilience toward obstacles that might hinder them. One participant also suggested having a call line within the solution for mental health where a counsellor could be approached. This idea was welcomed by me, but the depth of expertise in the mental health industry would be beyond the scope of this project at least in the projects infancy. Although it is wise to be open in defining what the solution is, it is also wise and potentially equally helpful to define what it is not.

SELF DIRECTED APPLICATION

Teachers were described in unfavourable anecdotes by participants suggesting a lack of a quality relationships with teachers. Teachers were not identified as motivators or related to success definitions. The only references to teachers in the findings were in the context of negative situations of conflict and students wanting to "stick up for themselves" and not feeling heard or supported.

Literature has widely covered the huge demands teachers experience on the job. According to much research the introduction of technology into the classroom placed additional strains on the teacher, resulting in a reluctance by some teachers to learn about the digital application and invest extra time into learning the technology as well as

teaching and implementing the technology on top of their existing responsibilities as teachers. A solution needs to consider the fact that teachers and education staff already have huge demands placed on them. The solution needs to be simple, accessible and easy to be picked up and intuitive enough to be self taught and self managing by the user. A digital tool which is user friendly, intuitive and flexible to extend inside the classroom to the bedroom could be a website or an app on a computer, a phone, or tablet.

MULTIPLE ACCESS POINTS

The solution needs to be accessible to student users in the event that they do not own a personal mobile or digital device. The solution needs to be accessed seamlessly and consistently across schools, public places including libraries and civic buildings and other spaces where access to digital devices and wifi is easily accessible.

RELEVANT CONTENT

Findings found that whilst some participants used YouTube videos to motivate themselves, they were put off by other content or videos which was not made in mind for a New Zealand secondary school student audience. Therefore content in the solution needs to incorporate appropriate language and slang for the user in the solutions architecture, user interface and the way the solution provides video and audio material. This process is important for users to engage with a new solution, and this is where the MVP would be best tested- directly by the intended user and iteratively adjusted until it responds engagingly to the customer.

INTELLECTUAL PROPERTY

Intellectual property (IP) was not a primary concern in the development of this project. Whilst the concept and the content and format of the learning modules, software architecture and the interrelatedness of the behavioural science principles within a digital interface could prove to be worthy of IP protection in the future. This will need to

be a consideration for leadership. At this stage of the research before the MVP development has been completed, the consideration of IP protection carries little weight.

PRODUCT VALIDATION

Findings found a positive response from participants in regards to a motivation and resilience training product. A majority of participants said that they would use the proposed product and the above discussion points are the suggested features and functionality that participants shared. Although an MVP has not been tested on participants, validation for the concept has occurred, providing impetus to continue the development of an innovative solution to student underachievement.

This discussion has raised implications of the findings and analysis for the business case in the next chapter for 'Moemoea'.

Chapter 7: Strategic Business Case

"Moemoea: an app for student motivation and resilience"

A Proposal to Improve Secondary School Student Motivation and Resilience in New Zealand.

September 2018

7.1 Executive Summary

This document presents a business case to targeted investor audiences for Moemoea, a digital product designed to develop Secondary School students' motivation and resilience in their studies. The purpose is to seek investment for the design, development and launch of Moemoea into the hands of its users – New Zealand secondary school students who want to improve their academic outcomes at school. The mission statement of Moemoea is reflected in its name - (Moemoea, Te Reo Māori) means to dream, to aspire to goals, and to achieve those goals. Moemoea is specifically designed to empower students to achieve their goals by developing the motivation to focus on goal completion and build resilience against setbacks.

Moemoea is a digital resilience and motivation builder for school students designed for easy user access online and in an app on any digital device. Combining audio, visual and interactive activities, the product trains users in effective strategies of goal achievement utilising its optimal intellectual property of behavioural and noncognitive systems rooted in motivation and resilience. Five interactive sections help the user break down a goal into manageable components whilst interactive training games teach success strategies which build user confidence to self-motivate themselves toward goal completion.
Specifically designed for the niche New Zealand secondary school market Moemoea provides an engaging user experience with pedagogically, socially and culturally relevant curated material. This customer centric digital product built in direct response to the suggestions and needs of secondary school students is also efficacious beyond year 13, preparing users with success skills for workplaces of the future.

Internationally, the education industry is adapting to digital technology. Digital tools and resources are more readily being accepted and adopted into homes and classrooms by

educators, students, and parents while the importance of resilience and motivation in education is increasingly recognised in international studies.

Preparing students with the skills of self-motivation, resilience and goal setting have resulted in improved academic outcomes and lifelong skills for success. Young people urgently require these skills now more than ever as social, economic and technological change bring challenges to their studies and future work opportunities.

Numerous studies warn that the transforming labour market in New Zealand and globally produces new industries and roles every week, requiring workers to solve new problems and to carry out non-routine tasks. Motivating oneself and maintaining resilience in an ever-changing labour market are essential noncognitive skills that young people need to start learning now.

Sir Peter Gluckman, formerly Chief Science Advisor to the Prime Minister, stresses the need to redevelop learning structures for youth in New Zealand to ensure resilience amidst social change. Gluckman recommends investment in developing capabilities in young people including motivation, self-regulation, focus and the ability to complete tasks. Moemoea is focused on learner growth and the transformation of students learning potential. The product supports its users in building the required level of resilience and motivation needed in a changing learning, social, technological and employment landscape.

The encompassing project report discusses the importance of learning resilience and motivation in youth, and its positive effect on improved academic performance. This business case discusses the business functionality required to launch Moemoea.

7.1.1 Strategic Case

Moemoea views the critical need to support student's competencies for success as its primary objective. Therefore, this business case proposes the set-up of a charitable

trust where relationships with funders can facilitate the building and release of a free base product into the hands of secondary school students in New Zealand. At its core, Moemoea is motivated to improve outcomes for students, with its charitable trust able to direct this social goal initially as a non-profit enterprise through three development phases.

Phase one, *initiated after funding; create the base Moemoea application, a minimum viable product (MVP) guided by the lean startup business model.*

Phase two *test prototypes of the Moemoea App on students in eight New Zealand secondary schools. Ongoing analysis and reviews will be conducted to measure outcomes, engagement and user satisfaction. The MVP testing will be implemented to enable the use of the lean startup feedback mechanism for the prototype to be adjusted and edited, undergoing development updates based on the prototypic app from student feedback of the app. It is estimated that the second phase of testing will take approximately three months.*

Phase three *will present an iteratively implemented app for **release and launch** into the New Zealand education market in partnership with stakeholders. This step requires expanding the awareness of the product through marketing and getting it into the hands of secondary school students.*

Commercial Opportunities *will be sought after the completion of phase three exploring applications of the base product into a commercialised premium product through Moemoea's commercial arm.*

7.1.2 Organisational Structure

The structure of the proposed organisation will be more clearly outlined in the following sections. As a technology startup, initially the structure will require malleability and flexibility through transitions between phases one through to three. A central working group of core developers will develop a governing body drawing on the strengths of working and industry connections, specialist technology and pedagogical knowledge and skill sets. This central working group will be led by a director. The group's first task

will be developing funding partnerships such as government ministries who can promote Moemoea to schools across the country where funds to purchase the product may be limited. A commercial arm will be established following phase three, to explore commercialisation opportunities of the product. This is explained further in the report.

7.1.3 Key Stakeholders

Key funding stakeholders are envisaged to be government ministries of New Zealand. These include the Ministry of Business, Innovation, and Employment (MBIE), the Ministry of Education (MoE) and Te Puni Kōkiri (TPK).

Key user stakeholders include the New Zealand secondary school student as well as individuals who exert great influence over this user group: teachers, principals and parents. Each of these four user stakeholders will be convinced of the efficacy and value of Moemoea to students who wish to experience greater success in school. Commercial stakeholders will also be sought after completion of phase three including interest from partners seeking the products software for use in education and enterprise. These may include private workplaces, other State-Owned Enterprises (SOEs) and other entities where leaders of industry see the value in up-skilling individual workers in their ability to self-motivate and develop resilience.

7.1.4 Financial Case

It is envisioned that Moemoea will be able to develop a network of support through developing joint venture partnerships with private and government agencies. This may be in the form of direct investment or sponsorship from contributing stakeholders.

As a charitable trust Moemoea will have the opportunity to focus initially on the best product possible to serve its users with commercialisation being led by the governance board's commercial arm.

7.2 Introduction

The strategic assessment outlines the motivation for creating a product for New Zealand secondary school students. It outlines the proposed development process and investment requirements to enable implementation of Moemoea. It includes a brief context for why motivation and resilience are important for academic success now, and valuable for preparing skilled workers of the future. It explains how motivation and resilience will work within the product offering and highlights key benefits Moemoea aims to instil in users.

The encompassing project report succinctly highlights the benefits of teaching student's motivation and resilience and its attribution to academic success. Extending beyond a student's formative school years, these skills are valuable in preparing young people for success in a rapidly changing labour market. In an age of rising technology adoption, and radical digital disruption across all industries, students need to be prepared and able to be adaptable to ever changing learning, social and working environments.

Moemoea is a success enhancing product hosting a comprehensive set of motivational, goal accomplishment and resilience building activities refined and upgraded from feedback of secondary school students. The site and app takes the user through a goal setting activity and builds a personal goal accomplishment program. Moemoea then introduces the user to resilience training games to build a specific motivational strategy appropriate for each task, designing a clear and manageable path to overcome obstacles or setbacks. At its heart, Moemoea is a confidence building tool in self regulation and self management toward success which is applicable for academic improvement at school and in building strong resilience and motivational skills that will be highly valuable in future workplaces.

Moemoea will operate across both native app platforms Android, iOS and a website through a user account. This ensures workability on personal digital devices at home and on public devices at libraries and schools, eliminating access barriers to students who may not personally own a device. Additional pedagogically relevant content will evolve in the Moemoea app including audio-visual, games and other engaging media based on customer needs. Moemoea is user-centric and will undergo regular software updating and edits in response to customer feedback to deliver consistently authentic and relevant content that incorporates language and instructions suitable for its intended user. This user friendliness and easy navigation ensures an engaging platform essential for even the most at risk or low achieving student.

Moemoea places particular emphasis on developing appropriate content to assist at risk or low achieving students. In New Zealand at risk or low achieving students are predominantly identified as being Māori, Pasifika and low socioeconomic students (Kirkham & May, 2015).

Moemoea responds to the needs of at-risk users supporting them in a way that is culturally, pedagogically and socially relevant. The app and website will use language, imagery and cultural context which is meaningful to at risk students. This is markedly different to other digital education resources in classrooms which do not harness the potential of digital learning platforms and culturally relevant contexts. The base product will be offered free of charge to New Zealand secondary students, eliminating the access barrier of cost to some customers. Moemoea focuses on learner growth and transformation, building motivational and resilience competencies for its users to yield tangibly improved academic outcomes in all communities and secondary schools.

7.2.1 Background: The context for change

Educational settings have seen the adoption of digital devices, media and technology across the teenage range into classrooms and homes. These include iPads, tablets,

laptops and cell phones being used in the classroom with educators making attempts to digitise resources with technology for students in learning environments around the country. Universities around the world have developed resilience apps for their student customer, having identified the need to support student resilience competencies in a competitive and highly demanding tertiary learning environment.

A digital transformation is having a profound impact across all international industries as businesses move to capitalise on growth opportunities provided by technological advancement. The World Economic Forum (WEF) published a substantial economic report warning governments of global trends and future impact of the employment market to workers and economies (WEF, 2016). Business models, technology and automation have revolutionized internal operations of the workplace affecting the worker. The report urges education leaders to recognise the value of building student confidence and academic ability through emotional regulation. The OECD (2016) suggests that teaching emotional regulation with noncognitive emotional and social skills (SEC) to school students will assist in both academic achievement as well as future workplace preparedness. The CES skills recommended are (1) dealing effectively with motivational challenges, (2) building intrinsic motivation based on interests, and (3) developing resilience, the ability to persist in the face of difficulty. The Moemoea app aims to provide the environment to practise those very skills.

The OECD (2016) urges educators and policy writers to include the teaching of a balanced set of noncognitive emotional and social skills (SEC) into national curriculums in order to prepare school students to successfully navigate the drastically changing 21st century and competitive employment market. Winstanley College in the UK has implemented a resiliency training program in classrooms for secondary school students after identifying students who found their learning environment highly pressured. The college is a leader in academic performance in the UK and this shows that even high achieving students struggle with motivation and resilience. The findings informed a

series of workshops for secondary school students to learn to work independently, using their own initiative instead of relying on being spoon fed by teachers (Carter, 2010). Moemoea encourages its student users to practice resilience. In addition the software could be easily adapted for use in a different cultural environment such as high or low performing schools overseas. Further examples of workshops and digital tools are shared in the competitor's analysis.

The Office of the Prime Ministers Chief Science Advisor (OPMCSA) in New Zealand reiterates the key findings in the 2015 OECD report on future workplaces and the skills required for them. In a 2018 report on New Zealand's digital futures in education the OPMCSA urges policy development around school students to include the teaching of digital and resilience skills to youth in preparation for the changing workplace (OPMCSA, 2018). This is particularly important when low skilled jobs are vulnerable as automation in the workplace replaces them with robotic operations. Today greater value is attributed to workers who are proficient in complex problem solving with technology, are digitally literate, resilient and able to self-motivate in the job. These skills are teachable in Moemoea which breaks down complex tasks into manageable components with motivational and resilience strategies in a digital tool.

Moemoea can help students learn skills now in order to protect their future employability against the vulnerability of a deflating unskilled-job market and teaches valuable workplace skills, desirable to the employers of the new work environments. Students can earn more by learning how to motivate themselves with resilience through their goals as "higher levels of problem-solving skills using digital tools have higher employment rates and receive higher wages" (OPMCSA, 2018, p.3). The education industry needs to align its products and services to the demands of today's environment, preparing students for a future in an employment market that is more volatile, complex and uncertain.

In the encompassing research report secondary school students were interviewed about their direct learning experiences with motivation and resilience. The key findings demonstrated the real need for a product like Moemoea. Alarmingly, the research found that:

- No students interviewed practiced or were taught goal setting at school
- Almost all study participants were unable to demonstrate planning or suggestions for how they might achieve their own goal.

There is a clear gap between what International reports are urging, and what some New Zealand secondary school students have experienced or have been taught about how motivation and resilience can be used in pursuit of success.

The New Zealand government has recognised the importance of assisting at risk or poor achieving students with policies and programmes including Ka Hikitia (Te Reo Māori: to step, lift up one's stride). This helps Māori students who might be left feeling disengaged from the learning process before they can learn skills, gain qualifications and knowledge to reach their full potential (Ka Hikitia, 2017). Currently in its third phase (2018-2022) this strategy seeks to develop an innovative community with Māori-led education models. Moemoea could complement this scheme by developing poor performing student's motivation and resilience capabilities to enhance success.

The New Zealand government has invested heavily in innovation and technology strategies through its various Ministry and State-Owned Enterprise (SOE) arms including Callaghan Innovation and establishing the Ministry of Business, Innovation and Employment (MBIE) in 2012. This is to encourage innovative new businesses and jobs to flourish, safeguarding the country's economy from deflating amidst the changing workplaces of the 'fourth industrial revolution' (WEF, 2016). A Ministerial Advisory Group for the Digital Economy and Digital Inclusion was established in February 2018 to advise the government on how to best ensure "all New Zealanders… can benefit from digital technologies (MBIE, 2018, p1). The government is also appointing New

Zealand's first Chief Technology Officer (CTO) to "drive a digital agenda for the nation and respond to the opportunities and challenges of our changing digital world" (Beehive, 2018, p2). The government wants to increase innovation, technological futures and ensure its future working citizens are valuable contributors to the nation's economic prosperity. Moemoea can work with MBIE rolling out Moemoea to the country's future workers so that young New Zealanders can begin practicing their motivation and resilience skills now for their successful futures.

7.2.2 Motivation and Resilience Resources

Investigation into existing education and teaching resources in New Zealand secondary schools has revealed a lack of identifiable or relevant resources which support motivation and resilience development for secondary school students.

Digital resources such as computer games and websites are easily available online to New Zealand students, yet many are costly or internationally based without compatibility with local curriculum, culture and thus lack relevance. For example, the app "Fabulous: Motivate Me" costs $95.99 for an annual subscription and uses American slang, scientific terminology and references which a secondary school New Zealand student would not reasonably identify with or understand (Fabulous, 2018).

Whilst it is clear there are learning resources to assist learning online, there are no products or services catering to the online development of goal setting, motivation and resilience designed for secondary school students in New Zealand. Therefore, a range of motivation and resilience products from inside and outside of the education industry are reviewed in a competitors' analysis, which explores features and functions which could appeal to the niche secondary school student market. At the time of writing, there was no available digital product which taught goal setting, motivation and resilience for the niche market of secondary school students. Moemoea will be an industry leader in this important sector of education.

7.3 Key Stakeholders

Moemoea will draw on the support of the following identified key stakeholders in order to roll through the developmental phases (discussed in section 2.2) to deliver the product into New Zealand secondary school students' hands.

Ministry of Education (MoE): The core business of MoE is to raise the overall level of educational achievement and reduce disparity in the results of all New Zealand students. Moemoea could work with MoE to ensure that low achievers and at-risk students have the opportunity to learn the valuable self-regulation skills of motivation and resiliency at tasks in school to reduce the disparity of secondary school results.

Ministry of Business, Innovation and Employment (MBIE): Delivers services, advice and regulation to develop the country's economic production and growth. Moemoea shares a mutual goal, to ensure all students in New Zealand have the opportunity to develop resilient and motivated behaviours for productive and prosperous lives. A working partnership between Moemoea and MBIE could see a product which prepared future employees for the 21st century, by developing resilient and motivated skills toward the increasingly complex and varying roles New Zealanders will experience in jobs now and in the coming decades.

Te Puni Kōkiri, the Ministry of Māori Development (TPK): is charged with advising the government on policies and issues affecting the Māori community and promoting Māori achievement. It is through TPK that various Iwi and Hapū groups may wish to invest in or support research in the development of student success. This includes potentially partnering with Moemoea in developing Māori students' abilities to self-regulate learning experiences by managing their motivation and practicing resilience through training in a digital tool.

Working groups, test groups and advisors will be sought including but not limited to:

- **Secondary school students in New Zealand**- both high performing and low performing
- **Secondary school teachers, pastoral and financial staff and principals**
- **Parents and caretakers of children**
- **New Zealand education curriculum and assessment entities** (e.g. NZCER or NCEA).

Other key stakeholders may be identified throughout the development of the Moemoea app and website which could include commercial entities or private workplaces, other State-Owned Enterprises (SOEs) and other entities where leaders of industry see the value in up-skilling individual workers in their ability to self-motivate and develop resilience.

7.4 Strategic Context

The strategic context for launching Moemoea addresses two issues. The educational need for motivation and resilience to improve learning outcomes of poor performing students and to prepare these same students for an evolving labour market.

The organisational structure of Moemoea is presented here which includes key outcomes of the businesses operations, value propositions and critical success factors.

7.4.1 The case for Moemoea

With the case being made for poor performing students need to learn motivational and resilience skills, Moemoea seeks to corroborate with various reports, strategies and initiatives from the stakeholder's section to improve the academic outcomes and career opportunities of New Zealand secondary schools' students. Moemoea links in with and can complement many Ministry objectives, educational strategies and business policies currently in place by the New Zealand government. The specific product features of

Moemoea have been influenced by the suggestions, requests and advice identified directly by New Zealand secondary school students in the encompassing project report.

7.4.2 Organisational Structure

To enable working alongside government and Iwi organisations in joint venture partnerships Moemoea will form as a charitable trust managed by a governing body with a commercial arm which can seek out further commercial opportunities domestically and internationally after the initial three phases have rolled out. This proposed structure allows adjustment and flexibility based on the availability of funding and partnership opportunities.

7.4.2.1 The Governing Organisation of Moemoea

During the three identified phases of implementation of the Moemoea business model (as outlined below), the varying labour needs change between each phase. However, a central governing body will oversee all phases and roll out of the base app and website to students. This governing body is the centre point of the organisation and will rely on the governing body membership for skills and contacts in the recruitment and facilitation of agreements and partnerships of Moemoea. It is envisioned that once the key operations of Moemoea are running effectively, will appoint a commercial board that will pursue commercial opportunities and report to the governance board. The commercial board will be responsible for running the commercial arm of Moemoea. This arm seeks opportunities and private ventures commercialising the intellectual property rights of Moemoea. These opportunities are explored later in the report. The governance board will aid in managing relationships with partner bodies and continue to provide overall governance to the Moemoea Group.

The governing body in its first three phases will be tasked with the ongoing development, release, edit, implementation and maintenance of the app and website

and establish initial partnerships with funders, as well as employing contractors as needed to fulfil key work tasks.

7.4.2.2 Governance Board

The governance board will be comprised of six members, each member contributing an array of skill-specialties to fulfil key requirements of each phase of Moemoea's development. The following table outlines an ideal Governance board, but subgroups could be established comprising members and contractors to optimise specific activity execution where skills and knowledge outside that held by the governance board are required.

Table 5: Governance Board Members and Responsibilities

Member	Role & Responsibilities
Governance Board Chair	Director of operations at Moemoea. Sets clear outcomes for all governance members and ensures an effective governance culture exists. Responsible for financial and auditing procedures, executive hiring, partnership development and relationship management.
Lead Hardware Developer	Tasked with developing infrastructure and processes for application hardware & website functions, facilitating strategies for programming and creating effective software based on user requirement. Technical expertise to solve bugs and improve future service and design offerings. Leads Applications contractors and subgroups if required.
Relationship Manager: Ministries	Representative of TPK, MBIE and MoE- developing ongoing support and ensuring the app and website (value offering) of Moemoea align with Ministry objectives. Keeps updated on

	Ministry strategy and programming to take full advantage of corroboration and collaboration with Ministry goals and available funding.
Relationship Manager: Iwi & Private Ventures	Representative of all Iwi partners and private venture partners and research institute partners- developing ongoing support and ensuring the value offering of Moemoea align with partner objectives. Keeps updated on partner priorities, direction and strategy to take full advantage of corroboration and collaboration with partner goals and available funding.
Student and Schools Manager	Representative of the end user, the student and other school stakeholders including teachers, principals, Board of Trustees (BoT) and parents. Responsible for testing and data analysis examining the effectiveness of the Moemoea app and website offering. Ongoing relationship management, regularly seeking out advice, suggestions, opinions and real time use of the applications to ensure the applications meet users' needs and satisfaction and swiftly resolves any issue or query from schools, teachers, parents and users.
Content & Curation Developer	Tasked with developing games, content and programming and the arranging and placing of this content in an effective and meaningful way. Responsible for monitoring user engagement and developing pedagogically appropriate tools to improve the functioning of app and website. Will lead content & curation development subgroups when required.

The structure of these roles have been laid out to ensure the collaborative output of sound business and scientific advice to launch and run an innovative product, whilst also providing space for the governance board members to explore additional discoveries, improvements and applications of the product.

7.4.2.3 Three Phases of Implementation

Implementation of Moemoea requires a sequence of planned events which are flexible and adjustable in response to the lean start-up business model. New education practices, partner priorities or motivational research may influence each phase therefore evaluation of the product will occur at every juncture, and consistent testing by the customer will enable iteratively refining of the product. The lean business model is an amalgamation of techniques which allow the testing and building of Moemoea's product efficiently, mitigating risk as much as possible through the controlled deployment of resources and validation of product by the customer. With the leadership of a strong Governance Board, the careful planning and implementation of the core operations will not be affected by any adjustments or amendments in the following proposed three phase plan of implementation.

Table 6: Three Phases of Implementation

Phase	Activities & Objectives
Phase One	Develop and prepare for market a MVP for Moemoea in the following formats: - iOS App for iTunes - Android App for Google Play Store - Website These three formats will be developed by the Lead Hardware Developer and will require testing and data gathering from users. The users are New Zealand secondary school students- both high performing and poor performing. The testing of these formats will be coordinated in partnership with the School and Student Manager and the Content and Creation Developer to see what areas of user engagement was most effective and what needs improvement. Recruitment of testers for the MVP needs to include:

	- Eight schools including two samples each from a Kura Kaupapa Māori, low, middle and high decile state schools. - Control group within the classrooms or learning environments This marks the first phase of iterative development of the MVP. Governance Board will focus on: - Initial key performance indicators (KPIs) agreed upon by Governance board and published. - Once KPIs have been set, the board needs to determine a method to measure the successful completion of KPIs. Publication of Phase One completion report which will include successes, failures and recommendations and requirements for the next two phases. It is estimated Phase one will take three months.
Phase Two	Formalisation of governance board and its operations. Appointments made for contractors as needed by forming subgroups of works required for product iteration and technical requirements including troubleshooting, feedback and suggestions. Lead Hardware Developer to measure quality assurance, including training of any new staff to improve app and website. Ministries, Iwi and partners approached with reports to seek advice on funding. Formal financial arrangements sought: funding for current and next phase of development. Iterative improvements having been made to MVP, Marketing of product to all schools and students across New Zealand begins. Content and Curation Developer seeks additional contractors if needed to ensure content and activities within the site and app are pedagogically appropriate and engaging for the user. Students and Schools Manager measures and implements feedback of the MVP, providing suggestions to the Content and Curation Developer and Lead Hardware Developer for improvement. Ensuring that the application is rolled out nationally as an open-access operation with all web browsers working without fault.

	Continued research and improvement of app and website continues, all updates are reported to the Governance Board.
Phase Three	Opportunities are sought to expand product offering into other e-learning actives, NCEA module learning, specific online workshops in schools and other applications of Moemoea across the education industry which could be useful for students. Formation of the Commercial Arm of the Governance Board where opportunities are sought from private enterprise to expand the value proposition using the applications of Moemoea into alternative industries. This includes a review of the current staff role capability, and whether additional support staff will be recruited to assist in current operations in addition to commercial opportunity seeking. Governance board observes critical success factors and measures the value proposition of Moemoea. Adjustments made to critical success factors as needed. Charitable Trust is formed and Moemoea is rolled out to as many students as possible.

7.5 Moemoea: The Product

Moemoea is an interactive, informative and success enhancing product- an app and website which trains the user in motivation and resilience to help them successfully achieve their goals. Benefits of using Moemoea include better organisation, preparedness, focus, ability to break tasks into small components and the users emotional and mental capability to be resilient and motivated toward their studies.

The encompassing research report asked secondary school students for their input in developing a product to assist them to be more resilient and motivated toward their studies. The following product description has been developed in collaboration with ideas from secondary school students, and is being built based on their interests.

The product harnesses optimal training strategies, noncognitive gaming behavior and pedagogically efficacious science in the software. This makes Moemoea suitable for school and personal goals even for the most at risk poorly performing student user.

Moemoea is sleek, modern and engaging with relevant curated content. At its heart, it is a supportive environment users can go to share their goals and plan their successful execution in small components with strategies to overcome setbacks and distractions. The support strategies mitigate the risk of not achieving the goal component and are rooted in behavioural science. These strategies build confidence in the users self efficacy and are the intellectual property of Moemoea. They include questionnaires, recordings and games which help the user discover what their motivational drivers are, and how to harness driver benefits by tapping into their core drivers when motivation is low. Engaging games and activities build resilience through repetition and scoring which encourages regular product use. Moemoea combines audio, visual, interactive and planning activities which train the user to get used to relying on themselves to accomplish and manage their own tasks. Combined with its intuitive interface and user

friendliness, Moemoea designs a clear and supportive path for poor performing students toward the accomplishment of a goal.

7.5.1 Moemoea includes the following core features:

1.   **Goal setting**- an introductory activity of breaking down academic goals into manageable bite sized components which is a straightforward and clear way to follow through on obligations. To mitigate the risk of the user not achieving the goal due to reasons from unforeseen circumstances to a lack of confidence, each step of the goal has an "awhi mai" or "help me" function, where the user builds up a set of strategies which could help overcome obstacles in order to achieve the goal. In addition to learning how to successfully dissect a goal, the product explains the wider implications of the behaviours required to focus on the goal. These include time management and exploring activities or behaviours which may need adjustment to dedicate the time required time for the goal.

2.   **Motivation modules**- a series of games exploring what motivational strategies could be used to keep the goals fresh and achievable. Activities define motivation, how its application as a tool is an effective success for strategy and helps identify users intrinsic motivational drivers. These drivers are then applied as a strategy to particular components of the goal as risk mitigation against goal components being disrupted or previously unachievable. The gathering of these drivers begins the algorithmic database of user preferences which increases Moemoea's smart interactive software increasing the level of personalization in the product to the customer.

3.   **Resilience**- activities, games and content to help users understand the value of persistence, where and when to apply resilience, how to figure out what is worth applying resilience to, and what is worth giving up on. Resilience is built by the user so that they are more emotionally and mentally stable to be able to return to a goal after a

setback. Reflection on goals or events which did not result in the desired outcome through vocal recording or writing in a private reflection journal is prompted when the user selects "awhi mai" or there "help me" function when a goal is not going to plan.

4.   **Failure Busters**- games supporting the removal of shame and obstacles of failing at an activity- a forum where users can share and celebrate failures, demonstrating how they were able to overcome a setback and return to success.

5.   **Support Content** – Motivational audio tracks, success stories of other students who have motivated themselves through setbacks, videos and images to help users in motivation, resilience and goal setting. There is a function to record audio tracks of self and peers to create mantras to motivate the user for specific components of a goal. Users will be able to easily create their own mantras, holding a phone or a laptop up to their mouth and get their friends, teachers and family to record sections of motivational messages for the student. The student will be able to access this motivational "tool" when they are feeling unmotivated to complete a specific task. When the student logs into Moemoe and selects "awhi mai" (help me), the last goal segment will come up on the screen along with the help options for that particular component of the goal. There are "M4" Pre recorded motivational mantras, messages and meditations. These will be available in either a female or male voice with a young New Zealand accent.

7.5.2 Important Considerations

Access and software framework. The base product will be free for the priority customer group- the New Zealand secondary school student, and is seamlessly accessible through a user account on all major digital devices from phones to laptops at school and at home. To build a large and engaged user base, Moemoea will ensure that the software architecture and user experience is compatible with most user devices and performs consistently. Users want apps and online products which are reliable, do not

crash or freeze and work succinctly across all devices including computers, tablets and mobile phones. The development Lead will conduct regular robust testing of the app and site to scan for bugs and maintain the digital infrastructure of the product to a high standard.

Cultural relevance and feedback. Moemoea uses language, imagery and references (e.g., slang words) which are especially catered to the New Zealand market. This will be achieved through a fast feedback loop where users are able to communicate ideas and issues directly with the Moemoea team when there are unexpected operational issues, bugs or dissatisfaction with components of the digital product. Regular communication with the user will be conducted with ratings and feedback prompts to ensure that the student is happy with Moemoea. This allows quick response solutions in the case of issues so that the user can enjoy an experience in the product which is consistent, seamless and authentically engaging.

Usability. User experience is a central characteristic of Moemoea because the interface and design layout of the content and activities needs to be engaging enough to entice users into prolonged use of the product. Long term use is important for the efficacy of skill development, and will also be useful in selling a premium product to loyal long-term customers once the commercialization arm establishes its value offerings.
Setting standard navigation controls and establishing strong visual features and traits, Moemoea will be instantly recognisable and easily usable for its customer whether they are accessing the product on a school computer or on their phone at home.

7.5.3 Additional features of Moemoea

Moemoea's governance and commercial board will regularly update the product adding additional features, language and content to the app and website in order to create

ongoing value for the user. The following features may be added to the content list of Moemoea over time:

- A booking system for one on one over-message goal setting, motivation and resilience help from a list of educators and trainers as a potential paid opt-in option.

- Applying Moemoea into the NCEA curriculum, by reviewing the curriculum modules and ensuring that a template for motivation and resilience is available to users for each assignment to guide them through each step.

7.6 The Current Environment

In the encompassing project report, data was collected from New Zealand secondary school students to hear directly from the customer what phenomena and wider experiences they have faced in their education. Moemoea the product is a response to that data.

In this section we look at how Moemoea can provide an innovative solution to improve student motivation and resilience for success in the current market place. This section explores the opportunities, market behaviours, the secondary school market, an analysis of competitors, risks and critical success factors.

7.6.1 Opportunities

Moemoea will transform the way secondary school students can access motivation and resilience training and content to successfully complete goals. There is an opportunity to lead the way in meeting customer demand for a more relevant, accessible and usable success-support tool within a digital education framework.

Social good of launching free learning tool for New Zealand students: Moemoea benefits students by enabling motivation and resilience education within an easily accessible base product, at no cost to the domestic market of New Zealand secondary school students. The priority is to ensure all students are able to access the product, so in the first instance the base app and website account will be free of charge to students. The administration and ongoing development of the product will be funded through partnership with government bodies. This first priority was established after conducting research in the encompassing report which identified an alarming lack of goal setting ability from student participants, and a dominant trend amongst participants where motivational and resilience experiences at school or home were largely negative. In the

research none of the participants mentioned any apps that they used for goal setting, motivation or resilience. Moemoea is positioned to become the go-to digital tool for students who want to improve their goal setting and learning.

Growth of secondary school student market: The customer segment of secondary school students domestically and internationally is increasing in size along with global population growth. There is concurrent growth in the use and increasingly easy access to digital services and products on computers, laptops and mobile phones at home, school and in the student's pocket. The Ministry of Education has established a 'Digital Technologies in the curriculum' initiative ensuring that New Zealand school students from years 1-13 have access to digital devices in the classroom to encourage innovation and digital literacy (MoE, 2018). Moemoea is advantageously placed to yield a large user-base with the target customer having unparalleled access to digital devices in schools.

7.6.2 The customer

There are large numbers of secondary school students internationally and in New Zealand who have regular access to, and engagement with, digital media and devices. In 2017 there were 800,334 students in New Zealand enrolled in a school aged between 5-19 years, 276,375 of them being secondary school students aged between 12-19 (Education Counts, 2018). Most of these students own a digital mobile device with 81% of 10 year olds and 91% of 18 year olds in New Zealand owning a digital mobile device (Pelea, 2016). Moemoea will lead secondary school student-centric innovation taking advantage of its customers' increasingly frequent access to digital devices, computers and mobile phones by being accessible and functional across all major digital platforms syncing neatly so that the user experience is the same each time a user logs in.

7.6.2.1 Wider market trends

Adolescent school students across the globe are increasing their use and exposure to digital tools in learning. "Smart tools and automated technology are changing the nature of schooling and daily life" (OPMCSA, 2018 p.1). Apps are most commonly used on mobile phones and portable tablets, both of which are being integrated into teaching components in the classroom. Mobile use is significant with 75% of 12-17 year olds in USA owning cell phones (AAP, 2013). Students keep their mobile and digital devices on their person most of the day, and as such, it is an untapped valuable teaching resource which could be utilised in advancing academia.

Mobile apps have enormous potential to change practises in teaching and learning (Hinze et al., 2017). Online tools and digital devices are being used with greater frequency across the world. Over three billion or 43% of the globes population has access to the internet and 84% of US teenagers have internet access (OPMCSA, 2018). The number of mobile phone users is expected to pass the five billion mark in 2019, with mobile phone penetration forecasted to continue growing (Statista, 2018b). OECD countries reported that 96% of 15 year olds had a computer at home and 72% of these students used a laptop, tablet or computer at school (OECD, 2015). Moemoea is positioned to capture this market by building its product infrastructure with digital features which are accessible both through apps and online. Moemoea will maintain its market dominance by continuously updating product functions to align with growth trends and user requirements, operating as a very customer-centric organisation. Since education platforms have expanded to include smart phone based learning the worldwide market for mobile learning products reached $5.3 million in 2012 (Adkins, 2013), which will continue to grow.

Moemoea will be one of the first digital learning products in an education environment which is readily adapting to digital trends and recognising the value of technology and devices in assisting academic achievement. In the absence of established, older or

trusted competitors in this niche market Moemoea can be a market leader in developing specific motivation and resilience training in a digital format to assist students in achieving their goals.

7.6.2.2 Commercial opportunities

The software and infrastructure can be on-sold to authorities and businesses overseas, assisting them to solve similar pain points of lack of motivation and resilience training in their customer base. Moemoea's commercial arm will actively seek opportunities to integrate its digital framework within existing learning systems, being a tool that compliments existing learning resources and curriculums. This could extend beyond school and University learning environments to private companies who want to invest in more resilient and motivated employees.

The commercial arm will establish a premium product of Moemoea, its income coming from a subscription based service with extra value coming from additional and more tailored motivational and resilience content. This would be sold through the App stores on mobile phones which is a growing industry.

The major distribution platform for mobile apps are the Apple App Store (iOS) and Google Play (Android). In the first quarter of 2018 android device users were able to choose from 3.9 millions apps and iOS device owners had approximately 2 million apps to download in the Apple App Store (Perez, 2018). The mobile app market is a growing industry as the apps are relatively easier and faster to develop than computer software, and with a considerably lower price point, the industry continues to produce apps at a rapid rate. The Apple store had 800 apps at its launch in July 2008, and has grown to 2.2 million in January 2017 (Statista, 2018a). As of June 2017, more than 180 billion apps have been downloaded from the App Store (Statista, 2018a). The most popular category of the App Store is gaming (23% of downloads) with business, education and lifestyle apps following closely behind (Statista, 2018c). Apps are a growing industry, with spending on app purchases in the Americas alone reaching $17.5 billion U.S. in

2017, projected to grow to $34 billion U.S. on mobile apps via app stores by 2022 (Statista, 2018d). Once Moemoea has rolled out its three phase development stages and the first priority of improving academic outcomes of New Zealand students is fulfilled, Moemoea's commercial arm can launch a premium subscription app on the Android and iOS app market.

7.7 Competitor Analysis

Although app numbers are vast, the number of apps pertaining to motivating and resilience building in its users are very small. In fact, the terms "motivation" and "resilience" come under a small number of apps related to "goal setting" in the business category of App Stores.

Motivation and resilience apps are very limited with a lack of presence in App stores however there are other types of resources in the form of presentations and workshops available to a broad range of business consumers. The number of products and services is still small and no product or service exists which caters specifically to secondary school students in New Zealand combining motivation, resilience and goal setting in a digital tool.

To consider competitors for analysis there are three main criteria:
1. The product or service is related to resilience or motivation or both for any student,
2. The product or service may be used by, or could be adapted to, a New Zealand market,
3. The product or service may be used by a secondary school student.

These criteria have been chosen because even though there are no direct competitors in this niche digital-tool, student-centric market, it is useful to see what products and services exist because:

1. Other products and services from other industries or customers may include functions and content which could positively inform the build of Moemoea, and,

2. Other products and services from other industries or customers may already be a government-funded incentive. Any government funded project with similar motivation and resilience outcomes will be identified so that the potential funders do not perceive Moemoea as a "replica" or "double-up" of existing projects.

7.7.1 Commercial Apps

This section begins by considering potential commercial competitors, digital education products in general and finally government funded projects which cover similar educational objectives to Moemoea. Whilst a competitors analysis has been conducted, with no direct competition for the specific secondary school student market, key information has been identified in order to demonstrate the popularity, usability and its features in a strengths and weaknesses analysis. The following five commercial apps were selected using search engine optimisation (SEO), finding the top five most downloaded apps for "motivation" and "resilience" for the period July 2017 - July 2018.

Table 7: Commercial Applications on App Stores

Name	Value proposition	Monetisation	Differentiation	Strengths and Weaknesses
1. **Peptalk Motivation** (Dark Knight Inc., 2018). *App store rating: 4.8 App store reviews: 7691*	Motivational audio recordings to help achieve goals. Playlists of high quality content: inspirational speakers covering many topics. Includes social media & YouTube celebrities.	Freemium model with elite subscription option which eliminates adverts and allows access to -premium content -offline streaming - dedicated Facebook support group - alarm. **Cost:** Daily $4.49, Monthly $15.49, Lifetime access $74.99	Extremely well curated will thought leaders and relevant celebrities from social media, YouTube, business and sports arenas which appeal to young market.	**Weakness:** It is an app with only access to audio recordings, no other exciting features. The content can be easily replicated and found for free on social media. **Strengths:** interface and user experience is seamless beautiful design bright colours and fast infrastructure the app if stylish clean and smart- very impressive looking, and would immensely appeal to a young user.
2. **Fabulous - Motivate Me** (Fabulous, 2018). *App store rating: 4.5 App store reviews: 15437*	Change habits in 19 days by setting and achieving goals and monitoring progress. Advertised as one of the most successful apps in the world for habit tracking. This app is a holistic service which teaches meditation, zen practise, exercise workshops and resilience practise.	Freemium model free to download app but limited access. **Cost:** Full access requires annual $154.99 subscription fee. Refers users to additional plans and apps within the app.	Full holistic habit building tracker with beautiful interface and clear design. Also assists motivation and provides many additional relevant useful and clever service offerings encompassing features like recordings, tracking,	**Weaknesses:** Freemium version has one activity to access, approximately 4 minutes before that activity ends and the user is asked to buy the premium version. The freemium user cannot explore the app enough before deciding on premium membership. **Strengths:** great user experience, music, colours, graphics and timing to create a game-like environment which is engaging and addictive. Excellent usability, guides the user through each step in the app. Interesting content, including habit tracking and audio messages.
3. **Motivation Quotes - Daily Quotes** (Monkey	Collection of hundreds of quotes in a neat clean modern user interface.	Freemium model, free to download app with a premium version without adverts and range of in-app	Dedicated image quotes app for motivation- with nice design, colours and font. Set motivational reminders in phone	**Weaknesses:** Very basic, could find the same images in google image search. Only does one thing, provide database of motivational quotes. Cant search for specific writers or thought leaders.

		purchases for 0.99c. **Cost:** Premium cost $6.99	alarm. Save and share quotes.	**Strengths:** modern interface.
Taps, 2018). *App store rating: 4.9 App store reviews: 37444*				
4. **Coach. me - Goal Trackin g** (Lift Worldwid e Inc., 2018). *App store rating: 4 App store reviews: 2317*	Goal and habit tracker tools, community of coaches and hire coaches through the app. Based on "Growth Mindset".	Freemium model, free to download. 90% of content is free. **Cost:** Pay for coaches approx. $30 USD per half hour.	Chat based coaching- pay for, subscribe to one-on-one coaching under various categories such as mindfulness, productivity etc.	**Weaknesses:** Lack of marketing strategy and brand awareness. Monetisation model might need re-thinking with limited income stream coming from one-on-one coaching. **Strengths:** Clean and organised interface, easy usability, notifications for goals and community of goal setters.
5. **Motivate : Daily Motivati on** (Brave New Logic LLC, 2018). *App store rating: 5 App store reviews: 2540*	Thousands of hand picked motivation videos on a motivation video playlist. Playback in the background. Intended for the gym, waking up or an added boost in the day.	Freemium model, free to download. Free version includes access to 5 videos per day. **Cost:** Motivate Pro or "customised category" $11.99 per month billing or $7.99 per month annual billing. Lifetime subscription cost of $399.99.	Specialised video playlist for motivation videos, a database similar to a YouTube/Netflix interface playlist for specific videos.	**Weaknesses:** only videos not other material. **Strengths:** clear and specific niche product which caters for only on thing: motivation through videos. Good for users who need an app for one specific service.

There is an abundance of websites and apps which are discoverable when put into a search engine, yet the content is highly subjective. Again, no search results rendered a commercial product similar to the Moemoea proposal.

7.7.2 Educational Resources

Although there are no motivation and resilience products catering specifically to the secondary school student market in New Zealand, there are tertiary providers domestically and internationally who have launched resilience programs for their students in digital and non-digital formats. Universities are providing these resilience training services for tertiary students because they recognise the high value of students resilience and its residual benefits including success rate statistics, research and longevity of engagement. Predominantly developed as part of Universities' pastoral care services, resilience workshops, apps and programs have been developed to improve a University students ability to cope with the pressures of life in academia. As these programs here are not commercial competitors, they have been assessed on their value proposition and strengths and weaknesses.

Table 8: Educational Motivation and Resilience Products and Services

Program type and Organisation	Value Proposition	Strengths and Weaknesses
AUT Resilience, app, AUT University, NZ . (AUT University, 2018).	The free iOS app includes activities, mindfulness exercises, listening recorded tracks and advice for remaining resilient in studies. The audio ranges from 2-13 minutes and users listen to the advice and exercises.	**Weaknesses:** App Is only available to AUT students with a student ID code. Limited content mostly audio tracks for mindfulness. No visual or interactive elements. Aesthetically ineffective design, not attractive. **Strengths**: Free for AUT students, clean and easy to use interface to navigate.

Thrive at UT, app, University of Texas, Austin (The University of Texas at Austin, 2018).	A free iPhone app "Thrive at UT" is available to all students which aims to assist students to improve their academic success on campus by making small changes in daily routine on the app. Videos of students and interactive activities feature on the app.	**Weaknesses:** interface is not clean or suited to a mature audience. Interactive activities are able to be played after an inspirational quote and video is seen which may not be relevant for all users. **Strengths:** The app is divided into seven areas in a clear organised way to understand.
The Resilience App, app, (The Resilience Institute International Limited, 2018).	The resilience app has daily practice tips for resilience training including online training modules, videos, tips and diagnostics of skills. Intended for the training of staff in organisations.	**Weaknesses:** interface is dated and graphics are not clean. Looks amateur. **Strengths:** catered toward organisations training employees, good example of a tailored to niche market.
Workshops, George Mason University, USA (Holler, 2017).	Online 5 week workshops with resilience badging challenges. Part of George Mason University's larger resilience project and student well-being initiative "Mason: thriving together".	**Weaknesses:** no digital app component. Not catered to secondary school students. Badging (earning digital badges and awards for achieving tasks) may be considered an amateur strategy to some students.
Workshops, Penn State University, USA (Penn University, n.d.)	Workshops have been developed for students and for industry covering six specific skills developed over 25 years of empirical research at Penn State including self-awareness, self-regulation, mental agility, strengths of character, connection and optimism- all designed to increase an individual's personal resilience.	**Weaknesses:** no digital app component. Not catered to secondary school students. **Strengths:** illustrious university and well respected research department associated with these workshops.
The Resilience Project, Stanford University, USA (Stanford University n.d.)	The Resilience Project is an ongoing program at Stanford University encompassing a video series detailing students who share their failures and how they bounced back called "Stanford, I Screwed Up!". The project is a part of the academic skills coaching at the University.	**Weaknesses:** no digital app component. Not catered to secondary school students. **Strengths:** Quirky and eye catching video titles and concept.
The Success-Failure Project, Harvard University, USA (Harvard University, n.d.)	The Success-Failure Project at Harvard University explores students and alumni experiences of success, resilience and failure on a website. This project is a part of the campus initiative to help students with their grades, perfectionism, careers as well as resilience. The project also includes videos of staff, faculty, alumni and students	**Weaknesses:** no digital app component. Not catered to secondary school students. **Strengths:** broad categories of specific issues that students may face in attempting to improve academic outcomes.

	reading out rejection letters they themselves have received.	

Although these resources have not been developed for secondary students, the benefits they provide for their tertiary students are motivated by the same notion as Moemoea's- to support learners in their journey to academic success. These educational resources included functions of habit building, motivation and resilience content, story sharing, and are components which will be pedagogically adapted within Moemoea for a secondary school student customer.

7.7.3 Government funded projects

The following two Apps have been co-developed by governments in Australia and New Zealand. They highlight a president for investment interest from Government in resilience and motivation education for students.

Table 9: Government Funded Projects

Program type and Organisation	Value Proposition	Strengths and Weaknesses
The Resilience Project, App, Australia. (The Resilience Project Pty Ltd., 2018)	The Resilience Project in Australia provides in-person workshops for secondary school students to develop resilience in academia through presentations, an app, teacher diaries and a school curriculum. https://theresilienceproject.com.au/school-programs/	**Weaknesses:** There is no content to develop resilience. The app is simply a diary to monitor feelings and experiences- there is no visual content to learn about resilience, or games, and no mention of motivation of goal setting. The functionality is too basic with no content or advice to assist students in developing resilience, motivation or goal setting for academic success. **Strengths:** The user has the option to audibly record their response and include video and pictures into their diary.

My FRIENDS Youth, App, New Zealand. (Friends Resilience Pty Ltd., 2018).	The program divided into 5-sessions of approximately 2 hours per session and is delivered by a certified trainer. There is one secondary school specific resilience and self-esteem program (for students aged 12-15) which has been trialled in 42 New Zealand secondary schools in 2015 for Year 9 Health and PE to practise self-esteem and resilience skills. There is a basic app to accompany the program. https://itunes.apple.com/us/app/thumbs-down-or-thumbs-up/id1301090858?ls=1&mt=8	**Weaknesses:** The app functions and user interface is amateur in its graphics and childish graphics render it unappealing to a secondary school market. There is no content for resilience to develop it, and no mention of motivation or goal setting. It is too basic- it is essentially a yes or no app, giving thumbs up or down for pictures. There is not enough variety, age appropriate content or features to make the app desirable for download outside teacher instruction. It has a 1 star review on the App Store. Costs $5.00 to download, no free trial version available. **Strengths:** The program has had testing, but at the time of writing, the program has not been continued.

The Resilience Project is sophisticated with good content yet the New Zealand resilience app My FRIENDS Youth is unsophisticated and does not appeal or function well for a secondary school user. Moemoea not only caters its stimulating content and programs to its customer, it will also present an aesthetically pleasing design across apps and website which is relevant and relatable. Moemoea will also be free to download for all secondary schools students in New Zealand.

Moemoea is designed for the student user, with their needs and preferences in mind. Reviewed competitors apps were not culturally relevant to New Zealand students with content, audio and video being UK or US centric, with accents and slang irrelevant to kiwi youth. The design, graphics, interactive visuals and content was arranged poorly and was often juvenile in appearance, isolating potential mature students. Language, instructions and features were not pedagogically appropriate, and as such the apps looked either boring and too childish for secondary school students. The "not cool" effective is a disincentive for a secondary aged student to engage with a product.

Moemoea is clean, modern, and specifically designed for ease of use and smart appearance so that the app and website have aspirational connotations and mature, desirable design aesthetics.

7.8 Risks

Undervaluing the product. The market is not currently solving the problem of low student academic success through motivational and resilience training. As part of a marketing strategy developed with the funding partner, Moemoea will publish empirical statistics on the efficacy of using motivation and resilience as a strategy in achieving academic goals. Another way of phrasing this risk is, 'what are the barriers in changing the markets existing behaviors and attitudes toward successful studies?' A complex marketing strategy with how-to tutorials on social media including YouTube, Facebook and Instagram will visually depict how Moemoea works targeted to the secondary school target customer, using language, cultural references and aspirational success figures as advocates to the service. It is imagined that the funding partner will be a government ministry, therefore the product will be distributed through their government arms directly to schools. Therefore, Moemoea will be positioned as a state recognised success tool, helping to add credibility to the notion of using a digital product to increase performance in school.

Securing funding. The development of an Android App and iOS app and a website is estimated to cost of $200,000 to manufacture. This does not include ongoing and administrative costs that will be incurred over the eight months of implementation from phase one to three. The value proposition of Moemoea is aligned with government initiatives and is compelling enough to be considered for support during phases one to three until the commercial arm can generate income through software sales.

Additional expenses. Digital products will require extensive and regular updating and building the original infrastructure is expensive. The lean startup business model allows a prototype package to be developed for the product at relatively low cost which tests the margin of error for the user. All the features of the product interface and experience

from navigational elements to animations will be tested before investment is made into the permanent app and website infrastructure. In addition, funding reserves will be allocated to inevitable technological loopholes which may require additional editing by developers.

Building undesirable product. The lean startup business model ensures Moemoea is developed from a customer centric perspective, built around a validated customer problem and with continuous iterations made based on user feedback. Interviews with secondary school students shared features and functionalities they would like in Moemoea (in the Findings section) as well as what they did not want. The framework of Moemoea has been developed in response to these direct evidence-based recommendations, validating the product assumptions. Further edits will be made in collaboration with student users to ensure the product is engaging enough to be desirable.

Intellectual property (IP) or copyright infringement. This will be mitigated through having designers, copywriters and content developers signing non-disclosure agreements (NDA) before beginning work with Moemeoa. Before commercialising the Governance Board will consider further IP options including trademarking, patenting and copyrighting the software, its content, interface and logo.

If New Zealand secondary school students are not able to leverage motivation and resilience and learn to apply it to learning they may not improve their academic results or practise these valuable life skills in their careers and work after school. It is important that Moemoea is released as an easy to access digital product as soon as possible, whilst the governance board will navigate the manageable risks that may arise.

7.8.1 Summary

The key takeaways from the market analysis include the opportunity to become a market leader in two markets- the secondary school student market and the digital education market of motivation and resilience due to a lack of direct competitors and lack of quality of age appropriate content. Although this business case has identified peripheral competitors, their customer segment is different being developed for young working professionals and university students not secondary students. Their delivery, content quality and software infrastructure do not meet the high standard Moemoea plans to deliver to its customer. Partnerships, social value and the strong customer centric component mitigate threats and risks, ensuring a successful product and an engaged satisfied customer.

7.8.2 Partnership

There is exciting potential to collaborate with government initiatives from The Ministry of Education, Te Puni Kōkiri and The Ministry of Business and Innovation. These ministries and their partners conduct regular funding rounds for new initiatives specialising in the fields of technology, employment and education. Moemoea sits on a unique intersection of all three of these categories and therefore is flexible in its ability to apply for funding in more than one field. There is space to collaborate with government and private initiatives on existing projects but combining value offerings for the customer. The Ministry of Education (MoE) has the largest amount of specific strategies related to Moemoea's product outcomes, therefore in the financial section 6.9 a proposed funding relationship with MoE will be proffered.

7.8.3 Social value

The social and economic value of Moemoea could significantly improve the prospects of at risk or poor performing students, assisting them to break through their learning barriers and instilling valuable lifelong skills of motivation and resilience which they can share with their communities. Competency in these skills is critical for social

development as resilience and motivation empowers people to deal with uncertainty, change and adversity which are equally relevant at school, at home and in the future projected workplace. A funder will be able to be a part of two significant growth journeys with the customer (1) improved study outcomes at school and then (2) valuable skills of problem solving for the workplace.

7.8.4 Customer centric

An interactive feedback loop passes critiques and suggestions directly to the Governance Board and developers for a fast response. This is especially useful if the user, teacher, parent or other stakeholders want to share an experience positive or negative, as this feedback creates room to improve the product offering.

The opportunities for Moemoea to a market leading product outweigh risks or threats in the education market, with potential for large scale growth across other industries with the selling of software and products through Moemoea's commercial arm in the future.

7.8.5 Critical Success Factors

Extensive motivation and resilience literature has been reviewed in regards to improving student academic performance which has identified the opportunity to develop Moemoea, a unique value proposition which assists secondary school students achieve better academic results through practising motivation and resilience. This report has found opportunities where this practise can occur and an investigation into a phased plan of app and website roll out has been established.

The following three factors are the critical success factors essential in the launch of Moemoea;

1. **Design and user experience.**
   - Product success relies on the experience it delivers. Usage scenarios will be carried out gathering insights considering different times, factors and places Moemoea may be used to form the context of ultimate user experience.
   - High quality development skills are required from staff to ensure the app and website are pedagogically appropriate and the interface and user experience runs consistently, without lags or bugs.
   - A pleasing, easily navigate able and useful design is central to the adoption and acceptance of Moemoea amongst the student customers.

2. **Lean startup model**.
   - The phases of development will follow the lean startup model and thus must be agile and adaptable to changing customer needs, funding availability, data analysis from users and respond quickly and adeptly to feedback from the user and the funding bodies or venture partners which may be associated with Moemoea.
   - Iterative developments will be made to appeal to the differing requirements of users and high functionality can be achieved when the business model allows flexibility to cater to the central business plan and its iterative adjustments.
   - The lean startup model is essential to a startup, where scalability of Moemoea functions and its user base will grow over the life cycle of the product. Moemoea aims to future proof itself against rapid technological advances and competitors by being agile in its response to its users, providing highly personal and flexible products when the customer needs them as opposed to homogenous resources which do not increase engagement and connectivity between the product and customer.

- Moemoea can be a leader in motivation and resilience training due to its ability to rapidly adopt technology.

- The digital tool is consistent with the global trend toward consumer automation and personalisation.

- Moemoea will adopt new technological and software advances as appropriate and increase the engagement of its user.

- This strength ensures the opportunity to gain market share of secondary school students and other markets as they arise.

3.   **Partnership Management.**

- Managing relationships between stakeholders throughout the life cycle of Moemoea will be conducted through good Leadership from the Governance Board.

- Key decisions must be made with thought and consideration to the mission statement of Moemoea and ensure that all key stakeholders impacted by any decision making are informed and their needs are catered to in a pragmatic way.

- Secondary school students having access to this product is the first priority. Commercial considerations will be developed after this first priority has been met.

- Directives from partners, iwi and ministries may involve varying regulations, policy requirements and/or strategies which will need to be implemented into either the company operations or the app and website functions.

- Conflicts of interest will be navigated soundly which may include conflicting priorities or requests from differing stakeholders and partners.

- The Governance Board will strategically set the direction of Moemoea by consulting stakeholders whilst focusing on the core features which make Moemoea directly useful to students in improving motivation and resilience skills for academic success.

7.9 Financial and Investment Case

The content of Moemoea is compelling enough to appeal to government ministries, crown research institutes as well as Iwi organisations who have a vested interest in increasing the success of New Zealand secondary school students and the flow-on into their working lives. In this section partnership arrangements are explored between a cross section of potential funders to provide an optimal funding partnership and mutual stakeholder benefits. Openness to both joint venture partnership and sponsorship provides an expanded source of investments.

7.9.1 Proposed funding arrangements with one Ministry

One funder, the Ministry of Education (MoE) has four ministerial strategies aimed to improve student wellbeing, learning and engagement which align with Moemoea's product offering. Meetings will be planned with key project coordinators responsible for the enacting and funding of programs to support the Ministries strategies. An optimal partnership with MoE could direct Moemoea's development through the following strategies:

Ka Hikitia (MoE): Māori success acceleration plan to change how the education system performs to enable increased educational success by Māori students.

Pasifika Education Plan (MoE): Aims to increase compatibility of education with the learners educational environment and home/cultural environment collectively with existing education providers and services.

Success for All (MoE): A ministry commitment to providing the foundations of success to all learners and to realise each child's potential through inclusive practises in education.

Digital Technology for All Equity Fund (MoE): a fund to deliver programmes to engage youth with limited opportunity in digital innovative technology learning to improve access to technology-based learning.

This proposed business case draws on funding from one of these viable sources to kick off the first implementation phase of development and further funding to be secured as successive phases pass. A charitable trust or not-profit will be established at the end of phase one which will be able to receive funding and work with partners to roll out the app, where the commercial arm will be able to explore commercial applications of the Moemoea product at a later date. The first priority is to roll out the base app to New Zealand students as soon as possible. Registering Moemoea as a charitable trust as a 'trust based' trust under the Charitable Trusts Act (1957) ensures that the initial trustees of Moemoea, or the governing board members, retain control over the organisation including future trustees and operate under a trust deed. Therefore, step one sees the establishment of a funding arrangement with one government body to sustain the the three phrase development of the Moemoea product into the hands of secondary school students.

7.9.2 Financial Forecasting Limitations

This product is in its infancy and an MVP has not been developed due to lack of funding therefore a detailed financial forecast is unable to be calculated with accuracy. With publicly funded ventures and state sponsored strategies it is difficult to find the location of relevant accurate management and financial information from government arms with which to develop an estimate of costs from. This renders it difficult to forecast potential benefits.

At the completion of developmental phase one, a formal and full report of outcomes and recommendations will be published at which point a more accurate and detailed financial forecast and cost benefit analysis will be provided as the project moves into its future phases.

The final costings of each phase completion will depend upon how funding partners have responded, as each government, non-government, crown research intensity and iwi group will bring varying contributions of support and resources to Moemoea, and also an array of deadlines and requirements. Moemoea is using the lean start up business model in order to be flexible in responding to the potentially competing demands of more than one funding partner. The funding at each phase my affect timing of various product features and quality. It is important to note that whilst these funding partners may bring monetary finance, they may also be able to provide non-cash capital in the form of resources, connections, expertise etc.

7.9.3 General Operational Budget: Phase One

A general operational budget has been developed for the setting up and budgeting for core work to be carried out under the governance board in phase one. Whilst there is no dollar amount, it looks at likely expenses both capital and working expenses at each implementation phase.

Table 10 : General Operational Budget for Phase One

Phase One	Budgeting for:	Estimate $NZ
Website Build (lite)	Infrastructure, User accounts, Interface with workflow optimisation platform syncing site with Android and iOS app's. Secure www.moemoea domain names and lease.	$30,000
Website Iteration	Leverage analytics that drives user engagement, respond to bugs and roll out a full high-value site.	$5500

Android App (Lite)	Pass App stores review process, MVP developed for end-user and software team testing with require functioning.	$60,000
Android App Iteration	Updated functionality in response to user need after testing.	$24,000
iOS App (Lite)	Infrastructure and interface prototypic build for testing. Insights learnt from critiques inform next phase iteration.	$45,000
iOS App Iteration	Updated app, ensuring syncing across android and website.	$18,000
Content	Curation and royalty costs (audio, visual), key recordings and testing content against user expectation.	$22,000
Recruitment of core team	Seek expressions of interest from future Governance board members. Salaries to be implemented in phase two.	$2000
Meeting, Travel, Contractors	Seeking funder partnerships, contributors and contractors to secure financial backing and workers for future phases.	$8000
Report Writing	Post-implementation evaluation and recommendations for phase two.	$5000
Total	Phase one budget	$219,500

7.9.4 Conclusion

This proposal seeks partnership in the implementation of an innovative digital product facilitating an improvement in secondary schools students academic results through motivation and resilience training. Moemoea aims to benefit approximately 200,000 secondary school students per year and this includes at-risk students and those who may not be able to afford a paid-for service. This business case proposes how maximal benefits may be attained by a partnership and requires the approval of this project to enable three-phase project development and the building of a minimal viable product (MVP).

As identified in the findings of the encompassing report (Chapter 4) many secondary school students have not been taught about motivation and resilience as concepts that could help their academic achievement. The only motivational or resilience tools interview participants used was Youtube, which is a video database, not a specific

learning tool with sound pedagogical infrastructure. No students were familiar with goal setting in school and a low 50% were able to demonstrate resilience by talking about a challenge that they had overcome. Without Moemoea secondary school students the valuable life skills of motivation and resilience may never be realised. Given the potential to raise New Zealand students academic success to realising greater social and economic value from the skills of motivation and resilience, Moemoea is a sound investment in its future workers.

Moemoea presents a comprehensive digital product which teaches secondary school students motivation and resilience skills to improve their academic success and prepares them with skills for the future. The status quo risks New Zealand students falling being their international counterparts in SEC skills and abilities including resilience- to overcome problems and to motivate oneself through tasks, that the changing workplace will require. In the short term, a lack of these skills results in the continued gap between high achieving and low achieving students, risking the lost opportunity to learn and a decline in New Zealand performance standards.

The next steps are to engage with key project coordinators and funders from the Ministry of Education to discuss how the Moemoea solution to improved student engagement may fit within the funding availability of their academic strategies. Then a core working group will be established to begin work on a prototype of the Moemoea iOS app, Android app and website.

Following Chapters:

Chapter Eight:　　　　　　*Conclusion*

Chapter 8: Conclusion

The vision of this project was to commercialise, through innovation, a solution to a long concerning underachievement gap between high achieving and low achieving students. The project was conceived four years ago working alongside rangatahi with great potential, great talent, yet little in the way of formal qualifications. It was through carefully and thoughtfully developed relationships that I was able to capture very detailed and very candid stories and experiences from young New Zealanders and apply them to the development of an innovative solution to student underachievement.

The key findings of this research point to a lack of support offered to secondary school students in New Zealand, in their development of noncognitive skills and competencies including motivation and resilience. There was also a lack of goal setting taught in schools with poor knowledge of how to attempt goal achievement. These implications were identified in the discussion section which led to a proposed solution in the business case, forming an argument to present to investors. Several levels of confirmation informed the product proposal, both from the findings, literature and from the market analysis which revealed a lack of competitors (tools or educational resources) which could train the specific combination of noncognitive competencies students could use in the pursuit of achieving success.

Whilst development will continue on Moemoea beyond this paper, it is important to note that even in the potential of failure, to e able to contribute this study to the dialogue of innovation in learning, educational technology and the development of noncognitive capability building in students for their success is valuable.

8.1 Study limitations

The largest limitation of this research was an inability to fully use the lean startup business model to inform a solution. A central component of the lean startup business model is creating a minimum viable product (MVP) for testing on the customer (Ries, 2011), however, this thesis was restricted by time and funding availability. Therefore whilst an MVP is currently in the early stages of development, the restrictions limit the inclusion of MVP measurements and results will not be included with this thesis but may be published at a later date. Instead, a strategic business case has been written for an investor in place of an MVP.

The small sample size of 14 participants will not reflect the national average of student experiences of motivation and resilience for success yet it is a starting point to developing a solution to assist all secondary students to motivate themselves toward achievement. It would be useful to conduct longitudinal research (although this is likely to incur a greater cost) into the long term effects of self-motivation and resilient behaviour can contribute to student success. This richer data could build evidence of characteristics and factors which directly influence student achievement and isolate components which can be leveraged for student success. This research could challenge existing educational practises and identify current limitations within the education system. Some further recommendations for research are also posed.

A Kaupapa Māori Research was not utilized in this research, although the practice is well implemented across academic research (See: Smith, 1999). The focus of the research problem came in response to the core customer group of underachievers. This customer group was identified through MoE statistics identifying Maori, Pasifika and low socioeconomic students as most at risk of underachieving. In conducting this research I did not formally care for participants as culturally-located human beings (Bishop, 2003) yet I was able to meter this with calling on the guidance of my kaumatua and community

leaders where the research took place through consultation detailed in the methodology. In the case that an MVP is able to be tested, a Maori methodology and co-design will be used to increase the understanding of influences limiting or expanding Maori outcomes. The same perspective will be taken in Pasifika research protocols, which is concerned with the empowerment of Pasifika peoples (See: Anae et al., 2001).

2.8 Recommendations for future research

- Whilst technology may have disrupted the future work environment it also affords broad capabilities, opportunities and innovative solutions to age-old problems. More students have a mobile phone in their pockets and access to wifi and devices like laptops and computers at school, libraries and most at home. The relevance of learning from someone or something that is relevant socially and culturally is key. Taking advantage of mobile technology in application to education could be combined with researched socially and culturally relevant material for improved academic success.

- The literature reports noncognitive capabilities and their efficacy in improving academic achievement as well as their value as future workplace competencies are in its infancy. Further research and development should be conducted into how, where and when noncognitive skills can improve academic outcomes and goal achievement, and apply this knowledge to the many capabilities of technology. Education researchers and policy writers should also make allowance for applying digital technology to 'anywhere, anytime' education-testing the scope of the flexible, adaptable nature of outside of school learning with the digital competencies and technological access young people already have.

- Non Cognitive behavioural traits motivation, resilience and self-efficacy should be investigated not just by academics, but also by policy writers, educators,

students, entrepreneurs and educational technology designers. With the increasing demands of future workloads in a digitally focused work environment, it is a matter of urgency to develop empirical evidence on what works and what does not work in supporting underachieving students with technology and behavioural science.

- Developing a universal definition of motivation, resilience and self-efficacy and its relational factors impacting underachieving students lives would allow a more coordinated approach toward engaging with underachieving students, government, schools and whanau about solutions. The definition needs to consider all factors or touchpoints where students experience motivation, resilience and develop self-efficacy which includes the school, home and peer environment.

The first chapter introduced the customer problem. It identified technology is widespread, easily accessible and the national curriculum had responded in part to this, although there was a gap identified between student technology proficiency and the leveraging of this proficiency such as more flexible learning on apps. Introducing stakeholders who could play a key role in developing the vital capabilities required identified the Ministry of Education as the most viable stakeholder. A brief introduction to the education industry found that whilst government priorities domestically and internationally had targeted significant funding toward the development of digital technology literacy skills, curriculums and engagement strategies, the consistent lack of academic success from the key customer group suggests additional resources are required to combat underachievement. An investigation into an innovative solution to this customer problem began.

Chapter two revealed literature on behavioural science identifying key noncognitive skills which have seen recent success in helping underachieving people become more motivated and focused. The studies included varying terminology and definitions revolving around motivation (extrinsic and intrinsic), resilience (also known as grit and persistence) and self-efficacy (self-belief and self-worth). These traits including self-management, self-control and focus are all related to the social-emotional noncognitive skills which have been linked to increases in performance.

A project proposal was developed in Chapter three clarifying research objectives and assumptions. It drew on the literature identifying opportunities to leverage technology and behavioural science to improve the student performance gap and improve academic outcomes amongst secondary school students. Government strategies seeking to address both the performance gap of students and underachieving students, and improve the technological capabilities of New Zealanders generally provide an opportunity to align a solution within government funding objectives. A project proposal in chapter three was made for Moemoea: A digital tool to train secondary school students resilience and motivation for success.

The extent of the problem was highlighted in the research by developing a methodology and collecting data from 14 secondary school students in New Zealand from a low socioeconomic community in Wellington. They shared experiences on motivation, resilience and success and defined these factors in their own words. Findings and analysis occurred informing the discussion chapter which connected the findings to a wider context of student underachievement. They responded favourably to a digital solution for training motivation and resilience. The collected data informed the product proposal presented in the strategic business case in Chapter 7.

New Zealand's future economic prosperity will likely be linked to the innovation and technological proficiency of its workforce. Future workplaces require a more refined skill

set from its workers rooted in digital literacy and underlined with self-management: an ability to be resilient, set effective goals and self-motivate which can be taught, practised and finessed in secondary schools now. These skills are also valuable in enhancing successful academic outcomes at school as these same core skills teach a student to be self reliant, confident and able to complete tasks and overcome distractions and obstacles.

8.3 Close

This research project is in its early stages. The way forward will require collaboration and close working relationships with funders which may be government, or other interested stakeholder identified in the business case. Future developments will continue to follow the lean startup model, placing the customer problem and the user at the heart of any proposed solution. A funding and research relationship to build an MVP for testing will increase the likelihood of an effective roll out of Moemoea. Reflecting upon the research questions and findings the validation of Moemoea has begun. Moemoea is a product which is in a prime place to take advantage of recent government investment in digital technology infrastructure.

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Appendices

Master of Innovation and Commercialisation Study
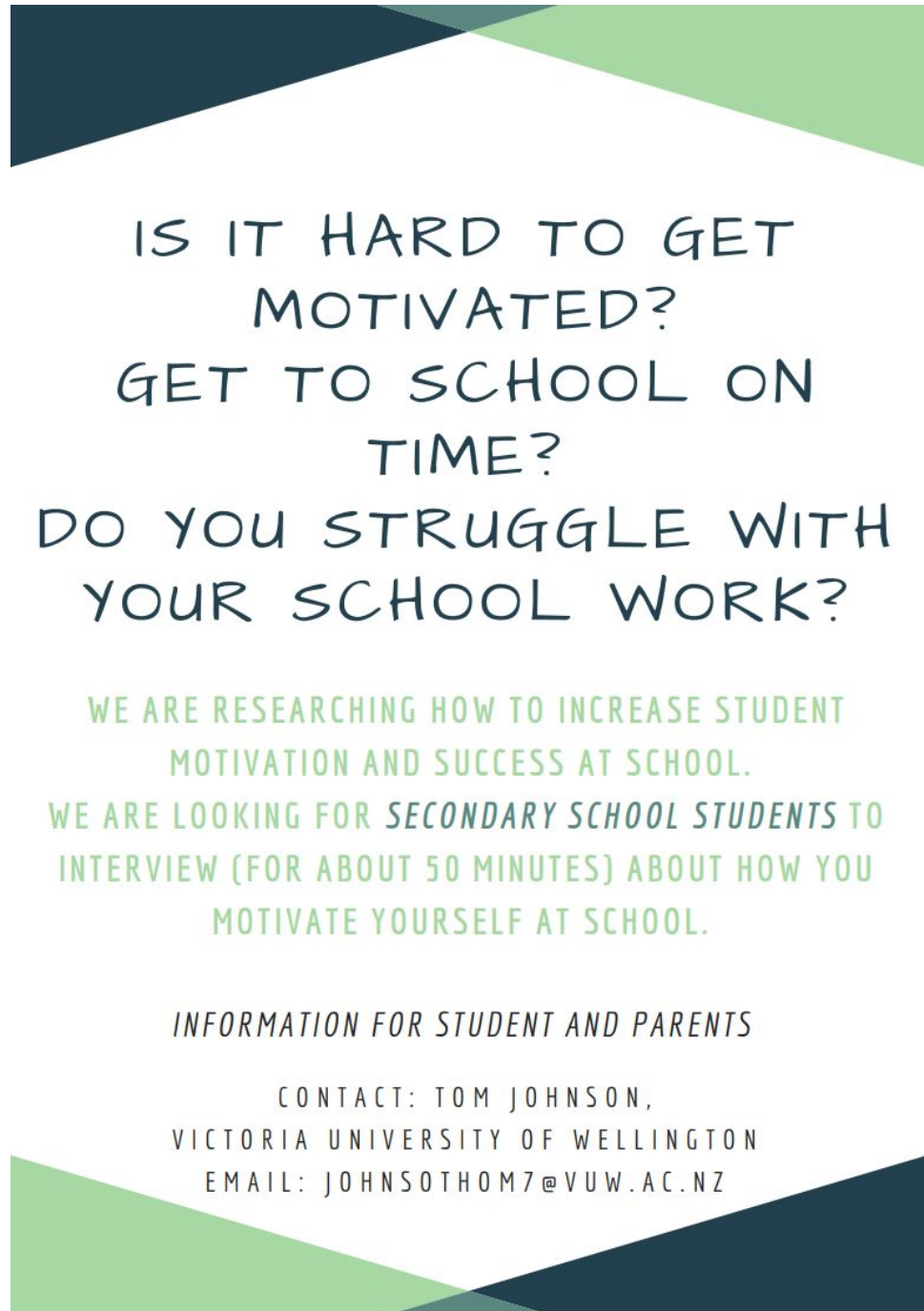
INFORMATION SHEET FOR PARTICIPANTS

Kia ora, Ko Tom Johnson taku ingoa. I am a student researching student success, motivation and resilience at Victoria University.

I want to learn about what you think about success - how you get it? What does success mean to you?

I want to ask you questions about motivation and resilience - how you keep going when something is hard.

I will use the interviews to help me make an app or website to help students succeed at school - you could be given this to use at school if you are interested.

How can you help?

If you are interested in sharing your stories about motivation and success I will email you a time to interview you somewhere at the library, school or Marae.

If you are under 16, I will need to get written consent from your parent or guardian as well.

The interview will be informal and I will ask you questions about what you think about success, when you have felt it, what you want to achieve. I'd be interested to hear what you have to say about motivation and resilience - how you overcome obstacles at school and study.

The interview will be between about 30-50 minutes. But you can stop anytime if you want or get tired. There will be a Youth Worker nearby in case you want to speak to someone after the interview.

I'll audio record the interview just for my notes, and you can stop the interview anytime you want.

If you change your mind, you can withdraw from the study up to 4 weeks after the interview. If you do, I'll delete all the information you gave me.

This research is confidential*. I will not name you in any reports, and I will not include any information that would identify you. Only my supervisors and I will read the notes from the interview and this will be deleted at the end of the research.

What will the project produce?

The information from our interview will be used in my Masters report for Victoria University. I may also use the results of my research for other things like conferences and reports.

If you accept this invitation, what are your rights?

First of all you don't have to be interviewed if you don't want to. If you do- here are some things you have the right to do:

- choose not to answer any question;

- ask for the recorder to be turned off at any time during the interview;

- withdraw from the study up until four weeks after your interview;

- ask any questions about the study at any time;

- receive a copy of your interview recording;

- read over and comment on a written summary of your interview up to 5 days after the interview;

- agree on another name for me to use rather than your real name;

- read any reports of this research by emailing the researcher to request a copy.

If you forgot something or think of something else you wanted to say after the interview, you can email me up to 5 days after the interview to add it to the research

If you have any questions, either now or in the future, please feel free to contact either:

Me! (Student Researcher): Tom Johnson

University email address: johnsothom7@myvuw.ac.nz

Supervisor: Name: Dr James Richard: Senior Lecturer—Marketing School of Marketing and International Business

Email address: james.richard@vuw.ac.nz   Phone (04) 4635415

Human Ethics Committee information

If you have any concerns about the ethical conduct of the research, you may contact the Victoria University HEC Convener: Associate Professor Susan Corbett.

Email susan.corbett@vuw.ac.nz or telephone +64-4-463 5480.

Master of Innovation and Commercialisation Study

INFORMATION SHEET FOR PARENTS/LEGAL GUARDIAN OF PARTICIPANTS

My name is Tom Johnson and I am a student in the Master of Innovation and Commercialisation at Victoria University of Wellington. This research is working towards developing a major report on my innovation and commercialisation project. I would like to interview 15 secondary school aged students to understand their thoughts about, and experience with, success - how they achieve it? And what success means to them?

I want to ask them questions about motivation and resilience - how they keep going when something is hard and what they do to keep themselves on track with their academic and personal goals.

I will use this information to propose a business plan that can help students improve academically and personally.

How can you help?

If you consent to your child participating, I will email them a time to be interviewed, most likely at a school or library.

For your child to participate, I will need to get written consent from you.

The interview should take no more than 50 minutes, I will audio record our interview.

Your child can stop the interview at any time, without giving a reason.

Your child can withdraw from the study up to four weeks after the interview. If they withdraw, the information they provided will be destroyed. This research is confidential. I will not name your child in any reports, and I will not include any information that would identify him/her. Only my supervisors and I will read the notes or any transcript of the interview, and this will be destroyed at the end of the study.

What will the project produce?

The information from my research will be used in my Masters report for Victoria University. I may also use the results of my research for conference presentations, and academic reports.

If you accept this invitation, what are your rights as a legal guardian of a research participant?

You do not have to accept this invitation if you don't want to. If you do decide your child may participate, you have the right to ask for a anonymised summary of the research.

Your child, as the participant in this study has the right to:

- choose not to answer any question;

- ask for the recorder to be turned off at any time during the interview;

- withdraw from the study up until four weeks after the interview;

- ask any questions about the study at any time;

- read over and comment on a written summary of the interview;

- agree on another name for me to use

- read any reports of this research by emailing the researcher to request a copy.

If you have any questions, either now or in the future, please feel free to contact either:

Me! (Student Researcher): Tom Johnson

University email address: johnsothom7@myvuw.ac.nz

Supervisor: Name: Dr James Richard: Senior Lecturer—Marketing School of Marketing and International Business

Email address: james.richard@vuw.ac.nz   Phone (04) 4635415

Human Ethics Committee information

If you have any concerns about the ethical conduct of the research you may contact the Victoria University HEC Convener: Associate Professor Susan Corbett.

Email susan.corbett@vuw.ac.nz or telephone +64-4-463 5480.

Appendix D: Parent consent form for participation of minors in study

Master of Innovation and Commercialisation

PARENTAL CONSENT FORM FOR CHILD PARTICIPATION IN RESEARCH
CONSENT FORM FOR PARTICIPATION IN RESEARCH BY INTERVIEW

"Moemoea: motivation and resilience in success seeking secondary school students in a digital age "

I …..

being over the age of 18 years hereby consent to my child

....

participating, as requested, in the interview for the research project on student success, motivation and resilience.

1. I have read the information provided.

2. Details of procedures and any risks have been explained to my satisfaction.

3. I agree to audio recording of my child's information and participation.

4. I am aware that I should retain a copy of the Information Sheet and Consent Form for future reference.

5. I understand that:

    ·   My child may not directly benefit from taking part in this research.

    ·   My child is free to withdraw from the project at any time and is free to decline to answer particular questions.

    ·   While the information gained in this study will be published as explained, my child will not be identified, and individual information will remain confidential.

    ·   Whether my child participates or not, or withdraws after participating, will have no effect on his/her progress in his/her course of study, or results gained.

    ·   My child may ask that the recording be stopped at any time, and he/she may withdraw at any time from the session or the research without disadvantage.

Parent/Legal Guardians signature……………………………………… Date………………........

I certify that I have explained the study to the participant and participants guardian and consider that she/he understands what is involved and freely consents to participation.

Researcher's name: Tom Johnson.   email: johnsothom7@myvuw.ac.nz

Researchers Signature…………………………………….. Date: …………………

Participant Consent Form

Research Project Title: "Moemoea: motivation and resilience in success seeking secondary school students in a digital age"

Researcher: Tom Johnson, School of Chemical & Physical Sciences, Victoria University of Wellington

I have been given and have understood an explanation of this research project. I have had an opportunity to ask questions and have them answered to my satisfaction.

I understand that I may withdraw myself (or any information I have provided) from this project up to four weeks after the interview without having to give reasons, by e-mailing johnsothom7@myvuw.ac.nz

I understand that any information I provide will be kept confidential to the researcher and their supervisor, the published results will not use my name, and that no opinions will be attributed to me in any way that will identify me.

I understand that the data I provide will not be used for any other purpose or released to others.

I understand that this information will be destroyed at the end of the study.

Furthermore, I will have an opportunity to check the transcripts of the interview.

Please indicate (by ticking the boxes below) which of the following apply:

- ¨ I would like to receive a summary of the results of this research when it is completed.
- ¨ I agree to this interview being audio recorded.

Signed:

Name of participant:
Date:

Appendix F: Interview schedule

Research Question 1: Qualitative

Criteria for Success

1. **What does success look like to you?**
2. What makes you think these things are successful? (eg. magazines, media)
3. Can you name two people who you think of as successful?
4. Can you tell me about a time that you felt successful?
   - Was it something you did?
   - Was it something you felt?
   - Was it a skill someone taught you?
1. What would be your biggest dream you could achieve?
2. What would you need to do or to have to achieve this dream?

Motivation
1. Can you tell me about a time when you felt motivated?
2. What does it feel like to you to be motivated?
3. Are there any people in your life that help you feel motivated?
4. What practical activities in motivation or goal setting have you done this year?
   - What have you enjoyed?
   - What have you found helpful?
   - What have you learnt?

Tools / Resources
1. **Do you have access to any people, tools or resources that helped with your motivation for success in your studies?**
   - at school
   - at home
   - other places
1. Do you use any apps, games, youtube videos, to help you feel motivated?

Research Question 2: Qualitative

Grit and Resilience
1. **Can you think about a time when things were difficult/not going so well? What is the hardest thing at school that you have had to do in the fast few years?**
2. How did you cope with this?
   - Were you able to do it? (Yes/No/Why)
   - How did you feel afterwards?
1. Can you tell me what this resilience or grit means to you?
2. What does resilience/grit do for you when you are wanting to achieve your goals?

Research Question 3: Qualitative

My Business "Moemoea"

1. I'm looking to create an interactive motivation tool for your phone or computer that is like a friend who can help you feel more motivated to achieve your goals and help you get up when something is blocking your path by prompting you to keep going and suggesting new ways to help you get back on track with your goals especially around being successful at school.
2. How would you feel about using this motivational helper? (YES/NO) - PROMPT FOR BOTH
3. Do you think you would benefit from this service? - WHY OR WHY NOT
4. Should this product/service be available
    1. To individual students (parents): free or paid
    2. Through individual schools for student use: free or paid
    3. Through the government education ministry: free or paid
    4. Through other organisations (NGOs): free or paid
5. Would you pay for a product/service that helped you achieve more success?
6. If so, how much?\ INDICATE - ROUGH IDEA OF FREEMIUM VS PREMIUM

Final Question:
1. Our goal is to understand what real "success" is TO YOU and what you need to get it. Is there anything else you might share that might help with that understanding?