

**A critical comparison of whole school and
programme level cross curricular strategies and
their relationship to the Design and Technology
curriculum in three New Zealand secondary
schools**

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Abstract

Cross curricular education is not a new concept and has more recently come into the spotlight as educators seek pedagogies to better prepare our students for the future. This study aims to identify cross curricular learning strategies currently in practice in New Zealand. The key aims sitting alongside this are to gather student and teacher perceptions of the practice, identify what is enabling and/or restricting cross curricular pedagogy and to identify sustainable cross curricular models.

Despite the terminology associated with cross curricular learning being inconsistent, for the purposes of this study, the terms cross curricular learning and curriculum integration are used interchangeably to describe teaching and learning happening across two or more learning disciplines. To unpack the different approaches to cross curricular teaching and learning, a hierarchy of cross curricular approaches is used to help clarify its different facets. The key findings of the literature review reveal why cross curricular education is so beneficial to both students and teachers and the potential barriers which can restrict its implementation and growth.

The research design for the study was a small-scale qualitative approach. With the study focusing on gathering perceptions of lived experiences, a qualitative paradigm was adopted to build and generate perceptions of cross curricular pedagogy. Data was gathered from three schools, interviewing both students and teachers in semi structured and focus group interviews. Interviews and focus groups were conducted to allow for both personal perceptions to be explained and to gather different insights from a group perspective.

The study revealed that cross curricular learning strategies included collaboration, essential support in terms of leadership and logistics, real world curriculum and student agency. In many aspects, these strategies were not only the key elements in making cross curricular learning successful, but could also act as the elements which aided in its failure.

Although more research is required into the sustainability of the cross curricular approach, the findings of this study will contribute to the literature on cross curricular education and inform the practice of educators interested in the pedagogy.

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The research was approved by the university ethics Committee on 22nd August 2017, AUTEK Reference Number 17/252.

Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person except that which appears in the citations and acknowledgements.

A handwritten signature in black ink, appearing to read 'G. Singh', is written on a light gray background.

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Abbreviations

NZC	New Zealand Curriculum
MOE	Ministry of Education
NCEA	National Certificate in Educational Achievement
LA	Learning Advisor
PBL	Project Based Learning
SDL	Self-Directed Learning
IP	Impact Projects
IEM	Individual Education Meeting
IEP	Individual Education Plan

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Chapter One | Introduction

Cross curricular education is not a new concept (Barnes, 2015; Beane, 1997; Dowden, 2010; Drake, 2012; Savage, 2010). One of its earliest pioneers was American philosopher John Dewey, seen to be promoting the practice as early as 1899 in his first publication of 'The School and Society' (Dewey, 1915). Despite this, it has only recently come back as a powerful strategy to help respond to the evolving needs of our students due to mass social change and effect of the 21st century.

The NZC recognised and responded to the changes of the 21st century officially in 2007, with its republication of the NZC and support of real life learning across curriculum disciplines which cross subject boundaries. However, this was not supported with guidance or suggestions as to how to approach such a gargantuan change to an otherwise antiquated and traditionalist system. Our current traditionalist system was developed in the peak of the industrial revolution and symbolic of the time period, whereby efficiency and profit maximisation was the key focus, both in business and in education (Robinson, 2010), subjects in separate learning areas, students taught in batches according to age and places of mass listening and instruction (Dewey, 1915). Embracing cross curricular pedagogy in an established school is daunting to say the least.

More recently, new schools have been built to accommodate cross curricular pedagogy. In turn, the staff, timetable and modern learning environments are all customised to support, enable and sustain integrated practice. However, this change is only beneficial to such a small percentage of students.

This research was built around identifying the strategies in place which enable and restrict cross curricular pedagogy; at both newly established schools and already established schools. By researching at a school built for cross curricular learning and a school adopting the pedagogy in its pre-established environment, strategies supporting and restricting the practice could be identified. Of interest, was identifying strategies which could be implemented in my own school and potentially embedding the practice in a school which was not at liberty to start from scratch.

Central to this study were the perceptions of key stakeholders; the students and the teachers. Literature suggested that real world learning and authentic context programmes associated with cross curricular pedagogy saw students engage with the

material at a deeper level and increased student engagement overall (Boyd, 2013; Lord, 2006). For teachers, an integrated curriculum resulted in increased collaboration and in turn a more positive working environment (Drake, 2012). It was very important to understand what students valued in the cross curricular approach and equally, whether teachers felt it was sustainable and worth the initial increased workload with setting up cross curricular programmes.

Another point of interest was how cross curricular models were affecting option subjects. In the interest of transparency, it is important to recognise my bias with option subjects, in particular my specialist teaching area, Design and Technology. There is still weight and value associated with different subject areas and their 'importance' in delivering results (Drake, 2012; Jephcote & Davies, 2007), particularly with literacy and numeracy. In turn, the weight and value associated with different learning areas affects option subjects and their continued battle to justify and promote their value and relevance which has a snowball effect on numbers, classes and ultimately staffing. Järvinen and Rasinen (2015), suggest Design and Technology is potentially in danger within a cross curricular context, arguing that its capacity to marry so well with numerous subject makes it prone to losing its identity as an independent field of knowledge and expertise.

Often, teachers can appear resistant to cross curricular approaches. Aside from not being interested in the pedagogy, other forms of resistance towards cross curricular learning is linked to a lack of knowledge and confidence in other subject areas (Barnes, 2015; Drake, 2012). This is particularly relevant for the research considering the study is focused on secondary schools, where teachers are trained as specialists as opposed to generalists. The research aimed to identify how this potential reluctance was eased and what strategies were being used to support teachers in navigating uncharted subject territories.

Research context

Newly built school environments are embracing cross curricular pedagogy in order to better cater for the needs and demands of 21st century learners. Despite the promotion of the practice by the NZC, guidelines and recommendations for cross curricular implementation within existing school environments is somewhat lacking. This study examines the cross curricular approaches of three New Zealand secondary schools and their implementation of the practice in accordance with their circumstance; namely a

newly built school and already established. The research took place in three co-educational schools in New Zealand, identified in this research by the codes School Ek, School Do and School Teen (one, two and three in Hindi) and is informed by the voices of teachers and students. The objectives of the research and corresponding location in this dissertation are outlined in Table 1.1.

Table 1 Research aims, questions and dissertation location

Research question	Research aim	Dissertation organisation
Research aim: What are teacher and student perceptions of cross-curricular teaching and learning and is the pedagogy valued?	<i>Research question: To discuss and explore teacher and student perception of and value in cross curricular learning</i>	Chapter Four Findings and Analysis Chapter Five Discussion of Themes
Research aim: What is restricting and or enabling cross curricular practice?	<i>Research question: To identify the restrictions which influence or enable cross curricular pedagogy within schools implementing a cross curricular approach</i>	Chapter Two Literature review Chapter Four Findings and Analysis Chapter Five Discussion of Themes
Research aim: What current frameworks are successful, sustainable and can better models be developed?	<i>Research question: To consider options for creating better and more sustainable cross curricular models</i>	Chapter Five Discussion of Themes

Chapter Two | Literature review

Being clear with terminology

Reviews of literature on cross curricular learning and curriculum integration have shown that there is inconsistency around the pedagogies' terminology (Arrowsmith & Wood, 2015; Boyd & Hipkins, 2012; Dowden, 2010, 2012; Fraser, 2000; Roy, 2016; Savage, 2010), so it is important to describe and define exactly what is meant by cross curricular learning and curriculum integrated learning, their similarities and their differences.

The more popular definition of the term 'cross curricular learning' is succinctly explained by Barnes (2015). Cross curricular learning is happening "When the skills, knowledge and attitudes of a number of different disciplines are applied to a single experience, problem, question, theme or idea, we are working in a cross curricular way" (Barnes, 2015, p. 66). Similarly, Boyd and Hipkins (2012), describe 'curriculum integration' as an alternative to a single subject approach or any approach which combines two or more subjects.

Although some of the literature describes both cross curricular and curriculum integration as learning from two or more subject disciplines, as previously discussed by Barnes (2015) and Boyd and Hipkins (2012) there are some who strongly disagree with this definition of curriculum integration in particular. Beane (1997), Dowden (2010) and Fraser (2000) suggest it is a lack of clarity and definition which has stopped the growth and development of what they believe to be curriculum integration. Beane (1997), argues that even since the 1920's curriculum integration was intended to mean much more than departments working across subject boundaries. Using Beane's model, the curriculum would be organised around significant problems and issues, collaboratively identified by students and teachers allowing for the enhancement of social and personal integration (Beane, 1997). Planning is done without regard for subject areas as exploration of the theme is the overriding purpose (Beane, 1997; Brough, 2008; Fraser, 2000). Students identify what is already known about the issue, identify avenues they wish to pursue, ask questions and suggest forms of investigations with teachers scaffolding ideas and the learning throughout (Fraser, 2000).

Boyd and Hipkins (2012) offer clarity around the different definitions of curriculum integration and explain the phenomenon by establishing two categories. The first is a thematic approach to curriculum integration, whereby learning is centered on a topic or

theme. This description would also marry well with the description of cross curricular learning given by Barnes (2015) and Savage (2010). The second is a democratic approach to curriculum integration whereby the unit is co-constructed with teachers and students and moving away from an organised curriculum. This explanation aligns with the definitions from Beane (1997), Dowden (2012) and Fraser (2000).

Savage (2010), acknowledging both approaches, gives a definition which embodies both the thematic and democratic methods of curriculum integration and the basic ideas of cross curricular learning;

“A cross-curricular approach to teaching is characterised by sensitivity towards, and a synthesis of, knowledge, skills and understandings from various subject areas. These inform an enriched pedagogy that promotes an approach to learning which embraces and explores this wider sensitivity through various methods” (Savage, 2010, pp. 8-9).

This definition is helpful in finding a control for the rather diverse definitions established thus far for curriculum integration in particular. Referring to the definition above, the semantic meaning of cross curricular is obvious in that learning happens across curriculum areas. Savage (2010) continues to elaborate upon the second sentence as being focused on a pedagogical element shared with and in part, owned by the student, aligning with the democratic approach to curriculum integration.

Overall, definitions of cross curricular learning are consistent and have made a more significant appearance in the British literature, with threads of Australian articles referring to the same definitions (Barnes, 2015; Johnson, 2013; Roy, 2016; Savage, 2010). Curriculum integration however, is more popular among American, Australian and New Zealand literature, although definitions are often debated and not consistent, and tend to take a much more student centered approach (Beane, 1997; Dowden, 2010; Drake, 2012; Fraser, 2000; Locke, 2008).

If we use the more widely accepted and more commonly practiced definitions, neatly defined by Barnes (2015) and Boyd and Hipkins (2012), cross curricular learning and curriculum integration in essence are one and the same; cross curricular learning occurring through curriculum integration. For the purposes of this research, the term curriculum integration and cross curricular learning will be used interchangeably to describe teaching and learning which happens across two or more learning disciplines, in

line with the definition from Boyd and Hipkins (2012). This is due to the interchangeable terminology used in both the literature and practice to more often than not, mean one and the same thing.

The NZC document encourages and is supportive of education which makes links within and across learning areas and values competencies, knowledge and skills which are rarely confined to one part of the curriculum (Arrowsmith & Wood, 2015; Boyd & Hipkins, 2012; Ministry of Education, 2007). Although curriculum integration has never been a strong tradition in secondary schools, there has been a growing interest in the approach since the publication of the 2007 NZC (Arrowsmith & Wood, 2015). The NZC suggests and encourages schools to look for 'natural connection between learning areas' (Ministry of Education, 2007), however, it does not refer to the terms curriculum integration or cross curricular learning, perhaps strategically, giving schools the opportunity to develop their own linked learning approach relative to their context. This is further supported by the lack of practical support, guidance or recommendations offered in the NZC as to how to implement or sustain learning links (Arrowsmith & Wood, 2015; Boyd & Hipkins, 2012). Instead it remains vague with the intention of schools focusing on content and approaches applicable to their own community (Boyd & Hipkins, 2012; Ministry of Education, 2007).

Due to this ambiguity, and potentially the intention of the NZC to allow schools the capacity to build cross curricular programmes to their requirements, educators perceive the practice in a number of ways and the approaches to it will differ in every setting (Arrowsmith & Wood, 2015; Boyd & Hipkins, 2012; Drake, 2012). Although it is not common in secondary schools, integration across traditional subject divisions is happening (Arrowsmith & Wood, 2015), and cross curricular approaches are interpreted in different ways, with some courses being completely student led while others are mostly set by teachers (Boyd & Hipkins, 2012). Drake (2012), suggests there is an element of excitement in the ambiguity and lack of standardised definition, in that teachers can be creative with the practice and craft their pedagogy around the needs of their students.

Some historical context

Curriculum integration as either a thematic or democratic approach is not a new concept (Barnes, 2015; Beane, 1997; Dowden, 2010; Drake, 2012; Savage, 2010). One of its key

advocates, an American philosopher named John Dewey, has been promoting the pedagogy since the first publication of 'The School and Society' in 1899 (Dewey, 1915). Dewey was an advocate of schools responding to social change and maintaining themselves by renewal, arguing that it is futile to educate children and prepare them for a society which no longer exists (Dewey, 1915; Locke, 2008; Shallcrass, 1967), a topic which is arguably still relevant today. Although, one of the problems with leading this change is that formal education is, by its nature, conservative and needs to strike a good balance between passing on traditions as well as being open to modification and new conditions, which was discussed even in the 1960's (Shallcrass, 1967).

"...we nearly always educate our children for the world we knew or know now and this is not the world they will inhabit, or in fact inhabit at present. We should keep reminding ourselves that today's five-year-old will be under 40 in the year 2000 and that he will be living in a world so different from ours as to be almost like science fiction. We are educating him for an unknown and uncertain future" (Shallcrass, 1967, p. 11).

Dewey (1915), describes schools as places for mass listening and instruction increasingly divorced from life. This description is reminiscent of an education system built in the time of the Industrial Revolution. The Industrial Revolution was focused on manufacturing for maximization and mass as efficiently as possible. One hundred years after Dewey's first publication, Robinson (2010), describes an education system which on the surface, little has changed. Robinson (2010) explains the secondary education system, whereby subjects are in separate learning areas and students taught in batches according to age; not entirely removed from the mass scale and efficiency principles of the Industrial Revolution upon which the education system was born. Robinson (2010), discusses the need for change in education, but acknowledges that change is hard when we still work in this system from the past. This is supported by Nair (2011), who describes the classroom environment as a 'relic' from the Industrial Revolution which required large workforces with basic skills. In turn, our ability to deliver a 21st century pedagogy in such an environment is naturally restricted (Nair, 2011). This universal education model was developed to provide a 'set menu' of knowledge and experiences to create competency and stability in society (Boyask, McPhail, Kaur, & O'Connell, 2008). Dewey, cited in Locke (2008), condemns this education model describing the goals as already fixed,

achievement preconceived and a false anticipation of circumstance when this learning can be used effectively.

Despite the literature, and as late as 1992, the Ministry of Education published their first outcomes focused curriculum, setting clear expectations of what students should know and be able to do, since then, and even before, there has been mass social change. We are living in a global village, populations have become increasingly diverse, technology has advanced and the world of employment has become more complex. In light of the 19th and 20th century education model needing to respond to the new demands of the 21st century, the MOE reviewed the curriculum, re- publishing the NZC in 2007 (Ministry of Education, 2007).

The response to this shift in knowledge value resulted in the introduction of the key competencies in the NZC (Ministry of Education, 2007). The NZC (Ministry of Education, 2007), acknowledges that since the establishment of the New Zealand education system there has been significant change in technology, society and how knowledge is viewed and that these changes significantly affect the kind of education students now require. The NZC not only affirms the need for change but also supports the concept of real life learning across curriculum disciplines; “The values, competencies, knowledge and skills that students will need for addressing real-life situations are rarely confined to one part of the curriculum. Wherever possible, schools should aim to design their curriculum so that learning crosses apparent boundaries” (Ministry of Education, 2007, pp. 37-38). This mirrors the views of Dewey (1915), who had always questioned why learning was segregated as this approach is so disconnected to real life. Describing subjects in traditional settings, he refers to knowledge as ‘neatly packaged’ which is rolled out for use on occasion which reduces the child to passivity, according to Dewey as cited in Garforth (1966). Obviously this is not the desired outcome, quite the opposite of what is desired by the NZC.

Experimentation with integrated approaches is not unheard of, despite the institutional structure of schools. Drake (2012), discusses the ‘project method’, which became a hallmark of the progressive movement of the 1920’s in the United States. This project approach was essentially inquiry based, offering student choice and experience around a topic, as opposed to being passive learners. This led to an important study directed by Ralph Tyler and Hilda Taba conducted from 1930 to 1942 as cited in Drake (2012), which

would demonstrate that students educated under the progressive philosophy were just as successful at university, and in some cases more so, than students educated traditionally (Drake, 2012). Sadly, this research was largely forgotten, possibly because of the mobilisation of the war effort or the efforts of traditionalist educators, however interdisciplinary approaches such as this did not entirely disappear (Drake, 2012).

In relation to New Zealand, curriculum integration has a strong history stemming from the New Education movement in the early 20th century (Boyask et al., 2008; Dowden, 2010). At this time, New Zealand's pioneering educators, were experimenting and debating the nature of society, the roles children would play in this society and what preparation was necessary (Boyask et al., 2008). Rejecting marginalised practices in the 1960's, Richardson (2012), was laying the foundations for the 'child centred' approach, believing children were engaged in activities of community which continues to influence the curriculum today. Despite this example being predominantly primary school focused and leaning more towards the democratic style of curriculum integration, the benefit of this approach is obvious in that learning becomes more personal and real for students. Back in the United States in 1989, the Carnegie Corporation's report *Turning Points* concluded that students were not progressing well enough to become productive citizens of the 21st century (Drake, 2012). This was due to the lack of personal meaning associated with their studies and thus an integrated curriculum was initiated in the late 1980's and early 1990's to create more real world contexts and more relevant curriculum (Drake, 2012).

During this time, there was as strong rationale behind interdisciplinary education and using real world context to capture students interest was a strong argument for its advocates (Drake, 2012). Considering the real world is not and never has been isolated into different subject disciplines, there were questions around why this was happening in the curriculum (Barnes, 2015; Dewey, 1915; Drake, 2012; Savage, 2010). Research at this time around student learning and achievement also favoured the cross curricular approach. Caine and Caine as cited in Drake (2012), conducted research demonstrating that the brain is most effective when it can make connections. During this time, the potential of the internet was just being realised, which became another reason for schools to look at different approaches to learning, potentially teaching more in depth as opposed to breadth and not aiming to teach students everything (Drake, 2012). At this

point, it was also becoming increasingly obvious that subject boundaries were not strictly boxed within their own knowledge discipline and in fact, were messy, interconnected and subdivided; consider for example medical physics, biotechnology, biochemistry and astrophysics. Despite the lack of quantitative evidence to support integrated learning, the Eight year Study proved that different designs of curriculum in the secondary school can ensure success beyond secondary education. In fact, students from the most experimental schools secured higher academic achievement than those who came from a more traditional school background. Students taught using integrated approaches were more motivated, engaged and presented fewer discipline problems (Drake, 2012). Despite the benefits of an integrated approach, the age of accountability took hold towards the mid 1990's prescribing an array of standardised testing which made teachers more focused on imparting 'essential' knowledge for students to make the grade and jump through hoops (Drake, 2012). Putting the integrated learning approach on the back burner to meet standardised testing requirements, the call for the approach was not heard again until a decade into the 21st century (Drake, 2012).

Reasons for cross curricular learning

Discussed by Barnes (2015), Byrne and Brodie (2012) and Locke (2008), there seems little reasons to maintain a single subject approach to learning when our lives are so rarely compartmentalised into separate learning disciplines. The current curriculum needs to expand beyond teachers isolated in different subject areas and instead learn from each other in order for students to work in context and make sense of the wider world and thus equipping students with the skills, knowledge and ingenuity which is essential in the changing global climate (Dewey, 1915; Drake, 2012; Ministry of Education, 2007, 2014; Qualification Curriculum Authority, 2009b; Savage, 2012). The following sections are broken down to represent the main findings from the literature which support reasons for embracing cross curricular pedagogy, including; engagement, pedagogy and collaboration.

i) Engagement

Studies have shown that programmes which have meaning for students and a real world, authentic context see students engage with material at a deeper level and in turn are more engaged with their learning (Boyd, 2013; Lord, 2006). In her study, Lord (2006), investigates student perceptions of enjoyment and relevance. Interestingly, the study

showed that students enjoyed the curriculum less as they got older and felt that by Years 10 and 11, the curriculum was built predominantly around assessment (Lord, 2006). Students felt more engaged when connections between the curriculum and real life were made, including gaining knowledge from professionals within the field (Lord, 2006). This is also addressed by Vars (1965), who argues that motivation for learning is increased when students are active in planning their learning and working on 'real-world' problems which in turn reduces behavioural problems. Lord (2006), also discusses practical application as an important aspect of a fun and interesting curriculum, which is also explored by Bartlett (2005), who describes cross curricular learners as active rather than passive due to the 'doing' approach rather than 'observing'. Summarising the integrated curriculum approach, Bartlett (2005), describes such a programme as focused on active student participation' which helped motivate students, reduce behaviour problems and found better attitudes towards school.

ii) Pedagogy

Aside from brand new schools with a cross curricular pedagogy from the start, implementing an entirely cross curricular approach in a traditional school establishment could be potentially tricky (Locke, 2008; Savage, 2012). To navigate the potential problems of an entire school shift from traditional approaches to cross curricular models, Savage (2012), suggests a cross curricular approach via pedagogy, embedding cross curricular approaches to teaching and learning in the work of the actual teacher or at what Jephcote and Davies (2007), describe as the micro level or individual 'teacher classroom' pedagogy. Pedagogy is considered as both practice and process, via which we acquire capabilities and develop them, however, teachers and students are at the heart of learning and to assume that their beliefs, aspirations and values would not influence elements and the design of the curriculum would be naïve (Arrowsmith & Wood, 2015; Savage, 2010). According to Bruner (1996), it is essential to consider the 'folk theories' that those engaged in practice already have. Any introduced innovations will inevitably compete with, replace or modify the existing guiding theories held by teachers and students. This point solidifies suggestions made by Savage (2012), who explains that while pedagogy and its relation to personally held beliefs are important, they can be challenged, although the development required time. Some schools however, have the luxury of starting from scratch with the cross curricular approach. New schools for example are built with the concept and philosophy as its guiding principle and thus

teachers are recruited upon their understanding and embracing of the cross curricular pedagogy (Arrowsmith & Wood, 2015).

iii) Collaboration

According to the literature, collaboration is essential to cross curricular pedagogy and is beneficial to teaching and learning in a multitude of ways. Firstly, it begins to disintegrate the walls separating subjects and break down the structure of what the literature suggests to be an antiquated system (Boyask et al., 2008; Robinson, 2010), via collaborative practice. Collaboration has been recognised throughout the literature as key to both school and student improvement (Datnow, 2011; Fleming, 2012; Ministry of Education, 2014). Within a cross curricular context, collaboration is also key in supporting teachers who are potentially apprehensive about making connections between and embarking upon subject knowledge which is outside of their knowledge remit (Byrne & Brodie, 2012; Savage, 2012). As secondary school teachers are subject specialists, they tend to be less keen for curriculum integration compared to primary or intermediate teachers who are trained as generalists (Arrowsmith & Wood, 2015). By remaining within subject disciplines, students are denied the opportunity to develop an understanding around the contribution of each discipline within complex problems and situations (Locke, 2008). The advantage of collaboration across departments is that teachers and students understand the bigger picture and appreciate differences. The collaborative planning process then allows for teachers to identify overlaps which then contribute to knowledge and understanding (Locke, 2008). According to the research, curriculum integration resulted in a more satisfied work force, teachers were satisfied with their jobs and experienced positive working environments (Drake, 2012). Savage (2010), unpacks this by discussing 'shop window' subjects such as music or technology for example, which are used on special occasions such as school shows, open evenings or community events and otherwise left alone. Because of this, teaching can be a lonely experience and not conducive to collaborative practice. However, it would be naïve to assume collaborative practice among teachers or faculties would be smooth sailing or without its difficulties with so many underlying factors to consider (Brundrett, 1998; Datnow, 2011). In order for collaboration to be successful and sustainable, Brundrett (1998) and Datnow (2011) recommend that collaborative practice be spontaneous, voluntary and development orientated. This form of advancement in practice is limited, however, as it is inevitably determined and restricted by meso level or middle organisational structures of control,

logistics and pressures, thus, dampening any spontaneous and voluntary efforts by classroom teachers. This is not to say that collaboration is solely responsible for either the success or failure of cross curricular pedagogy, however it is certainly an essential factor. At secondary school level particularly, specialists are required for their knowledge and skills in that subject area. Wilcock (2014), addresses the obvious barriers to cross curricular pedagogy, particularly, important subject specific knowledge. This knowledge barrier can potentially restrict links between subjects as inter disciplinary projects become harder to merge with fluidity, stay relevant and meet criteria for assessment.

Restrictions

Based upon the concept of learning and living being inseparably intertwined, Gwenneth Phillips cited in Richardson (2012), suggests the possible restrictions which have negatively affected innovation and development of this kind, including; a shift in educational decisions from educators to politicians and policy makers, numerous guiding documentation articulating outcomes and measurement and accountability (Richardson, 2012). Boyask et al. (2008), add to the list of restrictions, suggesting that despite supportive policies enabling experimentation, innovation is often dampened by the structure of schools which are ingrained in the past. The obvious truth also lies in human nature, whereby the sheer scale of such transformation inevitably brings numerous problems and the compelling argument is to stay stagnant (Locke, 2008). The following sections are representative of the most frequently discussed barriers to cross curricular learning and its implementation. These include; subject identity, assessment and essential support.

i) Subject identity

Despite the best intentions of teachers, educational leaders and the supportive documentation promoting cross curricular learning, there are numerous elements which are prohibiting the growth of the practice. Firstly, there is weight and value on separate subject areas, their status and teacher identity (Arrowsmith & Wood, 2015). In fact, Roy (2016), argues that one of the main reasons for competition associated with learning areas is the authorities creation of knowledge hierarchy, giving precedence to some areas over others, such as numeracy and literacy (Roy, 2016). Roy (2016), also links this to staffing, explaining that because of student numbers and options, neoliberal society teachers are not encouraged to collaborate (Roy, 2016). As subject specialists teachers

are very proud and protective of their discipline and herald the importance of it. This is also linked to teachers' lack of different subject knowledge and the reality that teachers feel 'out of their depth' with new content, making it difficult for them to entertain the idea of 'looking over the fence' (Arrowsmith & Wood, 2015). Savage (2010), explains this element as one of the obstacles in implementing cross curricular learning elaborating that teachers have a lack of confidence with themes and knowledge content. Specialist subjects develop the inspirational and enthusiastic teacher, thus, any proposed change must be carefully handled as opposed to ignored (Locke, 2008). Those schools engaging in cross curricular pedagogy need to find a balance whereby subject integrity and value does not decline (Locke, 2008). This is further supported by Byrne and Brodie (2012), who discuss the dangers behind the holistic approach, primarily, the loss of distinctive subject content. Järvinen and Rasinen (2015) recognise this danger and instead identify technology in particular as a high risk candidate in losing subject identity within a cross curricular context due to the faculties capacity to marry so cohesively with other curricula. This capacity could also make the subject vulnerable to becoming a cross curricular dumping ground when it should be focused on maintaining its credibility as a strong and independent faculty (Järvinen & Rasinen, 2015).

ii) Assessment

As previously discussed by Drake (2012), accountability hit the educational landscape around the mid 1990's. Since this time, an unwritten rule has developed whereby teachers have become answerable for poor student results and are continually pushed to achieve better results. Educators are pushed to act accordingly with what the public has determined and achieve those expectations (Drake, 2012). In terms of curriculum integration, Arrowsmith and Wood (2015), discuss the strong link between subject disciplines and NCEA assessment, which is essentially what schools are judged upon (Arrowsmith & Wood, 2015). This acts as a good indication as to why curriculum integration is perceived as a risk to teachers and thus not practiced at senior level. Essentially, curriculum integration is seen as a threat to senior results (Arrowsmith & Wood, 2015). Teachers have content to cover and need to prepare students for testing which takes priority over curriculum integrated approaches (Drake, 2012). Savage (2010), uses the student perspective for the assessment element, explaining that students in the traditional system feel if it is not assessed, it is not important and they do not see the point.

iii) Essential support

The literature has identified key elements that support curriculum integration. The first, is support from senior leaders (Arrowsmith & Wood, 2015; Savage, 2010). Without support from senior management, teachers will quickly burn out due to increased work load when setting up programmes and increased demands on leading teachers (Arrowsmith & Wood, 2015). Arrowsmith and Wood (2015) also refer to senior leadership support in terms of promoting and justifying the merits of cross curricular programmes to staff members and the community in order to gain support (Arrowsmith & Wood, 2015; Locke, 2008). Otherwise, teachers can become quickly isolated and again, burn out. Savage (2010) also suggests senior management taking responsibility for the curriculum at the appropriate stage and implement a high degree of coordination between teachers presumably without stifling and suffocating collaboration as previously discussed by Brundrett (1998) and Datnow (2011).

The second vital factor which was repeated in the literature was the need for flexible timetable and classroom structure which allows for deeper learning (Arrowsmith & Wood, 2015; Savage, 2010). This could include, although this not necessarily limited to, longer lessons, bigger classes with two teachers and modern learning environments. Nair (2011), an advocate of modern learning environments, argues that the classroom, built for the needs of the Industrial Revolution, has been 'obsolete for several years' (Nair, 2011, p. 1). Interestingly, Benade (2017), suggests that if the classroom is obsolete, this could imply that the practices happening within it are indeed the same. Benade (2017) continues to describe flexible learning environments which encourage innovative teaching and learning to equip students with the skills and knowledge required for 21st century economy. In his research, Benade (2017) discusses that as well as space designed for flexibility, modern learning environments also support potential collaborative practice and teamwork. Although Locke (2008) maintains it is easy to overlay collaborative planning to a secondary school timetable and staffing structure, there is the risk that the planning in practice could lose its significance when lessons are still taught in the traditional way in traditional classrooms and thus the practice is at risk of losing momentum.

The third recurring factor to support curriculum integration was professional development and considering the delayed development of cross curricular education, a

lack there of. In an article written by Arrowsmith and Wood (2015), where they compare successful and not so successful curriculum integration practices, they discuss the effect of professional development. At the time of publication, professional development for cross curricular pedagogy was not in abundance, however, the successful pedagogy was planned around individual needs on an opt in basis as opposed to compulsory attendance (Arrowsmith & Wood, 2015). This is further supported by Savage (2010), who explains that teacher development is top priority when implementing cross curricular pedagogy.

Cross curricular approaches

Although the NZC remains ambiguous about cross curricular approaches, researchers have been able to categorise the different approaches in practice. Arrowsmith and Wood (2015) and Drake (2012), describe different ways to approaching cross curricular learning or curricular integration to help students create and enhance knowledge and understanding. Different approaches will influence the nature and structure of programmes and some will be more appropriate than others, depending upon the context of the school and most appropriate form for the students (Arrowsmith & Wood, 2015; Drake, 2012). Drake (2012) describes the approaches in the form of a hierarchy ranging from traditionalist to transdisciplinary approaches, which are explored in the following table.

Table 2 Approaches to curriculum integration as a hierarchy

Curriculum integration strategy	Definition
Traditional	Specific content knowledge is taught in subject silos. Connections across disciplines are not explicitly taught.
Fusion	Whereby a topic is fused to an already existing curriculum. For example, environmental awareness fused into already existing subject areas. Subject boundaries stay intact (Drake, 2012).
Multidisciplinary	Disciplines are kept distinct, however, deliberate connections are made. A number of subject disciplines are used to address a topic or focus. This is examined with each discipline addressing the topic or focus through their own lens. Teachers do not need to change much, content and assessment remain unchanged. Students are expected to make connections as opposed to being explicitly taught (Arrowsmith & Wood, 2015; Drake, 2012).

Interdisciplinary (Thematic approach)	More explicit connections around a common theme, issue or problem, however, interdisciplinary skills such as critical thinking or change are emphasised across learning areas. Subject boundaries remain (Arrowsmith & Wood, 2015; Drake, 2012).
Transdisciplinary (Democratic approach)	Curriculum developed around interest of the student, beginning with real life context with student and teacher negotiation around unit material, activities and assessment. Subject boundaries are either merged or collapsed.

Although the above definitions give a flavour around different levels and approaches to curriculum integration, there is no specific reference to the student centred approach, heralded by Beane (1997), Brough (2008), Dowden (2012) and Fraser (2000).

Drake (2012), suggests that the hierarchy is helpful to understand different starting points in implementing integrated curriculum, however, Fraser (2000), argues that this is not the case, and in fact, thematic units have dramatically hindered the development of democratic curriculum integration. There are however, many success stories associated with thematic cross curricular approaches (Arrowsmith & Wood, 2015; Drake, 2012; Savage, 2010). Compared to the traditional school approach, the curriculum strategies discussed are lending themselves towards the principles of the progressive curriculum, aiming to motivate students as learning is relevant and eventually leads to the principles of constructivism where students take ownership and control of their own learning (Drake, 2012; Garforth, 1966). Interestingly, it could be argued that at the height of curriculum integration, transdisciplinary in this case, the learning becomes more aligned with the democratic integration approach although it is not specifically referred to (Beane, 1997; Dowden, 2010; Fraser, 2000). In its simplest form, Drake (2012), argues that virtually any subject discipline can be integrated with another with approaches ranging from one teacher teaching multiple subjects through a universal theme, or even team teaching combining areas of expertise (Drake, 2012). The danger however, is that links are forced and become inauthentic, whereby subject disciplines are still identifiable and risk being taught in weekly blocks.

Chapter Three | Methodology

This section will describe the approaches and rationale used to investigate the research questions. It will describe; the positioning of the study, the praxis and specific reasons why particular methods were chosen, how the data were analysed, how the participants were selected and the attention to detail when considering responsibility towards ethics. It concludes with an evaluation of the overall validity and reliability of the study.

Philosophical

When planning research, researchers need to think about assumptions and how they can influence the research. How we see, think and act is driven by our own personal worldview, assumptions or paradigm; beliefs about how research should progress, and what kind of knowledge is valued will influence the research design. These individual sets of beliefs, values and culture form the philosophical foundations of the research and thus will guide the research practice, the final representation and the dissemination of the research findings (Creswell, 2014; Leavy, 2017). Worldviews and paradigms arise based upon personal factors including profession, experience, culture and status to name a few, and will influence the approach chosen for the research (Creswell, 2014).

i) Ontological and epistemological positioning

Ontological and epistemological positioning essentially guides the paradigm for the research. This paradigm becomes the lens through which the research is viewed. Positioning and paradigms influence research from the very beginning. The research design must be built accordingly to the paradigm or lens that the researcher has adopted (Byrne-Armstrong, Higgs, & Horsfall, 2001; Creswell, 2014; Grix, 2001; Leavy, 2017). It is important to address the epistemological and ontological influences of this research as they influenced and guided the research methodology for this study.

Ontology is described as the social realm upon which reality is based. There are a multitude of ontological perspectives (Byrne-Armstrong et al., 2001; Grix, 2001; Hennink, Hutter, & Bailey, 2011). Ontological assumptions build our own social reality. Thus, it is not difficult to understand how different researchers will have divergent views and differing assumptions which inevitably affect the manner in which research is undertaken (Creswell, 2014; Grix, 2001). Being inextricably linked to the study by my position as a secondary school teacher of technology, I needed to be transparent in terms of ontology.

The positivist approach espouses objectivity, the notion of absolute truth and testing claims and hypothesis, valuing objectivity and neutrality from the researcher (Creswell, 2014; Grix, 2001; Hammond & Wellington, 2013). Considering my personal links to the study, remaining objective and neutral was not a realistic expectation due to bias and therefore, my ontological approach was better matched to that of a constructivist approach which emphasises peoples' subjective experiences and seeks meaning in varied and multiple views rather than narrow meanings (Creswell, 2014; Grix, 2001). The goal of this approach in terms of research is to rely on participants' views and meaning of the situation being studied. Researchers also recognise and consider their own background and personal experiences as an important factor in influencing their interpretations. They acknowledge this and position themselves accordingly to account for it (Creswell, 2014).

Epistemology on the other hand is concerned with the theory of knowledge, what counts as knowledge and how we come to know it (Byrne-Armstrong et al., 2001; Creswell, 2014; Grix, 2001; Leavy, 2017). It also informs how we enact the role of researcher and the relationship between researcher and participant (Creswell, 2014; Grix, 2001; Leavy, 2017).

The epistemological positioning of the research affects the entire research project, including; the way the literature is read, the selection of the research questions, the data collection, the analysis and the interpretation and write up of the findings (Byrne-Armstrong et al., 2001). Similar to ontology, my background and experiences, or 'baggage', inevitably effected the epistemological stance I assumed, due to bias (Byrne-Armstrong et al., 2001; Creswell, 2014; Grix, 2001; Leavy, 2017), and I could not remain objective and neutral as described in the pragmatic epistemological approach (Leavy, 2017). By taking an interpretive approach, I was able to focus on participants' social reality and reflections of views and events and construct meaning around their daily interactions and experiences (Creswell, 2014; Grix, 2001; Hammond & Wellington, 2013; Hennink et al., 2011; Leavy, 2017). I was aiming to gain some validity to the study by remaining transparent and acknowledging that the validated knowledge would be influenced by my own social norms and parameters (Grix, 2001).

ii) Qualitative paradigm

The paradigm of a study is described as being a result of the researcher's ontological and epistemological stances or a net which contains the researcher's ontological and

epistemological premises (Hennink et al., 2011; Leavy, 2017). In this case, my stances resulted in adopting a qualitative paradigm. This paradigm focuses on learning and exploring social phenomenon to then build and generate deep meaning of the particular, whilst maintaining that knowledge is both time and context dependent (Byrne-Armstrong et al., 2001; Leavy, 2014, 2017). In contrast, the quantitative approach focuses upon proving or disproving hypothesis while remaining neutral and objective (Creswell, 2014; Leavy, 2017) which as previously discussed was not the best approach after considering and being informed by my ontological and epistemological stances. From this qualitative perspective researchers are actively engaged in constructing and reconstructing meanings or social constructions of reality from research participants. Researchers adopting this paradigm value the subjective interpretation of participant experiences (Creswell, 2014; Leavy, 2017). As this study was seeking to establish teacher and student perceptions and value of cross-curricular teaching and learning, a qualitative approach was most suitable for the study. This approach aims to explore phenomenon and unpack meanings people ascribe to events, situations or activities. It is also used to acquire a depth of understanding and describe or explain a phenomenon (Leavy, 2017).

Praxis

According to Leavy (2017), praxis refers to the 'doing' part of the research. Various tools are used such as focus groups, to conduct research which can be grouped into genres or designs such as interviews (Leavy, 2017). The research method is the tool for data collection and will be selected upon consideration of the best approach for the safety and comfort of the participant and best approach for collecting good data. Selection of research methods are also made in conjunction with the research questions or aims alongside other more practical limitations such as availability and time restraints of participants, researcher experience and participant protection and safety (Leavy, 2017).

i) Genre/design – interviews

In this study, interviews were used as a learning and data gathering tool. An interview design is based around the idea of the interviewer and interviewee/s discussing specific topics in depth and seeks to gain insight into the issues up for discussion (Grix, 2001; Hennink et al., 2011; Leavy, 2017). The purpose of gaining detailed insight into the research issues from the perspective of the participant reflects and aligns itself with the qualitative paradigm (Hennink et al., 2011; Leavy, 2017) and motivates participants to

share their perspectives and co-construct knowledge and reality (Hennink et al., 2011; Leavy, 2017).

Interviews were very carefully planned (Creswell, 2014; Grix, 2001; Hennink et al., 2011; Leavy, 2017). Initially I had planned for participants to volunteer their participation in the research which lent itself to the participants being naturally conversational and thus drawing on what they are accustomed to (Leavy, 2017). This suited my own demeanor which is generally comfortable and confident when speaking to people and thus matched well with the interview process (Grix, 2001; Wellington & Davies, 2015). However, in the end, participants for interviews were selected by senior leaders of the school. Despite the hand selection, participants were receptive and happy to help with the study. Attention was paid to the finer details of interpersonal skills and making participants feel comfortable. It was important not to rush into the interview, and taking time to build rapport with participants was important (Hennink et al., 2011; Leavy, 2017). Piloting and preparing for the interview beforehand was very helpful and gave me security of having practiced and helped to refine my questions, thus avoiding any awkward moments in the real interview (Wellington & Davies, 2015).

At the beginning of the interviews, making small talk and offering refreshments and snacks were routines I used to establish a relaxed and comfortable atmosphere and build rapport with participants (Hennink et al., 2011). The seating arrangements were also considered. Sitting between tables could affect rapport development and facing each other could also be considered threatening and too formal (Hennink et al., 2011), thus by sitting at an angle to participants, I was still able to encourage interviewees with eye contact and make them feel at ease (Hennink et al., 2011). Eye contact, active interest and probing questions were used to show engagement and positive encouragement (Hennink et al., 2011; Leavy, 2017).

Interview guides were also used to identify specific themes and the order of questions, starting with broader questions and getting more specific (Leavy, 2017; Wellington & Davies, 2015). This guide was considerably robust considering my lack of experience in the field although I was aware that I would need to be responsive to outputs during the interviews and not necessarily follow the guide to the letter (Grix, 2001; Leavy, 2017; Wellington & Davies, 2015). Organisation of the material was also significant and worked alongside an organised and effective system for recording field notes which were used to

refer back to and explore if needed once the participant had finished what they were saying (Leavy, 2017).

Organisation and pre-planning was essential. Ideally, participants would have had access to the questions beforehand to prepare; however, due to the school selecting participants for me, I did not have the opportunity to communicate with them until the day of the interview. To accommodate for this, I gave participants time at the beginning of the interview to peruse the questions and avoid a 'rabbit caught in the headlights' type scenario.

Plenty of time was given to arrive at the meeting and set up equipment and refreshments, which left me able to welcome participants into a calm and comfortable environment (Grix, 2001).

At the end of the interview, it was important to close appropriately to establish a professional relationship after building rapport and trust (Hennink et al., 2011; Leavy, 2017). Closing questions were used to help draw the interview to a close and establish some distance from the participant (Hennink et al., 2011; Leavy, 2017). These questions included their overall thoughts on the topic and whether they had any questions they wanted to ask me.

Method/practices – semi structured interviews, focus groups and field notes

i) Semi-structured interviews

By choosing to conduct semi-structured interviews, a compromise is found between the inflexibility of a structured interview and the instability of an unstructured interview (Wellington & Davies, 2015). This form of interview gave a platform to participants for their voice to be heard (Hennink et al., 2011; Wellington & Davies, 2015), aligning well with the qualitative paradigm, the aim and scale of the study and my lack of experience in the research field, particularly with interviews (Wellington & Davies, 2015). Although the interviews did not have to happen face to face and could for example be conducted over a skype interview due the significant travelling distance, this presented more disadvantages than advantages (Creswell, 2014; Wellington & Davies, 2015). Sitting with participants, reading body language and gauging atmosphere was important in collecting data, as it meant I could more accurately gauge a perception as to the perspectives and social realities of my participants. The interview started by gathering basic information

about the participant, such as age, years of experience and job title. This part of the interview was used to officially recognise that the interview had started and remained simple to help the participant warm up (Wellington & Davies, 2015). I tried to keep questions to a maximum of 10, to avoid exhausting my participants and keep the data manageable (Creswell, 2014; Wellington & Davies, 2015), however, this was often exceeded when exploring markers within the interview and pursuing particular lines of interest. Prepared questions were kept meaningful and in line with the audience, using careful language and phrasing so that the participant could understand the question without difficulty (Wellington & Davies, 2015) and prepare in advance, albeit with the little time available. My intention was for interviewees to pick the location and time on campus in which the interview would occur. This was to ensure my participant could speak freely and not feel at risk and in turn compromise the data (Leavy, 2017; Seale, Gobo, Gubrium, & Silverman, 2004). However, due to the participants being selected and my time at the schools being organised and overseen, interview spaces were already selected and provided. Despite this, participants seemed at ease and comfortable in the space provided. Careful attention was also paid to questions and probing for further clarification, by asking participants to explain or clarify a response sensitively and politely as opposed to prompting a response which would skew and compromise the data (Wellington & Davies, 2015).

Semi-structured interviews allowed for flexibility and the pursuit of unexpected lines of inquiry (Creswell, 2014; Grix, 2001; Wellington & Davies, 2015). Despite the downside of gaining filtered views and perspectives from one participant (Creswell, 2014), this was balanced by conducting the same semi-structured interview with a second participant in the school and acted as a form of triangulation to try and establish some validity in the study (Grix, 2001; Leavy, 2017; Wellington & Davies, 2015).

ii) Focus groups

In order to gather different insights around the topic from different perspectives (Grix, 2001), students were interviewed collectively as a focus group. In this capacity, I acted as more of a facilitator than an interviewer, allowing dialogue to spark between group members in line with the supplied topic (Grix, 2001). Focus groups were used to focus on experiences and gather a range of opinions from community perspectives as opposed

isolated personal experiences (Bloor, Frankland, Thomas, & Robson, 2001; Hennink et al., 2011).

Use of focus groups with students were picked to help participants feel safer and more at ease being with their peers as opposed to a one on one interview (Wellington & Davies, 2015). This situation also helped in terms of supporting each other and students were able to jog each other's memories and discuss their viewpoints (Wellington & Davies, 2015). Inviting 6-8 students to participate in the group was specifically decided upon to allow for a good range of ideas, opinions and discussion (Bloor et al., 2001; Hennink et al., 2011). There was however, a need to implement skillful management to guide the discussion and keep it on topic. This would also decrease the risk of maverick voices or prolonged speech from dominant individuals (Hennink et al., 2011; Wellington & Davies, 2015). Questions were broad to begin with in order to help students recognize the start of the interview and help them warm up to the process (Hennink et al., 2011; Wellington & Davies, 2015). This strategy was also used to aid the gathering of markers which would be returned to later in the interview (Hennink et al., 2011; Leavy, 2017). Questions were not similar to interview questions as the intention behind the focus group was to promote discussion, thus personal questions were avoided and there were fewer questions to promote discussion (Hennink et al., 2011). Strategic questioning was also used to try and encourage members of the group who were quiet and struggled to voice their thoughts which I felt comfortable managing due to my experience in conducting group work and discussion in my profession (Hennink et al., 2011; Wellington & Davies, 2015).

Snacks and refreshments were on hand to make students feel more welcomed and comfortable (Hennink et al., 2011; Leavy, 2017). Seating was strategically placed to allow for eye contact of all participants and correct positioning of the microphone to collect all responses (Wellington & Davies, 2015).

iii) Field notes

As described by Mills and Birks (2014), field notes are written by the researcher during actual field work. Proximity means field notes are written simultaneously with interactions and events in order to describe and recount. Although field notes are often used to describe observations, in this case, 'on-the-fly notes' were used to remember words and phrases that captured responses and perceptions from participants during

informal interviews (Leavy, 2017). Due to the already substantial amount of data collected in line with the scale of the study, on-the-fly notes was all that was required from School Teen. Considering the school's status among the profession as a flagship school, pioneering cross curricular practice, the data collection at this school was intended to act as a form of validation with the findings. During the visit, informal interviews were conducted with both teachers and students.

Data analysis

The data analysis process in qualitative research is about making sense and making intelligible accounts out of the data (Leavy, 2017), as it does not speak for itself, we speak for it (Leavy, 2017; Vogt, Gardner, & Haeffele, 2012). The nature of data analysis is that it is a recursive process; analysis leads to interpretation, leading to analysis and so on (Leavy, 2017). However, for purposes of clarity, my methods of axial coding were broken down as follows; data preparation, initial immersion, coding, categorizing and theming and finally interpretation (Leavy, 2017).

Data preparation and organisation included two main objectives. Firstly, the data were backed up and stored in an organized repository system, namely the AUT Education Faculty data facility (Grix, 2001; Leavy, 2017). When the data was transcribed, I decided to use intelligent verbatim transcription. This style keeps everything spoken in the transcript but excludes false starts and meaningless repetitions. This meant the transcripts were capable of relaying meaning and upon receiving the transcripts I was able to decide what counted as relevant or irrelevant (Hennink et al., 2011; Leavy, 2017) and edit the transcript accordingly. By choosing to use grounded theory analysis, intelligent verbatim transcripts were essential in order to capture participants own words, expressions and phrases which allowed me to uncover meaning (Hennink et al., 2011). Also, being a qualitative study, participant's feelings and emotions related to the discussed issues were important and provided detail.

The nature of qualitative data is that there is a lot of it, thus I decided to sort or chunk the data into corresponding schools, interviews, focus group and the supporting field notes with each interview (Grix, 2001; Leavy, 2017). This early categorisation made immersion easier for me.

Despite listening to the recordings directly after the interview to ensure the clearest picture of what had been said (Grix, 2001), initial immersion was used after this alongside the transcripts in order to get a feel for the data before anything else. Repeated reading, listening, highlighting and note taking allowed me to get a feel for the data and allowed any ideas to develop (Creswell, 2014; Leavy, 2017). The transcript was also checked to identify errors and inaccuracies to act as a form of reliability (Creswell, 2014; Wellington & Davies, 2015), alongside removing names of people, locations or specific information which may have revealed the person's identity, these were either left blank, or replaced with a code or pseudonym (Hennink et al., 2011). By having a transcript and listening to the recordings multiple times, similarities, differences and key themes were identified alongside field notes which further aided my analysis of the data (Bryman, 2012). This initial immersion was also beneficial in beginning the data reduction process, although attention was paid to maintaining an open mind and staying adaptable to not miss discovering new or different patterns (Grix, 2001). At this point, I took a step back to allow time for the ideas to develop organically (Creswell, 2014; Leavy, 2017; Wellington & Davies, 2015).

Data then needed to be coded and classified. This stage consisted of assigning words or phrases to segments of data that summarized or captured the feeling of it (Leavy, 2017). This process was done by eliminating colloquialisms and connective words to leave verbs, nouns and adjectives which could be significant. I used a combination of my own Nvivo coding, relying on participants exact language to generate codes (Grix, 2001; Hennink et al., 2011; Leavy, 2017), and inductive coding which identified issues raised by participants themselves (Hennink et al., 2011). Ensuring complete immersion and being a visual learner, I would listen to the recordings alongside reading the transcripts. I used mind maps to write down key phrases or words from participants and then colour coded them into similar potential themes.

Once the data had been coded, patterns and relationships between codes were identified or grouped similarly, which then led to overarching categories or themes within the data (Leavy, 2017). This helped confirm my findings from the initial coding. This acted as another form of triangulation to support validity and for the coding to be organic and directly linked to data from participants. Through this process, I would write

memos which acted as a bridge to link coding and interpretation, documenting impressions and emergent understandings (Leavy, 2017).

Interpretation of the data was a journey through the condensed and categorised data to look for themes and make sense of the data as a whole (Leavy, 2017).

Sampling

i) Schools

Seeking out the best cases for the study was my utmost priority as this would directly affect my data collection (Leavy, 2017). I used a purposeful sampling technique for this study in that the best cases were strategically sought in order to address the research purpose and questions (Creswell, 2014; Leavy, 2017). Myriad factors including it being examination season and principals protecting teacher and student time meant finding schools to partake in the research was a struggle, and led to in depth research and communication with academics in the field who pointed me in the right direction. This was accompanied by utilisation of network contacts who acted as 'gatekeepers'. As described by Leavy (2017), gaining access to the research setting can be tricky and potentially blocked or aided by formal and informal gatekeepers. Even in public spaces, research necessitates positive relationships in the field (Leavy, 2017).

Selecting schools implementing cross-curricular learning at whole school and programme level was the first criteria in my search for participating schools. School Ek was selected due to its programme level cross curricular implementation. Although never explicitly referring to its curriculum model as cross curricular, supporting resources such as its website, curriculum documentation and Education Review Office report certainly referred to the school practicing elements of cross curricular pedagogy. This was also confirmed after an initial conversation with the schools' Deputy Principal. The school operates a single discipline timetable, however, allows students to accumulate literacy and numeracy credits in different subject areas. After an initial telephone conversation, this school was invited to participate via email.

School Do was selected for matching criteria to cross curricular learning at whole school level. All year groups in the school and the whole system were built around a cross curricular learning approach. This school was identified and invited to partake by utilising network knowledge and contacts. I researched the schools website, supporting

documents and Education Review Office reports to ensure it was an appropriate match and purposeful to the research at hand. Their invitation to participate was initiated with a call and then officially sent via email.

School Teen was identified via professional development experiences, network knowledge and contacts. School Teen was a last minute participant, however, and utilised due to its flagship practice around cross curricular teaching and learning. Their initial invitation was sent via email; however, an unexpected telephone call from their Deputy Principal prompted a last minute visit.

ii) Participants

Interviews

Due to the specific job criteria requested of participants, and thus a small pool of potential participants, it was my intention that a whole school advertisement was sent to all staff in both schools asking for participation upon meeting the requested criteria. This approach would protect participants from being identified in the final dissertation and was intended to encourage keen participants to partake in the study which would result in rich data. Ultimately, participants were selected by the school. Although this was not the initial intention, participants were accommodating and receptive. They were also made aware that although pseudonyms would be used in the study to protect their identities, complete anonymity was impossible due to the nature of being hand-picked by a senior staff member.

To gain a comprehensive view of the topic from a range of communities, both teachers and managers were requested to partake in the interview. Each had experience either teaching in a cross curricular setting or overseeing the implementation of a cross curricular programme. Due to the nature of the selection process, participants could only be given information sheets just before the interview was conducted and made aware that although they had been selected by a senior staff member they were not being forced to partake in the research. Participants were given time at the beginning of the interview to read the information sheet and the interview questions.

Focus groups

To shed more light on the topic from a different group of people (Grix, 2001), students from the schools were interviewed in a focus group. Focus groups were used with

students to gain insight from different communities and thus act as a form of triangulation (Leavy, 2017; Wellington & Davies, 2015). To align with the purpose of finding value in cross curricular education, students were interviewed to gather a more holistic perspective (Wellington & Davies, 2015). Through the analysis and discussion of the data, students were not numbered unless it was necessary to identify multiple opinions from different students on the same matter.

Senior students were selected for the focus groups for several reasons. Firstly, in both schools senior Year 11 students had experience of cross curricular teaching and learning. Therefore, in the interest of remaining consistent, students in Year 11 were initially invited to partake in the focus group. The original intention was to visit students in home group classes, introduce myself, explain the study and ask for their participation. Students would then email me using the contact details supplied on the information sheet if they were keen to partake and then be selected at random. However, similar to staff members, students were also selected. At School Ek, students were representative of a range of senior levels; Year 11-13. Due to School Do's circumstances, senior students were only Year 11. School Teen's student participants were Year 12. Although the selection of only Year 11 students would help with consistency, having a range of different year levels permitted a broad scope of different perspectives to be gathered and in turn helped move towards a sense of validity with the data.

Setting

It was initially intended that interviewees could pick the time and location of the interview. This was decided with the consideration that I was aiming to make the participant feel as comfortable as possible and not feel restricted or at risk (Hennink et al., 2011; Leavy, 2017; Wellington & Davies, 2015). However, due to the change in process, an interview room was provided for both interviews and focus groups at School Ek and Do. Due to the very impromptu and casual visit to School Teen, staff spoke to me in the staff room and students in the classroom. The location for all of the above was decided by the coordinating senior leader.

Participating schools were sent courteous email reminders a day before the meeting to help assure participant attendance (Bloor et al., 2001; Leavy, 2017).

Validity and reliability

In social research, one can never be sure of validity, we can only claim our test model is valid and methods were used appropriately for the research purpose (Leavy, 2017; Wellington, 2000). Validity can occur however, through the steps in the process of research (Creswell, 2014). Validity, meaning that that research checks for accuracy of findings and reliability meaning that approach is consistent (Creswell, 2014).

Although accuracy can never be entirely assured in qualitative research due to the nature of perceptions as opposed to objective reality, we can move towards accuracy to aid in its validity. In this study, accuracy was tested by giving participants the opportunity to check transcripts between researcher and participant (Creswell, 2014), and to make changes up to two weeks after receiving them. Also, by using multiple methods to gather data, triangulation could take place which built confidence in the findings and helped gain validity (Leavy, 2017; Wellington, 2000).

Reliability refers to giving consistent results which given the nature of the research was not possible (Wellington, 2000). Instead, reliability was pursued by checking transcripts between researcher and participant for conveying a reliable portrayal of perceptions, alongside checking that there was no drift in codes by referring to memos and notes (Creswell, 2014).

It was also important to clarify the bias that I brought to the study. By critically reflecting upon my ontological and epistemological stances and being transparent about the interpretive narrative, strengthened the validity of the study (Creswell, 2014). Partnered with this was the declaration and transparency around potentially conflicting themes identified in the findings and analysis which allows the reader to have faith in the findings being accurately portrayed (Creswell, 2014).

Ethics

Ethics are the moral principle which underpins qualitative research (Hennink et al., 2011; Leavy, 2017; Wellington, 2000), and is concerned with what people do and the way they act and behave (Wellington, 2000). Ethics must be considered during the planning, conduct and presentation of the research in order to minimize harm in every stage of the research (Hennink et al., 2011; Wellington, 2000). Due to the nature of qualitative studies, ethical issues become more pronounced as researchers are dealing with

sensitive topics, subjectivity and positionality in regards to the phenomenon and this can put people at risk (Hennink et al., 2011). Most research studies will undergo formal assessment by institutional review boards considering the broad topics of respect of persons, benefits of the research and justice (Hennink et al., 2011). Application of these principles include, although are not limited to; informed consent, self-determination or the right to refusal, the minimization of harm, anonymity and confidentiality (Hennink et al., 2011).

Common ethical principles have been agreed upon through the literature (Grix, 2001; Hennink et al., 2011; Leavy, 2017; Wellington, 2000), as well as criteria from the AUT Ethics Committee which informed my research. An ethics application was submitted to the AUTECH for approval which required me, as the researcher, to consider how social and cultural sensitivity, informed consent, respect for rights of privacy and confidentiality, respect for vulnerability and partnership participation and protection would affect my research.

i) Confidentiality

In this study, confidentiality was taken seriously and adhered to. I made sure participants were aware of being easily identified as they were handpicked for the study by senior leadership and could be identified in the final publication. Participants were made aware of the protocols to try and eliminate this potential, including, confidentiality agreements, the use of pseudonyms, codes and replacement of names (Hennink et al., 2011). Due to the nature of focus groups, it is impossible to maintain complete confidentiality; however, participants were clearly informed of the risks and made aware of the protocols to protect their identities in the publication. Although complete confidentiality cannot be ensured, restricting the number of people listening to the data could be limited (Hennink et al., 2011). Digital recordings, transcripts and field notes were not disclosed to anyone in the school or anyone not involved in the research except my supervisor and the transcriber. Participants were made aware that the transcriber would be signing a confidentiality agreement. All data was stored in a secure location at the AUT School of Education data facility. Data was stored separately to consent forms and will be kept for 6 years.

ii) Informed consent

As the study aimed to gain insight into perception and value and thus was personal and subjective, it was important to consider ongoing consent throughout the process as well as full information about the study and that it was voluntary (Hennink et al., 2011). Participants were made aware of their right to withdraw from the study at any stage. During interviews, I was responsive to participants and would refrain from lines of questioning if they started to show signs of feeling uncomfortable. Equally, when emailing participants to check transcripts, I was aware of their time and not pestering them. Equally, during the recruitment process, if invited participants did not reply to my email, only one follow up email would be sent. If this was ignored it was considered as a decline to participate in the study. Use of consent forms were made clear in the information sheet. Consent forms were signed at the interview, retaining a copy for my own records and giving a copy to the participant (Hennink et al., 2011).

iii) Potential benefits and outcomes

This investigation into cross curricular teaching and learning offered the opportunity for reflection on professional development of cross curricular pedagogy. For the students, there was the opportunity to express their thoughts and opinions on the approach and how it has affected their learning. This may potentially lead to new growth in the practice and identify areas of success or improvement. The research will also add to emerging knowledge and literature associated with cross curricular teaching and learning which could provide a basis for further study. It was important to make clear to participants that there was no personal benefit or gain by partaking in the research. This was made clear on the information sheet initially given to participants detailing the purpose of the study (Hennink et al., 2011). Of particular concern was that students may think I had some influence on their teachers and potentially their grades, my intent was to make it clear from the beginning that this was not the case. By identifying myself as a teacher from another school and a researcher I had no influence over their teachers or grades. My use of snacks and refreshments in the interviews were not detailed in the information sheet to avoid attendance for culinary delights. Findings of the study were explained to be of benefit to the wider teaching community and to myself as fulfilling requirements for attaining my MEdL qualification.

Conclusion

This chapter has outlined the research design and methodology to compare whole school and programme approaches to cross curricular teaching and learning and the value and perceptions of teachers and students towards it. It has explained the ontological and epistemological influences which have informed a qualitative paradigm and justified reasons for the use of semi structured interviews, focus groups and field notes to generate data for coding analysis. This allowed for exploration of data which maintained a focus on participant perceptions whilst establishing common themes via axial coding.

Chapter Four | Findings, analysis and discussion

As discussed in the literature review, there is disparity and uncertainty when referring to what cross curricular learning or curriculum integration is (Arrowsmith & Wood, 2015; Boyd & Hipkins, 2012; Dowden, 2010, 2012; Fraser, 2000; Roy, 2016; Savage, 2010) and approaches to cross curricular learning will differ in every setting (Arrowsmith & Wood, 2015; Boyd & Hipkins, 2012; Drake, 2012). This can range from whole school implementation of the pedagogy, to micro pedagogical level, whereby teachers employ the practice independently. It is therefore important and relevant to unpack and understand the approaches employed by each of the schools that participated in the research, in order to better understand the elements at play which could otherwise help or hinder cross curricular practice.

School Ek

School Ek is a special character state integrated school catering for both primary and secondary school students. It is the result of a merger of two schools to create a new composite school in 2014. Both inner city schools lost the use of their facilities in 2011 resulting in the schools being at two separate locations. The primary school is operating in a semi-rural setting and the secondary at a nearby University. Although not merged until 2014, the secondary school has been operating since 2001.

It is near to its capacity with a current roll of 450 students made up of 83% Pākehā, 13% Māori, 2% Asian, 1% Pacific and 1% other ethnicities. The school's vision is built upon students directing their own learning and creating a bespoke learning plan in partnership with Learning Advisors and whanau to pursue student passions and interests. Learning Advisors or LAs have a 'can do' attitude in supporting students to achieve their goals. Both home groups and subject classes are vertical, allowing students to work at a level which is reflective of their ability as opposed to being 'trapped' in a level (Education Review Office, 2016). Core classes such as mathematics and English are not compulsory; instead, literacy and numeracy credits are gained via assessments in different subjects depending on the student's strength. The school timetable is comprised of student elected subject disciplines with allocated time for mentoring and Project Based Learning or Self-Directed Learning, whereby students pursue their own project which may or may not gain credits. This project is completely bespoke to the student but supported by LAs who co-construct the project with students, adopting a democratic approach as

described by Boyd and Hipkins (2012). School Ek is currently involved in a pilot project supported by the Ministry and other providers to help build collective intelligence and collaborative practice. School Ek's exploration has led them to building and piloting a cross curricular programme at Level 1 towards the end of the 2017 academic year. Due to the vertical level set up, the pilot is being trialled with junior students in year 10; however, the capacity for the year 10 students to gain Level 1 credits is anticipated. Alongside this formal approach to cross curricular pedagogy, more organic approaches to integrated learning are being pursued throughout pockets of the school. After years without a formal school campus and the primary and secondary schools being separated, a new building is currently in the making for School Ek.

School Do

School Do is a cross curricular co-educational suburban school catering for Year 7-13. The junior school has a current roll of 630 comprising of 57% Pākehā, 14% Māori, 6% Chinese, 6% Indian, 2% SE Asian, 6% other European, 3% other Asian and 6% other ethnicities. The school's senior roll having opened in 2017 comprises of 100 Year 11 students due to its recent establishment. This roll will expand annually with Year 13 set for 2019. The school's founding philosophy was to create an innovative learning environment informed by educational research leading to better outcomes for students. Among other things, this resulted in cross curricular learning modules, where two subject teachers would come together to teach a conjoint module. At full capacity, each module is made up of 60 students in an open learning space with two teachers. Students are required to select one English module and one mathematics module each semester. Each day is split into three blocks of 100 minutes with 15 minutes at the start of each day for Learning Advisory. Learning Advisory is also allocated another two blocks throughout the week to support student monitoring and tracking. Two blocks in the week are also allocated for Impact Projects, whereby students participate in a project which is teacher led, thematic (Boyd & Hipkins, 2012; Drake, 2012) and benefits the wider community.

School Teen

School Teen opened in 2014 and is an established cross curricular school catering for Years 9-13. It has a current roll of 450 students comprising of 65% Pākehā, 12% Māori, 12% Asian, 4% Pacific and 7% other ethnicities. It is a suburban school catering for a newly developed community. The school has the potential for 1350 students on roll at

full capacity. The school uses an integrated curriculum approach which aims to support student enquiry across subject areas and help explore subject connections (Ministry of Education, 2016). Learning modules are made up of two subject areas and two teachers. Students also pursue their own interests via Impact Projects. The school also maintains independently taught subject areas or special interest classes which become more common in the senior years. These classes are to accommodate for students needing more work toward numeracy and literacy standards, language subjects and part time staff members. The hope is that these classes will reduce as student numbers increase alongside staffing to allow for more scope in senior modules.

Themes

The following themes have been selected for discussion due to their significance in the research data. Using a combination of Nvivo and inductive coding analysis methods, key phrases and words were identified and then banded into similar themes. Themes were either discussed at length by participants at either school or were identified as recurring topics across schools. Some themes are representative of overarching ideas and are accompanied by corresponding headings which help unpack the larger overarching theme.

Accompanying each theme are the research aims and questions first introduced in Chapter One. The questions have been reduced to phrases which encompass the overall theme of the aim and question. These phrases are then used to help present and discuss the findings holistically. These phrases include; cross curricular learning strategies, teacher and student perceptions, restrictors and enablers and sustainable cross curricular models. Each research aim and question will be addressed within the discussion textually, using significant themes from the findings and analysis. The intention is for the voices of the participants and my interpretation of this to come to the fore and be supported by literature discussed in Chapter Two to support key points.

i) Collaboration

As discussed in the literature review, collaboration has been recognised as key for both school and student improvement (Datnow, 2011; Fleming, 2012; Ministry of Education, 2014). More specifically, collaboration has also been identified as essential in making

connections between departments and supporting potentially apprehensive teachers with knowledge outside of their specialist field (Byrne & Brodie, 2012; Savage, 2012).

In particular, School Do's participants were positive about the collaborative element of cross curricular pedagogy and the affect it has had upon their classroom practice and professional development. Both participants were expressive in describing the energy and excitement for teaching in a collaborative way. In discussion, LeBron, a teacher from School Do, referred to collaborative practice as one of the highlights of cross curricular teaching and learning so far.

...co-teaching is the best professional development you could ever get in terms of planning with someone else, working with someone else, teaching with someone else in the same room, negotiating expectations.

This was also an aspect highly valued by Serena, the second participant at School Do, who expressed similar passion around collaborative practices associated with the cross curricular approach; not being isolated and working within a four wall silo.

I love the collaboration and not teaching in four walls tokenly anymore. Just the ongoing professional development of being here and being in this environment cross-curriculum is quite special, it's quite awesome.

Participants from School Do align themselves with Drake (2012), and her promotion of teacher satisfaction and positive working environments associated with an integrated curriculum. However, this does not come without its challenges and careful management of potentially tricky collaborative situations. Jackie at School Teen described challenges around teaching styles and learning to work together. This was also discussed by both participants of School Do, who expressed the importance of negotiating expectations, particularly in relation to teaching in the same room with a colleague.

...bringing in the two curriculum areas you've got two teachers so automatically how you approach things like behaviour management and expectations can differ.

Serena explained how consistent expectations were set from the very start with exposure to professional development to get all teachers on the same page. This was accompanied with other senior leadership initiatives to establish a cohesive environment

to support collaborative practice. Considered by Serena as a 'luxury' bespoke to the establishment of the school, staff were exposed to guest speakers, had time for upskilling and team building days to establish rapport between colleagues. This included; a four day camp, barbeque, sports day and whakawhanaungatanga, whereby staff had a 10 minute presentation on arrival about who they were as a person and as a teacher. Serena discussed the importance of knowing someone to help with collaborative practice.

It's quite hard to collaborate authentically with someone you don't know...little things that were kind of pulling us together on a social level so that we could actually understand who we all are...We were actually going below the iceberg so to speak so we were having to actually show ourselves... you need a bit of that for collaboration.

For Serena, cross curricular teaching and collaboration went hand in hand to ensure its continued success. Interestingly, she discussed that cross curricular teaching is achievable without collaboration but the planning process is delegated and thus results are disjointed.

...so they [teachers] will say you do your curriculum area five weeks here, I'll do mine five weeks here and that's cooperation, that's not collaboration, so they're quite different things.

The cooperative approach would appear to limit students in their understanding of how subject disciplines contribute toward complex problems and situations, unlike the collaborative process, allowing teachers to identify overlaps and students to understand the bigger picture (Locke, 2008).

Similar to participants from School Do, Kobe an LA from School Ek described cross curricular learning involving 'some form of collaboration from the teacher' and described the bubbling energy among staff to adopt such approaches.

...one of the things that I've found really positive about it [cross curricular] was just working with another staff member. That was actually really cool, particularly at the same time.

Due to the school's circumstances, School Ek's approaches to cross curricular pedagogy have been different at different times and although it can be limited by timetable

restraints and staff resourcing, there are certainly pockets of cross curricular teaching and collaborative practice happening organically across the school, as described by Carmello, participant two at School Ek.

...there's students in Art with Jasmin... supporting them [students] around Art but also signed up with Michael who runs a Business Studies course. So they're two separate courses... Chris in my home base is trying to set up a business to market his own artwork so he's driving the business side of it through one class, the art mentorship through the other one... those teachers are talking and weaving what they do together.

This very organic approach to cross curricular learning has been established by teachers due to the freedom of choice and autonomy in the school. This autonomy and freedom of opportunity was described firstly by Kobe and then Carmello;

...there's quite a bit of flexibility, so potentially that [cross curricular] could be done. So it's opportunity, but it's not necessarily dictated so it's not like you need to do cross-curricular now, but we could easily run really cross-curricular opportunities in there.... We are fortunate in that we have a bit of flexibility here in autonomy; we give our staff a lot of autonomy in terms of what they deliver and how they deliver it.

This organic development of collaboration aligns nicely with arguments from Brundrett (1998), and Datnow (2011), who recommend successful and sustainable collaboration be spontaneous, voluntary and development orientated. This could be considered a substantial request of teachers considering their already limited time and goodwill, although potentially be alleviated with the Ministry's recognition for school specific needs.

Interestingly, School Ek's official cross curricular pilot is part of a change initiative supported by the Ministry, whereby collective intelligence and collaborative practice is used to improve programmes for students within the area. Carmello explained that support from the Ministry in response to promoting collaborative practice came in the form of funding for release days, professional development and providing venues to bring schools together. Carmello explained it as 'tough finding the teachers to build programmes' and even described a 'shoulder tapping' exercise to recruit teachers for the

pilot initiative which lends itself to a forced and potentially tricky to sustain project. Odd, considering the already organic cross curricular developments happening within School Ek. One would also assume a collaborative ideology underlying the school's guiding principles, particularly in relation to Carmello explaining the unique education plans built for each student. In its very nature, this system requires teachers to cooperate and collaborate, particularly in relation to assessment and moderation considering standards will often cross over subjects and be moderated with different staff from different departments.

Collaboration discussion

Cross curricular teaching and learning strategies / Teacher and student perceptions / Restrictors and enablers / Sustainable cross curricular models

The research has shown that collaborative practice is a crucial element in supporting cross curricular pedagogy, this is also supported by the literature, which recognises collaboration as an important factor in the success of cross curricular pedagogy (Byrne & Brodie, 2012; Savage, 2012). Particularly at School Do, strategies to help build a cohesive and collaborative environment were a key focus with the establishment of the cross curricular school. It is important at this point to acknowledge the advantages which accompany the establishment of a new school, in this case; staff are employed knowing about the cross curricular initiative and thus are inclined to be more collaborative team members. Naturally, this eliminates the problems described by Bruner (1996), who suggests introduced innovations would encounter resistance from staff due to their already existing beliefs and practice. There is also more time and money allocated for the establishment of the school and the environment is built to accommodate and support cross curricular pedagogy. This includes the development of modern learning environments which are designed to encourage collaborative practice and move away from the old classroom environment described by Nair (2011).

School Do's participants were particularly positive about the collaborative element that accompanies cross curricular pedagogy and were expressive in explaining the positive affect it has had upon their work experience, aligning nicely with the research from Drake (2012), which suggests a more satisfied work force and positive working environment when the curriculum is integrated. Participants from School Ek also portrayed a bubbling

sense of enthusiasm around the practice and referred to collaboration as a highlight of the cross curricular approach when it has been a more explicit focus of the school.

Collaboration was also a key factor in addressing the lack of knowledge in a different subject area, discussed by Byrne and Brodie (2012) and Savage (2012). This was a concern expressed by a participant in School Ek, but solved by participants in School Do, who address collaborative strategies as key to making yourself vulnerable and working together.

Collaboration was recognised in the literature as the key to both school and student improvement (Datnow, 2011; Fleming, 2012; Ministry of Education, 2014) and was highly valued by teachers across all participating schools. Particularly for participants at School Do and Teen, collaborative practice was heralded as a significant benefit to cross curricular pedagogy.

Collaboration was a common element across schools and key to establishing, implementing and sustaining cross curricular practice. Participants at School Do in particular, discussed the difference between cooperation and collaboration and its affect upon the success of cross curricular projects within the school. With cooperation, results will be disjointed. Collaboration however, produces modules which are much more authentic and see better engagement from students.

ii) Student engagement | Real world and agency

Real world

The call for the curriculum to expand beyond isolated subject boundaries and for students to work in real world contexts is timely (Drake, 2012; Ministry of Education, 2007, 2014; Qualification Curriculum Authority, 2009b; Savage, 2012), or more than timely according to Dewey (1915). Although there is little quantitative evidence to support integrated curriculum approaches, there are small studies which have proven a more engaged and motivated student body when learning is integrated (Drake, 2012), and when learning is connected to real life experiences (Dewey, 1915; Lord, 2006; Ministry of Education, 2007), as opposed to artificial situations students cannot relate to or engage with.

In all three schools, students made it clear that integrated learning is something they valued highly due to the topics being relevant, more interesting and applicable to real life situations. In turn, students believed they were more engaged with their learning, more

focused and able to enjoy the application of their learning, expressed by the following two students.

(Student 1): ...it's stuff related to the real world, not just like three plus something equals...

(Student 2): For Phys-Tech, so that's all to do with engineering and stuff and I thought the Maths went really well into the engineering so that can prepare you for the real world if you want to become an engineer so you can use the Maths into the mechanics part of it.

(Student 1): I think it prepares you for real life real well because you have so much freedom to choose what you want to do.

(Student 2): Yes, it's more interesting when it's integrated. You're more focused.

(Student 1): It engages us more into it.

The real world context also went hand in hand with students IPs or PBL studies. Although all three schools embraced different approaches to PBL or IPs, project learning across schools usually went hand in hand with outside providers, or professionals in the field which motivated students due to its real life context. Summarising Bartlett, these project based approaches require students to be active participants as opposed to passive observers (Bartlett, 2005).

Student agency

When students discussed factors which contributed toward engagement with their learning, it became increasingly obvious that alongside realistic and relevant curriculum, student agency was a significant contributing factor. Particularly at School Ek, students are encouraged to drive their own learning by building their own Individual Education Plan or IEP alongside LAs and their family. Students take ownership mapping out their classes in line with their interests and what they need to achieve.

...you will have a plan and if you don't want to take an English class you'll plan out where you can get your English credits from through other subjects.

Students expressed a real excitement when talking about their learning. They enjoyed the sense of freedom and variety which ran alongside the school model. This freedom

also came in the form of vertical learning and assessment which was a common theme across both schools and acted as an engagement factor for students. School Ek, offers students the option of attending classes that match their academic ability as opposed to their age which offered many positives and opportunities for students. Firstly, they described avoiding stress by steadily getting Level 1 credits as opposed to within one academic year, allowing them to work at their own pace.

...you don't have that whole big stress, like I've got to get all the credits in one year, you do things at your own pace.

The second bonus was about not being 'trapped' in a level with any given subject. Instead, students can switch between years in order to work to their own ability and stay engaged.

...you're not trapped within a level. If you're smarter than all the other kids in one subject you can go up a level and you can get ahead and it's really helpful.

Students in School Ek also described a positive experience of assessment, describing how they are not just taught what they need to pass, or have to 'cram information just to write it down'. Instead, students at School Ek feel the cross curricular approach is more holistic and in depth. This describes a shift in assessment when comparing it to what Dewey (1915), describes as false anticipation of circumstance when learning can be used effectively.

...they don't just teach you what you need to learn to pass, they teach you the whole thing... It's good because you actually learn more. You don't just learn what you need to write down, you learn the subject.

This holistic approach to assessment addresses concerns around student perceptions of testing and importance. Savage (2010), argues that unless it is assessed, students do not see it as important. In this circumstance, students show an appreciation and priority for the in depth learning, knowledge and understanding they are acquiring as opposed to rolling out knowledge for recall in exams (Drake, 2012).

This was also mentioned by Simone at School Teen, who described a shift away from achievement objectives and realisation that learning wasn't about 'ticking a box' but the skills and bigger concept.

Students at both schools expressed a sense of appreciation and relief around how assessments were bespoke to their needs and accommodated for accordingly. Although approached differently at each school, the similarity at School Ek and School Do, was that their teachers described practice as highly responsive to students' individual needs and could change the form of assessment accordingly.

In her study 'Pupils' views of the curriculum: are you 'in the know'?' (Lord, 2006), established choice and independence of key importance throughout secondary school and that pupils preferred to put their own 'stamp of identity' on their work.

Although School Do maintains compulsory Maths and English modules for its students, students described a range of assessment options so that they could work to their strengths and be assessed when they are ready, engaging them via choice.

... the teachers give you a big range of stuff you can do for assessments, like you can do a slideshow presentation and with doing a presentation you can get speech credits as well and you can do it as a written report essay.

In its leading principle of bringing the curriculum to the student, School Ek exhibits bespoke assessment via its capacity to assess across departments. Students described a sense of individuality and working to their strengths.

...if you don't take an English class at Level 2 you can still get your English credits, which is really handy if you're not so strong in English but you really do like your Math and Science subjects... It gives a bit of individuality to the way you live.

Carmello also discussed this element when questioned about what makes students excited about their learning.

...autonomy and agency over how they're learning looks is pretty valued as well. I think our guys really value that.

There was a sense of risk however, expressed by both students and teachers, linked with the potential abuse of this privilege. Carmello discussed the potential for some students to lose sight and focus. This was also a concern expressed by students at School Ek who discussed the potential for the system to be easily abused and for students to waste time, particularly during their PBL time.

...It requires a lot of responsibility. People can abuse it. If someone is irresponsible they can just not learn anything from it and waste time. They could just do PBL and just not do anything, just bunk off and do something else.

Carmello acknowledged the risky aspect of students abusing such privileges, however, referred back to the schools IEP and Individual Education Meeting (IEM) which is built in response to the student's needs.

...just different personalities cope with different things. I think that's the beauty of our system, through starting with the IEM is finding out what's right for the child.

This was also a concern among students in School Do, who were incredibly proud and protective of the responsibility they had over their own learning journey. They described the importance of student leadership in supporting younger pupils to step up and take responsibility as opposed to abusing their learning opportunities.

It's all about respecting the privileges we have in the areas we have and acknowledging that we have this opportunity to learn openly and learn almost our way, but if they... like disobey that, it might be taken off us so we have to get them in the right...headspace.

Interestingly, Serena was in agreement, and acknowledged that there were some difficulties with Level 1 students managing their time appropriately during their Independent Learning time slots. Although she acknowledges there could be a biological component at play in terms of self-management and maturity at that age she did describe observing a shift in students using the time appropriately.

...our students are Year 11, I think they biologically lack the maturity to be able to self-manage...I think we're seeing a shift in students that use it appropriately and those that aren't quite getting there yet...

Recognising the shift in student capacity to develop soft skills such as self-management, it could be that the student agency element which seems to accompany cross curricular pedagogy is something that students need to acclimatise to. This was a strong area of discussion with students from School Do.

At the start of this year I couldn't self-manage and I failed one of my classes...this semester I've managed to get Level 3 credits because I've been able to organise myself. It [mind-set] was something that just developed over time, but it didn't take that long, it was just a matter of committing to it.

Although dispositional skills were discussed in both interviews and focus groups, there was a sense that this is something that needed to be developed overtime. It is important to note that students of both schools would have experienced a range of different approaches throughout their schooling and thus remain an unreliable cohort for establishing any form of progression in dispositional skills linked to cross curricular pedagogy.

I think student agency is starting to develop...this is a really mixed bag because of what these kids have gone through getting to where they are now in school,...

Further study will be required around the links between cross curricular pedagogy and the development of these skills, particularly the current Year 8 cohort of School Do, who by the time they reach Year 11 would have been exposed to the cross curricular approach for a substantial part of their learning journey.

Student engagement | Real world and agency discussion

Cross curricular teaching and learning strategies | Teacher and student perceptions

Drake (2012), discusses the element of student engagement with integrated curriculum approaches and how schools embracing the pedagogy experienced fewer discipline problems. This would align nicely with the study presented by Lord (2006), who identified a fun and interesting curriculum as key elements of a good curriculum, according to students. These factors included a real life context to students learning, and the opportunity for pupils to take responsibility for their work and learning; all factors conducive of a cross curricular approach. In line with the literature, research data points to increased student engagement with learning when programmes are authentic and connected to real life experiences (Boyd, 2013; Lord, 2006). This was identified in both modules and IPs at School Do and PBL at School Ek. Students made it clear that integrated learning was something they valued highly due to the topics being relevant, interesting and applicable to real life situations. They were also particularly motivated by the involvement of external stakeholders, such as local business owners who would be

involved in the project, aligning with Lord (2006), suggesting a more engaged student body when gaining knowledge from professionals in the field.

Although not identified in the literature, this research discovered students were excited about driving and taking responsibility for their learning. Although approached differently in School Ek and Do, students were consistent across the board in expressing their excitement for learning and ownership of their learning journey. This was explained overall as being linked to: bespoke and vertical assessment; freedom; variety; and choice.

iii) Essential support | Leadership, support and logistics

In the literature, leadership was found to be an essential factor in supporting cross curricular pedagogy (Arrowsmith & Wood, 2015; Savage, 2010).

This was confirmed by Kobe, in School Ek, who discussed how the approach to cross curricular learning has been different at different times. Although School Ek has numerous historical factors contributing to this inconsistency, one of the factors discussed was numerous changes in leadership roles. Despite cross curricular pedagogy not being an explicit focus of the school, the model suggests a cross curricular focus 'if it's done well'. There was certainly a sense that with a more dedicated focus on cross curricular learning the school had the potential to develop the model in more depth.

...I think there's a sense that with a bit more kind of support and encouragement or emphasis on cross-curricular work I think the school would do it better potentially.

A victim of circumstance, School Ek is somewhat limited by pre-established systems and structures which restrict the development of cross curricular growth. Boyask et al. (2008), add to this by explaining how such experimental practice is dampened by schools engrained in the past.

Unlike School Ek, School Do was established with cross curricular pedagogy at the forefront. This is beneficial for the establishment and sustainability of the pedagogy in numerous ways. Firstly, leadership employ staff on the premise that they are supportive of a cross curricular approach and had the opportunity to upskill staff with professional development and team building activities to embed a culture supportive of cross curricular teaching and learning. This alleviates the requirement to consider 'folk

theories' as described by Bruner (1996), of pre-existing staff members when introducing new innovations which compete with existing guiding theories.

Leadership support was also identified by participants at School Do with their involvement in tracking student progress alongside the kaiaarahi or learning advisor.

... one of the DPs is in charge of tracking is one of their portfolios, however it then sits with us as a kaiaarahi.

By reflecting upon arguments made by Drake (2012), who suggests risk and accountability are partly to blame for the lack of growth around integrated curriculum, we can begin to understand why this support from leadership at School Do alleviates this pressure, presumably to make staff feel more at ease.

This was an element also discussed by Simone at School Teen, who explained that assessment is co-constructed with a leadership team member. Leadership support with assessment was also referred to by LeBron, describing the extensive knowledge of the NZC from senior leadership and their support and guidance associated with this. Describing a feeling of support and joint accountability, LeBron describes how leadership streamlines assessment so that teachers can focus on teaching and learning.

...[leadership] give us guidance at a high level...they can support us. Our assessment procedures are...looked after in terms of moderation and all of that logistical stuff that's guided for us. We focus more on the learning and teaching.

Leadership at School Do recognise the potential for teacher burn out with the initial increased work load of setting up cross curricular programmes (Arrowsmith & Wood, 2015) and have implemented support structures around assessment accordingly. This approach also aligns itself with the recommendation from Savage (2010), who suggests that senior management take responsibility for curriculum at appropriate stages and implement coordination.

In terms of logistics, a flexible timetable and classroom structure were identified as important for deeper learning (Arrowsmith & Wood, 2015) in the literature review. This was also an element expressed by Allyson at School Teen, who commented that the 80 minute lessons were helpful and discussed by LeBron from School Do, who found the 100

minute structure essential in supporting students to engage with their learning at a deeper level.

Yes, the 100 minutes definitely helps. It's very hard to do [cross curricular] if you don't have enough time for the students to engage with the material at a deeper level, so time is a big thing.

This was also referred to by Serena at School Do, who felt a regular lesson time of 50 minutes was not enough time for students to apply their learning.

Another factor enabling cross curricular learning at School Do was the Modern Learning Environment. This was mentioned by LeBron when explaining how connections were made between subjects and how the environment aided a more natural process of collaboration throughout the year.

Because of the open environment you get to see the skills that are applied in different classes...I noticed that they were doing certain experiments in Chemistry. I said that would be pretty cool to apply in my subject, so when we get to that planning stage we've already got an idea of the subject areas that we would have that connection with. It's natural throughout the year...

With open plan learning areas, the possibilities for collaboration, team work and transparency are supported (Benade, 2017), which is clear considering the environment of School Do. Arguably, the open plan layout of the school does allow for teachers to feel exposed and vulnerable (Benade, 2017), however due to the collaborative and supportive environment established by the senior leadership team as previously discussed, LeBron identifies more with the benefits of such an environment as opposed to the potential risk and vulnerability.

Considering School Ek's already established timetable and environment, the cross curricular programme becomes a victim of circumstance. Sadly, the potential for its growth could be limited considering inevitable restrictions from logistics and resource constraints which are decided elsewhere at meso and macro levels of the system (Jephcote & Davies, 2007). Even in an established cross curricular environment there are still macro level challenges.

This was confirmed by Allyson at School Teen, who discussed the staffing formula supplied by the Ministry as incredibly restrictive for the cross curricular approach. School Ek's already existing framework means implementing new structures to support cross curricular pedagogy is incredibly difficult. This was identified by Kobe, who discussed 'physical environment' as a difficulty and by Carmello who discussed 'the logistics of setting it all up'. Alongside this was the essential element of time discussed by both participants at School Ek, who were in agreement that time was a challenge related to cross curricular teaching, explained by Carmello.

I think the biggest challenge is...time...finding time to get people together...to really build it properly...people have the ideas of what they could do...writing assessments that met the multiple standards involved just takes time and then you have to fit it within your timetable and structure and all that.

Although time is certainly a factor with the initial set up of cross curricular teaching and learning, maintaining time allowance for teachers was also identified as important for its sustainability in School Do. When discussing elements that have supported cross curricular learning, Serena discussed professional development and teacher only days to up-skill and plan and time.

It seems a bit of a cliché answer...you need the time because without time not only do you get to plan, but it's the reflective process of knowing what worked well and what didn't.

Time was also an important element according to Allyson at School Teen who when asked about challenges, 'always time' was the first response. This was a similar case for Serena who discussed the importance of time in relation to sustainability and the growth of the school. Despite tracking being handled by senior leadership, teachers as kaiarahi were responsible for this also. With the growth of the school and in turn iwis, or home groups, tracking will require more allocated time to avoid teacher burn out.

...for that [tracking] to stay sustainable there will need to be time understanding what our meetings are about and what they delegate teacher only days to, because we currently have meetings twice a week. So they will need to be willing to structure one of those meetings as just housekeeping and tracking, otherwise

it's going to eat into a lot of time and you'll get teacher burn out and staff won't stay. That is something to watch in the future.

Although teachers never seem to have enough time, for the cross curricular pedagogy it seems to be a key element in its enablement, success and sustainability. This is in relation to collaboration, planning, time for student tracking and even within the lesson.

Essential support | Leadership support and logistics discussion

Cross curricular teaching and learning strategies | Restrictors and enablers | Sustainable cross curricular models

The research suggests senior leadership is a key support for curriculum integration (Arrowsmith & Wood, 2015; Savage, 2010) and this was also evident in the research. Participants at School Do, referred frequently to support strategies implemented by the leadership team to help teachers focus on teaching and learning. Being a newly established school, School Do's leadership team opened with cross curricular pedagogy as their focus and thus its professional development, meetings and team building strategies were built in line with this. School Do participants discussed shared responsibility and a feeling of support from the leadership team around assessment. This strategy relates to suggestions from Arrowsmith and Wood (2015) and Savage (2010), who discuss the importance of leadership taking responsibility and supporting teachers to avoid stress and teacher burn out. This support strategy also relieved some of the tension around accountability, discussed by Drake (2012), who blames accountability as a key factor stifling the growth of curriculum integration.

In comparison, School Ek discussed the growth of cross curricular approaches relative to more support and encouragement from the leadership team. School Ek established without a cross curricular focus putting it at a disadvantage compared to the luxuries afforded to School Do. School Ek also has a history of changing leadership, thus, changing foci. It was expressed that the school could embrace cross curricular strategies more successfully if this was encouraged by leadership, an important point also acknowledged by Arrowsmith and Wood (2015) and Savage (2010). It is important however, to recognise the time secured by the leadership team from the Ministry of Education to help support the cross curricular pilot scheme at the school. Due to the Ministry initiative in situ at School Ek, time has been given to help develop collaborative practice and hopefully the development of a cohesive and successful cross curricular module. This will

hopefully alleviate some of the issues around additional time to help build the programme. Leadership in this case was identified as both an enabling and restrictive factor.

Logistics were also identified as a crucial support to the cross curricular practice alongside time. A flexible timetable, classroom structure and time are important (Arrowsmith & Wood, 2015; Savage, 2010) and identified by participants to enable the practice. Sadly, this is a definite restriction for School Ek, who have yet to experience the same luxuries as School Do.

iv) Subject issues

As identified in the literature, subject and teacher status and value on different subject areas all contribute towards the reluctance of embracing cross curricular pedagogy (Arrowsmith & Wood, 2015).

Due to School Do's founding philosophy of cross curricular learning, staff came on board knowing the schools cross curricular approach and in turn, were supportive and responsive to it, as described by Serena.

...because of its foundation and starting, staff have come on board with a bit more of that understanding, in an existing environment would be far more of a mixture of different views towards how precious learning areas are.

School Ek however, an already traditionally established school, faces possible problems when it comes to potentially embedding the practice more vigorously in the future with staff, as expressed by Carmello.

It has been tough...finding the teachers to build programmes...we did a lot of work last year on actually trying to build that [cross curricular programme]. The other person who helped facilitate that with me is on a year's leave, that's stalled a bit of the momentum this year....it's a big thing [key people] in terms of things that make stuff sustainable...there's an element of the personal attributes that people bring with them.

In the literature review, a lack of security around content knowledge was a significant factor leading to staff opposing the integrated approach. Teachers feeling 'out of their depth' and lacking the confidence with new themes and content knowledge could make staff feel vulnerable (Arrowsmith & Wood, 2015; Savage, 2010). When discussing

challenges cross curricular practice has presented for Kobe, new knowledge and a lack thereof around a subject area was certainly a cause for concern.

...it's the knowledge, I suppose one of the things might be that it's kind of been new knowledge, knowledge I don't necessarily have so it's put me out of my comfort zone possibly a little.

A similar case for Jackie at School Teen who identified one of the challenges of the cross curricular pedagogy was the knowledge of the other curriculum.

Jephcote and Davies (2007) address the historical relevance of subject areas also, suggesting that identities are forged overtime, accompanied by dispositions which make it tricky for subject specialists to step outside of their silo. Roy (2016), explores the subject value element further by suggesting that subject identity and protection of curriculum areas has been developed alongside a neoliberal society, breeding competition between subjects in terms of student numbers and the funding which accompanies departmental growth. Naturally, student numbers and classes are linked to staffing and thus teachers are very protective of their curriculum discipline because their jobs are inextricably linked to it.

This was touched upon by Serena at School Do, who was explaining the difficulties around teaching a compulsory subject and the strategic partnerships between her subject and others.

...so students must take a module that has my subject in it each semester. What that then means is because of the numbers we're attracting as being one of the compulsory strands it means a subject, say PE that might not have as many, if they join with us they're getting more students through.

Serena referred to 'awkwardness' with this situation in that some connections between departments did not always have an authentic or 'rich connection'. To alleviate this problem, Serena described how the decision had been made to have her compulsory subject area with every learning area. Although this does raise more questions than it answers, participants at School Do describe aspects of the teaching and learning as being in a state of evolution, aligning nicely with suggestions put forward by Dewey (1915), suggesting schools maintain themselves by renewal.

LeBron describes programmes and how teachers have 'adjusted it over time' and how 'you get to explore something different every time you teach a subject'. Interestingly, at the more established School Teen, Simone felt the sustainability of cross curricular learning was directly linked with flexible thinking and the willingness to explore. Serena described a similar process which responds to situations and potentially unforeseen problems.

...ongoing. I think it has to be here because we're very much a responsive school...everything seems to be in a state of evolution.

The need for subject specific skills was identified in the literature by Byrne and Brodie (2012), who discussed the dangers behind the holistic approach and the loss of subject specific knowledge. This was discussed by both teachers and students in School Do, particularly in relation to languages, and the need for specialist time to practice language skills, as described by one student in School Do.

One of mine [modules] is not actually integrated because it is a language...so that is a full year course and I think the reason [for not integrating] was because when you want to learn a language you need as much time as you can get to learn it and pick it up easily.

Serena at School Do also acknowledged a need for specialist time to focus on skills, however, explained that there were situations when specialist skills were taught and developed but using a different approach.

There are times where it has to be just one area because it's such a specialist skill and that's fine too...the reality is we could look at a Biology report and look at the bias and ethics and perspectives and then connect with Science and then go into something completely different. We just need to be willing to understand it's the same skills but a more relevant context.

Single subject lessons were also discussed with students at School Teen, who described their special interest classes as important time for external exam preparation. Although similar to Drake (2012), explaining teachers as having content to cover and need to prepare students for testing, there was not a feeling of this taking priority over integrated approaches. Instead, students said they needed this time to work on things in

isolation as there was a risk of 'getting sick of the complex stuff' that comes with a cross curricular approach.

The NZC encourages 'natural connection between learning areas' (Ministry of Education, 2007) and this was also seen as important for students also. Looking into subject combinations, students valued authentic and strong connections between disciplines in order for a module to be engaging.

Students at School Teen explained that if the subjects did not work well together, the module was not as good and felt forced. Students at School Do and Teen also explained that subjects could be easily identified and separated if they did not connect well, as explained by a student at School Do.

It was Statistics and PE...I felt that didn't really connect because we were focusing more on the PE, the Mau Rakau side, rather than the stats so because you couldn't find the connection you felt like you were only learning one thing rather than the other.

Serena described a similar case from a teaching perspective, describing modules that have not connected brilliantly, students then pick the subject that most of their effort goes into.

Even though it's supposed to be cross-curricular, they do still see it as it's English and Chemistry but I'm not bothering with Chemistry....the modules that we haven't collaborated well and they can see it...I think the ones that are integrated it's not an issue...it 100 per cent comes down to how you bring your learning areas together because then, if it's done authentically, they can't actually always tell what curriculum they're in but if it was a bit willy-nilly they know when they're doing something and not the other.

If collaborative practice is not developed, planning is delegated and links between subjects are forced and cross curricular modules have a tendency to be fragmented and taught independent of each other. When this is the case, students are able to identify poor links between subjects and then decide what assessment they apply their efforts to. The module then reverts back to a traditionalist approach. Establishing authentic connections between subject disciplines is certainly a key factor in a successful cross

curricular module although, students also value the independent subject time, particularly for exam preparation.

v) Design and Technology

Reflecting upon the literature review, Järvinen and Rasinen (2015), discuss the potential risk of Design and Technology departments becoming a dumping ground for cross curricular learning, due to its numerous potential links with other subjects.

When asked about the role of the Design and Technology department within cross curricular learning at School Ek, participants felt there was the potential for numerous links, however did not allude to it being overloaded or relied upon as described by Järvinen and Rasinen (2015). Although, it should be recognised that the Design and Technology department is part of the cross curricular pilot programme at School Ek due for trial at the end of 2017. As explained by Kobe, the Design and Technology department does have 'quite a lot of opportunities' to make strong links with other departments. Carmello was in agreement with this, describing it as a 'central department' and describing some of the potential links.

...the curriculum [Design and Technology] that lends itself to work closely with other areas...it easily links to Mathematics and Measurement. It's quite a creative field...there's lots of cross-over...

Although this description of potential links is somewhat limited, Carmello did not just describe the curriculum content benefits of the Design and Technology curriculum. Carmello also referred to the dispositional skills the Technology curriculum develops.

It seems to be a great tinkering space and a lot of that front end of the curriculum stuff gets woven in through it, the competency stuff. Students to be thinking, their working, relating with others. So for me it's quite central.

Serena at School Do acknowledged that the department has the potential to 'go' with everything, however, raised an interesting point linked to the ambiguity around the Design and Technology department and how because of this, it has not merged as well as what it could.

...it actually has the potential to go with everything... I think there are huge misconceptions around what Technology is and even from us as teachers I didn't

have an understanding of it until I taught with the two Technology teachers I've taught with.

Serena also referred to the importance of the department due to its 'future based' and 'relevant' context which students need to be more exposed to.

We need to be exposing students to those areas because a lot of them are future based and very relevant, yet they're not actually given the priority or attention they do deserve.

This implies that the Design and Technology department has not had so much success as others, which in fact is contradictory to the concerns expressed by Järvinen and Rasinen (2015), who expressed fears around its use as a 'dumping ground'. What seems to be the problem is the lack of clarification around what Design and Technology is, which is not helped by the range of different approaches to Design and Technology from school to school.

This was the case for LeBron, who explained that his understanding of the department was somewhat limited until he worked with the Design and Technology staff on a module. This then changed his perception, realising that the subject has a large scope to connect with other subjects.

...it's made me understand that Technology is not just cooking or making cars with wood...It's actually a process of product design and product improvement...you can apply Technology to a lot of other products and context.

Although the Design and Technology department is seen as a key player in the cross curricular approach in both schools, currently its representation among cross curricular modules at School Do is not reflective of this. This appears to be due to the lack of understanding around the nature of the topic and the ambiguity linked to the exact nature of the subject.

Subject issues discussion

Teacher and student perceptions / Restrictors and enablers

Järvinen and Rasinen (2015) suggest that Design and Technology is a particular high risk candidate for a loss of subject identity due to its ability to marry so well with other subjects in a cross curricular setting. Research demonstrates that this is in fact not the

case, but rather the subject is considerably misrepresented. Participants recognised the subject's potential but have yet to see it reach its full capacity when contributing to cross curricular modules. The main reasons for its lack of integration appear to be due to the ambiguity and lack of understanding of what exactly the subject entails. Some opinions of the subject are a little antiquated which would certainly contribute to its limited involvement. Cross curricular strategies at present are not as heavily influenced by the Design and Technology curriculum as previously thought, however, its potential and capacity has yet to be recognised.

Several factors associated with subjects were discussed which could be potentially restrictive when implementing cross curricular pedagogy. Firstly, staffing was discussed as a benefit for School Do, in that subject staff were employed knowing the schools approach to integrated curriculum. This lends itself to the staff being supportive of the approach. On the other hand, staffing was recognised as a potential problem in established schools which embed the practice. Naturally, School Do has the upper hand in employing staff already supportive of the cross curricular approach.

The second restrictive factor was a lack of knowledge in the other subject area and expressed by participants at School Ek. This was also identified in the literature by Arrowsmith and Wood (2015) and Savage (2010), who explain that teachers feel out of their depth with unknown subject knowledge and thus acts as one of the obstacles in implementing a cross curricular approach.

Chapter Five | Conclusion

Conclusion

To conclude, this section will look at the limitations of the study and its impacts. It will then move on to summarise each of the overarching themes identified in both the findings and discussion chapters. The section will finish with recommendations of bespoke models of cross curricular pedagogy and recommendations for further research.

Limitations

Being an interpretive study, the capacity to draw conclusions is limited. This is due to the subjectivity of the participants and their portrayal of a narrative, partnered with the capacity of the researcher to make sense of participant's perceptions and communicate these understandings to the wider world. Recognising the limitations of subjectivity and interpretations, this dissertation welcomes new understandings which would reveal different experiences and perceptions.

As outlined in Chapter Three, getting past school gatekeepers to access schools and then communicate with potential participants was challenging. It must be remembered that in each case, a senior leader took responsibility for sourcing the participants for both the interviews and focus groups. This in itself acts as a limitation upon the research as participants may have felt restricted in their responses considering their potential identification in the final research. Such limitations in the future can be avoided by explaining the importance of the selection process to the school gatekeeper.

Student engagement | Real world and agency

Students described an increased focus, interest and engagement with cross curricular programmes which were more authentic and connected to real life experiences. This was described in both modular courses in School Do and PBL at School Ek. Students valued the integrated learning approach and became particularly motivated when working with external stakeholders or professionals in the field. Students also expressed excitement in regards to the ownership they had over their own learning linked to assessment, freedom, variety and choice.

Collaboration

Collaboration was identified by teachers as the main benefit from embracing cross curricular pedagogy; in terms of its establishment, success and sustainability. It was valued highly by teachers across all participating schools and helped create a satisfied and positive work environment. Although School Ek only had pockets of cross curricular collaboration occurring, there was a real sense of energy and excitement at the prospect of the school having collaborative practice as a focus. Aside from the positivity around collaborating with colleagues, collaboration was described as essential for the establishment, implementation and continued success of the cross curricular approach and was of paramount importance when building programmes which were more authentic and engaging for students. Without collaboration, cross curricular learning became cooperation and resulted in disjointed learning programmes where two subjects were essentially taught in isolation but in the same space.

Essential support | Leadership, support and logistics

Supportive leadership was identified as a key factor in the success of cross curricular pedagogy. This ranged from senior leadership teams implementing strategies to promote collaboration, to overseeing student attainment and tracking. Equally, leadership was identified as a potentially restrictive element in the development of integrated learning, particularly if leadership roles were in a state of flux or the focus of the leadership was not dedicated to cross curricular pedagogy.

Similarly, logistics was also seen as a 'make or break' element for cross curricular implementation. A flexible timetable and classroom structure in particular were identified by participants as either enabling the practice or hampering its growth.

Subject issues

Research has shown that the loss of subject identity for Design and Technology is not a concern. According to participants, the subject is currently fulfilling its potential in relation to cross curricular learning, which in part appears to be due to the lack of clarity around what the subject encompasses and similarly, out of date perceptions around what the subject has to offer.

In relation to new staff employed into an already established cross curricular school, staffing and subjects did not arise as a problem. For already existing schools however,

subjects and staffing could be problematic. Participants at School Ek believed this reluctance from subject specialist teachers was due to the lack of knowledge of the other subject area and thus they felt out of their comfort zone. It is also important at this point to acknowledge the potential competition at play between option subjects and student numbers which can lead teachers to be protective of their subject specialism.

Recommendations

Current cross curricular practices in School Do appear successful, although a majority of this success must be considered in line with its recent funding and resourcing. School Ek's cross curricular approaches are still developing and in its infancy. Hopefully it is cross curricular potential flourishes with its new environment. More research will be required to determine whether frameworks at either school are sustainable as both schools were not working in stable conditions and in a state of flux considering for example, lower than average school roll and changing school campus.

Current models prove that cross curricular pedagogy requires adaptation depending on the circumstances of the school and the needs of the students, as opposed to finding 'better' models. In light of the research it is more appropriate to develop 'responsive' models which are built around the context of the school.

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Appendices

Appendix One – Ethics Approval



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www.aut.ac.nz/researchethics

22 August 2017

Ruth Boyask
Faculty of Culture and Society

Dear Ruth

Re Ethics Application: 17/252 A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 22 August 2020.

Standard Conditions of Approval

1. A progress report is due annually on the anniversary of the approval date, using form EA2, which is available online through <http://www.aut.ac.nz/researchethics>.
2. A final report is due at the expiration of the approval period, or, upon completion of project, using form EA3, which is available online through <http://www.aut.ac.nz/researchethics>.
3. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form: <http://www.aut.ac.nz/researchethics>.
4. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
5. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.

Non-standard conditions must be completed before commencing your study. Non-standard conditions do not need to be submitted to or reviewed by AUTEC before commencing your study.

Please quote the application number and title on all future correspondence related to this project.

AUTEC grants ethical approval only. If you require management approval for access for your research from another institution or organisation then you are responsible for obtaining it. You are reminded that it is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard.

For any enquiries, please contact ethics@aut.ac.nz

Yours sincerely,



Kate O'Connor
Executive Manager
Auckland University of Technology Ethics Committee

Cc: abbiedinglo@gmail.com

Appendix Two – Invitation to schools

		
Abbie Dingle Invitation to schools August 2017		
Dear Principal XXXX,		
Firstly, thank you for your time. I appreciate how busy you are and thank you truly for taking the time to read this correspondence.		
Reference:		
Research participant		
Date Information Sheet Produced:		
August 2017		
Project Title		
A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools.		
An Invitation		
My name is Abbie Dingle and I am a teacher and AUT student completing research towards a Master in Educational Leadership. I am also a 2IC of Technology at Waitakere College. I would truly value your schools participation in my research and request the contributions of 2 of your staff members and 6-8 of your senior students. I understand that their time is precious and thus have restricted interviews with teachers to 20 minutes and focus groups with students to 40 minutes. Protection of both students and staff is paramount and thus their protection is my utmost priority.		
What is the purpose of this research		
The purpose of this research is to investigate cross-curricular pedagogy in two New Zealand secondary schools. It will gather interpretations and perceptions from teachers and students as to the relevance and value of cross-curricular teaching and learning. This research seeks to identify what cross-curricular teaching and learning strategies are currently in place at either whole school or programme level. It also aims to identify options for sustainable cross curricular practice. This research will then be written up into a dissertation, counting towards a Master in Educational Leadership and potentially academic publications and presentations.		
How was the school identified and why are we being invited to participate in this research?		
Your school was identified from the literature because of its flagship pedagogy associated with cross curricular learning.		
How do we agree to participate in this research?		
Should you be happy for your school to participate in the research, please email me using the contact details below. I will then be in touch with you to organise a time to meet and discuss this further. I appreciate your time is precious so remain at your convenience.		
What will happen in this research?		
This research project involves interviews with teachers and focus groups with students.		
What are the discomforts and risks?		
Potential risks in this study could expose the school and participants to being identified when the research is published. A second potential risk is participants being identified when attending the interview. Please rest		

Abbie Dingle
Invitation to schools
August 2017

AUT

TE WĀNANGA ARONUI
O TĀMAKI MAKĀU RAU

assured protection and safety is of paramount importance in this study and my utmost priority. Measures will be put in place to ensure staff and students feel safe and comfortable.

What are the benefits?

I hope that this research will lead to identifying sustainable and effective practise currently active in New Zealand secondary schools to help other professionals who seek to implement this practise. This research is also contributing towards my 60 point dissertation and will potentially be used in academic publishing and presentations.

What opportunity do I have to consider this invitation?

Should you wish to partake in the research, please respond to this email within 5 working days.

Will I receive feedback on the results of this research?

Should you wish to receive feedback on the research, I will happy supply you with a summary of the findings.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr Ruth Boyask, Ruth.boyask@aut.ac.nz, +64 9 921 9999 ext 7569

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, Kate O'Connor, ethics@aut.ac.nz, 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form you will receive at the meeting for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Abbie Dingle, abbiedingle@gmail.com

Project Supervisor Contact Details:

Dr Ruth Boyask, Ruth.boyask@aut.ac.nz, +64 9 921 9999 ext 7569

Approved by the Auckland University of Technology Ethics Committee on August 22nd 2017, AUTEK Reference number 17/252.

Appendix Three – Principal permission form



Principal permission Form

Project title: A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools.

Researcher: Abbie Dingle

Project Supervisor: Dr Ruth Boyask

☐ I have read and understood the information provided about this research project in the Information Sheet dated August 2017.

☐ I have had an opportunity to ask questions and to have them answered.

☐ I understand that interviews and focus group will be taking place on campus with teachers, middle leaders and students.

☐ I understand that the school's participation in this study is voluntary.

☐ I give permission and allow the researcher on campus to complete the research.

☐ I wish to receive a summary of the research findings (please tick one): Yes ☐ No ☐

Principal's signature:

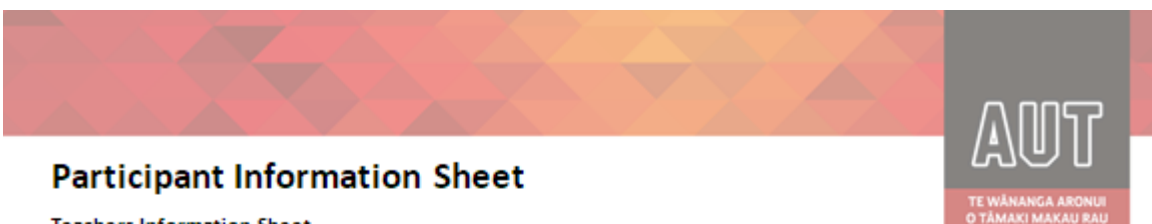
Principal's name:.....

Principal's Contact details (if appropriate):
.....
.....
.....
.....

Date:

Approved by the Auckland University of Technology Ethics Committee on August 22nd 2017, AUTEK Reference number 17/252.

Note: The Participant should retain a copy of this form.



Participant Information Sheet

Teachers Information Sheet

Date Information Sheet Produced:

August 2017

Project Title

A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools.

An Invitation

My name is Abbie Dingle and I am a teacher and AUT student completing research towards a Master in Educational Leadership. I am also a 2IC of Technology at Waitakere College. I would truly value your participation in my research and invite you to partake in an interview. I understand that your time is precious and thus have restricted the interview to last no longer than 20 minutes. I would also like to take this opportunity to ensure you that your participation in this research would be entirely confidential and the protection of your identity is of paramount importance.

What is the purpose of this research

The purpose of this research is to investigate cross-curricular pedagogy in two New Zealand secondary schools. It will gather interpretations and perceptions from teachers and students as to the relevance and value of cross-curricular teaching and learning. This research seeks to identify what cross-curricular teaching and learning strategies are currently in place at either whole school or programme level. It also aims to identify options for sustainable cross curricular practice. This research will then be written up into a dissertation, counting towards a Master in Educational Leadership and potentially academic publications and presentations.

How was I identified and why am I being invited to participate in this research?

You were identified because you responded to the all school advertisement and told me you are either a teacher familiar with cross-curricular pedagogy and a full contact load, or a manager who oversees cross-curricular programmes. You were randomly selected from those people expressing an interest in participating in the study.

How do I agree to participate in this research?

Should you wish to participate in this research, please email me, I will then be in touch with you to organise a time and place convenient for you to conduct the interview. Your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you. You are able to withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

What will happen in this research?

This research project involves interview with teachers and focus groups with students. Should you wish to contribute towards the research data collection, you will be required to answer some questions in an interview. The interview will take no longer than 20 minutes.

What are the discomforts and risks?

Given the small size of the targeted participants, potential risk in this study could expose you to being identified when the research is published. A second potential risk is your being identified when attending the interview. Measures will be put in place to ensure you feel safe and comfortable.

How will these discomforts and risks be alleviated?

If you choose to partake in this research you are at risk of identification, however, measures will be put in place to try and alleviate some of the risks and discomfort. Your identity in the printed research will be a pseudonym and the school will also be kept anonymous. The person transcribing the interview will also sign a confidentiality agreement. The time and place of the interview within the campus will also be of your choosing. I would also recommend that should you choose to participate in the research and you are concerned about confidentiality that you keep your participation personal as this eliminates one potential risk of identification. You are also allowed to withdraw from the study at any time, however, once findings have been produced, removal of your data may not be possible.

What are the benefits?

I hope that this research will lead to identifying sustainable and effective practise currently active in New Zealand secondary schools to help other professionals who seek to implement this practise. This research is also contributing towards my 60 point dissertation.

What are the costs of participating in this research?

I appreciate teachers are incredibly busy individuals. This research interview will take 20 minutes of your time and a further 20 minutes to include email correspondence and personally checking your transcript should you wish to.

What opportunity do I have to consider this invitation?

Should you wish to partake in the research, please respond to this email within 5 working days.

Will I receive feedback on the results of this research?

Should you wish to receive feedback on the research, I will happy supply you with a summary of the findings.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr Ruth Boyask, Ruth.boyask@aut.ac.nz, +64 9 921 9999 ext 7569

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, Kate O'Connor, ethics@aut.ac.nz, 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form you will receive at the interview for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Abbie Dingle, abbiedingle@gmail.com

Project Supervisor Contact Details:

Dr Ruth Boyask, ruth.boyask@aut.ac.nz, +64 9 921 9999 ext 7569

Approved by the Auckland University of Technology Ethics Committee on August 22nd 2017, AUTEK Reference number 17/252.



TE WĀNANGA ARONUI
O TĀMAKI MAKĀU RAU

Participant Information Sheet

Student information sheet

Date Information Sheet Produced:
September 2017

Project Title
A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools.

An Invitation
My name is Abbie Dingle and I am a teacher and AUT student completing research for my studies. I would truly value your participation in my research and invite you to partake in a focus group. I understand that being seniors, your time is incredibly precious and thus have restricted the focus group to last no longer than 40 minutes. I would also like to take this opportunity to express that your participation in this research will in no way influence or impact upon your studies.

What is the purpose of this research?
The purpose of this research is to investigate cross-curricular teaching and learning in two New Zealand secondary schools. It will gather teacher and student perceptions of the relevance and value of cross-curricular teaching and learning. It also seeks to identify cross-curricular teaching and learning programmes currently in place, aiming to identify options for sustainable cross-curricular practice. This research will then be written up into a dissertation counting towards a Master in Educational Leadership and potentially academic publications and presentations.

How was I identified and why am I being invited to participate in this research?
Students for the focus group were randomly selected from a register of senior students and then drawing numbers at random.

How do I agree to participate in this research?
If you wish to participate in the research please email me via the email on this information sheet. Please do this within 5 working days if you wish to participate. Please check your email frequently after this point for focus group location and meeting time. Your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you. You are able to withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

What will happen in this research?
This research project involves interviews with teachers and focus groups with students. Should you wish to contribute towards the research data collection, you will be required to be part of a focus group, answering and discussing questions with your peers. This should take no longer than 40 minutes.

What are the discomforts and risks?
Given the small group of participants and the nature of focus groups potential risks in this study could expose you to being identified when the research is published. A second potential risk is your being identified when attending the focus group meeting. Measures explained below will be put in place to ensure you feel safe and comfortable. It is important to remember you are part of a focus group and thus complete confidentiality cannot be ensured as you will be in the group with other senior students. At this point it is important to respect other people's views and opinions and make them feel comfortable to express these.

How will these discomforts and risks be alleviated?
If you choose to partake in this research your identity cannot remain completely confidential as it is known within the focus group. Your identity in the printed research will be a pseudonym and the school will also be kept anonymous. The person transcribing the interview will also sign a confidentiality agreement. The time and place of the interview within the campus will also be of your choosing and then negotiated upon consideration of your confidentiality, vulnerability and safety.

What are the benefits?

I hope that this research will help identify student perception and value held towards cross curricular learning and benefit teaching and learning in the future. This research is also contributing towards my 60 point dissertation.

What are the costs of participating in this research?

I appreciate as seniors your time is precious. The focus group will take no longer than 40 minutes. It will also take around 10 minutes of your time reading this information form and responding to emails.

What opportunity do I have to consider this invitation?

Should you wish to partake in this research, please email me using the details below within 5 working days.

Will I receive feedback on the results of this research?

Should you wish to receive feedback on the research, I will happily supply you with a summary of the research findings.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr Ruth Boyask, ruth.boyask@aut.ac.nz, +64 9 921 9999 ext. 7569

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, Kate O'Connor, ethics@aut.ac.nz, 921 9999 ext. 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form which you will receive and complete at the focus group meeting. You are also able to contact the research team as follows:

Researcher Contact Details:

Abbie Dingle | abbiedingle@gmail.com

Project Supervisor Contact Details:

Dr Ruth Boyask, ruth.boyask@aut.ac.nz, +64 9 921 9999 ext 7569

Approved by the Auckland University of Technology Ethics Committee on August 22nd 2017, AUTEK Reference number 17/252.



Consent Form

Interviews

Project title: A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools.

Project Supervisor: Dr Ruth Boyask

Researcher: Abbie Dingle

- ☐ I have read and understood the information provided about this research project in the Information Sheet dated August 2017.
- ☐ I have had an opportunity to ask questions and to have them answered.
- ☐ I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.
- ☐ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
- ☐ I understand that if I withdraw from the study then I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.
- ☐ I agree to take part in this research.
- ☐ I wish to receive a summary of the research findings (please tick one): Yes ☐ No ☐

Participant's signature:

Participant's name:

Participant's Contact Details (if appropriate):

.....
.....
.....
.....

Date:

Approved by the Auckland University of Technology Ethics Committee on August 22nd 2017, AUTECH Reference number 17/252.

Note: The Participant should retain a copy of this form.



Consent Form

Focus groups

Project title: A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools.

Project Supervisor: Dr Ruth Boyask

Researcher: Abbie Dingle

- ☐ I have read and understood the information provided about this research project in the Information Sheet dated August 2017.
- ☐ I have had an opportunity to ask questions and to have them answered.
- ☐ I understand that identity of my fellow participants and our discussions in the focus group is confidential to the group and I agree to keep this information confidential.
- ☐ I understand that notes will be taken during the focus group and that it will also be audio-taped and transcribed.
- ☐ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
- ☐ I understand that if I withdraw from the study then, while it may not be possible to destroy all records of the focus group discussion of which I was part, I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.
- ☐ I agree to take part in this research.
- ☐ I wish to receive a summary of the research findings (please tick one): Yes ☐ No ☐

Participant's signature:

Participant's name:

Participant's Contact Details (if appropriate):

.....
.....
.....
.....

Date:

Approved by the Auckland University of Technology Ethics Committee on August 22nd 2017, AUTC Reference number 17/252.

Note: The Participant should retain a copy of this form.

Appendix Eight – Focus group questions | Students | School Ek & Do

The logo for AUT (Auckland University of Technology) is displayed in white text on a dark grey rectangular background.

TE WĀNANGA ARONUI
O TĀMAKI MAKĀU RAU

Abbie Louise Dingle

A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools.

Focus group questions

This is Abbie Dingle with focus group #1 at (SCHOOL) on (DATE).

Here with me today I have (INSERT NAMES HERE) who are all in (INSERT YEAR LEVEL HERE)

Firstly I would like to thank you for agreeing to be part of this focus group and giving up your time. I appreciate as seniors you are incredibly busy, particularly this time of year.

A little about who I am and why I am here. I am a teacher and a student at AUT and completing some research for my dissertation. Thus, I have no affiliation with your teachers or influence over them so please believe that you can be completely honest and truthful in your feedback.

With your permission I will be recording this focus group discussion on this Iphone and on an Ipad as back up. I will also be taking notes so that I can accurately transcribe what you are saying. The recordings will then be sent to a professional transcriber who will also be signing a confidentiality agreement. Once the focus group conversation has been transcribed I will happily send you the transcription for you to check in order to ensure your responses have been recorded accurately. Upon receipt of the transcription you are welcome to edit any of your responses should you feel they do not accurately represent what you have said.

I would like to assure you that your identities and responses are completely confidential within this room, however, due to the nature of focus groups I cannot guarantee complete confidentiality. We can however, acknowledge the importance of respecting people's thoughts, views and opinions and their right to voice these in a safe environment where they feel comfortable.

I am researching cross-curricular teaching and learning and would really value your perceptions and opinion on the subject. In a broad sense, cross-curricular teaching and learning is traditionally isolated subject areas; mathematics, English and science for example, working together to deliver content knowledge which bridges the subjects together.

This focus group aims to find out how you feel about cross curricular teaching and learning.

This is a picture of (RELEVANT VISUAL STIMULUS HERE) from your school website. Could you explain a little bit about it for me

Abbie Louise Dingle

A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools.

Focus group questions

1. Is any part of your school experience cross curricular – if so, which?
2. Have you experienced learning that isn't cross curricular? Do you find the cross curricular approach more valuable in comparison? Why or why not?
3. Do you think cross curricular learning has changed or impacted how you learn?
4. Do you see any benefits to cross curricular learning?
5. What do you enjoy most about the cross curricula approach to your learning?

Closing

Thank you everyone. That concludes our time together in this focus group. Thank you so much for your wonderful responses. I will get the transcripts sent to you as soon as possible and please remember, if you wanted to modify or withdraw any information in the transcript it is absolutely your right. Your anonymity and protection in this research is of utmost importance. If you had any questions please don't hesitate to contact me. Thank you.

Approved by the Auckland University of Technology Ethics Committee on August 22nd 2017, AUTEK Reference number 17/252.

Appendix Nine – Interview questions | Teachers | School Ek & Do

AUT

TE WĀNANGA ARONUI
O TĀMAKI MAKAU RAU

Abbie Louise Dingle

A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools.
Semi structured interview questions

This is Abbie Dingle interviewing (NAME) at (SCHOOL) on (DATE)

- Name:
- Role within the school:
- Years at the school:

Opening: Firstly, I would like to thank you for agreeing to be part of this interview and give up your precious time. I am a teacher and 2iC myself so I understand how hectic and busy your life is and I really appreciate you giving up your time to be part of this interview.

Firstly, a little about why I am here and myself. I have chosen to focus on cross curricular teaching and learning for my dissertation. The New Zealand curriculum draws a focus on students using knowledge across disciplines and expanding experiences beyond subject boundaries similar to cross curricular pedagogy. Having taught design and technology for nearly a decade, I recognise and relate to similarities with the cross curricular framework and the design and technology curriculum. I am also interested in looking at schools with an immersion in cross curricular learning and/or schools with a strong cross curricular pedagogy and am looking forward to talking to you about this.

I would like to assure you that your responses are completely confidential, as is the schools identity. With your permission I will be recording this interview on an iPhone and on an iPad as a backup. I will also be taking notes so that I can accurately transcribe what you are saying. The recordings will then be sent to a professional transcriber who will also be signing a confidentiality agreement. The recordings will be downloaded onto a hard drive and locked away in a secure data facility at AUT. Once the interview has been transcribed I will happily send you the transcription for you to check in order to ensure your responses have been recorded accurately. Upon receipt of these you are welcome to edit any of your responses should you feel they do not accurately represent your correspondence. If you had any questions now or any which you do think of, please do not hesitate to contact me.

Starter:

This is (INSERT VISUAL STIMULUS FROM SCHOOLW EBSITE). Could you tell me a bit about it please?

Abbie Louise Dingle

A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools.

Semi structured interview questions

1. In your opinion, what makes teaching cross-curricular?
2. How does your school approach it? For example, does it happen across the whole school?
Or does it work more at a programme level, for example between departments?

(Depending on the field notes I make from this question will depend on Q3 and where it goes)

3. Can you give me an example of typical cross-curricular teaching at your school?
4. Can you tell me about the ways the school has supported cross-curricular learning? In terms of timetable, resources, PD?
5. Specifically, what have you received to help teach using a cross-curricular approach?
6. What challenges has cross-curricular teaching presented for you?
7. Do you think the cross-curricular approach is sustainable?
8. Is your view the same as your school's view?
9. Do you think students value the cross-curricular approach?
10. Do students find some aspects of the cross-curricular approach challenging?
11. Do you think cross-curricular pedagogy has effected learning outcomes for your
12. How would you describe the role of the Design and Technology department when thinking about cross-curricular pedagogy in your school?
13. What do you value the most in the cross-curricular learning approach?

Closing: That concludes by questions and brings our interview to a close.

Thank you so much for those wonderful responses. I will get the transcript sent to you as soon as possible and please remember, if you wanted to modify or withdraw any information in the transcript it is absolutely your right. Your anonymity and protection in this research is of utmost importance. If you had any questions please don't hesitate to contact me. Thank you.

Approved by the Auckland University of Technology Ethics Committee on August 22nd 2017, AUTEK Reference number 17/252.

Appendix Ten – Consent from | Teachers and students | School Teen



AUT

TE WĀNANGA ARONUI
O TĀMAKI MAKĀU RAU

Consent Form

Casual conversations and field notes

Project title: A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools.

Project Supervisor: Dr Ruth Boyask / *Researcher:* Abbie Dingle

- ☐ I understand the information I give will be used in the research project above.
- ☐ I have had an opportunity to ask questions and to have them answered.
- ☐ I understand that notes taken will be used in the research
- ☐ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
- ☐ I understand that if I withdraw from the study then I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.
- ☐ I agree to take part in this research.
- ☐ I wish to receive a summary of the research findings (please tick one): Yes ☐ No ☐

Participant's signature:

Participant's name:

Date:

Approved by the Auckland University of Technology Ethics Committee on August 22nd 2017, AUTEK Reference number 17/252.

Note: The Participant should retain a copy of this form.

Appendix Eleven – Teacher questions | School Teen



Abbie Louise Dingle

A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools.
Semi structured interview questions

Teacher questions:

1. Can you give me an example of typical cross-curricular teaching at your school?
2. Can you tell me about the ways the school has supported cross-curricular learning? In terms of timetable, resources, PD?
3. What challenges has cross-curricular teaching presented for you?
4. Do you think the cross curricular approach is sustainable?

Approved by the Auckland University of Technology Ethics Committee on *August 22nd 2017*, AUTEK Reference number 17/252.

Appendix Twelve – Student questions | School Teen



Abbie Louise Dingle

A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools.

Semi structured interview questions

Student questions:

1. Is any part of your school experience cross curricular– if so, which?
2. Have you experienced learning that isn't cross curricular? Do you find the cross curricular approach more valuable in comparison? Why or why not?
3. Do you see any benefits to cross curricular learning?
4. What do you enjoy most about the cross curricula approach to your learning?

Approved by the Auckland University of Technology Ethics Committee on *August 22nd 2017*, AUTEC Reference number *17/252*.

Appendix Thirteen – Transcriber confidentiality agreement

Abbie Louise Dingle A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools. Focus group questions	 TE WĀNANGA ARONUI O TĀMAKI MAKĀU RAU
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Confidentiality Agreement

Transcriber

Project title: A critical comparison of whole school and programme level cross-curricular strategies and their relationship to the Design and Technology curriculum in two New Zealand secondary schools.

Project Supervisor: Dr Ruth Boyask

Researcher: Abbie Dingle

- ☐ I understand that all the material I will be asked to transcribe is confidential.
- ☐ I understand that the contents of the tapes or recordings can only be discussed with the researchers.
- ☐ I will not keep any copies of the transcripts nor allow third parties access to them.

Transcriber's signature:

Transcriber's name:

Transcriber's Contact Details (if appropriate):

.....
.....
.....
.....

Date:

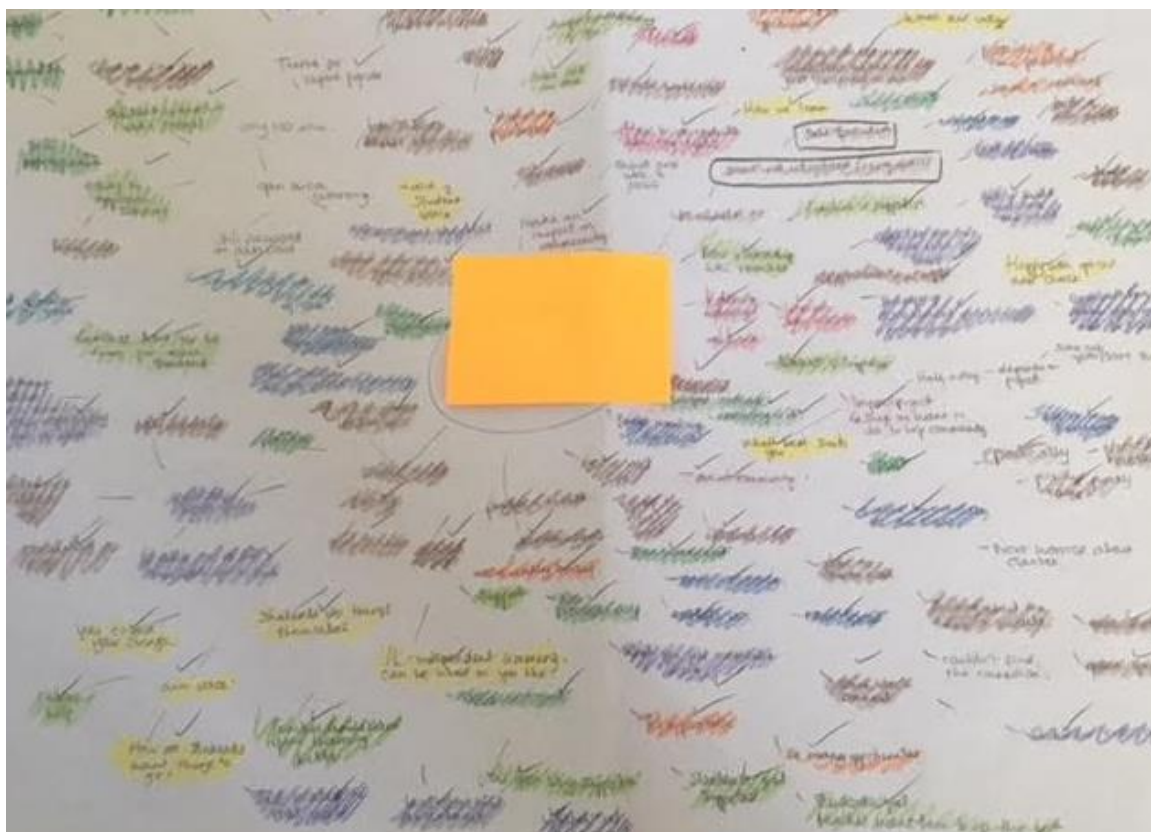
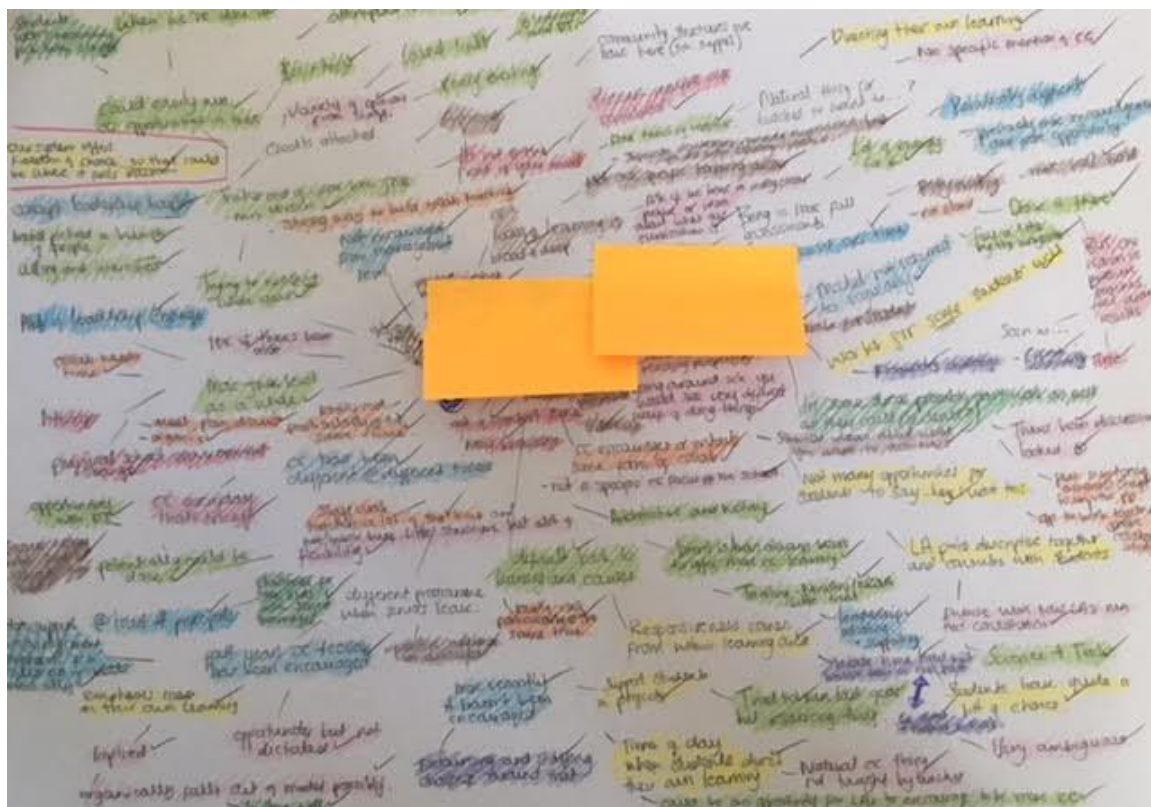
Project Supervisor's Contact Details (if appropriate):

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Approved by the Auckland University of Technology Ethics Committee on August 22nd 2017, AUTEK Reference number 17/252.

Note: the transcriber should retain a copy of this form.

Appendix Fourteen – Interview summary coding and categorizing exemplar | Interview and focus group | School Ek and Do



Appendix Fifteen – Field notes | teachers and students | School Teen

(Jackie)
 Cross curricular teaching @ HPSS
 changing + different everytime.
 • Dependent on LO's and theme.
 • Speed date every semester due to semester changes.
 • CO-assessment for NCEA standards
 ↳ in house (LPL (learning design leader) + HOF) + senior leader
 • Planning time.
 Challenge with knowledge of other curriculum area.
 Challenge with teaching style and learning to work together.
 Challenge: Different relationships with different people.
 Loves co teaching.
 Yes, absolutely sustainable, adds so much to what I'm doing.
 Would limit me to go back.
 Always evolving -
 > Thematic
 > Collaboration: Speed date
 > Leadership support w/ assessment
 Time
 > Challenge around other curriculum knowledge
 Challenge with teaching styles <
 > Co teaching
 Sustainable
 > Old way is limiting.

One module co @ L2 (psyche, Hist, Eng)
 Pros and cons with matches.
 - History and English link well
 - English and Maths not so well and still separate.
 Killing 2 birds with one stone: ie.
 - History essay and English assessment is the same document.
 Taken less time.
 Difference in not just learning one thing
 Not getting bored of being in one subject
 Subjects work well together - stupid not too.
 > Some matches are great
 > Bad when matches don't work. They stay separate
 > Double dipping
 > Taken less time
 > Not learning just one thing
 > Not bored

Appendix Sixteen – Cluster theming exemplar | Interviews and focus groups | School Ek, Do and Teen

Engaged in - Never bored - more interesting - we're more focused - brings mood up in the class - engaged more - not so isolated - This could be the future of learning - fun - easier to do the class - focused.

① Engagement

Students do things themselves - own voice - you choose your strength - how do students want things to go - Independent learning used as you like - what best suits you - How we learn - learn our way - A lot of student voice - happy with choice and choice.

② STUDENT AGENCY.

not related to real world - less stressful assessment - beneficial assessment that you feel comfortable doing - if able to do level 2 they work you to that level - NCEA option - Assessment deadline, given and your responsibility to get done - Assessment different - but for more - get a better outcome and result - like you are doing less for more - range of assessment options - Assessment when you are ready - standards cross - less on choices more.

③ ASSESSMENT

working - respect - self management - organisation - self management - are to develop the mindset - prioritise - time management - using initiative - not procrastinating - time management - develops actions - committing to it - managing your time - helping others.

④ HABITS.

real issues - priority - Geo and Stats - physics and health - biomechanics - CC is all life - prep for real world - drama and art - more to choose from - Some art connect - opens more doors - opens your interest - practical - relevant to life - deeper connection - best of both worlds - enjoy it more because integrated - It's not just focussed on one - CC more beneficial - go deeper - any easier than traditional schools - 2 in 1 - both subjects benefit each other - content and how they put it together - not restricted - get to it used to - confusing @ first - Integrating really well - Teachers can go in depth - related to topic - practically - practical maths - pick up easy.

⑤ CC IS...

is a privilege - so many opportunities - protective of their privilege - Sense of ownership - Acknowledging opportunities - Respecting privilege - we're really lucky.

⑥ PROUD.

all specialist classes - some not integrated - languages - some modules don't have connections.

⑦ SPECIALIST CLASSES

udent to teacher ratio small - easy to approach teacher - teacher able to help for each student - teacher understand your learning better - Teacher help - open and supportive - students feel supported - students feel teachers want them to their best - Teachers supportive - better relationships with teacher - teacher positive - more one on one - deep understanding of you.

⑧ STUDENTS FEEL SUPPORTED.

ive community - impact project - stuff we want to do to help community - Theme for past projects - make an impact on community - some all year some semester.

⑨ IMPACT PROJECT

ect - have to do modules with English - learning seriously - one on one work with teachers.

⑩ TRACKING

people not their cup of tea - traditional schools good for some - some would rather traditional - teacher - all sorts.

1 Principles of...
Tried to run last year but resourcing thing - Science and Tech - Design
there - fell a little by the wayside - A lot of energy for it - Done teaching
together - Really exciting - found links - Electronics and IT - attempted to run a
course - Bio and Tech - when we've done it - could easily run it opportunities
are - that @ end of year with JIVE - more time but as a whole - potentially
could be done - opportunities with IT - default back to learning area - courses -
structure and history - Intent is/has always been to offer more CC learning -
history / NZQA trial - so opportunity for LAs to encourage CC - progress and IT -
right individuals/desire - Hand picked a bunch of people - willing and interested.

Really cool particularly @ the same time - CC encourages or entails some form
of collab - opportunity to work together more collaboratively - Peer mentoring
among staff to improve PD - not siloed - Staff work together a lot of the time -
really cool particularly @ the same time - meet, plan, discuss - organic - collab
each time - Strong way to build collab teaching - positive working with another
off member - Challenging how you would collab with tech. 2 COLLABORATION

Empowers more on their own learning - support students in projects -
responsiveness comes from within learning area - Time of day when students
direct their own learning - Students have quite a bit of choice - LAs put
descriptive together and shared with students - not many opportunities for students
say - hey I want this - Works for some students well - Directing their
own learning - Our system offers freedom of choice so that could be their
choice down. 3 STUDENT CHOICE - Don't work as they would

4 LEADERSHIP
has been different @ different time - @ least 4 principles - past years
and collab has been encouraged - More support encouragement - emphasis
not could do it better potentially - more recently it has been encourage
concept leadership taught - a lot of leadership change - Not encouraged from
engagement level - different over time - model not referred to regularly -
radically different - previously more encouragement and more opportunity
leadership initiating and supporting. 5 STOPPING CC

everyday, tricky - physical school environment - Merger - It's not
the front of your mind - pressure maybe one contributor - out of context
- new knowledge - pressure creates put around results - Time 6 AMBA

applied - organically falls out of the model possibly - opportunity but not
taught - not much brief little structure but a lot of flexibility - IOK if there is
an a lot - Variety of opinions from staff - IOK if we have a clear or idea about
what our curriculum is - no specific mention of CC - There's been discussion -
has been looked @ - diverse with how LAs run consultation - Very ambiguous -
shared CC thing not taught by teachers - not a specific CC focus @ the
end - going around school you would see very different ways of doing things
this influence on outcomes - easier with some subjects than others - Works for
exploring - focus of learning is broad and deep - Authentic learning potentially -
done well - not one specific learning area - pretty exciting - more real world - separate
classrooms running two classes but you do both classes together - valuable for students
sustainable from teaching perspective - similar ideas about what you want to achieve
attention for some kids with subject marriages - if done well - Students won't
necessarily pick both classes. 7 SUBJECT MARRIAGES

resourcing and staying challenging - Release time now but hasn't been in
it - Be good to making it work - Resourcing challenge - Effect sustainability -
8 RESOURCING