Assessment of Cross-curricular Key Competencies: Challenges and Strategies for Senior High School Leaders and Teachers in New Zealand

By

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Abstract

Since the proposal of key competencies from the Definition and Selection of Competencies project by the Organization for Economic Co-Operation and Development (OECD), many countries have revised their national curricula to focus more directly on cross-curricular key competencies (OECD, 2018a). New Zealand identified five key competencies in the national curriculum, but they have been slow to take root, particularly in senior high school (Wolking, 2018). Due to the washback effect of high-stakes national testing, the National Certificate of Educational Achievement qualifications, most senior high schools' assessments have focused largely on subject-specific knowledge and skills (Education Review Office, 2018a; Wolking, 2018). The purpose of this thesis is to explore a way to integrate cross-curricular key competencies into classroom assessment practices in senior high school to promote students' learning. I employed a multiple case study, and cases of interest were senior high school leaders and teachers in New Zealand who engage or have engaged in the assessment of cross-curricular key competencies. Utilizing purposive sampling, I recruited 11 participants: three school leaders and eight teachers. Data collection methods included a qualitative survey and semi-structured interviews, both of which were conducted online due to COVID-19 restrictions. I used thematic analysis to identify, analyse, and report patterns within data. I found that support from senior management, collaborative professional development, and stakeholder involvement can help tackle the awareness gap between subjects and a lack of resources and promote school-wide assessments of cross-curricular key competencies in the senior high school.

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I appreciate the 11 participants who willingly accepted my request and shared their experiences. Their stories gave me insights for future practices, and I believe that they will be helpful for other school leaders and teachers who wish to integrate cross-curricular key competencies into their educational practices.

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CHAPTER 1
Introduction

This chapter first introduces the research topic and explains New Zealand's context. Next, it describes the research rationale and my position. Lastly, I present the thesis overview.

1.1 Key Competencies in the *New Zealand Curriculum*

Due to the increasing complexity and intensifying international competition in knowledge-based economies since the 1980s, countries within the Organisation for Economic Cooperation and Development (OECD) reformed their educational systems and focused on developing key competencies in students (OECD, 2018a). In 2007, New Zealand introduced the framework of key competencies into the national curriculum, the *New Zealand Curriculum,* and defined them as "capabilities for living and lifelong learning" (Ministry of Education, 2007, p. 12). The five key competencies are 1) thinking; 2) using language, symbols, and texts; 3) managing self; 4) relating to others; and 5) participating and contributing (Ministry of Education, 2007). The concept of key competencies originates from the OECD's Definition and Selection Competencies (DeSeCo) project, in which three categories of key competencies (acting autonomously; functioning in socially heterogeneous groups; using tools interactively) with one cross-cutting competency (reflective thinking) were identified (OECD, 2005).

The key competencies are described as "the key to learning in every learning area" in the *New Zealand Curriculum* (p. 12), and they are intended to be nurtured in eight learning areas (English, the arts, health and physical education, learning languages, mathematics and statistics, science, social sciences, and technology). While the *New Zealand Curriculum* specifies achievement objectives and key topics to be covered during 13 years of schooling, each school is expected to develop and design their own curriculum within guidelines set by the national curriculum and at the senior high school level by high-stakes national testing, the National Certificate of Educational Achievement (NCEA) qualifications. Accordingly, each school is responsible for integrating key competencies into the school curriculum based on broad specifications.

However, Hipkins (2018) discussed that the rationale and strategy to integrate key competencies into traditional subjects had not been specified by the *New Zealand Curriculum*. As a result, the extent to which and how the key competencies are embedded in educational practices varies from school to school. According to research by the Education Review Office

(ERO) (2019a) in New Zealand, most schools did not deliberately teach or evaluate key competencies with their students in Years 1 to 8. Wolking (2018) concluded from his research that the key competencies had been slower to take root, particularly in high schools. ERO (2018a) also reported that high schools had implemented the *New Zealand Curriculum* to a lesser extent than primary schools, specifically regarding key competencies.

An ERO report (2019b) identified barriers that hinder the effective implementation of key competencies, including school-wide confusion about their content and their role in students' learning, opposition from teachers, clarity of benefit, and unestablished assessment guidelines. As for assessment, due to the washback effect of the NCEA, most senior high schools (Years 11 to 13) focus largely on subject-specific knowledge and skills (ERO, 2018a; Wolking, 2018). The New Zealand Council for Educational Research (NZCER) (2018) investigated over 8,000 New Zealanders' experiences of the NCEA and reported that, in the senior high school, NCEA assessment standards were the de facto curriculum. Therefore, it is anticipated that the potential of the national curriculum featured by the key competencies is not fully realised, particularly in senior high school.

1.2 Assessment of Key Competencies in New Zealand

Schools in New Zealand have had great autonomy since the reforms in 1989 and can select their own procedures and instruments for assessment from a wide range of rating systems and quality-assured tests (Brown et al., 2014). There is no standardised compulsory assessment during Years 1 to 10, and students' progress is assessed by relatively low-stakes diagnostic tests such as the Progressive Achievement Test (PAT) and the Assessment Tools for Teaching and Learning (asTTle). Students in Years 11 to 13 complete the NCEA to gain school-leaving qualifications, which provide admittance to tertiary education. NCEA is high-stakes for teachers as well as students. Since the school reforms in 1989, school accountability has increased, and competition among schools has accelerated. School accountability is usually measured by students' NCEA performance. Up to half of the NCEA assessment is conducted by senior high school teachers within schools (known in New Zealand as internal assessment), and the other half is assessed by external examinations.

While the *New Zealand Curriculum* "encourage[s] and monitor[s] the development of the key competencies" (Ministry of Education, 2007, p. 38), whether and how to assess key competencies was a topic of debate and posed a challenge for the early adopters (Boyd & Watson, 2006; Hipkins, 2006). Attempts have been made to develop valid and reliable

assessments of the key competencies in New Zealand. For example, Peterson et al. (2013) focused on the four socio-emotional key competencies (thinking, managing self, relating to others, participating and contributing) in the *New Zealand Curriculum* and found that existing psychological questionnaires could be used to identify potential assessable constructs of each key competency. However, they admitted that the simultaneous use of all scales to assess the constructs diminished the individual model measures' value. Hipkins (2006) also asserted that the key competencies are interrelated, and any one of them involves the use of all others, thereby making it challenging to assess each competency in isolation.

New Zealand senior high school leaders and teachers are expected to be accountable for NCEA and conduct a coherent school curriculum with the national curriculum featured by the key competencies while tackling the complex nature of the key competencies in assessment.

1.3 Rationale for the study

Research shows that school leaders and teachers in New Zealand face challenges in integrating the key competencies into their curriculum and educational practices, particularly in senior high school. While assessment is an integral part of the curriculum, assessment of cross-curricular competencies is an unsolved question internationally (Hipkins & Cameron, 2018; Siarova et al., 2017; UNESCO, 2016). In many countries, both classroom assessments and national examinations of core subjects have concentrated on recalling subject-specific knowledge and applying basic skills, while less attention has been paid to assessing cross-curricular competencies (OECD, 2013). This is partly because cross-curricular competencies, including behavioural and social aspects of personality, are more complex in regard to their definition and structure, while subject-specific knowledge and skills can be relatively easy to measure (Levin, 2013; Siarova et al., 2017). This reality is problematic because what is assessed determines what is learnt (Looney, 2014; Care & Lou, 2016). Moreover, given that one of the primary roles of assessment is to promote lifelong learning (Hipkins, 2007), changing what is assessed and how it is assessed is urgent.

Competency is discussed differently across various frameworks. Although I use key competencies in the New Zealand context, I use cross-curricular key competencies for a broader set of knowledge, skills, attitudes, and values to distinguish them from traditional subject-specific knowledge and skills that have been mainly assessed by pen-and-paper written tests.

The purpose of this research is to explore a way to integrate cross-curricular key competencies into classroom assessment practices in senior high school to promote students' learning. I aim to learn from New Zealand school leaders and teachers and add insights to the field while informing school leaders, teachers, and researchers interested in how to embed cross-curricular key competencies into their practices.

1.4 The researcher's position

My experience as a teacher in Japan made me interested in this topic. My workplace was a private junior and senior high school in Tokyo, where my colleagues and I developed and implemented a tailored senior high school curriculum for the Japanese Government's Super Global High School project. The project aimed to develop global citizens with cross-curricular key competencies. While I witnessed that a variety of students' competencies were nurtured in class, I realized that their progress in cross-curricular key competencies could not be holistically captured only with traditional pen-and-paper assessment methods. Although my colleagues and I tried multidimensional assessments, such as performance-based assessments, it was so time-consuming to develop assessment criteria and tasks and get a consensus among teachers about validity and reliability that such assessments were neither manageable nor sustainable. Additionally, we needed to continue conducting traditional summative pen-and-paper assessments as most students were preparing for university entrance examinations focused on subject-specific knowledge.

From this experience, I decided to investigate assessment practices of senior high school leaders and teachers in New Zealand who are addressing the same problems to get insights for future practice in Japan and also make informed judgements on how well these ambitions have been realised in New Zealand.

1.5 Thesis overview

This first chapter introduced the research topic in the New Zealand context, the rationale, and the researcher's position. The second chapter reviews international research to explore how and to what extent teachers have changed their assessment practices to nurture and assess students' cross-curricular key competencies. The third chapter outlines the methodology used for this study. The fourth chapter presents the results from a collective case study that considers New Zealand senior high school leaders' and teachers' experiences and perceptions on the

assessment of cross-curricular key competencies. The fifth chapter discusses the necessary existing and desirable conditions and specific classroom assessment practices that are effective, valid, and manageable in assessing students' cross-curricular key competencies. The sixth chapter concludes the thesis by outlining the project’s key contributions, limitations, and areas for future research.

CHAPTER 2
Literature Review

2.1 Introduction

In this chapter, I review relevant literature, including books, journal articles, conference papers, reports, and websites, to identify how and to what extent teaching, learning, and assessments of cross-curricular key competencies have been implemented and changed. I gathered the literature mainly through Google Scholar, Scopus, and Victoria University of Wellington's library database, Te Waharoa. I also searched Education Review Office research, NZCER journals online, and the New Zealand Ministry of Education website, Te Kete Iparangi, to learn trends and the history of assessment of key competencies in New Zealand. The search terms I utilised were 'assessment' and variations on 'competency', 'competence', 'skill', 'capability', and 'deep learning'. I also used 'classroom', 'high school', 'secondary school', and 'teacher'. The search was limited to resources from 2006 onwards because most of the competency frameworks have been developed and the national curricula have been revised since the definition of competency by OECD in 2005. The resources were limited to those written in English so that both my supervisors and I could read them. I also reviewed the reference lists of chosen resources to cover as many relevant publications as possible.

The next section covers the following topics: how competency became important in global educational reform, how and why competency frameworks have developed, the incorporation of cross-curricular key competencies into national curricula, and changes and challenges in teaching and learning cross-curricular key competencies. The third section covers the following topics: debate on the assessment of cross-curricular key competencies, considerations in assessing cross-curricular key competencies, the assessment of cross-curricular key competencies in the classroom, and challenges that school leaders and teachers face in assessing cross-curricular key competencies. The fourth section discusses drivers and obstacles to educational reform in assessment. The fifth section summarises the literature review. The last section presents research questions based on the findings from the literature review.

2.2 Competency

2.2.1 Competency and educational reform

Competency as a broader set of knowledge, skills, attitudes, and values grew in importance during educational reform in the 1990s worldwide. The International Commission on

Education for the Twenty-first Century, established by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1993, determined necessary changes in education to respond to technical, social, and economic changes in a globalised world (Delors, 1996). The commission aimed to determine how educational institutions and learning processes can contribute to realising a future that is environmentally sustainable and fair for everyone.

The commission proposed two concepts of learning in 1996, one of which was lifelong learning. While the concept had already been presented in another UNESCO report published in 1972 (Faure, 1972), the commission broadened the concept and affirmed the importance of learning throughout life as one of the keys to meeting challenges in a rapidly changing world. With lifelong learning as its background, the second concept proposed was the four pillars of learning. These consist of learning to know, learning to do, learning to live together, and learning to be. The four pillars suggested a broader set of knowledge, skills, attitudes, and values that people require for both work and life.

Although there has been no systematic review of the influence of the 1996 UNESCO report, evidence shows that it has had an impact on worldwide education reform and competency-based curriculum development not only in UNESCO member countries but also in other international organisations, such as the Organisation for Economic Co-operation and Development (OECD) and the European Union (Carneiro & Draxler, 2008; Lee, 2007).

From a critical policy and practice perspective, however, Savage (2017) argued that competency-based education is influenced by neoliberalism, where the focus is to increase nations' economic productivity by allowing the market to operate freely as opposed to government control of the economy. He insisted that the purpose of education is narrowed down to the development of students' human capital, and only work-related competencies tend to be emphasised. Furthermore, Honda (2005) asserted that competency-based education might widen existing economic and social disparities as competencies usually reflect the values of a certain group in power. On the other hand, Matsuo (2017) stated that competency-based education has the potential for the holistic development of students' capabilities as it directs schools' pedagogic attention to students' values, attitudes, and skills as well as knowledge. This is significant in terms of indicating a shift from the utilitarian and productivist view that was dominant in education in the 1990s to the more holistic approach to education that emphasises the development of the whole person (Tawil, 2013).

2.2.2 Competency frameworks

The OECD launched the DeSeCo project in 1997 to identify and select desirable key competencies for a successful life and a well-functioning society. In the final report of the DeSeCo project, competency was defined as follows:

> A competency is more than just knowledge and skills. It involves the ability to meet complex demands, by drawing on and mobilising psychosocial resources (including skills and attitudes) in a particular context. For example, the ability to communicate effectively is a competency that may draw on an individual's knowledge of language, practical IT skills and attitudes towards those with whom he or she is communicating (OECD, 2005, p. 4).

The definition reflected the OECD's awareness that the mastery of specific knowledge and skills is not enough; rather, individuals must mobilise their knowledge, skills, attitudes, and values in unity. The DeSeCo project identified nine key competencies in three categories as follows:

- Using tools interactively: use language, symbols, texts, and knowledge interactively; use knowledge and information interactively and use technology interactively
- Interacting in heterogeneous groups: relate well to others; cooperate, work in teams; manage and resolve conflicts
- Acting autonomously: act within the big picture; form and conduct life plans and personal projects; defend and assert rights, interests, limits and needs (OECD, 2005)

The three categories are interrelated, and, as a foundation, thinking and acting reflectively are set as cross-cutting competencies.

Several researchers (e.g., Binkley et al. 2012; Fullan & Scott, 2014) and organisations (e.g., European Commission, 2006; Partnership for 21st Century Skills, 2008; UNESCO, 2015b; World Economic Forum, 2016) have independently developed frameworks for competency and labelled it differently. For example, the European Union identified eight key competences in the European Reference Framework of Key Competences for Lifelong Learning in 2006. The eight competences were:

1. Communication in the mother tongue
2. Communication in foreign languages
3. Mathematical competence and basic competences in science and technology
4. Digital competence
5. Learning to learn
6. Social and civic competences
7. Sense of initiative and entrepreneurship
8. Cultural awareness and expression (European Commission, 2006)

The framework urged member states to make teaching and learning of the key competencies one of the strategies for lifelong learning.

Another example of a competency framework is the Partnership for 21st Century Skills Framework in the United States of America. The framework defined 21st-century skills in three categories:

- Learning and innovation skills: creativity and innovation, critical thinking and problem-solving, communication and collaboration
- Information, media, and technology skills: information literacy, media literacy, ICT literacy
- Life and career skills: flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, leadership and responsibility (Partnership for 21st Century Skills, 2008)

Other than these skills, the framework identified 21st-century themes: global awareness, financial, economic, business, and entrepreneurial literacy, civic literacy, and health literacy.

The Sustainable Development Goals (UNESCO, 2015a) urged all generations to acquire skills beyond literacy and numeracy. The skills included readiness for primary education (4.2), technical and vocational skills (4.4), and skills needed to promote global citizenship and sustainable development (4.7).

The work by the DeSeCo project has been extended by the Future of Education and Skills 2030 project aiming to redefine the competencies that enable people to contribute to and benefit from an inclusive and sustainable future (OECD, 2018b). The framework by the European Union was updated in 2018 (European Commission, 2018).

2.2.3 Development of competency frameworks

The selection of the term for competency and the definition of the constructs are different among countries and regions based on its context (Gordon et al., 2009; Voogt & Roblin, 2012). For example, the European Union framework emphasises communicating in foreign languages, but this point is missing from other frameworks. On the other hand, all frameworks include digital literacy. Competency appears uniformly across regions as a necessary human trait to participate in the workforce, be a good citizen in the globalised society, and be a lifelong learner in the constantly changing world. According to Child and Shaw (2020), competency has three fundamental attributes. First, competency is an integration of multiple components (knowledge, skills, attitudes, and values) to be used in unity. Second, competency is heavily context-bound. Third, the definition of competency is affected by what is valued in the context.

Competency frameworks have been developed to be responsive to time and context. Also, they evolve through time.

Throughout this paper, I use 'cross-curricular key competencies' to refer to any kind of competency to clarify the difference from traditional subject-specific knowledge and skills. That is, 'cross-curricular key competencies' are those that have not been quantitatively assessed in subjects by traditional pen-and-paper tests.

2.2.4 Incorporating cross-curricular key competencies into national curricula

Following on from the DeSeCo project by the OECD, national governments have reformed the national school curriculum to incorporate cross-curricular key competencies in the last two decades. Case studies from the UNESCO-supported ERI-NET and NEQMAP groups (UNESCO, 2016; UNESCO, 2015b) found that a variety of cross-curricular key competencies were introduced or emphasised in national or school policies, plans, and curricula in all of the ten participating countries (Australia, Shanghai, China, Hong Kong, Republic of Korea, Japan, Malaysia, Mongolia, Philippines, and Thailand). The research showed that cross-curricular key competencies, such as critical thinking, reflective thinking, innovative thinking, reasoned decision-making, communication, and collaboration skills were integrated into curricula in the following three ways:

- Specific Subject: Learning of transversal competencies is included as a well-defined entity within the formal curriculum; for example, a subject with specific goals and syllabi for formal teaching
- Cross-Subject: Learning of transversal competencies runs across, infiltrates and/or underpins all "vertical subjects", i.e., traditional school subjects
- Extra-Curricular: Learning of transversal competencies is made part of school life and embedded purposefully in all types of non-classroom activities (UNESCO, 2015b)

UNESCO (2015b) reported that most of the ten countries use at least two integration methods as shown in Table 2.1. For example, India had a specific subject (moral education) competency to develop moral values while other competencies were integrated into traditional curricular subjects, such as language and science, and extracurricular activities.

The integration of cross-curricular key competencies into curricula, however, has caused a problem of 'curriculum overload' in OECD countries and partner economies (OECD, 2020). There are four dimensions of curriculum overload: curriculum expansion, content overload, perceived overload, and curriculum imbalance (OECD, 2020). Curriculum expansion occurs when new content items are included in the curriculum without removing prior content. Content overload is an excess of curriculum content over instruction time. Perceived overload is teachers' and students' perception and experience of curriculum overload. Curriculum imbalance occurs when certain areas of the curriculum are disproportionately prioritised over other areas. To ensure breadth and depth of learning, curricula should balance knowledge and skills which have been traditionally considered important and those that are new and future-focused.

Nieveen and Plomp (2018) admit that it is a challenge for school leaders and teachers to decide on how to place cross-curricular key competencies within the curriculum at a school level and classroom level. Integrating cross-curricular key competencies in the curriculum signals the need for fundamental changes at all levels — system, school, and classroom.

Table 2.1

Integration methods and countries' choice

Country and Economy	Specific Subject	Cross Subject	Extra-Curricular
Australia	✓	✓	–
Hong Kong SAR (China)	✓	✓	✓
Shanghai (China)	✓	✓	✓
India	✓	✓	✓
Japan	–	✓	✓
Republic of Korea	–	✓	✓
Malaysia	✓	✓	✓
Mongolia	✓	✓	–
Philippines	✓	✓	✓
Thailand	✓	✓	✓

Note. From "Asia-Pacific Education Research Institutes Network (ERI-Net) Regional Study on Transversal Competencies in Education Policy and Practice (Phase 1)", by UNESCO, 2015b, p. 12 (http://unesdoc.unesco.org/images/0023/002319/231907e.pdf). CC BY-SA 3.0 IGO.

In the process of curriculum redesign, several countries faced a pendulum between subject content and competencies. For example, the curriculum in England from 2000 focused on the development of key skills (communication, application of numbers, information communication technology, working with others, improving own learning and performance, and problem-solving) (Department for Education and Employment/Qualifications & Curriculum Authority, 1999). However, the National Curriculum that has been implemented since 2014 emphasised numeracy and mathematics, language, and literacy, while cross-curricular knowledge, skills, and attitudes are embedded within subjects and areas (Department for Education, 2014). The reform intended to improve performance in international tests like the Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA) as well as national standards (Department of Education, 2013). Conversely, New Zealand sought to weave key competencies and traditional content by changing the curriculum rather than considering key competencies to be an addition to traditional content (Hipkins, 2017).

2.2.5 Changes and challenges in teaching and learning cross-curricular key competencies

The integration of cross-curricular key competencies into curricula is related to the need for new teaching and learning methods. This is because cross-curricular key competencies cannot be taught and learned by a traditional subject and teacher-centred knowledge transfer approach. Since cross-curricular key competencies involve mobilising one's values, attitudes, skills, and knowledge in unity, they can be taught and learned in a meaningful context where the application of competencies is necessary.

UNESCO (2016) reported that teaching and learning have become more student-centred in countries that incorporate cross-curricular key competencies into their national curricula. For example, several researchers (e.g., European Commission, 2020; Fullan & Langworthy, 2014; Gordon et al., 2009) identified that the development of cross-curricular key competencies could be supported by student-centred teaching and learning approaches such as collaborative learning, inquiry-based learning, and experiential learning. OECD (2020) found that cross-discipline teaching and project-based learning can be a strategy to reinforce subject content and develop cross-curricular key competencies. In such teaching and learning approaches, students are supposed to solve a real-world problem in cooperating with their peers. By doing so, they are expected to make meaningful connections of subject knowledge and develop a range of cross-curricular key competencies, such as critical thinking, problem-solving, communication, collaboration, and citizenship. This is different from a traditional teaching and learning method in which students are expected simply to reproduce or apply existing content knowledge and skills.

Along with the changes required, school leaders and teachers face several challenges. First, there are a limited number of resources and materials to implement cross-curricular key competencies. UNESCO (2016) reported that half of the relevant case studies lack example lessons, which affects the development of students' cross-curricular key competencies. This issue means that teachers need to invest time in creating teaching materials, which may hinder them from conducting new types of teaching and learning. Second, teachers lack professional development opportunities to deepen their understanding of cross-curricular key competencies and apply such learning in their classes. Scoular and Care (2018) found that teachers did not think that they were ready and lacked the confidence to teach cross-curricular key competencies because they were uncertain of the expected outcomes compared with traditional lessons. This result makes sense, given that there is no conclusive evidence on effective teaching and learning approaches regarding cross-curricular key competencies. Finally,

teachers lack reliable mechanisms and practical guidelines to assess cross-curricular key competencies (UNESCO, 2016). With the absence of assessments for cross-curricular key competencies, teachers often opt to rely on traditional teacher-administered pen-and-paper examinations, which adversely affects what to teach and learn as well as how to teach and learn (Nieveen & Plomp, 2018).

In summary, even though school leaders and teachers are expected to integrate cross-curricular key competencies into their practices by the national curriculum and school curriculum, the lack of resources, professional development opportunities, and assessment tools pose significant challenges.

2.3 Assessment

2.3.1 Debate on the assessment of cross-curricular key competencies

Whether cross-curricular key competencies should be assessed has been a topic of debate. Boyd and Watson (2006) investigated early adopters of the *New Zealand Curriculum* and found that some teachers felt uncomfortable about assessing students' "dispositions" or "personalities". Others were concerned that offering feedback on students' performance might influence their self-esteem. On the other hand, Hipkins (2006) insisted that cross-curricular key competencies will be ignored if they are not assessed.

The previous section identified the changes in teaching and learning due to incorporating cross-curricular key competencies into the curriculum. Accordingly, classroom assessment needs to be redesigned to support new teaching and learning styles. Assessment changes are necessary for two reasons. Firstly, in an education system where cross-curricular key competencies are incorporated, learning outcomes are different from traditional ones (Hipkins, 2007). While traditional assessments have focused on students' abilities to recall and reproduce content (OECD, 2013), new types of assessment should focus on students' abilities to mobilise their knowledge, skills, attitudes, and values to respond to real-life contexts. The second reason involves the interdependence of assessment, curriculum, and pedagogy. Assessments signal which aspects of learning are critical, so they influence curriculum content and how it should be taught and learned (Care & Lou, 2016; Looney, 2014). Therefore, changes in assessment can guide changes in the curriculum, teaching, and learning. Furthermore, according to the OECD (2020), even if the curriculum encourages the development of cross-curricular key competencies, when assessments heavily focus on mastery of content, students and teachers will likely devote their time to what is assessed while sacrificing other development areas. This

tendency is more evident in senior high school, where students take examinations for university admittance (OECD, 2020). Thus, changes in assessment are necessary not only for monitoring students' progress in cross-curricular key competencies but also for developing those competencies.

2.3.2 Considerations when assessing cross-curricular key competencies

Purpose of assessment

The purpose of assessment can be classified into two topics: the use of assessment of learning (summative assessment) and the use of assessment for learning (formative assessment) (Harlen, 2005). Summative functions of assessments are used for recording and reporting what has been learned after instruction. For example, typical purposes are to evaluate learning outcomes, choose students for selection or grouping, and award certifications or qualifications (Dixson & Worrell, 2016). International and national standardised tests are examples of summative assessments. While summative assessments can extrinsically motivate students, they can narrow down teaching and learning to what is assessed as a result of the washback effect, the impact of testing on educational practices (Alderson & Wall, 1993; Madaus et al., 2009).

Formative functions of assessments are employed to improve teaching and learning in the classroom before and during instruction (Black & Wiliam, 1998). They are also used to identify students' difficulties and promote understanding of learning goals and criteria. For successful formative assessment, students are expected to recognise and take actions to close the gap between their current state and learning while teachers interpret the gap and provide appropriate feedback (Black & Wiliam, 1998; Hattie, 2009; Hattie & Timperley, 2007). Formative assessment practices are affected by how teachers perceive learning (Hargreaves, 2005); teachers who consider learning as the transmission of knowledge may use formative assessment in a teacher-centred way, while those who perceive learning as social-cultural may use formative assessment in a more student-centred way (Black & Wiliam, 2009; Cowie, 2012; Deluca et al., 2012). The latter focus puts importance on peer and self-assessments, which are often mentioned as examples of assessment as learning. Earl (2012) described that students become aware of their learning through self-reflection and can decide on what they want to learn next. Peer and self-assessments reinforce and extend the role of formative assessment for learning. Earl (2012) asserts that peer and self-assessments are effective in developing and assessing cross-curricular key competencies, such as initiative, critical thinking and decision-

making, because they help students take responsibility for monitoring their learning. The European Commission (2020) also emphasises the significance of the active role of learners in the lifelong development of cross-curricular key competencies.

The New Zealand Ministry of Education has emphasised the use of assessment for learning for over two decades by encouraging teacher judgements and interactions with students in the learning process (Harris & Brown, 2013). While the *New Zealand Curriculum* (Ministry of Education, 2007) clearly stated that the purpose of assessment is to improve teaching and learning, it also indicates that assessment is used for school accountability and qualifications. Black and Wiliam (1998) reported that teachers experience conflict and tension when they are responsible for both assessment of learning and assessment for learning. Therefore, senior high school teachers likely experience stress when conducting the summative internal assessment for NCEA and formative assessment of students' performance.

Principles of assessment

Quality of assessment is assured through three criteria: validity, reliability, and equity. Validity has been a primary concern in assessment (Crooks et al., 1996; Stobart, 2008). Validity is often described as content validity. However, since the 1980s, there has been a movement to consider it additionally as a validation process, which entails considering "a judgement of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences and actions based on test scores or other modes of assessment" (Messick, 1989, p. 13). Whereas validity is an overarching principle for assessment, reliability is an essential part of validity (Stobart, 2009). Reliability is "often defined as, and measured by, the extent to which the assessment, if repeated, would give the same result" (Harlen, 2007, p. 18). Validity tends to be sacrificed for reliability because the priority in assessment development is to have measurable constructs in simple and stable manners (Schoenfeld, 2017). This results in construct underrepresentation, a threat to construct validity (Messick, 1989; Stobart, 2009). For example, cognitive or social aspects of cross-curricular key competencies may not be assessed if teachers believe such aspects are too complex to be assessed precisely and instead measure only subject-specific content or skills. Even limiting the types of questions and answers in a test to increase reliability can undermine its validity because the whole picture of cross-curricular key competencies becomes fragmented (Boyd & Watson, 2006; Hipkins, Boyd, & Joyce, 2006). Alternatively, authentic assessment, such as assessment in real-life contexts or situations, can increase validity because cross-curricular key competencies are

cross-disciplinary and developed in both informal and formal settings (Gordon et al., 2009). Therefore, it is necessary to find an optimal balance of validity and reliability according to the assessment purpose when developing new assessments of cross-curricular key competencies. To ensure equity, assessments need to incorporate a variety of approaches while striking a balance between validity and reliability (Siarova et al., 2017).

Even if an assessment's qualities are assured by validity, reliability, and equity, teachers will not adopt it if the methods are too demanding. Prior studies show that the workload related to internal assessment has been an issue in some countries, such as Australia, Hong Kong, Malaysia and New Zealand (e.g., Stanley et al., 2009; Wylie & Bonne, 2016; Yip & Cheung, 2005). Therefore, manageability is also an important factor to consider when developing an assessment of cross-curricular key competencies.

2.3.3 Assessing cross-curricular key competencies in the classroom

Several researchers have reported examples of cross-curricular key competency assessment. Care et al. (2018), Griffin and Care (2015), and Griffin et al. (2012) investigated assessment in six countries (Australia, Finland, Singapore, USA, Costa Rica, and the Netherlands) to establish new forms of assessment. For example, the state of Queensland in Australia developed Rich Tasks (Queensland Government, 2001). These are project-based assessment tasks that require students to solve problems, think critically, and apply their knowledge and skills to new situations. Performances on the tasks are assessed and reported to parents at the end of Years 3, 6, and 9. Another example is the Project Work assessment in Singapore (Ministry of Education, 2005). It is an interdisciplinary learning opportunity for primary and high school students to develop their competencies in areas such as communication, collaboration, knowledge application, and independent learning. The process and product are assessed by a written report, an oral presentation, and a group project file. Primary schools and high schools in New Zealand use interdisciplinary learning opportunities to assess cross-curricular key competencies (McDowall & Hipkins, 2019). They use self and peer-assessment, learning stories, or unit-specific rubrics for assessment. McDowall and Hipkins (2019) reported that some teachers assess discipline-specific knowledge and cross-curricular key competencies separately while others assess them in integrated ways.

Darling-Hammond (2012) identified that open-ended and extended opportunities for students to demonstrate cross-curricular key competencies are necessary for the competency assessments. She also asserted that performance-based assessment is more appropriate than

traditional on-demand tests for the authentic assessment of cross-curricular key competencies such as creativity, problem-solving, communication, collaboration, learning to learn, citizenship, and personal and social responsibility. Performance-based assessment following open-ended tasks has the potential to nurture and assess a variety of cross-curricular key competencies, since it can include different types of assessment methods and integrate a feedback mechanism (McDowall & Hipkins, 2018; Siarova et al., 2017). Darling-Hammond (2012) indicated that classroom-based assessment is critical in the assessment of cross-curricular key competencies because it can examine students' competencies in meaningful contexts over a longer period than one-time pen-and-paper tests.

2.3.4 Challenges that school leaders and teachers face in assessing cross-curricular key competencies

The previous section identified that performance-based assessments and rich open-ended tasks can provide students with opportunities to demonstrate their wide-ranging cross-curricular key competencies. However, such assessments create several challenges for teachers. First, competencies in the target domain cannot be holistically assessed because task-based performance usually depends not only on an individual's interrelated competencies but also on emotions and incentives at the time of performing tasks, which are influenced by environmental factors (Zhou, 2016). Hipkins (2018) also stated that valid and reliable assessment processes and tools would be difficult to design and use for cross-curricular key competencies since "the highly contextualized nature of demonstrations of competency makes both generalizations and standardization problematic" (p. 10).

Second, performance-based assessment following open-ended tasks requires a high level of teachers' assessment capabilities in terms of creating valid assessment tasks and making a reliable judgement based on assessment data (Fullan & Langworthy, 2014). Sadler (1989) claims that connoisseurs can assist non-experts by presenting examples and explanations of tacit criteria when students create works that cannot be judged by their correctness and instead must be assessed qualitatively. However, since there is little evidence and few resources on effective assessment practices of cross-curricular key competencies, it would be a challenge to accumulate and share ideal examples of assessments. Moreover, the outcomes of such tasks are sometimes unpredictable. Bolden and DeLuca (2016) suggest that teachers should make space for students' emergent learning and unintended outcomes while they point out the limitation of criteria-based assessments in which learning outcomes are predetermined. Lee

(2013) also highlighted the limitation of deductive assessments where learning goals are specified by teachers in advance and students' progress is measured by predetermined criteria like rubrics. Along with deductive assessments, Lee (2013) recommended using inductive assessments where students' outcomes are open-ended, and their progress is assessed after engaging in a project or activity.

Third, teachers are reluctant to change their practices for several reasons (Hipkins, 2018). As mentioned above, teachers suffer from workload associated with internal assessment (e.g., Stanley, et al., 2009; Wylie & Bonne, 2016; Yip & Cheung, 2005). Creating and experimenting with new types of assessment increases teachers' workloads. Also, teachers experience conflicts dealing with existing and new types of assessments. For example, the European Commission (2020) found that teachers in Portugal experienced tension in a school culture that took a subject and teacher-centred approach while also preparing students for high-stakes examinations, and then changed its policy to become more student-centred and interdisciplinary. Yeong and Ng (2009) reported that teachers in Singapore also felt pressure to prepare students for high-stakes examinations, which often conflicted with project-based learning. In those high-stakes testing societies, teachers must cover test material while also providing students with opportunities to demonstrate wide-ranging competencies that are not assessed through high-stakes examinations.

In summary, teachers have difficulties assessing cross-curricular competencies due to the complicated nature of competencies, the demand of teachers' assessment capabilities, and the tension between traditional and new types of assessments. The difficulties rooted in the nature of cross-curricular key competencies and teachers' assessment capabilities can be addressed through professional development, but the tension between traditional and new types of assessments cannot be solved solely by individual teachers' efforts. These challenges must be addressed by the school and community where they work.

2.4 Drivers and obstacles for educational reform in classroom assessment

The previous sections outlined that school leaders and teachers have faced changes and challenges when they incorporate cross-curricular key competencies into their practices. What makes them change their practices, and what makes them overcome those challenges? This section examines factors that might lead to these changes.

Fulmer et al. (2015) suggested three levels that influence teachers' assessment practices: micro, meso, and macro. The micro-level includes the characteristics of individual teachers,

such as teachers' values, conceptions, and knowledge. The meso-level focuses on factors related to the school and school community. The macro-level includes national policies, cultural factors, and international trends. Fulmer et al. (2015) argued that many existing studies directly deal with the relationship between the micro and macro levels while little attention has been paid to the relationship between the micro and meso levels. Regarding the relationship between the micro and macro levels, Brown (2010, as cited in Fulmer et al., 2015) found that national policies and cultural values affect teachers' beliefs and practices, which shaped their conceptions of assessment. Other micro and macro level-related research shows that teachers in high-stakes examination contexts such as China, Hong Kong, and Egypt believe that tests lead to better learning and better school quality (Brown et al., 2011; Brown et al., 2009; Gebril & Brown, 2014). On the other hand, there is limited research about meso-level influences, such as school leaders, school community, and school culture on teachers' assessment practices, and micro-level factors, such as teachers' assessment values, conceptions, and knowledge. In the context of curriculum reform, some studies insisted on the importance of meso-level factors, such as a shared vision with stakeholders (European Commission, 2020) and school leaders (OECD, 2020). However, these do not specifically investigate meso-level influences on assessment. A mixed-method study in New Zealand by Yates and Johnston (2018) investigated economics and accounting teachers to determine the relationship of teachers' conceptions on assessment and their internal assessment practices for NCEA. They found the meso-level factors in each school influenced teachers' conceptions of assessment and their internal assessment practices for NCEA.

Given that schools in New Zealand have great autonomy, and practices vary from school to school (Wylie, 2012), understanding the differences and commonalities of meso-level conditions for better implementation of new types of assessment is beneficial.

2.5 Conclusion

The Delors Report (Delors, 1996) determined the changes needed in education to respond to a globalized world. It influenced educational reforms worldwide in the 1990s, and competencies as a broader range of knowledge, skills, attitudes, and values became increasingly important (Carneiro & Draxler, 2008; Lee, 2007). The choice of terminology and definition of competency varies in different countries and institutions due to their context (Gordon et al., 2009; Voogt & Roblin, 2012), and competency frameworks have evolved over time.

Governments have reformed the national school curricula to incorporate cross-curricular key competencies over the past two decades. However, integrating them into the curriculum has been a challenge for school leaders and teachers as fundamental changes are needed at all levels of the system, school, and classroom. One of those changes relates to the need for new ways of teaching and learning. In addition to a lack of resources and professional development opportunities, another major challenge is the development of classroom assessments to support new styles of teaching and learning. Changes in assessments are needed not only to monitor student progress in cross-curricular key competencies but also to develop those competencies. While performance-based assessments and rich open-ended tasks can provide students with opportunities to demonstrate a wide range of cross-curricular key competencies, such assessments pose several challenges to teachers due to the complex nature of those competencies, the demands on teachers' assessment skills, and the tension between traditional and new types of assessment. These challenges cannot be resolved through individual teacher efforts and must be addressed by the schools and communities.

The integration of cross-curricular key competencies challenges teachers' traditional beliefs and practices, but there is little research on how to change existing beliefs and practices, especially regarding assessment.

2.6 Research questions

My overarching research question is how senior high school leaders and teachers can integrate cross-curricular key competencies into classroom assessment practices. My three sub-questions are:

1. How and to what extent have senior high school leaders and teachers in New Zealand changed their assessment practices to measure and nurture students' cross-curricular key competencies?
2. What are New Zealand senior high school leaders' and teachers' experiences and perceptions about the assessment of cross-curricular key competencies?
3. What are the necessary existing and desirable conditions and specific classroom assessment practices that are effective for student learning, valid, and manageable in assessing students' cross-curricular key competencies?

I examined these questions by conducting an exploratory multiple case study with senior high school leaders and teachers in New Zealand.

CHAPTER 3
Methodology

3.1 Theoretical paradigm

The fundamental philosophy underpinning the present study was an interpretivist worldview. To interpret the subjective world of human experience is central in an interpretivist paradigm (Guba & Lincoln, 1989). This approach emphasises understanding the individuals being studied and their interpretation of the world around them. An interpretivist paradigm is appropriate for the present study, as its research questions sought to investigate how senior high school leaders and teachers could integrate cross-curricular key competencies into their assessment practices. In particular, I aimed to understand their experiences and perceptions of the contexts in which they practised daily. I did not intend to discover one reality that fits all school leaders or teachers as positivists or critical theorists would do. Rather, I hoped to find multiple realities of the school leaders and teachers so that readers of this thesis could apply the findings to their contexts.

The interpretivist paradigm is sometimes called the constructivist paradigm for its relativist ontology; realities are multiple and socially constructed (Mertens, 2015). Stobart (2008) asserted that "assessment is a value-laden social activity and there is no such thing as 'culture-free' assessment" (p. 1). This assertion was based on his idea that assessment should be understood as a socially constructed phenomenon that was affected by and responsive to its context (Dobson, 2009). A constructivist paradigm is appropriate to investigate a topic such as assessment because teachers' experiences of assessment are multiple and socially constructed.

3.2 Research design

An interpretivist paradigm assumes a subjectivist epistemology where researchers understand the meaning of data through their interaction with participants and socially constructed knowledge (Lincoln & Guba, 2000). Therefore, I employed a qualitative research methodology so that I could engage in naturalistic inquiry to generate rich and thick descriptions (Patton, 2002) of school leaders' and teachers' lived experiences. A qualitative research design has the potential to provide in-depth information about phenomena that require exploration and understanding (Creswell, 2012).

I employed a multiple case study as I sought to gain insights on how senior high school leaders and teachers could integrate cross-curricular key competencies into classroom

assessment practices by comparing the similarities and differences in 11 participants' experiences and perceptions. A case study is an approach to explore a phenomenon within real-life contexts from the perspective of those involved by studying one case or a small number of cases in depth (Stake, 2005; Yin, 2009). Yin (2018) suggested that a case study is appropriate when (a) the form of research questions is "how" and "why"; (b) the researcher cannot control the behaviours of those being studied; (c) the researcher investigates a contemporary social phenomenon; (d) the boundaries between the phenomenon and the context are not clear. All of these criteria apply to the present study. In this study, cases of interest are groups of high school teachers in New Zealand who engage or have engaged in the assessment of cross-curricular key competencies. According to Johnson and Christensen (2014), investigating multiple cases leads to better comprehension and theorising of the phenomenon. Given that schools in New Zealand have autonomy, and therefore, practices vary from school to school (Wylie, 2012), a case study is suitable to understand teachers' multiple realities in their contexts.

3.3 Participants

I used purposive sampling to recruit qualified high school leaders and teachers in New Zealand. I purposively reached possible participants who engage in or have engaged in the development and assessment of students' cross-curricular key competencies at their schools. Patton (2002) argued that purposive sampling is logical and powerful in terms of selecting information-rich cases from which researchers can learn about the phenomenon of interest. In particular, I employed maximum variation sampling and selected school leaders and teachers from a wide range of schools in terms of gender and authority to reflect the multiple realities of school leaders and teachers.

Firstly, I reviewed the latest Education Review Office reports and the websites of high schools in New Zealand to select schools whose curricula mentioned the development of cross-curricular key competencies. Secondly, I contacted school principals by phone or email. Finally, after receiving permission from the school principal or the deputy principal, I distributed invitation emails to teachers. The participants were provided with an information sheet and consent form via email. They were asked to print the consent form, sign it, scan it and email it back to me. I received the signed consent forms from all participants.

Initially, nine teachers and three school leaders agreed to participate. However, one teacher withdrew from the study because she could not find time for the interview. As a result, eight teachers and three school leaders from four schools agreed to participate. Six were female and

five were male. The number of participants from each school was two from a state co-education school, two from a private boys' school, one from a state co-education school, and six from a state girls' school. Of the 11 participants, three completed both the survey and the interview, two returned the survey, and six agreed to be interviewed. Table 3.1 shows the participants' profiles.

Table 3.1

Participants

Gender	Completed	Role	Subjects	School
Female	Interview	Teacher	Japanese, Years 9-13	State Co-education
Male	Interview	Teacher	Japanese, Years 9-13 English, Years 11-13	State Co-education
Male	Interview	Principal	N/A	Private Boys
Male	Interview	Teacher	Science, Years 10 & 11 Math, Year 9 Chemistry, Year 13	Private Boys
Male	Interview	Deputy principal	PE, Year 9	State Co-education
Female	Interview	Deputy principal	N/A	State Girls
Female	Interview Survey	Teacher	Science, Years 9 & 11 Biology, Year 12	State Girls
Female	Interview Survey	Teacher	Social studies, Years 9 Classics, Year 13 Anthropology, Years 9, 11-13	State Girls
Male	Interview Survey	Teacher	Social studies, Years 9, 10, 13 Classics, Year 12	State Girls
Female	Survey	Teacher	Physical Education, Years 9-12	State Girls
Female	Survey	Teacher	Math, Years 9-12	State Girls

3.4 Sample limitation

Although the invitation was sent to schools across New Zealand, teachers and school leaders of four schools only in the Wellington Region agreed to participate in this study. However, as data was gathered in 2020 during the COVID-19 pandemic, I decided not to pursue further participation as I assumed all those who were willing to take part had volunteered during the initial invitation.

3.5 Data collection methods

I collected data via a qualitative online survey and one-on-one, semi-structured online interviews using open-ended questions. The data were collected online because I could not return to New Zealand from Japan due to COVID-19 restrictions. However, conducting an online-based investigation allowed the participants to adjust the time for the survey and interviews flexibly.

Surveys and interviews are common sources of evidence (Yin, 2014). The advantage of a survey is that the participants can take time to complete it at their convenience. Moreover, as the respondents of the survey were intended to be interviewed later, the answers could be the topics for the interview. The advantage of an interview is that the participants can describe their personal experiences with their feelings. The semi-structured style allows the interviewer to change the sequence of questions or ask additional questions according to the interviewee's answers and reactions.

Initially, I planned to conduct focus groups with teachers in each school and individual interviews with school leaders. However, it transpired that teachers were too busy to find a compatible time for a 90-minute focus group with their colleagues, and their classes were affected by COVID-19 restrictions. Therefore, focus groups were changed to one-on-one interviews. However, as a result, I heard individual teachers' experiences and perceptions in-depth.

3.5.1 Survey

The qualitative online survey using Qualtrics software asked about basic information on assessment practices. The survey questions, participant information sheet and consent form are provided in Appendices A, C, and D.

The survey was trialled twice before being sent to the participants. The survey was

comprised of nine questions. The sequence, content, and wording were examined with my supervisors. The questions were not forced completion, but the respondents answered all questions. Questions 1 and 2 were multiple-choice questions asking the school type and year level they taught. Questions 3 and 4 were short description type questions asking their subject and years of teaching. Questions 5 to 8 were long description type questions about the development and assessment of cross-curricular key competencies at their schools. The final question asked them to add further optional comments on any additional information.

The answers to the survey were downloaded as an Excel file to a password-protected computer. They will be kept securely and destroyed by 31st December 2025.

3.5.2 Semi-structured interviews

The online, semi-structured interviews using Zoom software explored school leaders' and teachers' challenges and strategies for the assessment of cross-curricular key competencies. The interview questions, participant information sheet and consent form are provided in Appendices B, C, and D.

Before the interviews, I examined the questions with my supervisors and conducted pilot interviews with a peer researcher and a former teacher. As a result of the pilot interviews, a word was changed (from 'nurture' to 'develop') to make it easier to hear the question, and two questions were combined (challenges and how to overcome them) so that the answers would not be repetitive. All survey respondents were invited to be interviewed, and three out of five volunteered to participate. Another six school leaders and teachers agreed to participate in the interviews only. The meeting times and dates were arranged to fit the participants' schedules. The interview questions were sent by email before the interviews so that the participants could prepare for the virtual interviews. I conducted test interviews twice before the interviews to ensure that the Internet connection was stable, the audio was working well, and the recording functioned successfully. I set up a password so that uninvited guests could not attend and the meeting would be protected.

Each interview took approximately 30 minutes. My computer camera was on during the interviews, and the participants could choose to turn their cameras on or off. As a result, seven out of nine talked face-to-face with their cameras on from their school or home. Firstly, after introducing myself and thanking the participants, I asked them if they had read the information sheet and the consent form. Second, I outlined the interview and asked if the participants had any questions. Third, I asked for permission to audio-record their conversation so that I could

get all the details while carrying on an attentive conversation with the participant. Fourth, after the recording was on, I asked about 10 interview questions to the participants. The number and sequence of the questions varied depending on the participants, but the common questions were about the subject and year level they taught, the development and assessment of cross-curricular key competencies at their schools, the challenges in assessing the competencies, the key recommendations when starting the assessment of the competencies, and further comments on any useful topics. In addition to these questions, I asked about professional development, reactions of students and their parents, and the senior management team's support to teachers according to the participants' responses. Lastly, I asked if they wanted a copy of the interview recording, the script, and the final research report.

Creswell and Creswell (2018) noted that researchers must build trust so that participants can provide information about their inner world. To establish rapport, I began the interviews using icebreakers and conducted the interviews in a friendly manner. At the same time, I stayed impartial to the participants' responses because my positive or negative reactions might cause bias (Creswell & Creswell, 2018).

Each interview was audio-recorded and transcribed verbatim to facilitate subsequent data analysis. The recording data and transcriptions are stored in a password-protected computer. The identifiable data will be kept securely and destroyed by 31st October 2021, and the de-identifiable data by 31st December 2025.

3.5.3 Data collection timetable

Table 3.2 shows the data collection calendar. Data were collected from August to September 2020. The term was chosen to avoid school holidays and complete the data collection in New Zealand's school Term 3.

Table 3.2

Data collection calendar

Dates	Content
19 June 2020	Ethics approved
29 June – 31 August 2020	Invitation to participate sent
9 August – 30 August 2020	Five participants returned the survey
12 August – 29 September 2020	Nine interviews completed
29 October 2020	Transcription of interviews completed
9 November 2020	Transcripts sent to participants for member checking

3.6 Ethical considerations

Ethical approval was obtained from the Victoria University of Wellington Human Ethics Committee on 19 June 2020: ethics approval no. 28425 and no. 28425 (V1) (Appendices E and F). I obtained informed consent from all participants. Participation in the survey was anonymous, and participation in the interviews was not anonymous but confidential. Confidentiality of identical research data was maintained by restricting its access to my supervisors and me. In terms of data reporting, pseudonyms were used for all participants and schools. The data were stored securely in a password-protected computer and will be destroyed on the dates given above.

3.7 Data analysis

Stake (1995) claimed, "Each researcher needs, through experience and reflection, to find the forms of analysis that work for him or her" (p. 77). I used thematic analysis to identify, analyse, and report patterns within data. Thematic analysis is useful when exploring different perspectives of research participants, emphasising similarities and differences, and gaining unexpected insights (Nowell et al., 2017). Thematic analysis is appropriate because the research aimed to gain insights on how senior high school leaders and teachers can integrate cross-curricular key competencies into classroom assessment practices by comparing the similarities and differences in 11 participants' experiences and perceptions.

This study followed the six steps of thematic analysis as described by Braun and Clarke (2006):

1. Familiarising oneself with the data
2. Generating initial codes
3. Searching for the themes
4. Involved in reviewing the themes
5. Defining and naming themes
6. Producing the report

In the first step, I listened to the audio-recorded interviews several times to transcribe them into Word documents. Then, after uploading the transcripts into NVivo 12, I read them multiple times while highlighting significant statements. In the second step, I generated initial codes from the significant statements which were named from the topic the participants discussed. After grouping the codes to find potential themes in the third step, I checked if the generated themes covered the entire dataset and how each theme was interrelated by drawing a mind map. In the fifth step, the themes were finally named and defined. The key themes that emerged from the data were 'Assessment', 'Challenge and Strategy', and 'Next Steps'. 'Assessment' is about to what extent and how the participants assess students' competencies. 'Challenge and strategy' is about their difficulties in developing and assessing students' cross-curricular key competencies and their strategies to overcome the difficulties. 'Next steps' is about what they are planning or hoping to change.

3.8 Trustworthiness of the data

Guba (1981) suggested that four criteria of trustworthiness should be considered in research based on an interpretivist paradigm instead of internal validity, external validity, reliability, and objectivity in a positivist paradigm. The four criteria are credibility, dependability, confirmability, and transferability.

Credibility is the extent to which data and data analysis are trustworthy. Dependability is the ability to reproduce the same results in similar settings. Confirmability is the extent to which the research findings can be confirmed by other researchers by minimising researcher bias. These can be ensured by member checking, peer examination, and triangulation. In this study, I asked the participants to comment on the accuracy of quotes so that they saw their perspectives represented in any or all of the reported findings. As for peer examination, two experienced supervisors gave feedback at each stage of the research. Triangulation uses

multiple data sources or methods in qualitative research (Patton, 1999). I employed method triangulation and data source triangulation.

Unlike positivists, interpretivist researchers assume a subjectivist epistemology where they understand the meaning of data through their interaction with participants and socially constructed knowledge (Lincoln & Guba, 2000). Therefore, it is impossible or undesirable to completely exclude researchers' interpretations from their research. While I ensured the quality of the research using the strategies mentioned above, I was aware of reflexivity and explicated myself and the research procedure in this research.

Transferability is the ability to relate the research findings to the readers. Interpretivist research does not aim to generalise the findings as the emphasis is on the contexts of the participants. However, Yin (2003) stated that a multiple case study "(a) predicts similar results (a literal replication) or (b) predicts contrasting results but for predictable reasons (a theoretical replication)" (p. 47) as concepts and theories can be generated by analysing the cases. As the present study provided thick descriptions and analyses from multiple cases, it may be possible for readers to transfer the findings to other school leaders and teachers who engage in the assessment of cross-curricular key competencies.

3.9 Summary

The present study was underpinned by an interpretivist paradigm to gain insights on how senior high school leaders and teachers can integrate cross-curricular key competencies into classroom assessment practices by understanding their experiences and perceptions. I employed a multiple case study, and cases of interest were senior high school leaders and teachers in New Zealand who engage or have engaged in the assessment of cross-curricular key competencies. Utilising purposive sampling, I recruited 11 participants: eight teachers and three school leaders. Data collection methods were a qualitative survey and semi-structured interviews, both of which were conducted online due to COVID-19 restrictions. I used thematic analysis to identify, analyse, and report patterns within data. Trustworthiness was ensured through member checking, peer examination, and triangulation.

CHAPTER 4
Findings

This chapter first outlines three types of schools according to their implementation phase and presents the results of the survey and interviews for each school type. The results of each school type have common sub-sections for three key themes that emerged from the data: 'Assessment', 'Challenge and strategy', and 'Next steps'. 'Assessment' is about to what extent and how the participants assess students' competencies. 'Challenge and strategy' is about their difficulties in developing and assessing students' cross-curricular key competencies, and their strategies to overcome the difficulties. 'Next steps' is about what they are planning to change or hoping to change. The summary of findings is presented at the end of this chapter.

4.1 Categorisation of schools

I categorised the eleven participants' four schools into three school types according to the participants' answers to indicate their schools' implementation phase of cross-curricular key competencies:

- School Type A does not assess cross-curricular key competencies explicitly;
- School Type B assesses cross-curricular key competencies in each subject, but it is on its developmental stage of the overarching school direction;
- School Type C assesses cross-curricular key competencies for more than 6 years across the subjects.

The evidence of categorisation is shown in the first paragraphs with the description of the schools in the sections 4.1, 4.2 and 4.3 below. The school types and the participants' profiles are summarized in Table 4.1. For confidentiality, I call the schools "Schools A, B1, B2, and C". For the same reason, I use a pseudonym for each participant.

Table 4.1

School types

School type	Pseudonym & Gender	Completed	Role	Subjects	School
A: Does not assess cross-curricular key competencies explicitly	**Charlotte** Female	Interview	Teacher	Japanese, Years 9-13	**A**: State Co-education
	Oliver Male	Interview	Teacher	Japanese, Years 9-13 English, Years 11-13	
B: Assesses cross-curricular key competencies at a developmental level	**Jack** Male	Interview	Principal	N/A	**B1**: Private Boys
	Leo Male	Interview	Teacher	Science, Years 10 & 11 Math, Year 9 Chemistry, Year 13	
	Lucas Male	Interview	Deputy principal	Physical Education, Year 9	**B2**: State Co-education
C: Assess cross-curricular key competencies explicitly	**Amelia** Female	Interview	Deputy principal	N/A	**C**: State Girls
	Olivia Female	Interview Survey	Teacher	Science, Years 9 & 11 Biology, Year 12	
	Harper Female	Interview Survey	Teacher	Social studies, Years 9 Classics, Year 13 Anthropology, Years 9, 11-13	
	Hunter Male	Interview Survey	Teacher	Social studies, Years 9, 10, 13 Classics, Year 12	
	Lily Female	Survey	Teacher	PE, Years 9-12	
	Sophie Female	Survey	Teacher	Math, Years 9-12	

4.2 School Type A: Does not assess cross-curricular key competencies explicitly

School A is a school that does not assess cross-curricular key competencies explicitly. Two teachers teaching Year 9 to 13 Japanese and English from School A were interviewed. They had previously developed students' cross-curricular key competencies in their former schools, and they used the *New Zealand Curriculum* (Ministry of Education, 2007) as their guiding principle in their current school.

However, they did not explicitly teach or assess cross-curricular key competencies. Both of the participants from School A said, "They're not assessed at all". (Charlotte) and "It's a shame that we didn't assess key competencies". (Oliver)

4.2.1 Assessment

When asked about their assessment practices, one of the teachers from School A stated that they were focusing on the completion of work (content) for each subject.

> When you're at a school that has its own culture and its own challenges, you come down from this kind of idealistic level of the key competencies where everyone's developing competencies in a sort of perfect environment and so on, and you pare everything down to what you really need to assess. We needed to assess the completion of work. When I say assess, I mean we needed to report on it, right. So, we needed to report on it to parents, and parents put the pressure back on students to improve that if necessary. Because we had to assess that, because we had to report on it, we tended not to see us holistically, because we simply didn't have the time. (Oliver)

His answer implies that what is assessed in School A is influenced by the school context and parents' expectations. Also, it can be assumed that the main purpose of assessments in this school was to report on students' work in relation to specific subjects.

4.2.2 Challenge and strategy

Both teachers mentioned that they could not afford the time for the development and assessment of cross-curricular key competencies because they were busy dealing with their subjects' content and classroom management.

> The key competencies are wonderful. But on a practical day-to-day teaching level, and particularly in a tough environment, you've got so much you need to keep in mind. You're working so hard just to make things work properly. At some of these tough schools, managing behaviours can be 80% of your job. (Oliver)

Such a busy environment hindered collaboration with other teachers even if they wanted to start cross-curricular teaching and assessments.

> Our school aspired to have a kind of cross-curricular collegiality going on. But in practice, each teacher was so busy just preparing their own subjects. (Oliver)

The other teacher insisted that a lack of support from senior management in terms of time allocation hindered her from engaging in the development and assessment of cross-curricular key competencies.

> We have certain subjects, have a lot of work coming in and a lot of needy students. So, we are actually really busy. I'm guessing the reason why they (teachers) don't know about them (key competencies), it's because the school has not, the management, has not presented as professional development. (Charlotte)

She compared her current school with her former school where cross-curricular key competencies were explicitly taught and assessed.

> They (teachers) were really pushed by the senior leadership and also by the HOD, the head of the department, in my particular case, languages. He (the principal) regularly would remind us about the key competencies, and when we had a meeting with the department, checking that we were using them, and we did a lot of sharing of ideas, and he always said, 'Make sure you put it on a board with your lesson plan.' So, I feel like I got training there. It was

> like training for a marathon every day. Key competencies, I'm always thinking about that. That's why it's natural to me now. (Charlotte)

Another factor that potentially affects teachers' practices is pressure from external accountability testing. Both teachers mentioned the effect of NCEA on their practices, especially at the senior end of high school.

> We're very driven by NCEA. And the kids, of course, are very driven by NCEA as well. We have to put so much energy into focusing on getting it right. And the kids, of course. It's high stakes for them from the beginning of the year until the end. (Oliver)

The requirements for accountability in standardised testing force the teachers to focus on teaching to the national assessments rather than the development of cross-curricular key competencies.

4.2.3 Next steps

When asked about desirable changes to incorporate the assessment of cross-curricular key competencies into classroom practices, one of the teachers suggested that parents should get a generalised understanding of cross-curricular key competencies so that teachers can report on those. He intended to focus not on students' problematic behaviours that had been traditionally reported but on the potential competencies to improve them. He had a concrete idea on how to start an assessment of cross-curricular key competencies.

> When I say reporting on the key competencies, I would make that a weekly report, a very simple weekly report. We had to do weekly reports. As I've mentioned, we just have like, three or four criteria where you put a number between one and five in a box for every student. If you had to do that for every student, five competencies for every student, five numbers in five boxes. It wouldn't take too long. It'd be manageable. (Oliver)

4.3 School Type B: Assesses cross-curricular key competencies at a developmental level

School B1 and School B2 were categorised as School Type B, which is a school that assesses cross-curricular key competencies at a developmental level. The senior management team answered, "This is something we're working towards at our school". (Lucas) and "We're still in the baby stages with the curriculum review group because that only just started the last term". (Jack) One principal and one teacher (Year 9 Mathematics, Year 10 Science, and Year 13 Chemistry) from School B1, and one deputy principal (Year 9 Physical Education) from School B2 were interviewed. The two schools were categorised in the same group because both schools seek a school-wide policy on cross-curricular key competencies but have yet to develop one. School B1 is at a very early stage with the first step for teachers and students being to understand what cross-curricular key competencies are. The two participants from School B1 referred to "competencies" as the five key competencies in the *New Zealand Curriculum*. On the other hand, School B2 has already identified their cross-curricular key competencies based on their school values. According to the deputy principal interviewed, they are critical thinking. courageousness, creativity and communication.

4.3.1 Assessment

Although there has not been a school-wide policy yet developed in both schools, individual teachers have already engaged in the development and assessment of cross-curricular key competencies. Teachers are given discretion on what and how they assess in their classrooms. As a result, each department varies in terms of how they use cross-curricular key competencies and their effects on the assessments. For example, the deputy principal at School B2 introduced his own practice in his Physical Education class as described here:

> We assess critical thinking through junior college. We have learning journals, and we use Māori proverbs Whakataukī for students to reflect on and critique their experiences. We grade the level of thinking from a zero to eight scale, so excellent, high excellence, near achieved. We use a combination of teacher judgement and student self-reflection. The assessment is a summative-based assessment, but also, there's a lot of ongoing assessment within the lesson. Self-reflection is a really important part of teaching those competencies. Students are asked to grade the levels

> of participation or levels of contribution. Those types of things are really important, but a formative assessment as well. (Lucas)

He has been engaged in the development and assessment of competencies in Physical Education class for two or three years and can flexibly adjust the mode of assessment and assessment focus according to students' reactions. The lack of a school-wide policy on competency assessment potentially contributes to such flexible assessment practices because individual teachers can respond to unanticipated situations on the spot without moderation from other teachers. However, these practices are mostly with junior high school students who do not need to take high-stakes assessments.

4.3.2 Challenge and strategy

The three interviewees had different challenges and used strategies depending on their contexts. School B1 was at its very early stage of competency-based teaching, and the difficulty was related to a lack of standardised cross-curricular key competencies across the whole school.

> One of the difficulties was trying to get standardised key competencies across the whole school. In the early years, each department was trying to interpret what it would look like for them and their own departments. So certainly, if I speak from the Religious Education department, we would interpret, we would try and put our interpretations. And then the student interpretations or their understandings and put those up on the wall. But there were quite a few numbers of years ago. I probably know that we do need to relook at some of the key competencies again. And it's been difficult because, as I said, a lot of that can be done in the junior school, probably not doing a lot of it in the senior school. With a lot of it being driven by NCEA as well on top of it. (Jack)

His statement implies that subject departments work separately, with this division being greater in senior high school due to the influence of NCEA. He also mentioned that some attempts for the development and assessment of cross-curricular key competencies were made in the school, but none of them were continued, and he did not know why. As a strategy for a

school-wide approach, the school started to work with a private company to lead curriculum change and professional development.

On the other hand, School B2 has already engaged in curriculum change for competency-based teaching, and the deputy principal explained the challenge related to the change.

> Within Physical Education, it's probably more ingrained in what we do. And it's very valued. I know with my role as Deputy Principal and trying to lead curriculum changes within a wider school, some of the challenges are that tension between the curriculum outcomes, and the back end of the curriculum, particularly in the need to cover learning objectives from the achievement objectives. There's a bit of a pull for the teachers not to focus explicitly on key competencies. A challenge for us is actually just to build up that awareness that this is actually really important learning and we need to do this as well. (Lucas)

His answer implies that cross-curricular key competencies were not ingrained or valued in some subjects because those subjects needed to cover existing learning objectives. As a result, the gap in teachers' awareness was generated depending on what subject they teach. To tackle this challenge, the school began providing professional development opportunities where teachers could build their capabilities to lend themselves well to competency-based learning.

Along with the need to change teachers' awareness, the deputy principal in School B2 saw the need to change students' awareness as well. Even in Physical Education, where cross-curricular key competencies were ingrained and valued, raising students' awareness was an issue. As a strategy, the deputy principal conducted 'awareness talks' so that his students were ready for the assessment.

> The way I would approach this would be, first one, through awareness talks. At the start of lessons, outlining what we're doing, and why we're doing it, and then providing some opportunities for students, to have opportunities to apply the key competencies, whether it's through thinking strategies or learning activities. And then we do a lot of evaluation. At the end of the lesson, we would talk about what went well, what didn't go so well and, and discuss. (Lucas)

The novice science teacher at School B1 also realised the importance of paying attention to students' readiness for competency development and assessment. He described his challenge in assessing students' cross-curricular key competencies below:

> The obstacles with being a teacher are that all your students are different, and you have to learn a lot about them before you can assess their competencies and where they should be aiming for. I think learner knowledge is probably the most important thing. I need to assess the competencies and also to help them gain future competency. (Leo)

According to him, students were culturally diverse and there was a divide in their context. Therefore, teachers should be aware of students' situations. He mentioned the concept of te whare tapa whā, the four cornerstones (or sides) of Māori health as a strategy to see if students were 'spiritually ready, emotionally ready, physically ready, and supported by family'.

Although the three interviewees' challenges were different, they were all related to the fact that both teachers and students must be ready for the development and assessment of cross-curricular key competencies both mentally and technically.

4.3.3 Next steps

The next step that these two schools aim to take is to learn from other schools so that they can develop school-wide policies about the assessment of cross-curricular key competencies. The school leaders at both schools stated that examples and stories from other schools would be extremely helpful.

> I think, visiting the schools, certainly. And it's not just visiting, I will ask them to tell us how the journey had developed. Looking at how they structured it, looking at how they would have done that, made a fit. (Jack)

> I think sharing stories from other schools would be a wonderful support. Sitting up celebrating different approaches that schools have used, providing professional learning opportunities for teachers to see how different learning

> areas approach competencies. Physical Education is quite well-embedded. But say, how do the science learning area or the languages approach competencies-based learning? Those types of things would be really interesting. (Lucas)

Their statements imply that they are eager to listen to other school leaders' and teachers' experiences, not just to know about methods to overcome their challenges for a school-wide policy.

4.4 School Type C: Assess cross-curricular competencies explicitly

Only one school, School C, was categorised as a School Type C, which is a school that assesses cross-curricular key competencies explicitly. One deputy principal and three teachers (social studies and classical studies, science, and biology) teaching Year 9 to 13 from School C were interviewed. Also, two other teachers (teaching Year 9 to 12 Physical Education/Health and Mathematics) answered the online survey. The school has been engaged in the development and assessment of cross-curricular key competencies for more than six years. One of the four teachers who were interviewed said, "We've been doing it for about six or seven years, and we still haven't got it perfect. And every year we try and improve things." (Olivia) Senior management decided to use the 21st Century Learning Design rubrics created by Microsoft as a guide as it met the competencies the school wanted to develop in students. Referring to the rubrics, the teachers in Year 9 worked together across subjects in a hub to develop students' cross-curricular key competencies, such as collaboration, communication, ICT skills, knowledge construction, real-world problem-solving, and self-regulation. At the other year levels, it was left to the departments regarding what competencies were developed and assessed. But there was an emphasis on developing competencies rather than just knowing content throughout the school.

4.4.1 Assessment

The process of designing and conducting assessments is established as follows. Firstly, a hub leader develops a project or an activity that uses the same competency in all the different subjects in Year 9. Secondly, the teachers create an agreed-upon rubric. Finally, they mark a project collaboratively against that rubric after the students have practised and demonstrated the target competency. Teachers in Year 9 use the 21st Century Learning Design rubrics (or

the 21st-century skills booklet) to collaborate, plan, and conduct lessons as well as to assess students' progress across subjects.

A science teacher described her experience when she engaged in a project to develop students' collaboration skills:

> When we assess, in the 21st-century skills booklet that we have from the school, there is like a flowchart. We didn't make this. This is what was given to us. But there's a flowchart that says for each step when you design something, is it going to let them get to the top level of the skill? Or is it not a very good project, and it doesn't let them get that high. The first thing you have to check when you design the project is that it gives the students a chance to do the top of the level like let them do the complete collaboration. And then when we assess them, you can also use the flowchart again or there is a table for curriculum levels. And you can look at the students' projects and see what they have completed and you can give them a level. (Olivia)

The assessment data are used for both summative and formative purposes. For formative use, teachers shared rubrics with students to self-assess their progress and provided feedback for improvement. For a summative purpose, they give a mark to their students at the end of the project and write a report to the students' parents.

The teachers had engaged in this style of assessment in Year 10 too but had subsequently cut it down to only Year 9 to reduce their workload. In senior high school, some cross-curricular key competencies related to subjects are informally assessed, but subject content is the focus.

The teachers assess both subject content and cross-curricular key competencies if necessary. A social studies teacher described his experience of assessing subject aspects and collaboration skills with an English teacher:

> In the English example, both teachers watched the presentation and made some notes. And then we talked about what we felt. And then the same with collaboration. There were two teachers, not me, but two other teachers. They saw what happened, and they did the same thing. And then, the individual teacher marks the academic content for the subject. And then they share marks for collaboration. (Hunter)

They designed the assessment tasks so that they could assess both subject-specific learning and competency-based learning.

4.4.2 Challenge and strategy

In the process of establishing, developing, and assessing cross-curricular key competencies, the interviewees faced several challenges. One of the biggest barriers all the interviewees mentioned is to change their traditional way of teaching. A science teacher said:

> The challenge of the key competencies or the skills is that a science teacher, for example, we have always assessed content, like the knowledge that you have, rather than the skills. So, the first challenge was to change the way we teach. We are not teaching just content. We're teaching skills as well. (Olivia)

A social studies teacher added more explanation about the challenge:

> The one obstacle that we have is whatever project we're doing that's looking at key competencies needs to fit very closely with what we're already doing, or it needs to be very finite in its execution, and that we can focus on it for a week at a time and then maybe focus on another one next term or another one and two terms. (Harper)

Teachers need to teach subject-specific content and skills as well as cross-curricular key competencies within a time limit as the disciplinary content and skills are necessary when the students move onto senior high school. Class time has not changed, but the content that should be taught has increased. Another science teacher analysed the cause of conflicts between subject content and cross-curricular key competencies below:

> If the school decides in Year 9 we're not going to do the academic reporting, we're just going to report on collaboration, communication, creativity, then I think you would see a big shift because everything would be focused on that. And we'd be talking about that all the time. Students, parents. But we don't do that. The academic skill takes priority. (Hunter)

He changed his practices to develop and assess cross-curricular key competencies, but he felt that disciplinary content and skills that are reported to parents still take priority over cross-curricular key competencies.

A further challenge, which is related to the first challenge above, is that the development and assessment of cross-curricular key competencies are rarely done in senior high school. All the teachers mentioned the effects of the NCEA on their school's senior programs. Because the emphasis is on the students' acquisition of NCEA credits, teachers tend not to explicitly teach or formally assess cross-curricular key competencies in the senior high school. The deputy principal said:

> The NCEA just drives the assessment in the senior school. I think some of those standards, of course, incorporate some of the competencies, but they are very subject-specific requirements, and we are, unfortunately, for me, I think, NCEA given in terms of the assessments that we have to do, that's what we prepare the kids for. That's what we assessed against. And it's still pretty content-driven assessments really. I hope that with the changes in the NCEA level one, we might get away from that, but I'm not terribly confident that that's going to happen. So that means that we tend not to formally assess competencies. We still want students to develop those competencies and the activities that teachers prepare and develop, but they're not assessing it. (Amelia)

Statements from the other participants reinforced that what is assessed in NCEA drives the curriculum and assessments in the senior high school.

> When we get to high school, where older classes are, we're hoping that when NCEA changes the standards for year 11, we will be able to do more of that with year 11. But at the moment, it's a bit tricky because they don't get assessed on this for year 11. So there are no credits for the skills. So it's hard to do them or seniors at the moment, but we will get there. I know the science curriculum is changing. And so, there are going to be communication and collaboration standards and things, so that's good, so we can assess them then. (Olivia)

The third challenge is a lack of resources to create projects to develop competencies and to design assessments. Three out of the four interviewees mentioned the scarcity of materials for cross-curricular key competencies. The deputy principal said:

> There hasn't been a lot of help assessing them. There's not been a lot of resources and to support us looking at effectively the key competencies and the curriculum. I come from a science background, and there was quite a lot done about the science capabilities, and that work came out of NZCER. And it was good stuff for science. I think subject areas have developed their own approaches to assessing what I'd call the competencies or the skills that are linked with the subject. So, as I say, I don't feel that there's been a lot of work done to look at it across the board. And that's been the difficulty. (Amelia)

As assessments have traditionally focused on subject-specific content and skills, there have not been enough resources linked to cross-curricular key competencies. The teachers at School C needed to create assessments for cross-curricular key competencies on their own.

To combat these challenges, School C has used three strategies. Firstly, the senior management team led the school through strong leadership. They have been clear about the school's direction and offered support to teachers to change their practices. For example, the deputy principal understood that teachers need time for getting used to a new approach.

> I think it's having teachers time, giving them time to work together to think it through and see how it could be without because it is a change from what we're used to doing in secondary. We're quite good at subject-specific stuff. But when it's across, and you want to develop a really deep learning task, and then a bit more integrated, you really have to be quite focused as to what you're trying to develop and have a shared understanding of it. (Amelia)

She also assured me that "if teachers need time, we are open to, obviously, supporting them in whatever way we can".

Secondly, all the interviewees mentioned the usefulness of the 21st Century Learning Design rubrics (or the 21st-century skills booklet) that had been provided by the school senior

management. This provides useful information with regard to goal setting and developing assessment tasks, and also for the moderation of marking and students' self-assessment.

> The 21st-century guide that we've got, that's been really great because it's given us somewhere to start with the assessments. We've made our own assessments, but we've used their knowledge to help us work out where students will be on each level. (Olivia)

> That booklet is quite good in that it has flowcharts and so on, showing you how to create tasks that will genuinely test the skill. Then, we take that, and we look at the assessment tasks that we've set up. And we put the rubric from the booklet into the assessment tasks. (Hunter)

> We've found that quite handy as a measurement tool for students in terms of self-assessment, but also as teachers when we're discussing how a student has participated in a project over the course of a week or over the course of 10 weeks. (Harper)

The rubrics appear to compensate for the lack of resources and help the teachers to change their traditional way of teaching.

Thirdly, the school's senior management have professional learning opportunities. The deputy principal described it below:

> As a school, we have our own Professional Learning every Wednesday after school, and we have used some of that time to share expertise, share what each other's doing. And in Year 9, those groups, we call hubs, meet together and they talk about their (work) and share resources and work together that way. We are already encouraging them to learn and share and work together to develop those skills. (Amelia)

A science teacher described how they started their competency-based teaching and learned together.

> We have like, introduced the idea of the skills and we've looked at examples and we've just had a go at doing a small part of it. And each time we do a new project, we try and get better and better at it. But it depends on the teacher, depends on how much time you have, and depends on how long you've been at the school because different schools do different things. We're all at different stages of learning. And we just teach each other and we just share good practice, we don't really go anywhere for training for that. (Olivia)

As they have such a professional learning community in their school, teachers can help each other even when new teachers join their projects.

As a result of these strategies, both teachers and students have become ready for the development and assessment of cross-curricular key competencies. As for the teachers' change, the deputy principal said:

> We've gotten away from a sort of testing content to just class tests, knowledge tests, to more of these rubric style assessments of skills and competencies. There is still some content testing going on, but it's very minimal. Most of it is around how well they communicate, how well they show collaboration, how well they self-regulate. (Amelia)

Also, students are positively changing. The social studies teacher said:

> The students would never have spoken about key competencies before we're actually actively working towards developing them in a project. But after that, they're like, I can do this at that level. And they use that phrasing, or that terminology comes into the forefront of their mind. So, they realise it is maybe, there's more to learning into education than simply just understanding content or understanding a skill. (Harper)

4.4.3 Next steps

For better practices, three out of four interviewees insisted good examples should be shared among schools. They felt that there was a lack of resources, particularly for the secondary level.

However, the deputy principal said it was challenging to learn from other schools due to the differences in their contexts:

> I think examples, some really well-worked examples, at the right level would help. Sort of looking at matrices or whatever could help and how it is. But I feel we've got quite a lot of freedom and the curriculum in New Zealand way. It's not common for everyone to do the same thing. Everyone does slightly different things. And I think that while it's really good because it allows us to customise it to meet people in front of us, kids, class. It means that you can't just say, 'Oh, this is a good assessment', because it doesn't necessarily fit. (Amelia)

A social studies teacher also made a caution about learning from other schools.

> It should have a clear why. Everyone, every teacher who's doing it should be able to clearly say why they're doing it. Then there should be a clear how, how are you going to do it in your school for your students. You might take ideas from other places, but it should make sense for your community. So if everyone knows why and how that will increase your chances of success. (Hunter)

4.5 Summary

The data gathered from the participants indicated there were three types of schools depending on their implementation phase of assessing cross-curricular key competencies. School Type A did not have a school-wide policy to value cross-curricular key competencies, and teachers did not assess them explicitly. The two interviewees felt pressure for external accountability tests, such as NCEA, and as a result, their teaching and assessment tended to be content-specific. As a next step, reporting to parents about students' progress in cross-curricular key competencies was suggested to gain parents' understanding.

School Type B assessed cross-curricular key competencies in each subject, but it was in a developmental stage seeking the overarching school direction. Senior management had difficulties in building up a shared understanding among teachers and students about cross-curricular key competencies. Particularly, a gap among subjects was evident. Both schools in

School Type B sought opportunities where teachers and students could engage in competency-based teaching and learning. As a next step, they welcomed examples and stories from other schools.

School Type C had a school-wide policy to value cross-curricular key competencies and Year 9 teachers had assessed them for more than 6 years. In senior high school, the washback effect of NCEA was obvious, and teachers tended to think disciplinary content and skills took priority over cross-curricular key competencies. Teachers experienced difficulties in changing their traditional way of teaching, but professional development within the school was provided. There was a lack of resources to develop cross-curricular key competencies and design assessments. While teachers were eager to know examples from other schools, there was caution about using resources that might not fit the school context.

The table below is a summary of the findings.

Table 4.2

Summary of findings

School Type	Codes
A	<Assessment> Not at all.
	<Challenge and strategies> - Busy dealing with their subjects' content and classroom management. - A lack of support from senior management. - Pressure from external accountability testing.
	<Next steps> - Parents should get generalised understanding of cross-curricular key competencies. - Start an assessment of cross-curricular key competencies in a manageable way.
B	<Assessment> In Individual subjects. Not much in the senior school.
	<Challenge and strategies> - A lack of standardised cross-curricular key competencies across the whole school. → Started to work with a private company to lead curriculum change and professional development.

	- The gap of teachers' mindset/awareness is generated depending on their teaching subjects. → Started to have some opportunities where teachers could build up their capabilities to engage in competency-based learning. - A need for a change in students' awareness. → Awareness talks. - Learner knowledge. → Four walls.
	<Next steps> Examples and stories from other schools.
C	<Assessment> Across subjects at junior school. In individual subjects at senior school.
	<Challenge> - Change their traditional way of teaching. - Conflicts between subject content and cross-curricular key competencies. - Disciplinary content and skills that are reported to parents still take priority over cross-curricular key competencies. - Teachers tend not to explicitly teach or formally assess competencies in senior school. - What is assessed in high-stakes testing drives the curriculum and assessments in senior school. - A lack of resources to create projects to develop cross-curricular key competencies and to design assessments. <Strategies> - Senior management leadership. - Shared rubrics. - Professional learning opportunities.
	<Next steps> Good examples, particularly from senior schools.

CHAPTER 5
Discussion

This study aimed to determine a way to integrate cross-curricular key competencies into classroom assessment practices in senior high schools. This chapter draws together findings from this research with the existing literature by answering my three sub-research questions below:

- How and to what extent have senior high school leaders and teachers in New Zealand changed their assessment practices to measure and nurture students' cross-curricular key competencies?
- What are New Zealand senior high school leaders' and teachers' experiences and perceptions about the assessment of cross-curricular key competencies?
- What are the necessary existing and desirable conditions and specific classroom assessment practices that are effective for student learning, valid, and manageable in assessing students' cross-curricular key competencies?

5.1 Assessment practices for cross-curricular key competencies

I found that the assessment practices for cross-curricular key competencies vary from school to school with three out of the four schools taking part in my study having engaged in curriculum reform related to cross-curricular key competencies. This is not surprising as New Zealand's schools are self-governing and have autonomy over how they deliver their curricula (Wylie, 2012). Schools B1 and B2 gave discretion to each subject leader, and cross-curricular key competencies are intended to be developed in relation to subject-specific experiences. Whether they are assessed or not is up to each teacher's or department's decision. Although School C had a school-wide assessment policy of cross-curricular key competencies, teachers tended not to explicitly teach or formally assess cross-curricular key competencies in the senior high school, but they did collaborate to develop and assess cross-curricular key competencies across subjects in the junior high school.

In line with the existing literature (e.g., ERO, 2018a; Wolking, 2018), the assessment of cross-curricular key competencies has been slow to take root by teachers in the senior high school. As for the assessment, none of the teachers in this study formally assessed cross-curricular key competencies in the senior high school. Instead, external assessment (NCEA) drove the curriculum at this level of the school. The washback effect, the influence of testing

on educational practices, has been reported in other parts of the world, such as Portugal and Singapore (European Commission, 2020; Yeong & Ng, 2009). When assessment does not include cross-curricular key competencies, it is anticipated that students and teachers will pay less attention to cross-curricular key competencies and that they would rather learn and teach to what is tested (OECD, 2020). Therefore, it could be asked if it is better to let senior high school students focus solely on test preparation and whether it is enough to only teach and assess cross-curricular key competencies in primary and junior high schools. The answer seems to be "no" when I refer to the statement in the *New Zealand Curriculum* (Ministry of Education, 2007), the research results of the New Zealand Council for Educational Research (NZCER) (2018) and the results of my research. The *New Zealand Curriculum* (Ministry of Education, 2007) states that "[t]he values and key competencies gain increasing significance for senior school students as they appreciate that these are the values and capabilities they will need as adults for successful living and working and for continued learning" (p. 42). Also, the *New Zealand Curriculum* (Ministry of Education, 2007) emphasises the importance of cross-curricular key competencies in tertiary education while four corresponding cross-curricular key competencies (thinking; using tools interactively; acting autonomously; operating in social groups) are intended to be developed in the sector. That is, the development of cross-curricular key competencies should not be suspended in senior high school. NZCER (2018) investigated more than 8,000 New Zealanders' experiences of the NCEA and found that the respondents, including current students, NCEA graduates, and employers felt strongly that the NCEA should include cross-curricular key competencies. The school leaders and teachers from School C also insisted that NCEA should be changed so that they could continue the development and assessment of cross-curricular key competencies in the senior high school. In summary, to realise the real intentions of the *New Zealand Curriculum*, to only teach and assess cross-curricular key competencies in the primary school or the junior high school is insufficient. Rather, they should be developed and assessed in the senior high school as well.

However, the problem is how senior high school leaders and teachers can manage this increased workload. They would be required to develop disciplinary knowledge and cross-curricular key competencies while also dealing with the reality that the content and format of high-stakes testing will not radically change soon. In Japan as well, the dichotomy between subject-specific content knowledge and cross-curricular key competencies has been an issue at a senior high school level (Shimojima & Arimoto, 2017). The Japanese government already tried to shift from a content-based curriculum to a competency-based one in the national curriculum that was implemented in 2010 (Ministry of Education, Culture, Sports, and

Technology, 2008), but classroom practices had still focused on mastery of subject-specific content due to the washback effect from high-stakes university entrance examinations (National Institution for Youth Education, 2017). Therefore, the government tried to revise the university entrance system along with the national curriculum that was implemented in 2020 (Shimojima & Arimoto, 2017). Nevertheless, major changes to the standardised university examination were given up due to the government's lack of preparation, and the new test is almost the same as the old one, which assesses senior high school leavers' content knowledge. Teachers are expected to prepare students for university entrance examinations that mainly focus on subject-specific content while the national curriculum expects teachers to nurture both subject-specific content and cross-curricular key competencies in a balanced way.

Hipkins (2017) insisted that cross-curricular key competencies are not additional layers to the curriculum and that they should be woven into the curriculum, but my research found that senior high school leaders and teachers do find it challenging to integrate cross-curricular key competencies into their teaching and assessment practices. The next section (5.2) looks at the dominant perceptions that the participants had that could hinder them from the assessment of cross-curricular key competencies in senior high school. The following section (5.3) examines possible solutions to promote the development and assessment of cross-curricular key competencies in senior high schools.

5.2 Perceptions of cross-curricular key competencies

I found that all participants were well-aware of cross-curricular key competencies since all had some experience developing them either in their current or previous schools. All seemed to be positive towards teaching and assessing cross-curricular key competencies. However, some factors prevented them from explicitly teaching or formally assessing them in senior high schools.

The three common perceptions that emerged were that: disciplinary content and skills take priority over cross-curricular key competencies in senior high school; there is a gap in awareness about the assessment of cross-curricular key competencies among subjects; resources and models for assessment of cross-curricular key competencies are lacking.

5.2.1 Disciplinary content and skills take priority

The interviewees of all school types emphasised that disciplinary content knowledge and skills that were assessed in NCEA and reported to parents took priority in terms of classroom teaching and assessment. Even when they recognised the importance of cross-curricular key competencies and the positive effects of their assessment on students, they taught and assessed disciplinary content and skills that were the focus of NCEA as a result of external accountability pressure. This is consistent with the existing literature insisting on the washback effect of NCEA on teachers' practices (Hipkins, 2007; NZCER, 2018). My research showed that it has hindered teachers from assessing cross-curricular key competencies in senior high school.

How can the low status of cross-curricular key competencies be improved? As discussed in the previous section (5.1), the development and assessment of cross-curricular key competencies should not be given up due to the washback effect of high-stakes testing at a senior high school level, and the NCEA should be changed to align more with the *New Zealand Curriculum* featured by cross-curricular key competencies. Or even if cross-curricular key competencies are not assessed in the same way as subject-specific knowledge and skills in NCEA, their importance should be recognised among stakeholders, including students and parents, so that they are given the same status with disciplinary content and skills.

5.2.2 Assessment awareness/conceptions differ

School leaders and teachers from School Types B and C mentioned whether and how cross-curricular key competencies were assessed was different among subjects. For example, the Physical Education teacher from School B2 stated that cross-curricular key competencies such as self-management or participation were valued in Physical Education, while teachers' awareness in some other subjects of cross-curricular key competencies was lower, and there was even resistance. This result aligns with Remesal (2011), who found that mathematics teachers were more content-specific and suggested that high school teachers' conceptions of assessment could be different due to their teaching subjects.

My research suggests that collaborative professional development opportunities across subjects can change subject-specific conceptions and these collaborations could fill the gap in teachers in awareness of cross-curricular key competencies. In School C, a mathematics teacher seemed to recognise the importance of cross-curricular key competencies as she collaborated with other subjects' teachers to develop and assess them in the junior high school. Also, while

a science teacher admitted that it had been difficult for her to change what she assessed from content knowledge to cross-curricular key competencies, after five years' experience, she became a hub leader who designed relevant assessment tasks.

The importance of professional development for adapting to new curriculum has been emphasised (European Commission, 2020; Fullan, 2015). Given that cross-curricular key competencies are cross-disciplinary (Gordon, et al., 2009), collaborative professional development across subjects can give teachers opportunities to see what and how cross-curricular key competencies can be nurtured and assessed in their subjects.

5.2.3 Resources are lacking

School leaders and teachers from School Types B and C stated that learning from other schools or organisations would help, as they lacked good examples for the development and assessment of cross-curricular key competencies, particularly in the senior high school. The lack of resources and materials to implement cross-curricular key competencies was already indicated in the existing literature (UNESCO, 2016), but the present study found that school leaders and teachers were eager to listen to 'stories' on how other schools proceed with the new curriculum related to cross-curricular key competencies and tackle tensions caused by the reform. They admitted that the schools in New Zealand were different from each other, and they appreciated the insights from other schools rather than the materials themselves.

What can be done to increase the resources to develop and assess cross-curricular key competencies? As schools in New Zealand are diverse due to their self-governing nature, centrally provided resources may not be useful. Rather, it may be preferable for the government to build either face-to-face or online platforms for schools to collaborate or interact with each other. In each school, similar to teachers in School C who were given time and opportunities, teachers in New Zealand schools should have the chance to develop their own ways of teaching and assessing cross-curricular key competencies.

In other contexts like in Japan, centrally provided resources can be helpful. For example, when the Japanese government started a Super Global High School project, which aimed to nurture cross-curricular key competencies in senior high school students, the Ministry of Education, Culture, Sports, Science and Technology opened a website and held an annual conference so that each school could share its practices. This may work because Japan has a long history of lesson study, collaborative action research (Lewis & Takahashi, 2013). It is common in Japan to observe a lesson and have a discussion for future practices not only at a

school level but also at district and national levels. Some teachers adopt the model as it is while others arrange it depending on their working environment.

When there is a culture where teachers learn from other schools, and most of the schools share the same or similar problems to address, centrally provided resources and frequent collaboration opportunities are helpful. On the other hand, when schools differ greatly from each other, school leaders and teachers should take time to develop their own ways once they learn from other schools.

5.3 Desirable conditions for assessing students' cross-curricular key competencies

While each school has different challenges according to which implementation phase they are in, three overarching themes have emerged as common in all the school types for the implementation of school-wide assessment practices of cross-curricular key competencies. The themes are: support from senior management, collaborative professional development, and stakeholder involvement.

5.3.1 Support from senior management

Support from senior management in schools is critical in making a school-wide change in the development and assessment of cross-curricular key competencies, as clearly shown in the case of School A. Even if teachers are capable of or eager to teach and assess cross-curricular key competencies, if their school does not have a clear policy to value the competencies, they cannot explicitly teach and assess the competencies because parents expect the school to manage students' behaviours or prepare for external accountability tests. On the other hand, the senior management in School C clearly showed the teachers what and how cross-curricular key competencies should be nurtured and assessed. Also, the senior management in School C supported the teachers in terms of allocation of time, offering professional development opportunities and building up a receptive community among teachers. Gordon et al. (2009) emphasised that school leadership is critical for the successful implementation of cross-curricular key competencies when establishing a climate of collaboration and trust as well as building reflective communities of practice. Fullan (2008) also insists on the importance of school leaders' roles in terms of creating a supportive framework when implementing a new curriculum because curriculum reform requires teachers to change their beliefs, thinking, practices, and systems throughout the school.

The support that is needed from senior management is different depending on the implementation phase for each school. This is because teachers have different challenges in changing their ways of teaching and assessing. During early implementation, as with School B1, teachers do not have a shared understanding of cross-curricular key competencies. Even when teachers identify important cross-curricular key competencies and have a shared understanding like in School B2, there can be a gap or division among teachers, which seems dependent on the subjects they teach. Moreover, some teachers think that disciplinary content and skills that are reported to parents still take priority over competencies like in School C. Their existing educational practices are influenced by multiple factors, so the senior management team should understand that teachers need time and support to unweave interrelated strands. Particularly in the senior high school, as most of the participants admitted, their educational practices are driven by NCEA, so further discussion between senior management and teachers is desirable on how they can take steps to align their curricula and NCEA for better development and assessment of cross-curricular key competencies. As ERO (2018a) suggested, if school managers have strong leadership, they can prioritise the development of cross-curricular key competencies over the acquisition of NCEA credits. Additionally, as McDowall and Hipkins (2019) showed, school leaders can encourage teachers to assess discipline-specific knowledge and cross-curricular key competencies either separately or in integrated ways utilising interdisciplinary learning opportunities.

Senior management teams are expected to show a clear policy in making a school-wide changes in the development and assessment of cross-curricular key competencies, but it should be in a way that each teacher's flexible decisions are respected. School C had a school-wide policy, and a 21st-century rubric was provided by senior management, but teachers could still make autonomous decisions on what and how to teach and assess their students. Troudi et al. (2009) concluded from their study with English language teachers that the teachers felt that they lacked autonomy in assessment due to the school managers' decisions and constraints. Even if schools choose a systematic way, this decision should not hinder teachers' autonomy.

5.3.2 Collaborative professional development

The participants from all the school types mentioned the need for professional development to adapt to new ways of teaching and assessing cross-curricular key competencies. Kwakman (2003) suggested four categories of professional development: first, reading and observation for acquiring new knowledge and information; second, giving it a try in a

classroom as an experiment; third, reflecting on routine behaviour and making a change; and four, collaboration with peer teachers to get feedback and devise new ideas. In the present study, Schools B1 and B2 were mainly in the first stage, where teachers read relevant materials to understand the nature of cross-curricular key competencies and seek shared understanding. In School C, teachers who engaged in the cross-curricular key development project in the junior high school were at the fourth stage, where they were allocated time to share ideas and expertise every week. What was typical in School C's professional development was their trial-and-error approaches and the professional learning opportunities across subjects. As for their trial-and-error approaches, a science teacher insisted that "having a go" is an important attitude when starting competency-based teaching. A social studies teacher also said that she did not ask for perfection in the initial trials. Such trial-and-error approaches can encourage teachers to take steps toward new types of teaching and assessments. Professional learning opportunities across subjects can be effective in competency development and assessment. By sharing information about classes and students, teachers can avoid both curriculum overload and assessment overload. A social studies teacher in School C answered that he could save time in both teaching and assessment when he taught and assessed students' collaborative skills alongside the English teacher. In teaching and assessments of cross-curricular key competencies, meaningful connections between topics or skills are common (Gordon et al., 2009), so professional development of teachers among subjects can help teachers realise the connections between subjects and design learning and assessment to nurture students' development.

Although professional development within schools is active, it was rare in the investigated schools to partake in these activities with teachers from other schools. OECD (2020) encourages more opportunities for teachers to network and collaborate with other teachers both within and outside of schools to manage curriculum changes. As the deputy principal in School C said, the lack of collaborative professional development opportunities with teachers from other schools may be rooted in the awareness that every school in New Zealand is different due to so much discretion being given to each school. However, the participants' answers clearly show that learning from good examples is one of the next steps. For example, the principal in School B1 stated that he would like to hear stories from traditional boys' schools as he anticipated that they had similar challenges to his school. Given that most of the participants answered that learning from other schools would be of help, professional development opportunities among schools should be made a priority.

5.3.3 Stakeholder involvement

Students and their parents play an important role in the successful implementation of developing and assessing cross-curricular key competencies. As for students, they are expected to not only be aware of the importance of cross-curricular key competencies but also reflect on their progress by themselves. Students in Schools B1, B2 and C engaged in self-assessment through learning journals or rubrics. The European Commission (2020) discussed that the active role of learners is key because learning to learn is seen as crucial in lifelong learning, which is a goal of competency-based learning discourse.

In New Zealand, parental involvement is emphasised as a powerful driver for students' learning (ERO, 2018b). ERO (2018b) called relationships with parents 'reciprocal learning partnerships' (p.4) and suggested that parents are not just the receivers of the score reports from school but important informants for students' learning. However, while some of the participants mentioned the importance of parents' understanding of cross-curricular key competencies, none of the participants answered that they officially assessed and reported on students' cross-curricular key competencies to parents. This may be because, as mentioned, high schools are expected to prepare senior students for NCEA. However, the OECD (2020) insisted that for successful curriculum reform, stakeholder involvement, including parents, is essential. When an assessment of cross-curricular key competencies is one of the integral parts of curriculum reform, schools should engage with parents more about assessments. Moreover, as cross-curricular key competencies are developed in both informal and formal settings (Gordon et al., 2009), exchanging information about students with their parents should help both teachers and parents to find their strengths and needs.

5.4 Summary

As international research suggests, senior high school teachers' assessment practices are influenced by high-stakes testing for qualifications and subject-specific conceptions of assessment. As a result, disciplinary knowledge and skills are prioritised, and cross-curricular key competencies are not formally assessed or reported. Consistent with existing literature, the participants in this study reported that resources for the assessment of cross-curricular key competencies are lacking. To overcome these challenges and integrate cross-curricular key competencies into classroom assessment practices, I suggest three strategies: support from senior management, collaborative professional development, and stakeholder involvement. Senior management support is crucial in terms of showing a clear school policy to value cross-

curricular key competencies and building a supportive framework for teachers. Collaborative professional development across subjects within a school is helpful for teachers to have a shared understanding and awareness of cross-curricular key competencies and beneficial for the creation of teaching and assessment materials. Moreover, collaborative professional development with other schools can be helpful if they face similar challenges, but the time and opportunities to develop the school's own approach are desirable considering the nature of self-governing schools in New Zealand. Finally, to tackle external accountability pressure and promote students' learning, students' active involvement and parental understanding in the assessment of cross-curricular key competencies are necessary.

CHAPTER 6
Conclusion

This chapter concludes the present study by outlining the key research findings in relation to the research aim and research questions and presenting the contributions to the field. It also reviews the limitations of the study and proposes areas for future research.

6.1 Summary of the study

This study aimed to find a way to integrate cross-curricular key competencies into classroom assessment practices in senior high schools. The three sub-research questions were:

1) How and to what extent have senior high school leaders and teachers in New Zealand changed their assessment practices to measure and nurture students' cross-curricular key competencies?
2) What are New Zealand senior high school leaders' and teachers' experiences and perceptions about the assessment of cross-curricular key competencies?
3) What are the necessary existing and desirable conditions and specific classroom assessment practices that are effective for student learning, valid, and manageable in assessing students' cross-curricular key competencies?

I conducted this research with 11 participants (three school leaders and eight teachers) from four different schools about their assessment practices of cross-curricular key competencies utilising a multiple case study. I collected data through an online qualitative survey and online semi-structured interviews and analysed the data using thematic analysis to identify, analyse, and report patterns. According to the implementation phases of cross-curricular key competencies, the four schools were categorised into three school types; School Type A which did not assess cross-curricular key competencies explicitly; School Type B assessed cross-curricular key competencies in each subject but was on its developmental stage of the overarching school direction; and School Type C assessed cross-curricular key competencies across subjects.

The results indicated that three out of four schools engaged in school curriculum reform in relation to cross-curricular key competencies and that the integration methods varied depending on the schools. However, none of the schools formally assessed cross-curricular key competencies at the senior high school level while they were developed and assessed in the

junior high school. All the interviewees answered that their assessment practices in the senior high school were influenced by NCEA, which mainly focused on subject-specific content. This study confirmed the washback effect by high-stakes testing that has been reported internationally (Alderson & Wall, 1993; ERO, 2018a; European Commission, 2020; Hipkins, 2007; Madaus et al., 2009; NZCER, 2018; Wolking, 2018; Yeong & Ng, 2009).

Further findings of experiences and perceptions about the assessment of cross-curricular key competencies showed that the participants had three perceptions in common; 1) disciplinary content and skills took priority over cross-curricular key competencies in senior high school; 2) there was a gap in awareness about the assessment of cross-curricular key competencies among subjects; 3) resources and models for assessment of cross-curricular key competencies were lacking. School leaders and teachers from School Type C wished to develop and assess cross-curricular key competencies in the senior high school, but these three factors hindered them from explicitly teaching and formally assessing cross-curricular key competencies at that grade level. The first perception that disciplinary content and skills took priority over cross-curricular key competencies in the senior high school was closely related to the washback effect by NCEA. Teachers are expected to prepare students for NCEA, and they report disciplinary content and skills to parents. The second perception that there was a gap in awareness about the assessment of cross-curricular key competencies among subjects aligns with the existing literature suggesting that some teachers have content-specific conceptions about assessment depending on their teaching subjects (Remesal, 2011), which resulted in some subjects valuing cross-curricular key competencies while others did not. The third perception that resources and models for assessment of cross-curricular key competencies were lacking has also been indicated in the existing literature (UNESCO, 2016), but the unique point in this study was that the investigated school leaders and teachers hoped to listen to ‘stories’ on how other schools implemented the new curriculum related to cross-curricular key competencies and how they tackled tensions caused by the change. This can be related to the self-governing nature of New Zealand schools and indicates the need for resources and models to help them develop their own materials and models.

To tackle these three factors that prevent school leaders and teachers from assessing cross-curricular key competencies at a senior high school level, the following three strategies were suggested as necessary and desirable conditions: 1) support from senior management; 2) collaborative professional development; and 3) stakeholder involvement. The first strategy, the importance of senior management in curriculum reform related to cross-curricular key competencies, has been previously emphasised (Fullan, 2008; Gordon et al., 2009), but this

study found that necessary support from senior management is different depending on schools' implementation stages. First, senior management should clearly show that the school values cross-curricular key competencies as well as why and how the school values them. Second, at its early stage of implementation, a shared understanding of cross-curricular key competencies needs to be sought because teachers sometimes have subject-specific conceptions. Once a school identifies cross-curricular key competencies to be valued, senior management should offer necessary resources for teachers to make changes. For example, in one of the investigated schools, those resources were allocation of time, professional development opportunities, and a receptive school culture. The second strategy, collaborative professional development, can be both within a school across subjects and among schools. Collaborative professional development across subjects was suggested because one of the investigated schools had a weekly professional development meeting with different subject teachers. They were successful in designing learning and assessment to nurture students' cross-curricular key competencies across subjects and saving time for both teaching and assessment of cross-curricular key competencies. However, these activities were only being conducted in the junior high school. Also, collaborative professional development with other schools was suggested because participants from all the school types answered that learning from other schools would be helpful, but they had not sought such opportunities. The third strategy, stakeholder involvement, was suggested to engage students and parents more in the assessment of cross-curricular key competencies. The participants thought that students and parents expected the senior high school to prepare students for NCEA, and they had not formally informed students and parents of cross-curricular key competencies. To promote students' learning in cross-curricular key competencies, students and parents are expected to not only recognise the importance of cross-curricular key competencies but also be involved in the assessment process. Particularly, for parents, taking advantage of the culture in New Zealand where partnerships with parents are cherished, they are expected to be more involved in the assessment of cross-curricular key competencies not as the receivers of score reports from school but as important informants for students' learning.

6.2 Contributions and implications of the study

6.2.1 For other researchers

Fulmer et al. (2015) insisted that many of the prior studies have focused on the relationship between the micro and macro-level influences on teachers' assessment practices while little attention has been paid to the relationship between the micro and meso levels. The present study suggested that meso-level factors, such as school leaders, school community, and school culture influence micro-level factors, such as teachers' assessment conceptions and knowledge, which resulted in affecting teachers' assessment practices. This implies the need for further research on the relationship between the micro and meso levels to promote the assessment of cross-curricular key competencies in senior high school.

6.2.2 For the government

Boyd and Watson (2006) reported that some teachers showed their discomfort or hesitation about assessing students' "dispositions" or "personality" among early adopter schools of the *New Zealand Curriculum* that featured cross-curricular key competencies. However, after over ten years since its first implementation, the debate is no longer whether cross-curricular key competencies should be assessed. Rather, the focus among the investigated four schools was how cross-curricular key competencies could be assessed in the senior high school. The participants recognised the importance of cross-curricular key competencies and hoped to develop and assess them effectively. However, assessment in the senior high school was NCEA-driven and content-specific. This tension cannot be addressed through individual efforts by teachers and schools. The government should take measures to align NCEA more with the *New Zealand Curriculum* that features cross-curricular key competencies. Unless national high-stakes testing aligns with the national curriculum, the real intention of the curriculum cannot be fully realised because teachers and students tend to focus more on what is tested. If the government aims to nurture cross-curricular key competencies consistently from early childhood education to tertiary education, development and assessment should not be suspended in the senior high school due to the content and subject-specific national high-stakes testing. Rather, assessment should be changed so that it factors in students' cross-curricular key competencies as well.

6.2.3 For school leaders and teachers

Given that New Zealand's schools are self-governing and diverse (Wylie, 2012), centrally made materials or models to integrate cross-curricular key competencies into their assessment practices are not suitable. Rather, each school in New Zealand should have time and opportunities to develop their own way once they learn from other successful schools using online or face-to-face platforms where they can share their experiences and expertise.

6.3 Limitations of the study

6.3.1 Sample

This was a small-scale study involving 11 participants in one city in New Zealand. Before it can be concluded that my findings are applicable nationally, a larger-scale study including a representative sample of senior high schools throughout the country is needed. To evaluate the extent to which my findings are applicable internationally, further investigation needs to be conducted in other countries, with representative samples of senior high schools.

6.3.2 Data collection

I utilised a survey and interviews, but the data collection instruments had limitations. The questionnaires were self-administered online, so participants may have answered inaccurately if they misunderstood the questions due to the wording. In the interviews, I tried staying impartial to the participants' responses, but due to the way questions were asked and probed, I may have evoked different answers depending on the interviewees.

6.3.3 Data analysis

I employed thematic analysis for data analysis, but the interpretation of the participants' responses and naming of the themes may be subjective due to my biases.

The responses were analysed on a school-by-school basis, although there should be differences in beliefs and practices among the participants at the same school. In addition, the sample consisted of teachers and principals with different perspectives on assessment practices (e.g., teachers at the classroom level and principals at the school level). Furthermore, the number of participants and their roles differed from school to school (e.g., only the deputy

principal was interviewed in School B2). Therefore, the responses do not necessarily represent the school as a whole.

6.4 Area for future research

I only recruited participants who were well-aware of and positive about cross-curricular key competencies since all had some experience of developing the competencies either in their current or previous schools. However, further investigation is needed to understand the challenges faced by school leaders and teachers who are not positive towards teaching and assessing cross-curricular key competencies. Also, research with students and parents needs to be conducted to seek a feasible way to integrate the assessment of cross-curricular key competencies.

I could not investigate school leaders and teachers who explicitly and formally assessed cross-curricular key competencies in senior high schools in this study. I hope to seek other schools in New Zealand or other countries that have successfully integrated cross-curricular key competencies into their classroom assessment practices at a senior high school level and ask how they ensure the assessment quality (validity, reliability, and equity) despite the complicated nature of cross-curricular key competencies.

This study confirmed the washback effect of high-stakes testing, and I hypothesise that the integration of cross-curricular key competencies into classroom assessment practices in the senior high school will become easier if high-stakes testing is not content-specific and rather focuses on cross-curricular key competency development. Therefore, in the future, I hope to compare the experiences and perceptions of school leaders and teachers teaching for International Baccalaureate programmes with those teaching students preparing for traditional pen-and-paper university entrance examinations.

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Appendices

Appendix A: Survey Questions

1. What type of school are you working in? (Authority, school gender)
2. What grade do you teach?
3. What subject do you teach?
4. How many years have you been working at your school?
5. What cross-curricular competencies are aimed to be nurtured in your school?
6. How are the cross-curricular competencies being nurtured in your class?
7. How are the cross-curricular competencies being assessed in your class?
8. How do you use the result of the assessment?
9. Is there anything else you would like to add or, is there anything else you think might be useful for me to know?

Appendix B: Interview Questions

1. What subject and grade do you teach?
2. What cross-curricular key competencies of students are developed in your class?
3. How are the competencies developed in your class?
4. How are the competencies assessed in your class?
5. How do you use the result of the assessment?
6. What are the challenges in assessing the competencies? How have you overcome the challenges?
7. What changes have been brought by assessing cross-curricular key competencies?
   (i) Changes in individual students
   (ii) Changes in the whole class
   (iii) Changes in teachers
8. What key recommendations can you make to other principals/teachers who want to start the assessment of cross-curricular key competencies?
9. What are the key conditions for integrating cross-curricular key competencies into classroom assessment practices?
10. Is there anything else you would like to add or, is there anything else you think might be useful for me to know?

Appendix C: Information Sheet

Assessment of Cross-Curricular Key Competencies: Strategies and Challenges for Senior High School Teachers in New Zealand

INFORMATION SHEET FOR PARTICIPANTS for Interviews

You are invited to take part in this research. Please read this information before deciding whether or not to take part. If you decide to participate, thank you. If you decide not to participate, thank you for considering this request.

Who am I?

My name is Yuko Ohira, and I am a Master's student in Education at Victoria University of Wellington. This research project is work towards my thesis.

What is the aim of the project?

This project aims to explore a way to integrate cross-curricular key competencies into classroom assessment practices in senior high school. Your participation will support this research by giving insights into future practice for the teachers addressing the challenges of assessing cross-curricular key competencies. This research has been approved by the Victoria University of Wellington Human Ethics Committee # 28425.

How can you help?

You have been invited to participate because your school's curriculum mentions the development of cross-curricular competencies. If you agree to take part, I will interview you online. I will ask you questions about your experiences and perceptions on the assessment of cross-curricular key competencies. The interview will take approximately 30 minutes. I will audio record the interview with your permission and write it up later. You can choose not to answer any question or stop the interview at any time, without giving a reason. You can withdraw from the study by contacting me at any time before 30th September 2020. If you withdraw, the information you provided will be destroyed or returned to you.

What will happen to the information you give?

This research is confidential* . This means that the researcher named below will be aware of your identity, but the research data will be combined and your identity will not be revealed in any reports, presentations, or public documentation. However, you should be aware that in small projects your identity might be obvious to others in your community.

Only my supervisors and I will read the notes or transcript of the interview. The interview transcripts, summaries, and any recordings will be kept securely and destroyed by 31st October 2021.

What will the project produce?

The information from my research will be used in my Master's report and academic publications and conferences.

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

You do not have to accept this invitation if you don't want to. If you do decide to participate, you have the right to:

- choose not to answer any question;
- ask for the recorder to be turned off at any time during the interview;
- withdraw from the study before 30th September 2020;
- ask any questions about the study at any time;
- receive a copy of your interview recording;
- receive a copy of your interview transcript;
- be able to read any reports of this research by emailing the researcher to request a copy.

If you have any questions or problems, who can you contact?

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

Student:
Name: Yuko Ohira
University email address:
ohirayuko@myvuw.ac.nz

Primary supervisor:
Name: Dr. Anne Yates
Role: Senior Lecturer
School: School of Education
Phone: 04 463 9744
anne.yates@vuw.ac.nz

Co-supervisor:
Name: Prof. Stephen Dobson
Role: Dean of Faculty of Education
Faculty: Faculty of Education
Phone: 04 463 5603
stephen.dobson@vuw.ac.nz

Human Ethics Committee information

If you have any concerns about the ethical conduct of the research, you may contact the Victoria University of Wellington HEC Convenor: Associate Professor Judith Loveridge. Email hec@vuw.ac.nz or telephone +64-4-463 6028.

* Confidentiality will be preserved except where you disclose something that causes me to be concerned about a risk of harm to yourself and/or others.

Assessment of Cross-Curricular Key Competencies: Strategies and Challenges for Senior High School Teachers in New Zealand

INFORMATION SHEET FOR PARTICIPANTS for Questionnaire

You are invited to take part in this research. Please read this information before deciding whether or not to take part. If you decide to participate, thank you. If you decide not to participate, thank you for considering this request.

Who am I?

My name is Yuko Ohira, and I am a Master's student in Education at Victoria University of Wellington. This research project is work towards my thesis.

What is the aim of the project?

This project aims to explore a way to integrate cross-curricular key competencies into classroom assessment practices in senior high school. Your participation will support this research by giving insights into future practice for the teachers addressing the challenges of assessing cross-curricular key competencies. This research has been approved by the Victoria University of Wellington Human Ethics Committee # 28425.

How can you help?

You have been invited to participate because your school's curriculum mentions the development of cross-curricular key competencies and you are currently working on or have worked on the development and assessment of students' cross-curricular key competencies. If you agree to take part, you will be asked a questionnaire on an online form. I will ask you questions about your experiences and perceptions on the assessment of cross-curricular key competencies. The questionnaire will take approximately 10 minutes.

You can withdraw from the questionnaire at any time before the questionnaire begins.

You can also withdraw while the questionnaire is in progress.

What will happen to the information you give?

This research is confidential*. This means that the researcher named below will be aware of your identity, but the research data will be combined and your identity will not be revealed in any reports, presentations, or public documentation. However, you should be aware that in small projects your identity might be obvious to others in your community.

Only my supervisors and I will read the answers to the questionnaire. The answered questionnaire and summary will be kept securely and destroyed by 31st October 2021.

What will the project produce?

The information from my research will be used in my Master's report and academic publications and conferences.

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

You do not have to accept this invitation if you don't want to. If you do decide to participate, you have the right to:

- choose not to answer any question;
- withdraw from the questionnaire while it is taking part;
- ask any questions about the study at any time;
- be able to read any reports of this research by emailing the researcher to request a copy.

If you have any questions or problems, who can you contact?

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

Student:
Name: Yuko Ohira
University email address:
ohirayuko@myvuw.ac.nz

Primary supervisor:
Name: Dr. Anne Yates
Role: Senior Lecturer
School: School of Education
Phone: 04 463 9744
anne.yates@vuw.ac.nz

Co-supervisor:
Name: Prof. Stephen Dobson
Role: Dean of Faculty of Education
Faculty: Faculty of Education
Phone: 04 463 5603
stephen.dobson@vuw.ac.nz

Human Ethics Committee information

If you have any concerns about the ethical conduct of the research, you may contact the Victoria University of Wellington HEC Convenor: Associate Professor Judith Loveridge. Email hec@vuw.ac.nz or telephone +64-4-463 6028.

* Confidentiality will be preserved except where you disclose something that causes me to be concerned about a risk of harm to yourself and/or others.

Appendix D: Consent Form

Assessment of Cross-Curricular Key Competencies: Strategies and Challenges for Senior High School Teachers in New Zealand

CONSENT TO INTERVIEW

This consent form will be held for five years.

Researcher: Yuko Ohira, School of Education, Victoria University of Wellington.

- I have read the Information Sheet, and the project has been explained to me. My questions have been answered to my satisfaction. I understand that I can ask further questions at any time.
- I agree to take part in an audio-recorded interview.

I understand that:

- I may withdraw from this study at any point before 30th September 2020, and any information that I have provided will be returned to me or destroyed.
- The identifiable information I have provided will be destroyed by 31st October 2021.
- Any information I provide will be kept confidential to the researcher and the supervisor.
- The findings may be used for a Master's report and academic publications and presented to conferences.
- The recordings will be kept confidential to the researcher and the supervisor.
- My name will not be used in reports, and utmost care will be taken not to disclose any information that would identify me.

- I would like a copy of the recording of my interview:
  Yes ☐ No ☐
- I would like a copy of the transcript of my interview:
  Yes ☐ No ☐
- I would like to receive a copy of the final report and have added my Email address below.
  Yes ☐ No ☐

Signature of participant: _____

Name of participant: _____

Date: _____

Contact details: _____

Assessment of Cross-Curricular Key Competencies: Strategies and Challenges for Senior High School Teachers in New Zealand

CONSENT TO PARTICIPATE IN QUESTIONNAIRE

This consent form will be held for five years.

Researcher: Yuko Ohira, School of Education, Victoria University of Wellington.

- I have read the Information Sheet, and the project has been explained to me. My questions have been answered to my satisfaction. I understand that I can ask further questions at any time.
- I agree to take part in a questionnaire.

I understand that:

- I can withdraw from the questionnaire while it is in progress.
- The identifiable information I have provided will be destroyed by 31st October 2021.
- The findings may be used for a Master's report and academic publications and presented to conferences.
- The answered questionnaire will be kept confidential to the researcher and the supervisor.
- My name will not be used in reports, and utmost care will be taken not to disclose any information that would identify me.

· I would like to receive a copy of the final report and have added my email address below.
Yes ☐ No ☐

Signature of participant: _____
Name of participant: _____
Date: _____
Contact details: _____

Appendix E: Ethics Approval

VICTORIA UNIVERSITY OF WELLINGTON
TE HERENGA WAKA

Phone 0-4-463 6028
Email judith.loveridge@vuw.ac.nz

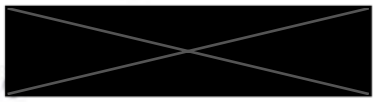
TO	Yuko Ohira
FROM	Associate Professor Judith Loveridge, Convenor, Human Ethics Committee
DATE	19 June 2020
PAGES	1
SUBJECT	**Ethics Approval** **Number:** 28425 **Title:** Assessment of Cross-Curricular Key Competencies: Strategies and Challenges for Senior High School Teachers in New Zealand

Thank you for your application for ethical approval, which has now been considered by the Human Ethics Committee.

Your application has been approved from the above date and this approval is valid for three years. If your data collection is not completed by this date you should apply to the Human Ethics Committee for an extension to this approval.

Best wishes with the research.

Kind regards,



Judith Loveridge

Convenor, Victoria University of Wellington Human Ethics Committee

Appendix F: Ethics Amendment

VICTORIA UNIVERSITY OF WELLINGTON
TE HERENGA WAKA

Phone 0-4-463 6028
Email judith.loveridge@vuw.ac.nz

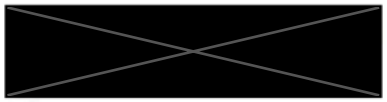
TO	Yuko Ohira
FROM	Associate Professor Judith Loveridge, Convenor, Human Ethics Committee
DATE	29 October 2020
PAGES	1
SUBJECT	**Ethics Approval** **Number:** 28425 (V1) **Title:** Assessment of Cross-Curricular Key Competencies: Strategies and Challenges for Senior High School Teachers in New Zealand

Thank you for your application to amend/extend your ethics approval. This has now been considered and the request granted.

In the case of an amendment, this approval is valid until the end date of your original ethics approval; in the case of an extension, this approval applies until the new end date that you have nominated. If your data collection is not completed by this date you should apply to the Human Ethics Committee for an extension to this approval.

Best wishes with the research.

Kind regards,



Judith Loveridge

Convenor, Victoria University of Wellington Human Ethics Committee