The Landscape of Teaching Multi-Age Classes in a New Zealand Secondary School

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A thesis submitted in partial fulfilment of the requirements for the degree of Master of Applied Practice
Unitec Institute of Technology, 2019

Abstract

Multi-age education is characterised by intentional grouping of students from more than one year level. These types of classes frequently occur in primary schools, and this is where the majority of the research is focussed. Secondary schools specialist subjects are beginning to adopt a multi-age approach, but there is little research into the use of multi-age classes as a method of teaching at this level. This study explores the landscape of multi-age teaching in secondary school design and visual communication classes, from the perspectives of both teachers and students.

A qualitative methodology was employed for this research and used data gathering methods of semi-structured interviews and a focus group. Five semi-structured interviews were conducted with teachers who had experience teaching multi-age classes in a specialist subject area at secondary school level. A focus group was conducted with a group of students who were part of a multi-age DVC class to discuss their experiences in this type of class.

The key findings of this study highlight the benefits and challenges of multi-age teaching in a secondary school specialist subject context. The findings were established through the students' and teachers' views and opinions of their personal experiences of being part of a multi-age class. The findings also explored advice that experienced teachers would give to teachers who were new to multi-age teaching.

The recommendations of the study focus on advice for teachers who are interested in implementing a multi-age DVC classroom. The advice covers the areas of class size, planning, student–teacher relationships, and the teacher as a teacher.

Acknowledgements

The completion of a thesis is not an easy journey. This particular journey took longer than I anticipated, and I am fortunate to have been supported by many people who have enabled me to complete it.

I would firstly like to acknowledge and thank my family. To my partner, Tony, and my daughter, Elise, thank you for your patience and support as I have tried to balance family, work, and study over the past three years. Thank you also to my sisters, Michaela and Andrea, who encouraged me to continue with my studies and believe in myself, and in particular to Michaela for her work transcribing the focus group.

I would like to acknowledge the leadership team at my school for allowing me to undertake my research in the school. I would also like to thank my colleagues for their ongoing encouragement and support. In particular, I would like to thank Amy for facilitating my student focus group for me; thank you for the time and effort you put into running this on my behalf. I would also like to truly thank the participants in this study, the teachers and the students, for your time, honesty, and willingness to be a part of this research.

My gratitude for the guidance, insights, and support that I have received from my thesis supervisors, Stephanie Sheehan and Jo Mane. The feedback provided to me by both of you was invaluable and has kept me motivated throughout this journey.

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CHAPTER 1: INTRODUCTION

Background

As a design and visual communication (DVC) specialist teacher in a New Zealand secondary school, my interest in multi-age teaching was ignited by my own experiences with the changing needs of my students and the school I work at, in relation to how a small specialist subject area such as DVC fits into the school's timetable system. The boundaries of my senior classes began to blur, as timetable pressures saw students who wanted to study DVC needing to enrol in other year level classes to make their timetables work (for example a Year 13 student working in a Year 12 DVC class). What began as a couple of students per year increased in the 2018 academic year. Hearing similar stories from colleagues at other schools led me to begin looking at the area of multi-age teaching within a senior secondary school context.

DVC is a specialist area within the technology learning area of the *New Zealand Curriculum* (Ministry of Education, 2017). It is a subject where students focus on understanding and applying drawing techniques and design practice, learn about design, and develop design thinking skills in the context of spatial and product design (Ministry of Education, 2019; Samaeli & van Musscher, 2018). Students conceptualise and develop their ideas in relation to a brief, with students working independently to solve a design problem. As a specialist subject area, many small to medium sized secondary schools have only one specialist teacher for this subject area, and student numbers vary from year to year.

Multi-age classes are classes that consist of students from more than one year level with one teacher. Wilkinson and Hamilton (2003) explain that in New Zealand primary schools, composite or multi-age classes are a common organisational choice, for both economic and developmental reasons. Multi-age classes are commonly found in very small schools, in developing countries, and where there are uneven numbers of students as different year levels (Hattie, 2002). By the time students reach intermediate and secondary school levels, the use of multi-age classes has traditionally disappeared.

Multi-age classes are most often found in primary schools, with most of the literature available focused on the year groups from new entrance to Year 3 (Krockover, Pekarek, Riggs, & Shepardson, 2000). Because of the assessment requirements and subject specific teaching that takes place at secondary school, the multi-age class model is not common, and as such there is very little research into multi-age classes at this level. It is however a model that small specialist subjects adopt in order to enable them to continue to offer the subject, and for students to be able to study areas that interest them. In 2006, New Zealand's Minister of Education Steve Maharey said, "Personalising learning is the best way to ensure that all children are learning to the best of their ability" (Maharey, 2006, para. 3). Personalised learning fits with the idea that schools must move away from the one size fits all model, and suggests the system be built around the learner, rather than needing the learner to fit the system. Personalised learning also asks how resources for learning can be used more flexibly to meet this need (Bolstad et al., 2012).

The usual method of organising students in a secondary school setting is with the use of year level groupings, with all students in one-year level expected to be achieving at a similar level. The timetable structure then directs students to particular places, for particular subjects, at certain times. Attempting to enable students to have access to all the subjects they want to study can be an impossible task at secondary school level for many reasons. The traditional model can mean that when subjects clash on the timetable, a student can be faced with the choice of choosing one subject over the other. As well as my own experience of increasing numbers of students working offline (studying a subject outside of the timetabled class option and often sitting in class with students from other year levels), I heard of increasing numbers of DVC teachers, subject specific technology teachers, and visual art teachers who were finding themselves teaching combined classes for the same reasons. This led me to start wondering how a multi-age teaching model could work in a secondary school context, and more specifically, in the subject area of DVC.

Context

This research study was conducted in a region of New Zealand that has a number of small to medium sized secondary schools, across a range of decile ratings. Due to the size of these schools, an increasing number of art and technology teachers experience

combined classes and have started implementing these classes using a multi-age teaching approach. The size of the schools often means that for specialist subject areas, the teacher is frequently the sole teacher for that subject. Timetabling considerations and the number of students taking the subject may mean that the projected class size may not reach the optimum number of students to make running the class as a single level class economically sensible.

This research explored the experiences of both teachers and students in multi-age class environments. Five teachers from four different secondary schools participated in this study. All the teachers involved in this study were full time teachers who taught at least one multi-age class in DVC, a subject specialist technology, or visual arts in 2018. The roll sizes of the schools these teachers worked in were between 500 and 1,000 students, and in each case the teacher involved was the sole specialist teacher for their specific subject. The students who participated in this study were all members of a multi-age DVC class I taught in 2018. As the students involved were known and taught by the me, another teacher at the school also participated in the study as a facilitator for the students. All participants in this study volunteered their time to participate in the interviews or focus group that were used to gather data.

Research Aims and Questions

Aims:

1. To investigate the philosophy behind the implementation of multi-age teaching at secondary school level.

2. To investigate the challenges and advantages for teachers and students in multi-age classes.

3. To recommend strategies for the effective use of multi-age classes.

Questions:

1. What is the philosophy behind multi-age teaching at secondary school level?

2. What are the challenges and advantages for teachers and students in a multi-age class?

3. What strategies enable the effective use of multi-age classes?

Rationale

This research was motivated by my own experiences as a DVC teacher who teaches multi-age classes at senior levels. Previously, two factors have been the drivers behind these multi-age classes. Firstly, subject clashes due to two single class subjects being timetabled at the same time; and secondly, a fluctuating number of students taking the subject. In order to solve these situations, teachers are often asked to cater for students outside of the usual timetable line (offline), or to combine classes so that students are still able to study the subject.

Having offline students has become a common situation for teachers in visual arts and technology over recent years and seems to be an increasing phenomenon that enables students to continue subjects that meet their personal learning needs. A multi-age approach of teaching more than one year group at a time is becoming more popular as a way to address this issue. Multi-age classes require a different way of teaching and learning as both teachers and students adjust to this alternate structure within highly structured traditional secondary schools.

The increase of multi-age classes that I have experienced led to my interest in exploring the landscape of multi-age classes in a New Zealand secondary school DVC class. Therefore, this research aimed to identify and explore the landscape of multi-age classes in a New Zealand secondary school from the perspectives of teachers and students.

There is a wide range of research available on multi-age or composite teaching; however, much of it is focused on the primary school level. Most of the research relevant to multi-age in a secondary school context is based on international studies and does not provide clear guidelines or information on how multi-age classes could be implemented in New Zealand secondary schools, or provide information on the characteristics of a successful multi-age classroom. This study concentrated on the experiences of teachers and students in a multi-age class. The challenges and advantages identified and discussed are those perceived by teacher and student participants. This research intends to identify how their experiences could support

other New Zealand teachers and provide strategies to help those who find themselves in a similar situation to implement multi-age classes.

The outcomes of this study will be of particular interest to the teachers who participated in the study as they continue to implement multi-age classes in their schools by identifying advantages and disadvantages and pedagogical approaches that can support multi-age classes. It may also be of interest to schools and teachers looking at implementing similar multi-age classes, whether it be due to economic need or philosophical choice.

Thesis Organisation

Chapter 1 – Introduction

Chapter 1 identifies and defines what multi-age classes are in the context of a secondary school. It presents a rationale for the choice of thesis topic, followed by the research aims and questions, and concludes with an outline of the thesis.

Chapter 2 – Literature Review

In the literature review, literature related to the themes in this thesis is outlined, including a history of multi-age teaching. These themes are reasons for multi-age classes, academic benefits and challenges, and pedagogical and spatial practicalities. The literature comes from a wide range of sources, but primarily from international studies due to a scarcity of New Zealand related research in this area.

Chapter 3 – Methodology

In Chapter 3 I explain my epistemological stance and how it relates to my research. This chapter also outlines the data gathering methods that were selected and how validity and ethical issues were addressed.

Chapter 4 – Findings

Chapter 4 summarises the findings from the semi-structured interviews with teachers and the student focus groups. Teacher and student perceptions of multi-age classes are outlined in this chapter.

Chapter 5 – Discussion, Conclusion, and Recommendations

Chapter 5 brings together the literature and findings and discusses the recommendations that may be considered by teachers of multi-age classes. This chapter also outlines the limitations of this study and considerations for further research.

CHAPTER 2: LITERATURE REVIEW

The focus of this chapter is to obtain insights into multi-age classrooms through a review of the literature. This literature review will set the scene and explain the intentions and thinking behind this type of classroom setting by looking at the history, description of, and reasons that multi-age classes may occur. It will also seek to identify the perceived benefits and challenges for students and teachers, and investigate the practicalities of multi-age classrooms in relation to pedagogical approaches and spatial considerations.

Context of Multi-Age Education

History of multi-age education

During the 17th and 18th centuries, the one room schoolhouse was the school experience for many students. The industrial revolution saw the one room school model develop into one that is very similar to the one experienced today. As Kappler and Roellke (2002) noted, "fuelled by concerns about productivity and efficiency, these reforms focussed on educating students rationally and efficiently" (2002, p. 166). The belief behind the change to a graded system was that society would thrive with an educated population (Stone, 2010). This system has been likened to the conveyor belt systems of mass production.—The graded school 'conveyor belt' sees students enter the system as raw product and, by progressing through a series of stages, these students exit as educated adults (Stone, 2010). The skills considered necessary were organised into age appropriate knowledge that students needed to show competence in, in order to be promoted to the next level, where the next piece of knowledge in the jigsaw puzzle could be added (Broome, 2014).

The 1960s and 1970s saw ideas such as the ungraded school, open education, and individualised instruction become driving forces in education. These ideas were driven by developmental theories of learning and student-centred instructional models and saw the multigrade classroom become an educational innovation. Pardini (2005) says that today's multi-age philosophy shares its roots with the guiding principles of early childhood education, where the emphasis is on the child rather than the curriculum. When educators describe these shifts to ideas such as the ungraded school, they often relate them to the historical image of the one room school (Miller, 1990).

Description

Hoffman (2002) states that "in a multi-age classroom, students of different ages and ability levels are taught together without division into grade designations" (p. 47). Multi-age programmes are most frequently found in primary schools, with most of the literature published relating to multi-age education focused on age groups from new entrance to Year 3 (Krockover et al., 2000). Multi-age classes (also referred to as combination classes, multigrade, split-grade, mixed-age, non-graded, and vertically grouped) are classes in which students from more than one year are grouped together in the same class, with the same teacher (Hattie, 2002). A multi-age class is made up of deliberate groupings of students from at least two grade levels to form a learning community (Broome, 2009a; Hoffman, 2003).

Multi-age classes allow students to be grouped flexibly in terms of development or interest level to encourage cooperation rather than competition (Broome, Heid, Johnston, & Serig, 2015). The intention is to recognise and honour individual differences and allow students to learn at their own pace and in their own way (Krockover et al., 2000). Students in multi-age environments still move from easier to more difficult concepts with the help of their teachers, but this happens at the student's pace, as students can approach tasks from their own developmental level and with their own needs in mind (Broome, 2009a; Hoffman, 2003). Multi-age classes recognise that students learn at different paces and are "set up so that children can make continuous progress at their own rate of development" (Heins, Tichenor, Coggins, & Hutchinson, 2000, p. 31).

Reasons for creating multi-age classes

Multi-age classes tend to be created for two very different reasons—economic versus philosophical. Veenman (1995) explains that classes are formed by necessity (economic) and are often labelled multigrade, whereas multi-age classes are formed deliberately and are established for their perceived educational benefits (philosophical choice). Economic considerations that lead to the implementation of multi-age classes are created by situations such as school budgets, student and teacher numbers, and available space (Broome et al., 2015). Multi-age classes in this context are created out of necessity and, generally, the same teacher teaches students from two or more grades at the same time. This is done as an administrative way of addressing staffing,

enrolments, or uneven class sizes (Proehl, Douglas, Elias, Johnson, & Westsmith, 2013).

When economic considerations cause the creation of multi-age classes, classes are often still instructed in the same manner as a single age level class. These split class situations may be contributing factors to the perception that the multi-age model is undesirable, as while results for multi-age classes have been consistent, results for spilt level classes are more variable (Broome et al., 2015). Veenman (1995) asserts that when multi-age classes are created for enrolment or economic reasons, they often claim the same academic and non-cognitive advantages as multi-age classes created for philosophical reasons – making a "virtue out of a necessity" (p. 322).

Philosophical choice is the second reason for creating multi-age classes. This version of the multi-age class has the same type of teacher and student configuration, but for educational reasons, rather than administrative. Educators believe it is in the best interests for the students' development and focuses on the individual student's talents, needs, and interests (Proehl et al., 2013). In this context, the multi-age approach supports a student-centred approach that is built on shared experience. This approach tends to be more theme based and connected to students' interests (Broome et al., 2015).

Multi-age classes are common in developing countries, in small schools, and where there are uneven numbers of students at different year levels (Hattie, 2002). In the New Zealand context, Wilkinson and Hamilton (2003) explain that New Zealand has a high incidence of multi-age classes partly due to the large number of small schools, especially rural schools, with larger schools using them to handle uneven numbers of students across year levels.

While the literature suggests that multi-age classrooms are a minority in the United States of America, Mulryan-Kyne's (2004) research on multigrade primary schools in Europe indicated that up to 53% of students were in a multi-age class. Her analysis found that two grade multi-age classes are often found in large graded primary schools, whereas three or more grade level classes are usually found in areas of lower population such as rural schools.

Benefits and Challenges of Multi-Age Classes

Academic

Miller (1990) reviewed and analysed 21 studies, nearly half of which were conducted in the 1960s and 1970s when there was significant interest in team teaching, individualised instruction, and multigrade grouping. Half of the multi-age programmes studied were driven by philosophical choice rather than economic necessity, which Miller felt would suggest a difference in the attitude and belief of the teachers concerned. The other half of the studies focused on combined classroom situations. In the studies that looked at student achievement differences between single grade and multi-age classrooms, Miller (1990) found that "there is little or no difference in achievement in students in single or multigrade classrooms" (p. 1). In a literature review by Mason and Burns (1995), it was found that multi-age classes created for economic reasons can have a slightly negative impact on student achievement. In relation to academic achievement in non-graded classes, Pavan's (1992) review of studies indicated that in 91% of the studies, non-graded groups performed better (58%) or as well as (33%) the graded groups on measures of academic achievement. In only 9% of the studies did the non-graded students perform worse than graded students. These results were also reflected in studies that analysed data for at risk students.

Mulryan-Kyne's (2004) research found that 39% of teachers in her study felt that multigrade settings provided low achieving students with more continuity than a single grade class, as it enabled them to interact with material from more junior grade levels from year to year which would consolidate their learning. In the opinion of 27% of the teachers in the study, older children gained from the constant revision as teachers presented new content to other students that they themselves have already dealt with, and this provided older students an opportunity to gain confidence and develop leadership skills by helping the younger students. A total of 32% of the teachers felt that younger students gained as they were able to absorb knowledge from older children, and this was an area of particular benefit to higher achieving students.

Veenman's (1995) research asserted that there is no significant difference between the quality of instruction between multi-age or single age level classes, as long as class size is controlled, and teachers are trained in techniques appropriate to multi-

age teaching. There was also a belief that a feeling of superiority can be created in multi-age classes due to the stakeholders (parents, teachers, schools) and policies leading to selection favouritism that sees higher achievers and more experienced teachers being placed in these classes (Song, Spradlin, & Plucker, 2009). Veenman (1995) agreed that this selection bias contributes to the finding that there is no difference in achievement between multi-level and single level classes, but that greater individualisation was also a factor. In their study of New Zealand schools, Wilkinson and Hamilton (2003) found a small negative effect in relation to academic results. They felt that as multi-age classes are common in New Zealand, that the effect of selection favouritism would be minimal.

Teachers identified a number of disadvantages, such as difficulty in maintaining high quality education for all, with weaker and/or older students missing out and increased levels of discipline problems (Quail & Smyth, 2014). Broome (2014) supports this by stating that the most frequently expressed disadvantage relates to the difficulty in instructing multi-age groups that have wide developmental spans. It is interesting to note that in Wilkinson and Hamilton's (2003) research in New Zealand, that in only five of the eight schools that met their selection criteria did they find a greater range of abilities in the multi-age classes to that of a single year class, and that those differences were negligible. While the test scores showed a similar range of abilities in both of the types of class, teachers in composite classes reported a wider range of abilities in terms of their perception—a situation that Wilkinson and Hamilton attributed to the teacher's expectation that a multi-age class would include a wider range of abilities.

In their conclusion, Wilkinson and Hamilton (2003) state that their findings provide little support for the explanation that the slightly lower performance of students in multi-age classes was due to students being given less direct instruction or precisely tailored support, and that what matters, regardless of whether the class is multi-level or single year, is the nature and quality of the instruction provided. Veenman's (1995) reasons for multi-age classes not being better were the fact that there is no specific training for teachers who embark into multi-age teaching, and the workload issue which means that teachers do not have time to utilise more effective grouping strategies.

Miller (1990) points out that some of the research evidence suggests there may be significant differences depending on the subject and/or grade level, and notes that the studies he reviewed reflect the complex and variable nature of school life. Song et al. (2009) cite Lloyd's (1999) research in which they state, "the wide range of ways multi-age groupings are implemented makes it difficult for researchers to generalize the academic impact of multi-age education" (p. 1). The vast number of different configurations for a multi-age classroom means that each class may be different to the next in terms of age range, variations in ability, and teacher experience and training.

Veenman (1995) found that most of the studies he analysed revealed no consistent differences in academic achievement between students in multigrade and single grade classes and concluded that multigrade students learn as much as their peers in single grade classes.

Students

The multi-age philosophy can bring with it fears from parents with older children in the class. One fear is that their children are not challenged and that the teacher will spend all their time helping the younger children. In contrast, parents of younger children worry that the older children will dominate the class and that the curriculum might be too difficult (Pardini, 2005).

Multi-age classes give students continuity to their instructional and interpersonal relationships as students and teachers remain together for at least two years (Song et al., 2009). This reduces competitiveness and encourages teachers to be more student-centred, and to establish more secure student to teacher relationships (Krockover et al., 2000; Veenman, 1995). Students form relationships with a wider variety of people than is possible in a single-age class. Younger students are able to observe and emulate a range of behaviours that they see in older students, and older students are able to assume responsibility and show leadership. This leads to a greater sense of belonging, security, and confidence, and promotes qualities and attributes that are relevant to the complex and changeable social environment outside of school (Veenman, 1995).

The social environment of school for children is an important area for parents and educators. Pratt (1986) questions the perceived advantage that single-age classes have over multi-age classes, if those single-age classes stimulate rivalry and aggression. In contrast, multi-age classes may promise greater cooperation, nurturing, and friendship at no real cost (Pratt, 1986). One of the characteristics of the multi-age philosophy is a classroom where deep relationships are formed between students, teachers, and parents. The teachers are facilitators and see each student as an individual, and students get to see each other for their personal qualities and capabilities, rather than their year level (Hoffman, 2003).

Teachers have noted that non-graded teaching develops peer learning and enhances the self-concept of older students who take on this role—which also encourages positive peer relationships and recognises diversity (Krockover et al., 2000; Veenman, 1995). Veenman (1995) refers to a study conducted in Connecticut that identified the greatest advantage of multi-level classes to be the opportunity for younger students to advance academically due to being exposed to curricula designed for a higher level.

Miller (1990) analysed the findings of qualitative studies looking into student attitudes in multi-age and single grade classes. He found that the results generally favoured the multi-age classroom, both in relation to attitude to school and in the student's attitude towards themselves. Pavan (1992) found in her review of studies that in relation to mental health and school attitudes, students in non-graded schools were more likely to have positive self-concepts, higher self-esteem, and better attitudes to school than students in graded schools. In Pavan's (1992) review, 52% of the studies indicated that non-graded schools were better in this area for students, while 43% of studies found that non-graded and graded situations had a similar influence on students. The positive results that Miller (1990) and Pavan (1992) reported are also supported by Broome (2009a), who found that in relation to attitude toward school and self-concept, 75% of the studies he analysed found that students in multi-age classes had a better attitude in relation to both aspects. In contrast, Song et al. (2009) found that in schools where the multi-age model was used for students who needed more time to achieve at the expected level, that this could result in lowered self-esteem for the students.

Multi-age instruction is seen to be a way of effectively meeting the individual needs of children and develop leadership and problem solving skills (Stone, 2010). Multi-age

instruction is a proven practice that is developmentally appropriate for children, with the greatest impact being seen in children who have had multiple years in the model (Eighmy & Ritland, 2012). According to Pavan (1992), the longer students experienced a non-graded system, the more positive their academic achievement and their attitude toward school became.

Broome (2009a) looked at the use of multi-age homerooms and the implications this had in art classrooms. He found that the community spirit that was established in multi-age homerooms transferred over to the art classroom, being displayed in a cooperative attitude that was not seen in traditional art classes. Broome et al. (2015) noted that "students become teachers and teachers become learners. This breaking down of the hierarchical power relationship between student and teacher creates a studio/lab setting focused on discovery" (p. 32).

With the diverse needs of students in a multi-age class, a personal relationship is needed with each student in order to differentiate instruction. Having the student for longer than one year gives teachers time to find the best way to instruct them. The level of interaction between teachers and students provides students with the confidence that the teachers care about them and their needs (Proehl et al., 2013). Diversity is not just about culture, race, or ethnicity, but to all the things that make us different. Hoffman (2003) notes that "every classroom is made up of children with diverse families, abilities, learning styles, and behaviours" (p. 6). Pratt (1986) claims that the evidence on multi-age grouping seems to confirm the idea that the diversity in these groups enriches these groups.

The multi-age classroom is more like a family unit than a single grade classroom can be, with students developing strong relationships with their peers and teachers as they are together for at least two years (Proehl et al., 2013). Older children can teach younger children about the classroom expectations and orient the new students to the culture of the classroom, while younger students can look to the older students for support and guidance (Proehl et al., 2013).

Teachers

Broome (2014) re-examined the data collected during his 2009 research, looking at the amount of experience a teacher had and whether they were supportive of multi-

age education. He found that for teachers who were early in their careers (1–5 years' teaching experience), 36% were in support, while 27% opposed multi-age classrooms. Teachers with more experience were more likely to be in support of multi-age classrooms, with 75% of teachers with 6–10 years of experience being in support (25% in opposition). The percentage in support of multi-age classrooms decreased slightly for teachers with more than 10 years' experience, with 67% in support (17% opposed) for teachers with 11–15 years' experience and 60% support (27% opposed) for teachers with 16 or more years' experience.

Broome's (2014) findings that teachers in their first five years of teaching had a higher percentage of uncertainty around multi-age art education led him to propose that this may be due to them not yet having a range of professional experiences to call upon. Eighmy and Ritland (2012) make the point that there is little initial training and ongoing training for multi-age teachers.

Teacher belief in the multi-age system and preparedness are also important factors in multi-age education. Song et al. (2009) found that many teachers had very little preparation for teaching a multi-age class, and that as many as eight in ten teachers opposed differentiated instruction. Other related issues were lack of resources and support for the multi-age teacher, and lack of preparation through teacher education programmes or professional development opportunities (Quail & Smyth, 2014). Differentiated instruction, while common in all classrooms, is altered in a multi-age classroom. In a single level class, differentiation involves taking the same lesson and trying to make it work for each student, whereas in a multi-age class, differentiation involves the teacher creating lessons to suit the needs of each student, and not necessarily teaching the same thing to all students (Eighmy & Ritland, 2012).

Working in a multigrade school requires ongoing teacher training and a commitment to hard work. In general, teacher training is organised around whole class or small group instruction. When teachers find themselves in a multigrade setting, they discover that the time requirements and skills needed were not part of their training and/or previous experience (Miller, 1990). Veenman (1995) reported that principals felt the optimal number of students in a multigrade class was 20 or fewer, while Mulryan-Kyne (2004) stated that the maximum class size teachers considered to be effective in a multi-age setting was 15 students.

One of the major factors identified as a disadvantage for teachers of multi-age classes is an increased workload with more planning required. Studies reviewed by Quail and Smyth (2014) note that multi-age teachers reported a higher workload and greater difficulties addressing the needs of a diverse class. Veenman (1995) also notes the belief that there is more work, preparation, and planning involved in a multi-age class. The challenge of multigrade teaching is believed to be created by the need to differentiate class materials and activities to cater for students of different ages and abilities (Quail & Smyth, 2014). In Mulryan-Kyne's (2004) research, 48% of respondents felt that the quality of teaching and learning was compromised by the organisational and instructional planning that was needed to keep everyone on task due to the variety and gap in abilities.

Broome's (2009a) study of multi-age art education found that the most frequently expressed disadvantages related to having many different developmental levels within the class. Other challenges cited by teachers were not feeling like they had enough time to spend with each year level in each of the subject areas and finding time to work with individuals (Quail & Smyth, 2014). Mulryan-Kyne's (2004) research found that 70% of participants expressed a concern that they did not have enough time to spend with individuals and to monitor work. These aspects can then lead to classroom management difficulties, with Mulryan-Kyne (2004) stating that teachers reported difficulties with keeping all year levels on task and that some felt that lower achieving students were missing out.

Mulryan-Kyne (2004) identified that multigrade classes have positive effects on teaching and learning as they are stimulating and interesting settings to work in. Of the teachers in the study, 32% felt that there was a variety of work and the atmosphere was generally busy and productive.

In relation to the social aspects of multi-age classrooms, Mulryan-Kyne (2004) points out that 37% of the teachers surveyed felt that teachers got to know students (and their families) better, and as the students had the same teacher for a longer period of time it was easy to check that students' needs were being met. Mulryan-Kyne's study also found that 32% of the teachers reported that the family like atmosphere and what children learned from interacting with one another was good for their social development as they learned to cooperate and get along, and older students learned

to be patient and tolerant. However, Mulryan-Kyne (2004) also notes that 39% were concerned that older children were disadvantaged academically and socially by having to share their teacher with younger children.

Pratt (1986) states that the creativity and inventiveness required of multi-age teachers takes a lot of time and energy, but that teachers should be encouraged as evidence indicates that for students, these environments are socially and psychologically healthy places.

Practicalities of Multi-Age Classrooms

Pedagogy

Multi-age, student-centred education changes the way school is 'done'. Multi-age classes have different rules and materials to single grade classes. Multi-age classes have different strategies and organisations, and a teacher in this environment will not be successful using the tools of a graded system (Stone, 2010). For teachers to be successful in a student-centred environment, teachers need to make changes to the standard methods of teaching single grade classes. Teachers need to shift their attention from teaching curriculum to teaching children (Krockover et al., 2000).

Key elements of multi-age teaching include the use of cooperative learning, flexible grouping, and integrated units of work. Students are encouraged to be independent and to share their learning with others (Pardini, 2005). In a multi-age class, teachers work as the facilitator and see each student as an individual. For this to happen, students and teachers need to get to know each other well so the teacher can understand each student's learning style and personality, and the students in turn will begin to understand personalities and learning styles their peers and teacher. Teaching should therefore include students and teachers problem solving and learning together (Hoffman, 2003).

The philosophy of multi-age teaching involves structuring learning tasks to meet the needs of individual students in a way that student choice is integrated, and information and skills are learned in a context meaningful to the student (Hoffman, 2003). Students move from easier to more difficult materials at their own pace, and their progress is evaluated using methods such as observation, portfolios, and checklists (Heins et al.,

2000). Teacher planning in relation to this should include activities that can be modified and adapted for the students' wide range of abilities and learning styles so that students can work at their own pace (Hoffman, 2003).

Krockover et al. (2000, p. 73) recommend six practices for the multi-age classroom:

1. That students be involved in the decision-making process around theme and activity ideas in order to increase motivation and interest.
2. Students should have the opportunity to display their work in the classroom as a way to increase pride and motivation.
3. Teachers should consider using project-based learning to engage students in long-term projects related to a theme. This will allow them to experience concepts and ideas in context.
4. Activities should relate to the lives of the students and the community. By making connections with real life situations, students learn to problem solve, making the activity worthwhile.
5. Teachers should explain the rationale for the activity as it will connect students to the concept.
6. Use open-ended, student-centred inquiry activities that encourage students to use higher level thinking skills, rather than following step by step instructions.

Students in multi-age classes often work cooperatively in pairs or groups, sometimes organised by themselves based on interests or needs, sometimes organised by teachers to encourage cross age interaction and the formation of new friends (Broome et al., 2015). Group work allows younger students to observe older classmates at work and take note of skills that they will develop. Older students gain leadership experience by demonstrating techniques and leading discussions (Broome et al., 2015). Throughout a school day, students in multi-age classes work in a variety of flexible grouping configurations. How the group is formed is dependent on the needs and interests of the students (Hoffman, 2002).

Wilkinson and Hamilton (2003) found similarities between multigrade and single grade classes in the way that teachers grouped students. In each type of class, teachers set up similar numbers of reading groups with a mix of similar ability levels. Wilkinson and Hamilton (2003) also found that the teachers in each type of class were also similarly

successful in catering to the needs of the individual students. In a multi-age classroom, students' work is often self-directed and tasks are worked on collaboratively, and as such, the teacher's role shifts from direct instruction to the whole class, towards using more time to support the student's individual learning (Miller, 1990). Hoffman (2002) notes that this does not mean that direct instruction disappears; it just becomes less dominant and often happens in a different format such as one-to-one or small groups.

As well as being members of small groups, students work independently, in pairs, and in large groups. In group work, students contribute according to their skill level (Krockover et al., 2000). Multi-age classroom teachers understand the role that social interaction and collaboration have in the classroom. Students often work in collaborative small groups that are either teacher or student led. Because of the wide range of ages and abilities, collaborative learning is necessary (Hoffman, 2002).

One of the participants in Broome and colleagues (2015) study explained that he used demonstrations of skills and techniques with small groups of students based on their readiness and interest. As these students participated in the demonstration and developed a skill, they were then able to become peer tutors for others. In this situation, leadership was distributed evenly throughout the classroom, rather than resting with the teacher.

Part of a teacher's role in a multi-age classroom is to observe students working together to make sure that the interactions are positive and that it is not always the same student taking on the role of teacher (Hoffman, 2002). For positive interaction to occur, teachers need to provide instruction on how to work together before and during the session (Smit & Engeli, 2015).

Broome (2009b) describes the multi-age practice of looping where a student stays with the same teacher for a number of years. As students remain with the class and the teacher for a number of years, the themes that are used for project-based learning will also need to loop so that students are not repeating the same theme year on year. Multi-age instruction often uses themes in order to connect concepts to the students' interests. These themes cannot be too vague, or the students will lack direction (Broome et al., 2015). Broome (2009b) discusses one of his research participants and her journey in a multi-age art class. Initially, this teacher was trying to run different

projects for each year level before moving to lessons that targeted the developmental levels within the multi-age class and teaching them as a whole.

Spatial

Multi-age environments rely on a well-planned learning space rather than a classroom organised around rows of desks. The environment should be open and have learning centres and project areas (Stone, 2010). Tables and chairs are frequently rearranged, rather than having rows of desks (Heins et al., 2000). Tables are chosen over desks as they promote the cooperative process common in these environments (Eighmy & Ritland, 2012). The furniture used needs to allow for flexibility as student seating is organised to provide mixed groupings for interaction and collaboration (Hoffman, 2003). When teachers are working with students in small groups, others are working at learning centres or developing projects (Stone, 2010). Students are grouped with other students of similar or varied ability and are encouraged to help each other in the learning process. This instils leadership and nurturing qualities in the students. Tables suit this purpose as groups can be changed frequently, according to the students' interests and abilities rather than their grade (Eighmy & Ritland, 2012).

Learning and activity stations are placed in a number of locations around the classroom (Heins et al., 2000). These areas enable students to work independently on tasks and projects that are designed to address a wide range of interests and levels. Students can choose their workstation and are not assigned to activities, but instead approach their options with curiosity (Eighmy & Ritland, 2012). Instructional and organisational practices intend to encourage student-directed learning, with students allowed to make choices reflecting their interests and learning styles. This means that materials and technology need to be easily accessible in order to encourage student independence (Hoffman, 2003).

Summary

This literature review has looked at the history and reasons for the creation of multi-age classrooms. While there have been many studies that have looked at multi-age classrooms from the primary school perspective, there is a paucity of research in this area related to the secondary school context. My particular area of interest for multi-age secondary school education is in the area of DVC specifically, and the technology

curriculum in the wider sense. The closest subject specific research in this area is that of research into primary school multi-age art settings.

While the literature reviewed is not specific to my area of interest, I believe that the principles, beliefs, and pedagogical approaches discussed are also applicable to the secondary school DVC context. Hoffman (2003) suggests that descriptions of multi-age classrooms in operation are needed to offer information about how practices are implemented and possible links between the practices and student achievement. My research into multi-age classes at a secondary school level will enable me to look at these ideas from the point of view of the student as well as the teacher and may provide insights that can feed back into the primary school experience.

CHAPTER 3: METHODOLOGY

Introduction

This chapter begins with an overview of the research methodology used in this study. An explanation of the rationale behind adopting a subjectivist epistemological position and qualitative approach to the methodology, research design, and data collection is provided. This chapter also provides the rationale behind identifying grounded theory methodology as the most suitable approach to describe and analyse the experiences of the teacher and student participants in a secondary school multi-age environment.

The data collection and data analysis methods used are then outlined. This is presented in two sub-sections which detail the semi-structured interviews and focus group. The chapter concludes with a discussion of the validity, reliability, and ethical considerations relevant to this study.

Research Methodology

Bryman (2012) explains that an epistemological issue involves questioning what should be regarded as acceptable knowledge in a discipline. Epistemology is the study of the origins of knowledge and justifying claims of knowledge (Vogt, Gardner, & Haeffele, 2012), and what we know, how we know it, and how we know that we know it. The purpose of this research is to investigate the changing landscape of the DVC classroom and the implications of multi-age education in a secondary school DVC classroom for students and teachers.

This research takes place within an interpretive paradigm, which is based on the idea that social reality is created through the subjective experience of people (Morgan, 1980). The study utilises a qualitative research methodology as it aims to uncover the lived reality of the research participants (Mutch, 2005), in this case, a multi-age classroom. Because of the subjective and descriptive nature of the data that will be gathered, a qualitative analysis of this data is appropriate.

Qualitative research explores what is assumed to be a socially constructed reality using an in-depth description of the situation being studied from the perspectives of the people involved. The interpretive paradigm views the relationship between the

people in the know and what is known as being inextricably connected (Yilmaz, 2013). As I sought to explore, describe, and explain the experiences of teachers and students in a multi-age secondary environment, a qualitative study was deemed to be the most appropriate approach.

In the case of this study, the qualitative methodology employed is that of grounded theory. Grounded theory was developed by Glaser and Strauss at the University of California in the 1960s. It aims to generate a theory that explains a social process, interaction, or action (Petty, Thomson, & Stew, 2012). The theory is constructed using the data from the participants who have experienced the phenomenon being studied. Grounded theory is rooted in symbolic interactionism which focuses on the meanings of events to people and how they convey that meaning (Baker, Wuest, & Stern, 1992). Baker et al. (1992) note that "the researchers' purpose in using the grounded theory method is to explain a given social situation by identifying the core and subsidiary processes operating in it" (p. 1357).

The data that is of interest when using grounded theory may come from a variety of sources. Baker et al. (1992) state that everything is a source of data to the grounded theorist—from observing social interactions to listening to what participants say about themselves and others, from reading what other researchers have written, to thinking about our own past experiences. Petty et al. (2012) identified that the most common data collection method used by grounded theorists were interviews. In this research, the data gathered will be descriptive and interpretive as it focuses on the experiences of participants in the environment being studied. The participants' experiences in a multi-age classroom are subjective, and I will interpret what they say in order to understand their meaning. This approach has been used as it seeks to identify and explore participants' beliefs and experiences.

I have been a technology teacher, and more specifically a DVC teacher, for 14 years. I feel that the relationship and trust between teacher and student is a very influential factor for students in a technology classroom. With more students needing to work offline across senior DVC classes in the school that I teach in, I feel that the possibilities offered by multi-age classes both as a pedagogical choice and as an economic choice will see them become a more popular choice for schools and teachers. The trust relationship between students and teachers will become a vital

part of this new type of environment—but how do student's and teacher's feel about multi-age classes in the early stages of implementation? This study aims to investigate this new classroom landscape.

Sampling Selection

There were two groups of participants in this study—students and teachers. The students involved were drawn from the school where I teach. These students were members of the three senior National Certificate of Educational Achievement (NCEA) DVC classes that I teach, which due to various timetable considerations became multi-age and multi-discipline classes for the 2018 school year. The students were asked to volunteer to be part of a focus group discussing their experiences with an aim of having students involved from each year level.

I intended for the focus group to include between four and six participants and comprised of students from across NCEA levels. On the day of the focus group, four of the five students who had expressed interest were at school and could participate. The timing of the focus group contributed to the number of students able to participate as it was held at a very busy point in the school year for the NCEA level students, and illness and competing academic commitments for students made it a challenge for students to commit to other activities.

The second group of participants in the study were teachers who had taught multi-age classes during the last two school years. One of these participants was a teacher who teaches at the same school as me, with the balance of the participants being teachers from similar size schools in the region who also experienced an increase in multi-age classes. The teacher from my school was identified via the school's timetable, while the other teachers were identified through expressions of interest after discussing my research with teachers at a local subject cluster meeting.

I planned to interview between six and eight teachers who had experience teaching multi-age classes. I intended that three of these teachers were to be teachers from the school I teach at (one from technology, one from art, and one from music). In the end, I was only able to interview one teacher from my own school as one of the teachers was on sabbatical when the interviews were conducted, and I could not interview the second teacher due to a conflict of interest as I was involved in their appraisal process

for that academic year. All of the teachers interviewed from outside of my own school came from schools within the region that were of a similar size and were the sole senior teacher of the subject in their department.

Data Collection

Data was collected and analysed from students and teachers who had experienced a multi-age classroom situation. I sought to gather sufficient data while maintaining a manageable sample size. This research utilised two methods to gather data for analysis—semi-structured interviews and a focus group. The student participants were involved in a focus group where they discussed their experiences in a multi-age classroom during 2018. With the teacher participants, I undertook semi-structured interviews. Each of the participants completed a consent form prior to taking part in the interview or focus group.

Semi-structured interviews

Semi-structured interviews were conducted with teachers who had experience with multi-age, and in some cases, multi-subject classes. The semi-structured interview was organised around a set of predetermined open-ended questions that enabled further questions to emerge based on the dialogue between the interviewer and interviewee (DiCicco-Bloom & Crabtree, 2006). Semi-structured interviews contain key questions to help define the areas to be discussed, but they also allow the interview to explore an idea or answer in more detail. The flexibility of semi-structured interviews in comparison to structured interviews can also allow for the discovery of information that the participants feel is important that had previously not been considered by the researcher (Gill, Stewart, Treasure, & Chadwick, 2008).

The interviews were with teachers who had taught in high school multi-age classrooms for at least one school year. I chose to interview these teachers as they had experienced the environment and dealt with the changing environment to a multi-age class, whether the changes were economically or pedagogically driven. They had managed and adapted their own practice to suit their new environment and could have advice and information of value to others beginning this journey. They were leaders for others who may teach multi-age classrooms in the future.

In preparation for the interviews, I prepared a framework of guiding questions to give me the bones of a discussion, with some ideas for follow up questions to elicit further information from participants. Five teachers were interviewed as part of this research —one drawn from the school that I work in, and four from other schools in the area. Prior to the interview, I sent participants a copy of the guiding questions so that they could consider the questions and the intended direction of the interview.

The teacher from my school was identified via the school timetable as teaching multi-age and/or multi-subject classes. While the teacher involved from my school was not a teacher of DVC, they taught a subject that is taught in a similar type of classroom setting and teaching approach. The teachers interviewed who taught in schools other than my own were identified through discussions at the local graphics and technology teachers association cluster meeting. The majority of these teachers specialised in DVC, while one specialised in textiles technology. The information provided to the interviewees prior to their participation made it clear that their responses would be digitally recorded and that the data and their identities would be kept confidential. The participants were also given the opportunity to check the transcript of their interview and modify their response over a seven-day period after receipt of their transcript. They could also choose to withdraw their response for another two-weeks after they had confirmed the transcript of their interview.

The interviews were conducted in environments that were comfortable to the interviewee. Mutch (2005) explains that part of establishing rapport with an interview participant is to have an environment that is conducive to discussion—quiet, comfortable, and free from distractions where possible. I reminded the participants of the purpose of the research and that their contributions would be confidential. The interview questions focused on their experiences teaching multi-age classes, considering both their pedagogical and organisational practices.

Focus group

Gill et al. (2008) explain that focus groups are used to gather information on collective views, and to gain a rich understanding of the participants' experiences and beliefs. They allow for conversation and building on answers that arise from the initial questions. The use of a focus group was appropriate as a method to gather data from a student perspective on multi-age classes. A focus group environment allowed them

to support and be supported by others, and for teenagers, I felt this was a less threatening environment for them to participate in. A focus group also enabled a discussion-based environment for the student participants. As I was the teacher of the students who were involved in the focus group, a colleague facilitated the focus group on my behalf as I wanted the students to be able to speak freely and offer their opinions, rather than feeling that they needed to edit their responses in order to 'please' me.

This method of data collection gave access to the views of several students at once, with a group dynamic that could produce data that may not have been possible in an interview situation. The students could listen to each other, agree, disagree, and further explain their responses, helping to gather more in-depth understandings of their experiences.

The sample for the focus group came from the students in my multi-age NCEA DVC classes. The optimum size for a focus group is six to eight participants; however, focus groups can run successfully with as few as three participants. Small groups run the risk that limited discussion could occur (Gill et al., 2008). With 35 students to draw from, the aim was to run a focus group with between six and eight students.

To gather participants for the focus group I spoke to the multi-age classes that I taught and explained my research and how I was approaching it. I then sent a follow up email via the teacher who was to act as facilitator for the focus group session asking for interested students to respond to the email to confirm their expression of interest. The request also made it clear that the focus group would be digitally recorded and that the data and identities of the participants would be kept confidential. As this research was taking place within a school setting, consent was also sought from the parents of the students concerned.

As I was using a neutral facilitator to run the focus group, I needed to consider the traits that are important for this role. The facilitator needed to be knowledgeable about what I was researching, organised, confident, open, sensitive, and flexible. I needed the facilitator to be someone who could put the students at ease. Because of this, I asked a colleague from the technology department to act as facilitator as she is friendly and cheerful, and students respond well to her personality. She is able to put people

at ease, as well as being organised and an active listener who I felt confident would be able to facilitate the discussion as well as manage the group dynamic.

As the students were all students undertaking NCEA examinations in 2018, the timing of the focus group needed to fit between benchmark exams within school, school holidays, and final internal assessments. The reality of this was a very small window in which to run the focus group before students began their end of year assessment drive. Five students expressed interest in participating, with four students returning documentation and participating in the focus group.

My intention for using a focus group for these participants was to give the students the comfort of the presence of other students, and to allow them to bounce ideas off each other. Being in an interview situation with an unknown teacher may have felt daunting for these students who were aged between 15 and 18 years old, while having peers with them could offer comfort and support. Using a focus group interview setting also served to increase the confidentiality of the students. As DVC is a smaller subject area, I may have taught many of the participants for between two and four years. The relationships and knowledge I have of my students due to this ongoing teacher–student relationship could mean that, despite allocating a pseudonym to each student and having another teacher interview them, I may be able to identify them through their answers. Therefore, complete anonymity of student identities could not be guaranteed although every effort was made to do so.

The focus group took place in a neutral environment away from the technology block. The facilitator was provided with an interview guide that they used to initiate and open conversation. As part of the process, students were asked to complete a plan of the DVC classroom and identify areas of significance for them, such as their preferred work areas and spaces they used for group versus individual work. As a natural progression of this, the focus group then discussed what they would like to see in this classroom setting and gave them opportunity to suggest other formats.

Data Analysis

The first stage of data analysis was transcription of the recording from the focus group and interviews. A third party transcribed the focus group recording in order to maintain participant confidentiality. Once I received the focus group transcription back from the

transcriber, I asked the focus group facilitator to read through it and check for accuracy. I changed the format of the transcription to landscape with a panel at the side so that I was able to add my notes and comments (Mutch, 2005). As I made my first read through, I made note of my initial reactions. From there, I began to make note of any key themes that were emerging.

For the interviews, I carefully transcribed the digital recordings, checked, and rechecked to ensure accuracy. Pseudonyms were allocated to the participants in order to maintain confidentiality. The process of transcribing gave me the opportunity to become very familiar with the data and enabled me to identify key themes. It also allowed me to recognise similarities and differences between the responses that different participants gave.

A transcript of each interview was sent to the interview participants for them to check. The participants were aware that they had a seven-day period in which to respond to me should they need to modify their data and a two-week period after this to withdraw from the study.

Pope, Ziebland and Mays (2000) explain that in many qualitative studies, the process of analysing data inevitably begins during the data collection stage and is a continuous process, as it is impossible to not begin thinking about what is emerging from the data. This enables the researcher to revisit and refine questions and pursue emerging ideas in more depth.

Analysing text in qualitative research involves using analytical categories that are inductively derived and are based on the themes that emerge from the data itself (Bryman, 2012; Pope et al., 2000). Initially, the data is read and reread to identify themes and categories. All the data relevant to a category is identified and examined using a process called constant comparison, where each item is compared with the rest of the data (Pope et al., 2000). It is an inclusive process and categories are added to reflect as many aspects of the data as possible. These categories are then refined and reduced in number by grouping them together, allowing identification of key themes (Pope et al., 2000). Mutch (2005) states that it is important to approach the findings with an open mind. An eight-step thematic analysis process is proposed by Mutch (2005) to analyse the data gathered from the focus group and interviews. When

browsing the data and keeping an open mind, rather than looking for information I was expecting to see, I took note of particular aspects that caught my eye. These were highlighted and read more closely, before being coded as themes by making notes in the margin of my reading copies of the transcripts. Bryman (2012) explains that coding usually involves writing notes in a margin and then slowly refining these into themes. He also expresses the concern that coding can decontextualize the data and result in a loss of the participant's narrative flow. Coding is the first stage of determining themes and allowed me to consider the meaning of the data. It was important to keep Bryman's (2012) concerns in mind during this phase and to check the legitimacy of the codes in relation to the data.

Next I looked at the patterns that emerged from the coding more closely and then I grouped and labelled these. I looked at different ways that I could group the themes that I was seeing emerge and considered how I could label these groups. From here I identified some themes that were stronger and also links between themes. From here Mutch (2005) suggests that the next step to take is to check for consistency and resonance. At this stage, I checked that the identified themes were consistent and valid. As part of this, I considered the themes that were common in the literature of multi-age classrooms and compared these with what I was finding within my own data. At this stage I also established which themes were stronger than others and developed sub themes. The final step was to report my findings by summarising the key themes with relevant examples and these can be found in Chapter 4.

Reliability and Validity

Kirk and Miller (2005) explain that "reliability is the extent to which a measurement procedure yields the same answer however and whenever it is carried out" and that "validity is the extent to which it gives the correct answer" (p. 105). Reliability in qualitative research is the extent to which what is found can be replicated, and validity is the degree to which the data is interpreted in the right way (Kirk & Miller, 2005). A subjectivist approach supposes that people construct their own social reality and see things in different ways. Multi-age classrooms can occur due to pedagogical choice or economic necessity, and the contexts, emotions, and perspectives of the participants means that each person has a different reality and all of these different realities exist at the same time. The reliability of the data collected was checked through the

provision of the transcript and summaries to participants so that they could validate their responses. As this research aimed to provide a valid description of what was said in the specific situations of the semi-structured interviews with teachers and the focus group of students, rather than generalising these as experiences of the wider population, accurate recording, transcribing, and reporting of the data was essential to ensure the reliability of the gathered data.

Validity within this research relates to the authenticity and the trustworthiness of data and the interpretation of the data. Bias can be a validity issue in interviews and focus groups. Participants for both the interviews and focus group were selected based on a first-come first-served basis from received responses to the initial email request. For both the focus group and the interviews, open questions were used to allow participants to respond to the topic of the question in their own way and describing their experience of that question, rather than asking them to affirm my own experiences. To minimise the possibility of researcher bias in the focus group, I asked a colleague to run the focus group on my behalf. As the participants in the focus group were students that I taught, I needed to have a neutral party as the facilitator so that students could speak freely, without the modifying influence of me as their teacher. The facilitator of the focus group also needed to ensure that every participant had the opportunity to speak. Validity was also an important consideration in the interpretation of the data and coding of the responses. During the first read through of each of the transcripts I took note of my initial reactions and noted these down as possible aspects where bias could creep in.

Ethical Issues

Morrow and Richards (1996) explain that ethics are a set of moral principles and rules that we conduct ourselves by, and that ethics in relation to research is the application of a system of moral principles to prevent harm to others. Research ethics centre around two key things—informed consent and protection of the participants. There was no harm anticipated in this research and no intention to deceive any of the participants. The research took place in an area that I live and work in, and as such, I knew all of the participants through teaching them, working with them, or through meeting them at the New Zealand Graphics & Technology Teachers Association local cluster meetings. As Bryman (2012) points out, researchers behaving unethically may

reflect poorly on institutions, and as such, gaining approval from the Unitec Research Ethics Committee was a necessary step to protect the participants, myself as the researcher, and Unitec.

To address ethical issues during my research, I sought approval from the principal of the school that I teach in, and where much of the study is situated. I explained the intention of my research and how the school would be involved, assuring the principal that the participants would be allocated a pseudonym to provide them anonymity.

Participants were informed in writing about the nature and purpose of this research and were assured that their participation would be kept confidential and their information reported anonymously so that under no circumstances could they be identified. They were also assured that the data they provided would be confidential and stored securely on password protected systems.

I explained to the students in the multi-age classes that I teach that I was undertaking research around multi-age classes and intended to conduct a focus group involving students in order to find out about their experiences. As part of this explanation, I explained that I would not facilitate the focus group, and would only read the transcript and would not know who had volunteered to participate. From there, the colleague who had agreed to facilitate the focus group for me sent out an information email to the students asking for expressions of interest to participate. Before the focus group meeting, the students and their parents were given a copy of the information sheet and asked to sign a consent form. Interview and focus group excerpts used in this thesis do not reveal the identity of the respondent, other people, or organisations that they may refer to.

Teachers who participated in the semi-structured interviews where identified in two ways. Teachers who taught at the same school as me were identified via the school timetable and I spoke to them and explained my research and asked if they would allow me to interview them. The teachers I interviewed in other local schools were identified through a local subject association meeting, where I explained my research and asked for expressions of interest. These teachers were then sent the information sheet and consent form in preparation for the interviews.

Because this research was intended to explore multi-age classroom practice in New Zealand secondary schools, it could both directly and indirectly have an impact on Māori as there are likely to be Māori students and teachers in this context. This project did not specifically focus on participation and/or outcomes for Māori participants; however, any research conducted in New Zealand can be considered to impact Māori. In the case of my research, the impact was likely to be indirect and related to findings that could have implications for future practices in the teaching of multi-age classes that involve Māori students. I sought advice from a Māori member of staff at my school regarding my proposal, research methodology, and the interview and focus group process.

The consent forms for the focus group and the interviews stated that they would be electronically recorded, and an opportunity was given for participants to ask any questions prior to this taking place. After the recordings had been transcribed, the facilitator of the focus group and the participants of the interviews were given their transcripts to check and verify. Participants were aware that they had a week to amend or clarify any responses that they had made.

Summary

The increase in multi-age classrooms in New Zealand secondary schools is an issue that a number of teachers and students are experiencing within the technology curriculum. While there is considerable research and information regarding multi-age classrooms in a primary school environment, it is a relatively new phenomenon at secondary school level. My aim was to explore multi-age teaching and learning experiences in the New Zealand secondary school and in particular in a DVC context. In a New Zealand secondary school context what advantages and challenges do those who have experienced these environments see? What strategies and approaches do teachers identify that support an effective multi-age environment?

This chapter described the methodology and research methods that were employed for this research project. I provided justification for adopting a subjectivist epistemological position and the rationale for a qualitative approach. The participants in the focus group and semi-structured interviews were introduced. I explained my reasons for choosing to use a focus group and semi-structured interviews as data

collection methods and I rationalised the use of inductive data analysis using themes that emerged from the data. To conclude, I described the provisions made to ensure the reliability and validity of the collected data and the relevant ethical issues that related to this research study. In the next chapter, the findings of this research are presented.

CHAPTER 4: FINDINGS

Introduction

This chapter presents the findings from the interviews of teachers who have taught and managed multi-age technology classrooms in the last two years, and the focus group of students who were part of a multi-age DVC class in 2018.

For the interviews, where possible, I have combined the results of my analysis. I have used pseudonyms to protect participants' identities and the identities of the schools they were working in.

I have endeavoured to present the findings from the focus group and interviews without bias or judgement.

Research Questions

1. What is the philosophy behind multi-age teaching at secondary school level?
2. What are the challenges and advantages for teachers and students in a multi-age class?
3. What strategies enable the effective use of multi-age classes?

As outlined in the methodology chapter, the findings of this research emerged from the analysis of the data collected from semi-structured interviews and a focus group. Semi-structured interviews were undertaken with five teachers from four different schools. Three of these teachers were specialist teachers in DVC, one was a specialist teacher of textiles technology, and one was a specialist teacher of visual art – photography and design. All of these teachers had taught a multi-age class for at least one year and had all been teachers for at least 14 years. The students involved in the focus group were all students in a senior multi-age DVC class in 2018. They ranged in year level from 11 to 13. Questions explored their experiences in a multi-age class, the perceived advantages and challenges of this set up, and in the case of the teachers, their advice for other teachers.

From the literature review I found little guidance on how multi-age teaching could be executed at a secondary school level, and more specifically, in a New Zealand DVC classroom. As a teacher who was beginning to implement multi-age DVC classes, I

was interested in identifying approaches that other teachers had found successful and learning from their experiences. By interviewing teachers who had experience in this area, I hoped to discover some key ideas and practices, as well as possible pitfalls to be aware of. As I was in the process of implementing multi-age classes in my own practice, I also took the opportunity to explore the student experience through a focus group.

This data analysis focused on:

1. The perceived advantages and challenges of multi-age teaching
2. The classroom experience of a multi-age class—teaching approaches and spatial considerations
3. Teachers' advice about how to implement a multi-age class

Background

The teachers in the interviews had a variety reasons for why they were teaching multi-age classes. While some of the reasons were essentially similar, the teachers' explanations varied.

In their interview responses, Teachers A, B, C, and D all identified timetable clashes and a decline in student numbers as being the major contributing factor that led to the creation of their multi-age classes, and they felt that multi-age classes were the only solution for the classes to continue. In these cases, while the teacher agreed to it, the decision was ultimately made by senior leadership and timetabling needs.

For Teacher E, while the multi-age class was instigated by the same factors as the other teachers, they felt that the decision to opt for a multi-age model was about creating flexibility in the timetable. This allowed students to take the subjects that best fitted them as individuals, rather than what fitted their timetables. Teacher E had experienced the fluctuation of student numbers that usually occur for small subject areas from year to year and began to look for opportunities within this. Taking a proactive approach of offering multi-age classes enabled the subject to exist in a way that created flexibility in the school timetable, allowing students access to the subject without the pressure of needing to choose between two subjects that clashed due to

timetable constraints. As Teacher E stated, "You have to adapt to the situation, and that was my adaptation".

From the perspective of the students, one reason for multi-age classes was to enable all students to still take the subject. For the student who identified as being offline (or studying the subject outside of the usual class hours), they appreciated the fact that they could still take the subject, even though it was in an unusual way.

The number of multi-age classes that teachers taught in 2018 varied. While Teacher D only had one multi-age class, this class was made up of all three NCEA year levels. For Teacher E, all of their timetabled classes in 2018 were multi-age classes. For the other three teachers, they each had two multi-age classes on their timetable.

All of the multi-age classes that these teachers taught were limited to senior students only (Years 11–13), with the most common combination being Years 12 and 13. Two of the teachers had multi-age classes that covered all three NCEA levels for their subject area (Teachers A and D) and one teacher had a Year 11 and 13 combination (Teacher C). The teachers commented that their preferred combination was Years 12 and 13 together. Their preference was to keep Year 11 as a standalone class, as this age group required more attention. This was because it was the students' first year of NCEA and teachers expressed how they felt that the Year 12 and 13 students in these classes missed out (Teachers A and D).

Multi-Age Classes – Perceived Advantages and Challenges

Perceived advantages

Insight and competition

All of the teachers interviewed were able to identify a range of advantages to teaching multi-age classes. Four out of five respondents felt that the fact that the younger students got to see what the older students were doing was an advantage, as the students gained insight into the higher levels and also gained access to skills and knowledge at an earlier stage than they otherwise would. Teacher A stated that "the younger students see what the seniors are doing, and they aspire to do the same". These teachers felt that this prepared the students for future learning and helped them

to achieve at the highest level possible as they were challenged (Teachers A, C, D, and E).

Teachers A and C commented on the competitive aspect that having different levels in a class brings. Students can see what other levels are achieving and aspire to reach that, extending themselves to either reach new levels or to stay ahead of younger students. Teacher C talked about a group of Year 13 students in a multi-age class with a group of very capable Year 12 students. These Year 13 students stepped up the level of their work as they did not want the Year 12 students to "show them up". While Teacher C attributed this to a competitive factor, they also acknowledged that this was because the teacher could not pay them as much attention as in other years due to the mixed year levels, and they did not have the audience (of only their year group) that they were used to having.

Shared teaching

Another advantage identified by four of the five teachers was the sharing of teaching as students took on the role of teacher at times. Teacher E spoke specifically of this being an advantage, as they felt that students can bring a different perspective to what is being taught, and they felt that the different language used by students could remove barriers that sometimes existed to learning something. Teacher E noted "The Year 13s have a wonderful method of encouragement. 'Come on you can do it… get on with it…'. They will sit there and they can pull students back in".

In being asked what they liked about being in a multi-age class, students responded by saying that they liked being able to learn from each other; sharing knowledge and ideas. The students liked having the Year 13 students' class work as exemplars as it showed them where the work they are doing leads.

The students also spoke of the ability to ask for help from other students when the teacher was busy. They admitted that initially they did not ask other students as they were shy and didn't know the students, but by Term 2 they felt comfortable doing this. Students also liked the variety they gained from asking a range of people for help and opinions. One of the students explained that the act of explaining or teaching something to others helped them understand it more themselves. It also gave them confidence in their ability (Student).

The students acknowledged that they felt the multi-age class was an advantage when the teacher was busy with other students as well as "it is nice to have someone else there who knows how to use the laser cutter for example, or how to do something on the computer rather than having to wait for the teacher" (Student). They felt that the act of being able to help others and accept help from others made for a friendly and accepting class environment.

Size and atmosphere

Two other advantages that were identified in the interviews were smaller class sizes and a community atmosphere. While multi-age classes often begin due to a decline in student numbers, and hence smaller classes, other teachers have identified class size as an area to be aware of. Teacher B felt that having smaller numbers of each year level allowed you to spend more time with the students and work with their individual needs. Teacher E explained, that for them, one of the advantages of multi-age classes was that students became a community and not just a class. They helped each other out and interacted in a more natural way than a traditional classroom environment due to the range of ages and experience.

Perceived challenges

Planning

An aspect that every respondent mentioned as a challenge was the level of planning required for a multi-age class. As Teacher D commented, "You won't get away with not planning in this environment, even though you have to be flexible and know that your lesson will change from what you planned, you have to have a plan initially". Two teachers highlighted the beginning of the year and the busyness of this time in terms of planning needs (Teachers A and D). The teachers explained that this part of the year seemed extra busy with a multi-age class on your timetable, as you have a range of new classes all of which you are learning about and getting set up, and then on top of that you have the multi-age class that has very specific needs.

All of the other factors mentioned as challenges can be linked to a disparity between the needs of the students at different levels. With the senior focus being on NCEA, the teachers all expressed concern that students would miss out due to the multi-age nature of the class. Teachers C and D discussed that they had concerns that older

students might miss out because younger students are more needy, and the assumption was made that the older ones knew the ropes. These two teachers also worried that the work ethic and time management issues of senior students could be modelled to younger students when they see how the older students worked.

Class size

Each of the teachers interviewed commented on class size. Discussion in this area went in both directions—too big and too small. All of the teachers recommended smaller numbers (18 students maximum was the size commonly quoted) to get a harmonious group working. Too large a class and the individuality was lost and quieter students could not shine or feel missed, but too small can also be difficult. While 18 students were noted as an ideal class size, all of the respondents acknowledged that the class size is not a fixed thing as personalities in the class are also a factor.

Student concern

Students involved in the focus group were asked what they did not like about being in multi-age classes, or what they might change, to which the students initially responded by saying there was not anything they did not like. However, after discussion in the group, one student mentioned that when they are asked to help out it can be a distraction from their own work. While they were happy to help out with peer teaching, they were aware that this can be a distraction for them and felt that it was important that students felt confident to say no if they needed to (Student). It is important to note that this is the only multi-age class for each of the students involved in the focus group. The students therefore do not have another version of multi-age teaching for comparison.

The Classroom Experience of a Multi-Age Class – Teaching Approaches and Spatial Considerations

Teaching approaches

Relationships

The teachers were asked if they felt that the roles of teacher and student changed in a multi-age classroom. Four of the five teachers felt that these roles changed and highlighted the following changes. Teacher B said, "I think you build a closer relationship with the students because you have more one on one". The teacher felt

that this allowed students to feel more connected and confident to participate and share.

Teachers B and D both mentioned that the relationships between the students changed. Teacher D explained that the reduction of focus on the year level a student is in seems to enable students to be more open to communication, and teaching, from students across year levels. Teacher E felt that the multi-age class environment enabled students to see the teacher in a different way, not just as teachers but as social beings, due to the different relationships that were built between teacher and student and that teaching and learning was shared. Teacher E stated, "I am building a community of learners and I am not the bearer of all knowledge". Teacher A said that a teacher in a multi-age classroom is "busy and needs to be resilient, patient and adaptable", while students learn "resilience, patience, problem solving, self-management, self-direction and independence".

In the focus group, students were asked to describe the role of the student in this type of classroom. One Year 13 student stated, "The Year 12s in the class are similar to us in maturity, no issues, it is a student friendly environment. Everyone talks together and it is way different to other classes". Other aspects identified by the focus group was that "lots of responsibility is given to the students to get work done and manage yourself and not being constantly pushed by the teacher" and that "you tend to ask students alongside you first before you approach the teacher which is great" (Student).

Planning

I asked the teachers if, when planning for their multi-age classes, they planned to teach them as separate classes which happen to be on at the same time, or if they consider the class to be one class made up of varying levels. All of the teachers answered that they teach them as separate classes; however, within their expansions on their answers many of them talked about the aspects in which they viewed the class as a single class entity.

All of the teachers explained that they looked for opportunities to bring the different levels or areas together to teach common skills and knowledge. Teacher C explained that they start the year with a shared starting point or focus so everyone is working on a similar topic to begin with, before they branch out into year specific work. Four out

of the five teachers commented that they used similar projects and similar deadlines across the year levels to enable them to have shared moments as regularly as possible. As Teacher D explained, "Even in a single level class we have multiple projects being worked on due to the nature of the subjects. In a multi-age version of this class we have a wider range of levels, and with that a wider range of projects, but it does still have similarities to a single level class. With individual projects you do lots of 'just in time' teaching and you look for opportunities for communal learning and bring the students together for that".

One particular area of note was that the teachers who had the most experience teaching multi-age classes (Teachers A, D, and E) were able to identify what they did more easily and could talk more specifically about their approaches than the other two teachers. The overriding feeling from all of the teachers, no matter what approaches they used, was that they did it the way they did as it was the only way they knew how to manage a multi-age class.

The students who participated in the focus group noted that a lot of the teaching took place in small groups, such as year groups, and individually. They commented that this meant that it can take quite a bit of time to get around everyone, but that because students are encouraged to help each other there is less of a wait for someone to come and help.

The teachers were also asked to consider how their teaching approaches with their multi-age classes differed from their approaches used for a single level class. The teachers interviewed found this question challenging to answer, as many of them were not consciously aware of the differences as being tangible. They knew there were differences but hadn't identified what they were. As they discussed this they began to identify some aspects.

Teacher A explained that they now take the approach of facilitator across all of their classes and that this came from their experience of teaching multi-age classes. Teacher A's feeling was that they needed to be a facilitator in their multi-age classes due to the varying levels and needs of the students and that through "having to do it", they had learnt the benefits that this approach has and as a result now apply it to all of the classes they teach.

Teacher D felt that they were more structured with a single level class and did less "just in time" teaching in that environment; whereas with a multi-age class they tended to grab those teaching moments more often. Teacher D felt that in a multi-age class you had to take the opportunity to go off on tangents to the planned direction of a lesson, as students wanted and or needed to. Sometimes "the best planned lesson can be the worst sometimes, and if you let it run the way the students want it to run it, it can be the best" (Teacher D).

Teacher E answered that there were definite differences in the pedagogical approaches that they used in their multi-age classes. In a multi-age class they always identified students who had the capacity for working with someone else and stated, "I use what I have available to help me with the numbers or one-to-one" (Teacher E). Identifying students that had the ability to work with and help others allowed this teacher to feel confident that all students were able to get what they needed in class, as "we work with a relational population who relate to people, not computers or situations, so if I am able to use a person to help someone I am going to do it" (Teacher E).

Student experience

The student participants in the focus group were asked how the multi-age environment 'felt' to them. They commented on the relaxed feel of the environment and the fact that they felt able to ask for help. The students felt that this set up worked in DVC and as it was relaxed, it was not a big deal to ask for help. One Year 11 student noted that "You can ask for help when you need it, nice environment and everyone gets along. Everyone asks for help when they need it and get the help when they need it". The Year 11s also said that it was a big contrast compared to junior years, and it felt very relaxed in comparison. One students explained that they felt "more comfortable when asking for help from someone their own age". The Year 13s felt that it hadn't really affected how they worked or helped others. They attributed this to the fact that in DVC "you are all learning the same thing, and will all end up at the same point eventually. Younger ones can end up teaching the older ones. We are all doing the same projects, just Year 13 is slightly harder" (Year 13 student).

In relation to how often the students asked for help or advice from other students in the class, the students answered that it was quite often but that it was generally from

students in their own year group or older. The students commented that having the structure of 'Feedback Friday' was also a good way to help each other out in a non-threatening way (Feedback Friday was a session that I ran in the multi-age classes where students were all asked to give feedback to at least three other students in the class via post it notes). This format was "very helpful as others might see something that you don't, so you get help without asking for it" (Student).

Spatial

When the teachers were asked about the spatial considerations of a multi-age classroom, all of the teachers were able to identify a range of factors that held importance for their rooms. Three of the teachers commented that they felt break out spaces were needed. This was to enable the teacher to bring together various groups for teaching moments and feedback as the need arose. They felt that break out spaces allowed for this without disruption to other members of the class. Teacher C explained that with their current layout, a number of students need to move in order to create a space for a specific group to meet. This means students are out of their comfort zone and the flow of the class is disrupted.

Three of the teachers explained that they lay their class out with desks in groups to encourage co-operation. The group layouts had the flexibility for students to spread themselves out and choose where they sat, while also allowing teachers to create groups for teaching or feedback needs as required. Teacher A explained that they have the desks set up in groups as "more and more the students are collaborative learners. They want to work collaboratively. But also, the feedback that I have from students who have gone on to university is that whole idea of peer assessment, critiquing, and receiving critique. I am starting to do that a lot more in my classes so that it builds resilience if they choose to go down that pathway".

Teacher E talked about student ownership of spaces within the room and student accountability for that space. They described their ideal for their multi-age classroom saying, "I would have one computer per cubicle that three students use—they can put their work up and then they become part of it. It would also allow for protection of equipment as that group would own and be responsible for that space and equipment. For that group of 3 – this is yours, it is yours to look after, you protect it and look after it, you deal with any problems, any issues then come back to me". The other four

teachers also talked about student accountability, but they focused on access to resources. Teacher A explained that in their classroom "resources are openly accessible (perhaps too much). The students need to learn to take responsibility for the equipment—if it's gone its gone".

Related to student ownership and accountability within the space was having student work displayed on the walls. Teacher A explained that there is "lots of student work up on the wall" for students to refer to and to connect students to the space.

The available physical floor area does limit what is possible. Teacher C explained that the spatial arrangement of a multi-age classroom needs to allow room for student movement from break out space to workspace, from resource area to workspace and so forth. Associated with this is the size of the desks that are common in DVC, technology, and art classes, as the paper sizes being worked on are often A3 or larger. Teacher C also commented that the surfaces of the room itself can also be constraints as these types of classrooms are often clad in hard surfaces due to the practical making based components of these subject areas and this can make for a noisy space.

Student participants were asked to identify spatial aspects that they felt were important or that they would like to change in the classroom where their multi-age class was taught. They felt that having a sofa (and related seating area) was very important as it provided a discussion space and a place to contemplate. This relates to what the teachers talked about in relation to having a breakout space. The students discussed that there had been conversations around bringing in a few of the small machine tools from the workshop to give them more possibilities with their model making, but the consensus was that the room had everything they needed and that they felt they were not limited by anything within the space.

As for what the students would remove or change about the space, responses were quite pragmatic with the students discussing that they felt that the multiple entry points into the room were a distraction as they felt that it turned the space into a thoroughfare of sorts for other people.

The students liked the storeroom that is off the space and identified that this was a high use area. The students would like to see this space become more open (remove door and open it up) as the doorway makes the entry to the space quite cramped. The

students also suggested a more open environment (remove doors) and an increase in storage within the classroom for their folders and work.

Another suggestion the students had was to change from large single person desks to smaller desks that could seat two students. These smaller desks would allow the space to be rearranged more easily with groups or areas set up for specific tasks. As one student stated, "If we had smaller desks we could arrange more, but maybe a group shared space would be better for those doing technical drawings". Circular and sharing desks were also mentioned and the students felt that "Big circles would be better than smaller circles" (Student). The students came back to the topic of the desks in later discussion, highlighting their desire for movable desks to allow them to change and control the layout of the classroom. They felt that the large desks currently in use meant that students felt an ownership of a particular desk space and when the room was rearranged this led to stress for some students.

Advice for Teachers Starting out in Multi-Age Teaching

Finally, the teachers were asked what advice they would give to teachers starting out in multi-age teaching.

Knowledge of students

Three of the respondents gave the advice that you needed to get to know the students who will be involved in the multi-age class and that this knowledge needs to cover the student's academic ability and their personality. Understanding the student's academic ability is essential, as it is important to help the structure the classroom and the teaching, but in a multi-age classroom knowing the student's personality is equally as important. As mentioned by the respondents earlier in relation to how the roles of teacher and student change in a multi-age class, building a relationship with each of the students is an important factor for success in a multi-age class.

Teacher E encouraged utilising the knowledge of the students and enabling them to teach each other. Their reasoning behind this was that it had two benefits—creating a community of learners and building the knowledge and understanding of the students concerned.

It was suggested by Teachers A, C, D, and E that having a shared task at the beginning of the year was a good way to get to know the students, to learn about their abilities, how they worked with others, and to get to start to get to know their personalities. This shared task was also seen as an important start of year structure by these teachers in terms of setting expectations of the class and the classroom.

Teacher related

In this section, all responses relate to advice given about the teacher experience in a multi-age class.

Teacher E said that they felt the need to have everyone on task but had learnt not to panic if the students seemed to be not doing something all of the time. They stated, "If someone came into my class to do an observation they would think 'Oh my god they are not doing anything'. But actually, the reality of the situation is there is down time" (Teacher E). Teacher E explained that you need to understand there is downtime as a designer, and that it will also happen in a classroom "so cut yourself some slack".

Teacher D felt that you needed to be "flexible but organised". They felt that you had to plan your lessons, have all the resources organised, know where everything is, but, be prepared to change. They stated, "You plan it but be prepared to change, but I think if you have it in your head where you are going then at least you can feel like you gave it your best shot and if things go to custard don't be hard on yourself" (Teacher D). Teacher C talked about organisation and flexibility in the same way and said "it's also about letting yourself lose control a little with some things, because some days you will feel terrible about that because I didn't see that group or I was meaning to get that but I didn't because that group took longer".

Two of the teachers suggested that it was important to let the students see that you are human and that you are a learner too. The multi-age environment changes the student–teacher relationship and the students need to understand that it is a journey everyone is travelling together. Teacher E said "You can't do everything. There is a different rhythm and you are not the bringer of all knowledge". Teacher A said "Enjoy it as much as you can. Don't go in there negative and stressed—the students will feed off that".

Planning related

Planning for a multi-age class was an area of advice given by all of the respondents. A key suggestion in this area that overlapped with the knowledge of students theme, was to start the year with a shared task. The knowledge gained from this could then be used in planning.

Teacher D said that "Being organised was crucial in a multi-age classroom as you can't fudge it. You need a plan, even if that plan changes". They explained that in a multi-age class you need to know what is going on in each lesson. You need to be prepared with specific ideas and tasks, but as mentioned in the teacher related section, flexibility is needed so that you can change that plan as the need or opportunity arises.

Teacher C suggested that teachers look for opportunities for what can be taught together across the year groups. Teacher D explained the same idea in looking to use purposeful shared moments and deliberate acts of teaching—taking the opportunity to use moments and questions from students as learning opportunities for the class or sections of the class.

Creation of the class

The common thread across all of the teachers was related to the size of the class and all suggested that a teacher of a multi-age class needed to control class size. The suggested size specified by four of the teachers was 18 students. Their justification for this was that if the class was too large it became too difficult to manage, but they also warned of classes that were too small. Teacher C explained that "If the numbers are too small it becomes a bit flat and feels slow because they can't feed off each other". Teacher E explained that "too many students can mean that quieter students don't shine… so the personality of the student is something that you have to be aware of… It's not a fixed number as the personalities matter".

Finally, the teachers were asked if they would choose to teach multi-age classes or single level classes. All of the teachers interviewed could see the benefits of a multi-age class. Teachers A and D both felt it was dependent on level and size when it came to multi-age classes. They both preferred to have the Year 11 group as a single year level but for Years 12 and 13 they could see the benefits of small multi-age classes.

Teacher B could see that there were advantages to both options but admitted it was easier to teach a single level. Teacher B also said "Ask me again in a year", as they were going into more defined multi-age class setting for the 2019 academic year. Teacher C preferred separate classes but would choose to combine them if the numbers were small in order to achieve a better class dynamic.

Teacher E said that they would definitely choose to have multi-age classes; however, felt that more time was required and suggested double lessons as an option for this. Teacher E said that "Multi-age classes support a community atmosphere. In a family we are multi-age, as a workplace we are multi-level—so why do we separate out at school?".

Summary

Chapter 4 presented the information gathered from the interviews of teachers who have experienced multi-age classrooms and from the focus group of students from a multi-age class taught by the researcher. To gain further clarification of information gathered by the facilitator of the focus group, a discussion of the transcript was held between me and the facilitator and this conversation is also reflected in the information presented from the focus group. There have been direct quotes used, as well as paraphrasing in order to summarise responses.

CHAPTER 5: DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

Introduction

This chapter presents the overall findings from the interviews and focus group in relation to the literature review, and the implications of these in relation to the three research questions. This is followed with recommendations for future multi-age practice, the limitations of the study, and recommendations for future studies.

What is the Philosophy Behind Multi-Age Teaching at Secondary School Level?

To understand the philosophy of multi-age classes in a New Zealand secondary school DVC context, it is important to understand why these classes are created. The literature indicates that multi-age classes tend to be created for two very different reasons, namely economic or philosophical (Veenman, 1995). Multi-age classes created due to economic reasons are often created out of a necessity arising due to situations such as school budgets, student and teacher numbers, and the spaces available (Broome et al., 2015). It is an administrative way of addressing staffing, enrolments, or uneven class sizes (Proehl et al., 2013). All of the teachers who participated in this study identified that a decline in student numbers or timetable clashes for students had been the original motivators behind the introduction of multi-age classes in their subject area. Four of the five teachers viewed the creation of their multi-age class(es) as a pragmatic decision that allowed the subject to continue and for students to have access to the subject.

In contrast, multi-age classes created by philosophical choice are formed deliberately and for their perceived educational benefits (Veenman, 1995). For multi-age classes set up because of philosophical choice, educators believe it is in the best interests for the students' development and focuses on the individual student's talents, needs, and interests (Proehl et al., 2013). While Teacher E explained that the initial impetus behind the creation of their multi-age classes came from student numbers for the subject, their explanation leaned more towards Veenman's (1995) philosophical choice reason. While the decision began for pragmatic reasons, it was also a proactive choice for that teacher and the opportunities that they saw with multi-age classes

meant that they could continue with that structure each year regardless of class numbers now, due to what they perceive as advantages.

The students involved in a multi-age class understood that the reason behind the creation of multi-age classes was so that students were able to continue with that subject in a way that fitted into the school's timetable needs and the student's own needs.

Broome (2014) found that teachers in their first five years of teaching had a higher percentage of uncertainty around multi-age classes, which he proposed may be due to them not having a range of personal experience to draw from. All of the teachers who were interviewed in this study were very experienced classroom teachers, with between 14 and 30 years of teaching experience. Each of these teachers had taught a multi-age class for at least one year. Broome re-examined his 2009 data to look at the level of experience a teacher had and whether they were supportive of multi-age classes. The level of support for multi-age classes indicated by teachers peaked for those teachers with six to ten years of teaching experience (75% in support), and for teachers in Broome's study who were within the same range of teaching experience as the teachers in this study, Broome found that 60% supported multi-age classes. From the responses gathered in this study, I found that all of the teachers could see the benefits of multi-age classes; however, there were conditions around this. When the teachers involved in this study were asked if they would continue to support multi-age classes 40% of the respondents would choose to use multi-age classes for Year 12 and 13 students if necessary, 40% would prefer to keep single level classes, and 20% would always choose multi-level.

What are the Challenges and Advantages for Teachers and Students in a Multi-Age Class?

This study outlined a number of advantages and challenges in implementing multi-age classes in a secondary school context. These include both academic and social aspects. These will be discussed in detail below.

Advantages

Academic

All of the multi-age class advantages identified by the participants in this study related to the experience of the students who were members of the class. Both the student and teacher participants observed that younger students got to see what the older students were doing, and felt that this was an advantage as it allowed students to gain access to skills and knowledge at an earlier stage than they would have otherwise. The younger students looked up to the older students and aspired to emulate them. The students in the focus group commented that they got to see where their learning will lead them. Veenman (1995) identified this as the greatest advantage of multi-age classes for younger students. The teachers felt that the challenges that this provides the students prepares them for future learning and helps them to achieve at the highest level they can. The students' point of view echoes that of the teachers in this aspect, with the students commenting that having the Year 13 students' class work as exemplars helped them to see where what they themselves are doing leads. This ability for the students to see the work in progress as exemplars with the actual students in front of them is much more real for the students and they can see the possibilities for themselves.

The experience the younger students obtained in a multi-age class can also be an advantage for the senior students. A competitive aspect is inspired in the older students due to the different levels of skill evident in a multi-age class. Older students are encouraged to further extend and challenge themselves in order to stay ahead of the younger students in the class. This is a different type of competitiveness than that identified in the literature, as it is directed at oneself, a desire to do better, rather than being an externally positioned competitiveness between two people. The literature related to multi-age at primary school level by Veenman (1995) and Krockover et al. (2000) identified a reduction in competitiveness due to the time spent in a multi-age class and the resulting relationships from a more student-centred approach. The age differences between the primary school students in the literature and the secondary school students in this study is likely the reason for the difference between the literature and this study. For the teachers and students in this study, the competitiveness experienced in a multi-age class appears to be an advantage.

Mulryan-Kyne (2004) suggested that multi-age classes give low achieving students the chance to interact with materials from more junior levels, which can help them consolidate their learning, and for older students there is constant revision opportunities as teachers present new content to other students that they have already learnt. It also provides an opportunity for these students to gain confidence and leadership skills by helping younger students. While this research was conducted at the primary school level, it appears to still hold true in a secondary school context. As discussed previously, the teacher and student participants identified that seeing what other students are doing gives them the opportunity to be challenged and learning higher level skills earlier. This aspect goes hand in hand with the reverse, which is the repeated access to knowledge and skills as they are taught to students at other year levels. This is an advantage for students on a number of levels, from helping lower achieving students by giving them the opportunity to interact with the knowledge on a number of occasions, to consolidating and developing deeper understandings for older students as they interact with the learning again in a different way, as they help other students with their learning.

Students explained that an advantage for them was being able to learn from each other—sharing knowledge and ideas. They spoke of how in a multi-age class they felt comfortable asking other students for help when the teacher was busy. As well as the convenience of being able to get help from a range of sources, they also appreciated the variety they gained by asking a range of people for help and opinions. When the student acts as a teacher it helps them consolidate their own learning and gives them confidence in their own ability. This peer teaching aspect is something that builds as the year progresses, as students become confident with each other and with their own ability. Krockover et al. (2000) and Veenman (1995) both noted that peer teaching builds the confidence of students who take on this role, while also encouraging positive peer relationships and helping students recognise diversity. The teachers interviewed agree with the literature and the students' perspective on peer teaching. Teacher E explained that students can use common language and experiences when explaining a concept to their peers, and can relate the learning to experiences that we as teachers have no idea about. The students have the ability to encourage each other and get peers back on track, just as easily as they can distract each other. From the student perspective, peer teaching featured as both an advantage and a challenge related to

multi-age classes. Students identified that being asked to help out their peers could at times be a distraction to them as it shifted their focus away from their own work. While they enjoyed being involved in peer teaching, they felt it was important that they had the confidence to say no and prioritise their own learning tasks when they felt this was necessary.

Social

In senior DVC classes (multi-age and single level), students often have the same teacher over the course of their senior years. The relationships that are built between students and teachers over this time are important and having students for longer than one year gives teachers time to learn what they need and how they learn (Mulryan-Kyne, 2004; Proehl et al., 2013). Proehl et al. (2013) state that knowing the students and building relationships with each of them gives the students confidence that the teachers care about them and enables the teacher to differentiate instruction to the student's needs. The teachers in this study supported the idea that the relationships developed with students were important in a multi-age class and were perhaps closer. The teachers attributed this to having more one-to-one interaction in a multi-age class than in a single level class. These relationships mean that students feel more connected and this may help them feel more confident to participate in class and share ideas. This in turn may encourage students to ask for help more regularly to help them improve their understanding and knowledge. With the focus being on the student and the relationship with them, rather than on their year level, communication becomes easier. The relationship that is built also means that students see their teacher in a different way, the teacher becomes a person, rather than simply the teacher.

In the primary school settings that Mulryan-Kyne (2004) studied, she reported that participants felt that the interaction students in multi-age classes had was good from a social perspective, as they learned to cooperate and get along with a wider range of ages. She also notes that there is some concern that older students may be disadvantaged socially and academically due to having to share a teacher with younger students. The students in this study seemed to refute this when multi-age classes were considered at secondary school level. They felt that the developmental differences between ages levels out by senior secondary school, and as a Year 13 student stated, the maturity levels across the class seemed similar. Students form

relationships with a wider variety of people than is usual in a single-age class, and once the multi-age class was established, the students felt comfortable and confident talking to the others. The students in this study described their class as a student friendly environment. A multi-age classroom allows students to develop strong relationships with their peers and teacher, because they are together for at least two years (Proehl et al., 2013). The students identified the relationships that they develop between themselves as an advantage to multi-age classes. They liked the variety of students they got to know and talk to. The relationships the students built with each other meant that they felt able to ask for help from their peers and to also accept help in return. The older students in this study indicated that they looked forward to seeing what the younger students did in future years and sharing their own journeys. As new students enter the multi-age class each year, those who are already established in the environment can introduce new students to the culture of the classroom, with younger students encouraged to look up to the older students for support and guidance (Proehl et al., 2013).

Community spirit

In a study closer to the context of a DVC classroom, Broome (2009a) looked at multi-age use in relation to art classes. He found that the community spirit formed in multi-age classes was visible in a cooperative attitude, and that the traditional hierarchy of teacher to student changes as students recognise themselves as teachers and teachers as learners. This community spirit transfers to student attitudes with Broome (2009a), Miller (1990), and Pavan (1992) all finding that students' attitudes toward school and themselves is better in multi-age classes. In this study, Teacher E explained that a multi-age class becomes a community, not just a class. They felt that students help each other out and interact in a more natural way and believed that this was due to the wider range of ages and experiences within one class. The students referred to this community spirit also in their comments about the relationships between students and how they related to their teacher. Teacher E stated that "multi-age classes support a community atmosphere. In a family we are multi-age, as a workplace we are multi-level—so why do we separate out at school?" In a multi-age class, students learn to see themselves as a learner in a different way and get to share their knowledge and understanding with others in a different way. Perhaps it is also

more representative of the real world, and is something that could support their transition into the working world they will enter?

Class size

Class size featured both as an advantage and a challenge for teachers. For the teachers in this study, small class numbers for single year classes meant that multi-age or combined classes would be created. The resulting multi-age classes then also tended to be smaller. Teacher B commented that having smaller numbers allowed the teacher to spend time with the students and to then work with their individual needs. The concern expressed by teachers was that when the classes get too large, a multi-age class becomes dramatically more challenging to teach and manage and teachers worry that students then miss out. Class size will be discussed again in the advice for teachers section.

Teacher challenges

The challenges identified by teachers tended to relate to the behind the scenes aspects of multi-age teaching. These are the things that make multi-age teaching different from that of a single level class. Some of these factors are common across teaching; however, the teachers interviewed in this study felt that these factors became more important when applied to a multi-age class.

Planning

Veenman (1995) noted that teachers believed that there is more work, planning, and preparation involved in a multi-age class. The teachers in this study supported this statement in their contributions and identified the level of planning required for a multi-age class as a challenge. The overall feeling was that multi-age teachers had to plan, and plan for every possibility, but also be prepared to deviate from that plan as the need or opportunity arose. Two particular pressure points for planning stood out from the interviews with the participating teachers—planning for the needs of all levels and planning for the start of the year.

Quail and Smyth (2014) noted that multi-age teachers reported a higher planning workload due to needing to address the diverse needs of the class and the associated need to differentiate materials and activities for the different ages and stages. All of

the multi-age class teachers interviewed taught classes comprising senior secondary school students, where the focus for students was on the NCEA assessment related outcomes and all of the teachers interviewed expressed concerns that students would miss out due to the wide range of ages, levels, and abilities in one class. The planning associated with meeting the needs of all levels within the three NCEA levels, is time consuming and challenging for the teachers involved. Mulryan-Kyne (2004) found that teachers she studied were concerned that the quality of the teaching and learning was actually compromised by the demands of the organisational and instructional planning needed to keep everyone on task in a multi-age class.

The beginning of the year was highlighted as the most important, and most challenging, time of year in relation to planning for a multi-age class. All of the classes on the teacher's timetable at the beginning of the year are new to them, and they need to get to know each of these classes and get them set up. Teachers also have one or more multi-age classes to also get to know and the specific challenges of having a two to three different year levels to work with at one time.

Developmental differences

The challenge of planning leads into the diversity of student knowledge and experience within a multi-age class and having time to work with the different levels. Broome's (2009a; 2014) multi-age art study identified the many different developmental levels as an area of concern. In contrast, research of New Zealand primary schools by Wilkinson and Hamilton (2003) found that the developmental differences in the classes studied was actually very similar between single level and multi-age classes. Wilkinson and Hamilton (2003) noted that teachers perceived there was a wider range of abilities in their multi-age classes and Wilkinson and Hamilton attributed this to teacher expectation. In this study of New Zealand secondary school DVC teachers, the developmental differences mentioned were linked to the needs of the various levels of NCEA. Teachers expressed concern around ensuring that each year level received the attention and the specific skill instruction that the students required. Teachers worried that the students missed out due to the multi-age nature of the class. Related to the context of secondary school, teachers also expressed concern that work ethic and time management issues that may be exhibited by

students with the independent focus of DVC, could be negatively modelled to the younger students.

What Strategies Enable the Effective Use of Multi-Age Classes?

Krockover et al. (2000) said that teachers in a multi-age classroom need to change their focus from teaching the curriculum to teaching children. Stone (2010) explained that multi-age classes have different rules to that of a single grade class, and that different strategies and organisations are needed. Teachers in this study identified a range of areas where they felt they used different approaches with their multi-age classes.

The place of teacher and student

Teachers in this study felt that the roles of teacher and student change in a multi-age class. As explained in the advantages and challenges section, the relationships between students and teacher, and students with other students change due to the nature of a multi-age classroom, and the roles of student and teacher change also. The relationships built due to increased one-to-one interaction between students and teacher can allow the students to feel more connected and confident, increasing their ability to participate and share in class. It also means that students get to know the teacher in a different way and see the teacher as human. Teaching and learning become a shared endeavour between students and teacher.

The peer to peer relationships between the students also alters. As discussed previously, the removal of year levels helps to open up communication and this allows students to take on the role of a peer teacher. Pardini (2005) found that students in a multi-age class are encouraged to be independent and to share their learning with others. The students in this study agreed with this idea and said that students were given the responsibility for the management of their own work and that part of this responsibility was helping each other.

Opportunities and shared moments

Multi-age teaching involves structuring learning to the needs of the individual students, with the information and skills being learned in a context that is meaningful to the student (Hoffman, 2003). The teachers in this study all explained that they looked for

opportunities to teach common skills and knowledge across the year levels or groups in the multi-age class, often beginning with a shared focus before they branched out into their independent work. While the nature of DVC means that student work is independent, the teachers all noted that they tried to use similar contexts and deadlines across the year levels to enable them to have shared moments as regularly as possible. The student participants noted that a lot of teaching takes place in small groups and one-to-one due to the needs of the projects being worked on and the skills and knowledge needed by individuals at that particular time. They did comment that this does take a lot of time, but the peer teaching opportunities within the class assisted with this.

The teaching approaches used in a multi-age class can transfer over to single level classes as well. Taking on the role of facilitator was an approach that Teacher A felt was a necessity in their multi-age classes due to the wide range of levels in the class. Hoffman (2003) found that multi-age teachers are facilitators of learning and see each student as an individual, their personality, and their learning style, rather than focussing on their year level. The experience of acting as a facilitator in the multi-age classes showed this teacher how they could use this approach to their benefit in their single level classes as well.

The overall feel of the classroom changed with a multi-age class also. Teachers identified that they were more structured in their approach to single level classes, while in a multi-age class they recognised that more flexibility was needed. With the wide range of abilities in the class and the needs for different levels in terms of knowledge and assessment, the structure also needed to change and move to suit the class, at that moment. Demonstrating and teaching new skills often happens in small groups (Broome et al., 2015; Hoffman, 2002), and from the point of view of the teachers in this study, occurs from looking for opportunities and moments within projects to teach new skills with groups created based on the readiness and interest of the students. For some students this gave them the opportunity for skills and knowledge to be consolidated, while for other students it was an opportunity for acceleration. Broome et al. (2015) note that these groups allow younger students to observe older students, while older students get to experience leadership opportunities by helping to lead groups and teach skills.

Spatial aspects

As part of the teaching approaches used by teachers in a multi-age class, this study sought to find out how the teachers interviewed arranged their classroom spatially, and what areas they and the students considered to be important to how they work with their multi-age classes. The spatial arrangement part of how a multi-age class operates.

The most important consideration identified by the teachers interviewed in setting up the room is that it needs to cater to not just a multi-age class, but also any other classes that use the space. Often there is a mismatch between the needs of junior classes and those of senior classes, regardless of whether it is multi-age or a single level. Specialist technology classrooms are used by all year levels, multiple teachers, and occasionally multiple subject areas. An example of the difference in needs between junior and senior classes is the number of students. Junior classes tend to be larger and so the layout of the room needs to be able to accommodate the largest class being taught in it. The needs of the other classes that use the space need to be weighed up, and the set up that suits the majority implemented. Heins et al. (2000) found in the environments they studied, that the furniture was frequently rearranged to suit the needs of the class at that moment in time. While the teachers in this study mentioned rearranging furniture to suit the class or topic, the reality given the scale of the furniture used in a DVC classroom is that rearranging the room is a major undertaking. This means that some of the identified areas teachers would like to use cannot be implemented.

Two of the teachers interviewed also discussed that the rooms they were teaching in were originally designed for classes of 24, while they are now needing to accommodate 28–30 students in that same space. Some DVC teachers were teaching in purpose built rooms, designed to accommodate the larger scale furniture that a DVC class requires, but many of the teaching spaces in use were ones that were not originally designed or built for this type of class.

The spatial layout of the classroom needs to allow movement between areas, for both students and teachers. Stone (2010) explained that multi-age environments need well planned spaces that are open and have access to different types of learning areas (for example learning centre and project areas). With the increased use of small groups

for teaching in a multi-age class, teachers felt that having breakout spaces would be a good idea. Having a space that could be used for small group teaching, without needing to move students around in the class, held a lot of appeal to the teachers interviewed, as they felt being able to minimise disruptions to students during the course of a lesson was important. The students who participated in the focus group were in a purpose built DVC room for classes. They identified the breakout area that had been set up in the room as an important space for them as it provided room for small group teaching and discussion, as well as space for contemplation when they need it.

The furniture used in a multi-age classroom needs to allow for flexibility so that it can be organised to provide different groupings for interaction and collaboration (Hoffman, 2003). Group seating arrangements were the preferred option by teachers, with the intention of encouraging cooperation and making peer teaching opportunities easy for students. In the focus group, the student participants expressed that they liked the idea of having tables (rather than desks) that were easy to move to make changing the layout of the room easier. As part of this, the students they felt that tables that sit two or more students would be better at making this possible compared to single person desks. Eighmy and Ritland (2012) support this with their suggestion that tables should be used as they promote cooperative learning and make it easy to rearrange groups to meet the students' interests and abilities.

Krockover et al. (2000) recommended that students have the opportunity to display their work in the classroom and suggested that this is a way to increase student pride and motivation. The feeling of student connection to the space was mentioned by teachers as of importance, and they also related this to responsibility and accountability for both the space and resources through the display of their work and access to all areas. At a secondary school level where students are moving from class to class during the day, being able to connect them to the space by having student work displayed allows them to feel that the space is theirs.

This ownership of the space also ties into the easy access of resources. Students and teachers agreed that having easy access to resources was important in a multi-age class. It removed a responsibility from the teacher and meant that they were less likely to be interrupted when helping students with requests for resources, and it hands

personal and community responsibility to the students for the care of the resources provided for their benefit.

Recommendations

The recommendations from this study are in the form of advice for teachers who are embarking on a multi-age classroom journey for the first time.

Advice

As much of the literature notes, there is no specific professional development or training in teacher education programs that focuses on teaching strategies for a multi-age class (Eighmy & Ritland, 2012; Miller, 1990; Quail & Smyth, 2014; Veenman, 1995; Song et al., 2009). Embarking on a multi-age teaching journey can be a daunting journey, one that feels that you are entering uncharted water, as in many schools the teacher undertaking this change to their teaching does so in isolation. Being able to access advice from teachers who have experience of multi-age teaching will make the experience easier for teachers who are new to it. The following section discusses the advice that the teachers who participated in this study would give to other teachers embarking on a multi-age class journey.

Class size

The first piece of advice from teachers was to be in control of the size of the class. The teachers interviewed all suggested that teachers entering into a multi-age class situation needed to be aware of class size and warned of both too big and too small class sizes being less than optimal. Veenman (1995) reported that school principals in his study felt that the optimum number of students in a multi-age class was 20, while Mulryan-Kyne (2004) suggested a maximum size of 15. All of the teachers interviewed in this study recommended smaller class sizes and their suggested ideal class size was 18 students. The teachers also discussed the fact that this number needs to be flexible as the personalities in the class need to be taken into consideration for the class to work harmoniously. If the class is too large, individuality can be lost, and quieter students can be overlooked. On the other hand, if the class is too small it can also be problematic. Too few students, or an odd mix of students in the class, can mean that there are not enough people to bounce ideas off and this can be just as difficult as having too large a class.

Relationships

The second piece of advice was to get to know your students as learners and as individuals. While the teachers acknowledged that it is important to understand the individual student's academic ability, they felt that in a multi-age class it is just as important to know the student's personalities. The depth of relationship this creates between the student and teacher allows students to feel connected and understood and this knowledge will in turn help teachers to meet the varying needs (learning and social) of the students. This advice echoes the findings of Hoffman (2003) and Proehl et al. (2013). Hoffman found that teachers need to understand the student's learning style and personality, and that students need to understand this about their peers and teacher in return. Proehl et al. (2013) felt that knowing the student helps the teacher with their ability to differentiate the instruction for students and that it also gives the students confidence that the teacher cares about them and their needs. As a way to develop this understanding of the students, the teachers suggested having a common task for all the students within the multi-age class. They felt that this gave them an opportunity to engage with the students and learn about who they were as both learners and people.

Planning

The third piece of advice related to planning. Planning was identified by the literature and the participants in this research as an area of challenge in a multi-age class; however, it is also a vital component of teaching. Veenman (1995) and Quail and Smyth (2014) both noted that multi-age teachers reported a higher workload due to preparation and planning for a multi-age class. This workload is created by the planning requirements of a multi-age class which sees teachers needing to have activities that can be modified and adapted for the different abilities and learning styles of the students in the class (Hoffman, 2003), and differentiating the class materials to suit the different ages and abilities (Quail & Smyth, 2014). The teachers in this study felt that a teacher's knowledge of students in the class was a vital aspect of planning in a multi-age class, with the need to teach a wide range of students and skills, all at the same time. Differentiating the work, having a range of tasks, and knowing who you can call on to assist other students are all vital aspects of planning for a multi-age class.

As part of planning, teachers identified that being organised is an imperative part of teaching a multi-age class. You need a plan for the lesson, but you also need to be flexible enough to change and adapt as you go. If the opportunity arises to change your plan, or if the lesson is not going according to plan, then you need to be ready to change and to accept that this is part of the multi-age teacher role.

The teachers suggested looking for opportunities for skills and knowledge that can be taught together across year groups as a useful approach for the multi-age teacher. As is the use of what Teacher D called "purposeful shared moments and deliberate acts of teaching". All year levels will have knowledge and skill needs in common, and finding the opportunities in your planning to teach these together for the students allows you to use the knowledge and skills of the more experienced students in the class to assist the students and to extend everyone's knowledge.

Teacher related

The final piece of advice is for the teacher as a teacher. The interviewed teachers identified that as a teacher of a multi-age class, you need to understand there are times when you feel like you are not able to get to everyone and will worry that not everyone is on task. Teachers must trust themselves and their students. A teacher may have planned for the lesson, but as Teacher D explained, in a multi-age class you need to be "flexible but organised". The lesson is planned, the resources are prepared, but the students might need you to focus on something else with them during that lesson. Taking a detour as the students require focuses on their real time needs, rather than the schedule of events the teacher may have in place.

The teachers also emphasised that it is important for the students to see the teacher as human and to identify yourself as a learner within the class. The multi-age class structure means that it is important that everyone understands they are a part of a journey and that it is one being undertaken by all members of the class. A multi-age class is a community that everyone has a place in, and that it can change from lesson to lesson. A teacher cannot do it all, and cannot be all things at all times. Teacher E explained that the teacher is only one source of information and sharing that responsibility with others is part of the journey.

Limitations

The findings in this study are limited in a number of ways. The study focused on a small group of teachers in one region of New Zealand, and a small group of students who had been part of a multi-age class in one school. As such, the findings are specific to this group of participants and their schools. All of the participants in this research were volunteers and it is possible that students and teachers for whom multi-age teaching was a less favourable option chose not to participate.

The findings around the creation of multi-age classes are based on the perceptions of the teachers involved in this study. This limits the study's findings because it is solely based on the views and opinions of a small group of teachers and students.

Another possible limitation in this study was the fact that it was practitioner research. Although efforts were made to ensure the teacher participants openly shared their opinions and views of multi-age teaching, it is possible that pre-existing relationships could have affected the accuracy of the responses and how they were perceived. Because the focus group comprised of students that were in my multi-age classes during the period of the study, the focus group was run by another teacher and transcribed by a third party. The inclusion of these steps to assure the confidentiality of the student participants could affect the accuracy of the responses and the way I perceived the responses when reading the transcript.

Recommendations for Future Studies

Multi-age classes in New Zealand secondary schools are still in their infancy and this study focused on multi-age classes in one region of New Zealand where they were created due to the needs of small to medium size schools. This study did not include school leadership or community voice. For these reasons, I suggest the following as areas worthy of further research:

1. A study of multi-age classes across New Zealand secondary schools to more fully establish understanding of the advantages and challenges of multi-age teaching.

2. More in-depth research on the characteristics of successful multi-age classes in New Zealand schools and the impact these classes have on student achievement and engagement.
3. Research that includes school leadership and school community understanding of multi-age teaching in a secondary school context.
4. Development of resources to help schools and teachers who are planning to implement multi-age classes.

Final Word

This research was driven by my interest in multi-age classes in a secondary school setting. I found myself implementing a multi-age approach in my senior DVC classes and my perception was that this was an increasing common situation for colleagues in my subject area. The research intended to identify characteristics and successful approaches according to students and teachers, in the hope of helping other teachers who embark on this journey.

Personally, I have gained a vast amount of knowledge relating to multi-age teaching, and an appreciation of the work and effort that teachers undertake in implementing these types of classes. I was also surprised by how closely the existing literature that focused primarily on primary school multi-age classes correlated with this study.

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APPENDICES

Appendix A: Participant Consent Form – Teachers

CONSENT FORM – ADULT PARTICIPANTS

RE: Master of Applied Practice

THESIS TITLE: The landscape of teaching and learning in multi-age, multi-subject classes in a New Zealand secondary school

RESEARCHER Jan Garbutt

Participant's consent

I have been given and have understood an explanation of this research and I have had an opportunity to ask questions and have had them answered. I understand that neither my name nor the name of my school will be used in any public reports. I also understand that I agree to this interview being recorded. I understand that I will be provided with a transcript of the interview for verification and that I may withdraw myself or any information that has been provided for this project up to two weeks after the return/confirmation of my verified transcript.

I agree to take part in this project.

Signed: _____

Name: _____

Date: _____

UREC REGISTRATION NUMBER: (2018-1030)

This study has been approved by the Unitec Research Ethics Committee from 9/7/18 to 9/7/19. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 8551). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix B: Participant Consent Form – Students

![Unitec Institute of Technology logo]

CONSENT FORM – CHILD/MINOR PARTICIPANT

RE: Master of Applied Practice

THESIS TITLE: The landscape of teaching and learning in multi-age, multi-subject classes in a New Zealand secondary school

RESEARCHER: Jan Garbutt

Participant's consent (signed by caregiver)

I have been given and have understood an explanation of this research and I have had an opportunity to ask questions and have had them answered. I understand that neither my child's name nor the name of the school will be used in any public reports. I also understand that I may withdraw my child at any time prior to the running of the focus group. I understand that we will be provided with a transcript to check before data analysis is undertaken.

I agree that the child/minor named below may take part in this project.

Name of child/minor: _____

Signed: _____ (caregiver)

Name: _____ (caregiver)

Date: _____

UREC REGISTRATION NUMBER: (2018-1030)
This study has been approved by the Unitec Research Ethics Committee from 9/7/18 to 9/7/19. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 8551). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix C: Participant Information Sheet – Teacher

Information for participants

Research Project Title
The landscape of teaching and learning in multi-age, multi-subject classes in a New Zealand secondary school

My name is Jan Garbutt. I am currently enrolled in the Master of Applied Practice degree at Unitec Institute of Technology and seek your help in meeting the requirements of research for a Thesis course which forms a substantial part of this degree.

Synopsis of project
As a secondary school teacher who is experiencing a change in the landscape of my classes from a single level, single class environment to one that sees classes that include a range of year levels and subjects in one space at one time I am interested in what this change means to teachers and students. This project will look at teacher and student experiences in a multi-age and/or multi-subject class.

I request your participation in the following way. I will be collecting data using an interview schedule and would appreciate being able to interview you at a time and venue that is mutually suitable. I will also be asking you to sign a consent form regarding this event. The expected duration of the interview will be one hour. I will be recording your contribution and will provide a transcript (or summary of findings if appropriate) for you to check before data analysis is undertaken. You will be asked to verify this within a week of receipt of the transcript.

Neither you nor your school will be identified in the thesis. I do hope that you will agree to take part and that you will find this participation of interest.

Please contact me if you need more information about the project. At any time if you have any concerns about the research project you can contact my supervisor: Stephanie Sheehan, phone 09 892 7692 or email ssheehan@unitec.ac.nz

UREC REGISTRATION NUMBER: (2018-1030)
This study has been approved by the UNITEC Research Ethics Committee from *9/7/18* to *9/7/19*. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 8551). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix D: Participant Information Sheet – Student

![Unitec Institute of Technology logo — Te Whare Wānanga o Wairaka](logo)

Information for participants

Research Project Title
The landscape of teaching and learning in multi-age, multi-subject classes in a New Zealand secondary school

My name is Jan Garbutt. I am currently enrolled in the Master of Applied Practice degree at Unitec Institute of Technology and seek your help in meeting the requirements of research for a Thesis course which forms a substantial part of this degree.

Synopsis of project
As a secondary school teacher who is experiencing a change in the landscape of my classes from a single level, single class environment to one that sees classes that include a range of year levels and subjects, in one space, at one time, I am interested in what this change means to teachers and students. This project will look at teacher and student experiences in a multi-age and/or multi-subject class.

I request your participation in the following way. Miss Rose will be conducting a focus group interview of students who are experiencing multi-level or multi subject classes in Technology in 2018 and I would appreciate your contribution as a member of the group. I will also be asking you to sign a consent form regarding this event. The focus group interview is planned to take place in the Travers Centre meeting room, during spell 4 on the 7 September. This time has been selected as it is a study line for year 12 and 13 students and rec line for year 11's.

If you agree to participate, you will be asked to sign a consent form. This does not stop you from changing your mind if you wish to withdraw from the project. Your parent/guardian can also ask for you to be withdrawn. However, because of the schedule, any withdrawals must be done before the focus group takes place.

Neither you nor the school will be identified in the thesis. Your contribution in the focus group will be recorded and I will provide a transcript (or summary of findings if appropriate) for you to check before data analysis is undertaken. I do hope that you will agree to take part.

Please contact me if you need more information about the project. At any time if you have any concerns about the research project you can contact my supervisor: Stephanie Sheehan, phone 09 892 7692 or email ssheehan@unitec.ac.nz

UREC REGISTRATION NUMBER: (2018-1030)
This study has been approved by the UNITEC Research Ethics Committee from *9/7/18* to *9/7/19*. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 8551). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix E: Interview Schedule – Teachers

Title: The landscape of teaching multi-age classes in a New Zealand secondary school.

Aim:

1. To investigate the philosophy behind the implementation of multi-age teaching at secondary school level
2. To investigate the challenges and advantages for teachers and students in multi-age classes
3. To recommend strategies for the effective use of multi-age classes

Guiding Questions:

- How long have you been a teacher?

- You are teaching a mixed level class this year or have taught one in the past. What circumstances led to this happening?

- How many mixed level classes do you have this year?

- What is/was the make up of this class/es?

- What year levels have you experienced multi-level classes with?

- In terms of your planning for these classes do you teach them as separate classes who happen to be on at the same time, or do you consider them as a single class (one project/topic) with varying levels within it?

- Why do you choose to teach the class in that way?

- What do you see as the advantages of teaching a mixed level class?

- What do you see as disadvantages?

- Do you think they roles of teacher and student change in this environment?

- How?

- Examples?

- How does your role as teacher change? Describe your role as a teacher in this space?

- Describe the role of the student in this space?

- Make a quick sketch of your classroom layout for me.

- Can you please indicate for me any areas that you feel are important in your management and organisation of a multi-level class

- Describe how you set up your classroom space.

- Does your room also need to work for single level classes?

- What constrains you in your layout?

- What is your ideal set up for your classroom?

- How do the techniques you use in your multi-level classes differ from those in a single level class?

- What advice would you give a teacher who is teaching a multi-level class for the first time?

- Would you choose to have classes that are multi-level or would you prefer to have single level classes?

Appendix F: Interview Schedule – Focus Group

Focus Group Guiding Questions

Date:

Time:

- Introductions
- The purpose of this focus group is to find out about what your experience of a multi-level class has been like. In its simplest explanation a multi-level class is one that includes students from a range of different year levels in one class at the same time. Students work at the level relevant to them but within an environment where they can work with and learn from students of other years.
- How many of you here are students who are technically 'offline' in your DVC class? For example, you are a year 11 in a year 12 class, or year 13 in a year 11 class.
- Are any of you in multi-level classes or 'offline' in any of your other subjects? Is so what is the subject?
- What lead to you being 'offline'?
- All of the senior DVC classes have some form of 'multi-level' to them this year. Now that you have been part of these DVC classes for a while what do you think about it?
- What do you like about it?
- What don't you like?
- What would you change?
- What do you think are possible advantages for you as a student in a multi-level class?
- What do you think are the possible disadvantages?
- If you are one of the 'offline' students in your class what was it like for you at the beginning of the year?
- What is it like now for you?
- How do you think the role of the teacher changes in a multi-level class?
- Examples?
- In what ways do you think the teaching is different in a multi-level class?

- Describe the role of the student in this space?

- How often do you help others students in the class?

- How often do you ask for help or advice from other students in the class?

- What does this feel like for you?

- What is it like for you as a student?
    - As a year 13?
    - As a year 12?
    - As a year 11?

- You have been given a drawing of the classroom – can you mark approximately where you sit or the various areas that you sit if you move around.

- What other areas do you use in the class? (Note them on your classroom plan, discuss as a group)

- What would you add?

- What would you remove?

- What would be your ideal set up? - Discuss what they would like to see/sketch on plan

- What type of furniture would you like to see used in this type of class? (desks, tables, easy to move……)

Two options have been trialled in your multi-level classes:
1. Separate structure/projects for each year level
2. One theme (same topic and brief) at all levels with tasks scaffolded to different levels

- Which option did you prefer?
    - Why?

- Thinking about you personally, what do you think would be the best multi-level structure for you? *Leave open for discussion but if they are looking confused here are some options to think about/discuss:*
    - All year levels same theme
    - Different projects for different level – same theme but different brief or different themes/briefs

- o Focus on common skills with students working on individual brief within area of interest or passion for them (i.e. want to be an architect so focus on architecture as context….)

Full name of author: Jan Garbutt

ORCID number (Optional): ....

Full title of thesis/dissertation/research project ('the work'):

The landscape of teaching multi-age classes in a New Zealand secondary school

Practice Pathway: CISC 9090

Degree: Master of Applied Practice

Year of presentation: 2019

Principal Supervisor: Jo Mane

Associate Supervisor: Hayo Reinders

Signature of author:

Date: 24 August 2019

Unitec
Institute of Technology
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Declaration

Name of candidate: Jan Garbutt

This Thesis/Dissertation/Research Project **entitled**

The landscape of teaching multi-age classes in a New Zealand secondary school

is submitted in partial fulfillment for the requirements for the Unitec degree of

Master of Applied Practice

Principal Supervisor: Jo Mane

Associate Supervisor/s: Hayo Reinders

<u>**CANDIDATE'S DECLARATION**</u>

I confirm that:

- This Thesis/Dissertation/Research Project represents my own work;
- The contribution of supervisors and others to this work was consistent with the Unitec Regulations and Policies.
- Research for this work has been conducted in accordance with the Unitec Research Ethics Committee Policy and Procedures, and has fulfilled any requirements set for this project by the Unitec Research Ethics Committee.

  Research Ethics Committee Approval Number: *(2018-1030)*

Candidate Signature: Date: 24 August 2019

Student number: 1475826