

# *The Music Study*

A study of the effect of learning a musical instrument on academic progress.

*“Learning music to me is life. I am very passionate about it and I hope to play until I am old. When I play music its kind of like I am in another world. Everything is good and I can feel the emotions in the music.” 17 year old music student*

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**Rationale:**

Several international studies purport to show a link between children learning to play a musical instrument with increased academic ability. The current study, cross sectional and descriptive in design, looks at the evidence available for this claim and presents some original data from children themselves.

Expected results from this research were that instrumental music studies enhance intelligence, particularly cognitive skills, academic study is improved and that students and teachers are universal in their praise of the benefits of such programs.

**Methodology:**

This involved a review of current research with visits to schools with instrumental programs, interviews with students and teachers, surveys of students and anecdotal evidence. The data collected was all collated and analysed, before being put into graphical form.

**Introduction;**

There is a large amount of media attention on the benefits of music for improving intelligence. This has come about by extensive research studies conducted – mainly in the USA – with groups of children, investigating a link between learning music and improved academic ability. One of the earlier research attempts resulted in media over attention, misapplication and exaggeration. This is the so-called “Mozart” effect; that “music (listening to Mozart Sonata K) makes you smarter”. Although the authors do not support this claim, the myth persists and has given rise to much research, that in many cases does indeed show a small but significant link between learning music (rather than just listening) and enhanced cognitive ability. The first part of this paper looks at these significant studies.

## **Review of current research;**

In 1993, a small scale study involving college students was undertaken by Rauscher, Shaw & Ky (1). This showed that students who had listened to Mozart Sonata K. 448 scored higher on a spatial reasoning task. However the effect was small and unsustainable and unfortunately was latched on to by an enthusiastic news media and popular magazines that created the myth of the 'Mozart' effect. Even today this persists in spite of further research that shows the existence of a 'Mozart' effect in children is very debatable. (Crncec, Wilson & Prior, 2006; Hui 2006)

Several studies have shown that music instruction via keyboard, voice and rhythm have improved cognitive performance. (Rauscher et al 1997; Costa-Giomi 1999). These studies involved children in long term studies with music instruction, control groups and pre and post testing involving standardised tests (Kaufman Assessment Battery for children, Stanford-Binet Intelligence Scale). These authors make statements such as "*We believe music training can have a positive effect on the development of spatial intelligence in pre-school children*" and "*There is a significant link between early music instruction and cognitive growth in specific non-music abilities*" (p 629)

Other studies concluded "*Music instruction improves fine motor skills*" (Orsmond and Miller 1999) (p 35) and "*Aural skills involved in learning music can affect phonetic awareness, an important skill in learning to read*" (Lamb & Gregory 1993) Other researchers found a direct link between music training and improved verbal memory tests (Chan, Ho & Cheung 1998).

One of the most illuminating studies was a longitudinal experimental one conducted by Schellenberg in 2004. This was an exacting and detailed investigation that linked music instruction with general increases in intelligence. It is worthy to look at this study in detail because it makes some very important conclusions. Scientifically robust and using a large amount of data gathered over a long time, Schellenberg found significant improvements in general intelligence for the musical group compared to the control (non-musical) group. He used 6 year old children (n=144) randomly assigned to the two groups and followed them over a 3 year period. He performed pre and post testing using the established WISC- III intelligence test. The differences in effects favouring the music groups were small but significant. He was able to also show significant improvements in verbal comprehension and perceptual organization. Time and time again the research seems to show the positive effects learning music has on spatial reasoning – particularly proportional reasoning involving whole-part concept. The concept is deeply involved in musical notes, tempo and rhythmic patterns similar to how students learn percent, decimals and fractions.

Catterall and Rauscher (2008) argue that while it is difficult experimentally to prove links between music and arithmetic skills, the diverse tasks involved in learning and playing a musical instrument improve cognitive skills such as auditory, visual and motor abilities. These researchers unpacked the Schellenberg data and a more fuller analysis showed that gains in general intelligence were in fact due to an improvement

in visual-spatial intelligence. Furthermore they were able to demonstrate that the gains in general intelligence were greatest for children with pre-test IQ scores that were on the lower end of the scale.

In the USA, there are a number of significant websites dedicated to the advocacy of the benefits of a musical education. These quote all the relevant research articles with summaries such as “music’s value”, “music’s impact” and “benefits of music”. One of the more influential “*Music Education Online*” considers there are 4 benefits of music education: Success in society, in school, in developing intelligence and in life. Each of the benefits has extensive attestations and research backing. There is no doubt that the authors make compelling arguments for retaining and increasing education in music. This is in part a response to the educational cuts occurring in some school board districts, resulting in decreased funding for arts programs – including music instruction. But it also points to a deeper realisation of the importance of performing arts and music in particular.

*SupportMusic.com* is a public service led by NAMM and MENC\*. On their website they state; “... intends to critically impact resolve and support for music education in local communities...” This is high powered and makes use of the scientific studies undertaken “ Research reveals strong correlations between music education in schools and academic achievement”. They further provide a succinct summary that answers the question; “Why learn music in school?”

“Because music .....

- Develops skills needed by the 21<sup>st</sup> century workforce
- Keeps students in schools and less likely to drop out
- Improves the atmosphere for learning
- Helps students achieve in other academic studies like maths, science and reading
- Helps communities share ideas and values among cultures and generations
- Is a disciplined human endeavour with intrinsic value to society.

NAMM commissioned a survey of 1500 people in 2009 with findings that echoed an earlier GALLUP survey-:

- More than 9 in 10 Americans believe music education should be part of every student’s day
- 81% feel that participating in school music correspond with better grades and test scores.
- 75% said they believe learning a musical instrument helps students in other subjects such as maths and science.
- 96% of school principals interviewed agree that participation in music education encourages and motivates students to stay in school.

In Venezuela, a national network of orchestras for youth and children – El Sistema - has been developed over the past 35 years. Set up in 1975 by founder Jose Abreu, this outstanding program has transformed the lives of hundreds of thousands of impoverished young people. The Venezuelan government fully funds the program, recognising the impact it has on rescuing youth from an environment of drug abuse and crime. Such is the success and profile of the program that similar music programs have been set up in poorer areas of USA and Scotland.

The top orchestra from this program has played to enthusiastic reviews at Carnegie Hall and the BBC Proms- indicating the high level of musicianship reached through the program. One of its members is regarded as among the top conductors in the world.

El Sistema continues to grow and in 2007 the Inter-American bank granted a US\$150 million loan for the extension of the program to seven regional centres throughout Venezuela. This same year an inspired UK government announced an extra 335 million pounds just for music education in schools. Julian Lloyd Webber said this about the announcement:

*“We have an impoverished South American Nation to thank. Last August in the midst of school holidays, when an uncomfortable number of British children seemed even more disaffected than usual, the Simon Bolivar Youth Orchestra arrived from Venezuela, to deliver performances at the Edinburgh Festival and the London Proms that were, quite simply, marvellous.”*

Brian Levine, Managing Director of the Glenn Gould Foundation, wrote in 2008;

*“El Sistema has demonstrated conclusively that music education is the gateway to lifelong learning and a better future”*

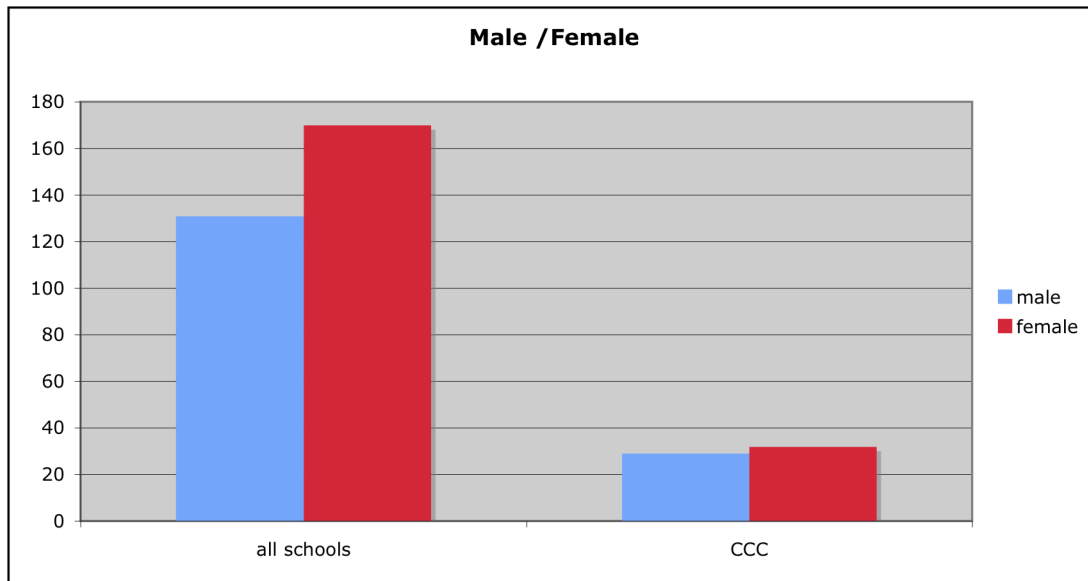
## **The Study**

The study involved visiting 10 schools in Australia, USA and Christchurch. (Appendix #1). The schools ranged from very large co-ed to small single sex with a great variation in size and quality of music programs. Because of the limited time available for this study, it was not possible to conduct long term research into some of the claims made by earlier researchers. Instead it was felt appropriate to ask the students themselves about their experiences and to compare the limited results from 3 countries. The results themselves need to be interpreted carefully because some of the samples were small ( $n < 20$ ) but nevertheless they do show trends and attitudes that in the main reflect and support the great body of music research recently undertaken.

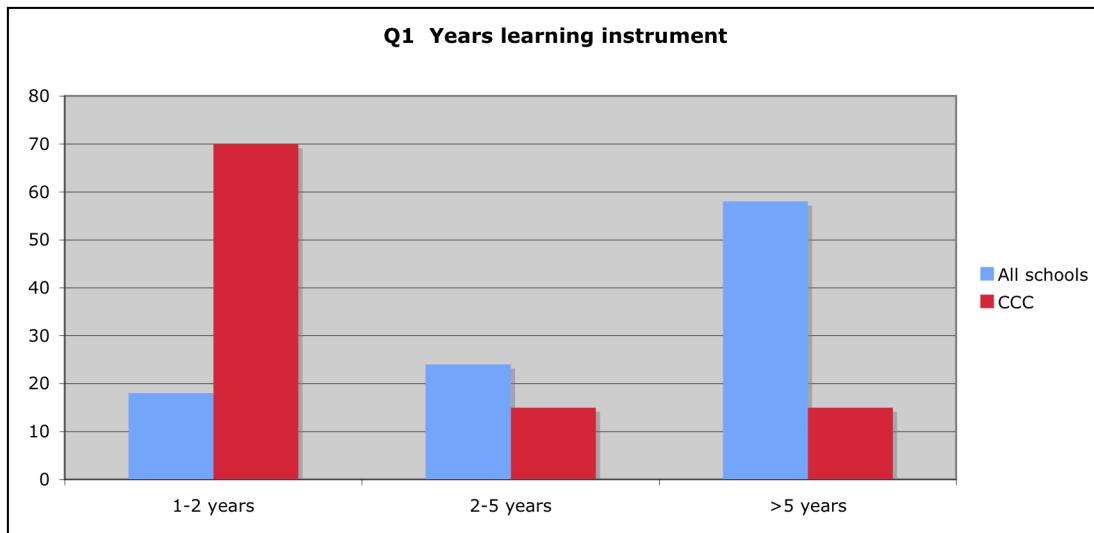
A questionnaire (Appendix #2) was prepared that was given to all students – this contained 10 questions allowing for a range of responses via tick box and one open ended question allowing for student comment. The questions were designed to test students’ attitude to learning an instrument, the value they placed on music and how they felt about their school’s music program together with any academic benefits.

The response was excellent from the students and some very insightful comments were made. Teachers were also questioned and their comments are included. In total over 300 students’ questionnaires were completed by the music students in these schools. The results were collated and analysed (Appendix #3) before being presented in graphical form. All student data was collected anonymously and every effort was made to ensure student confidentiality.

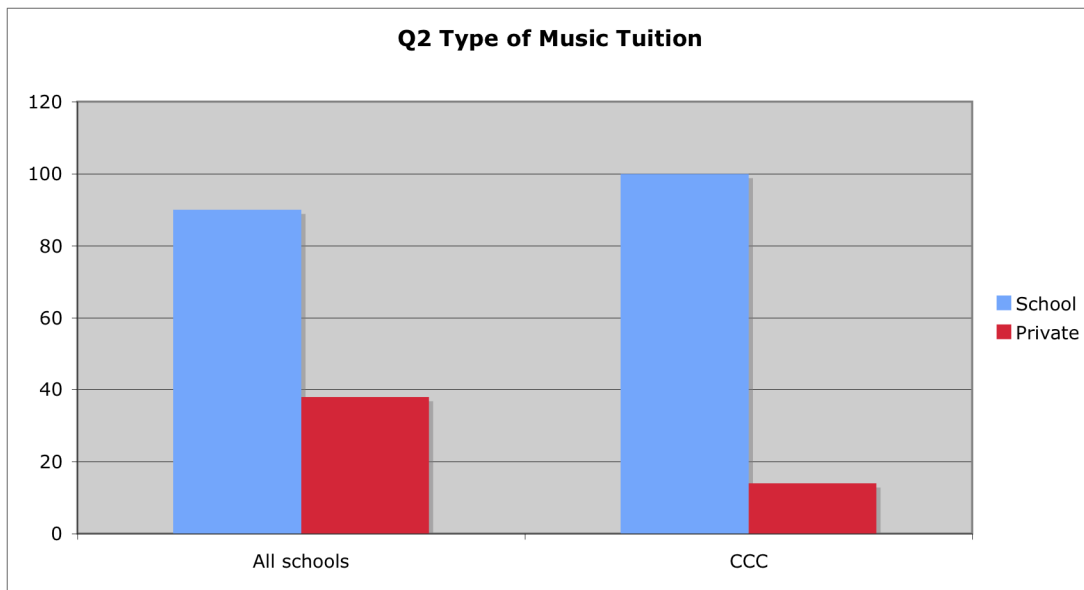
## The Graphs



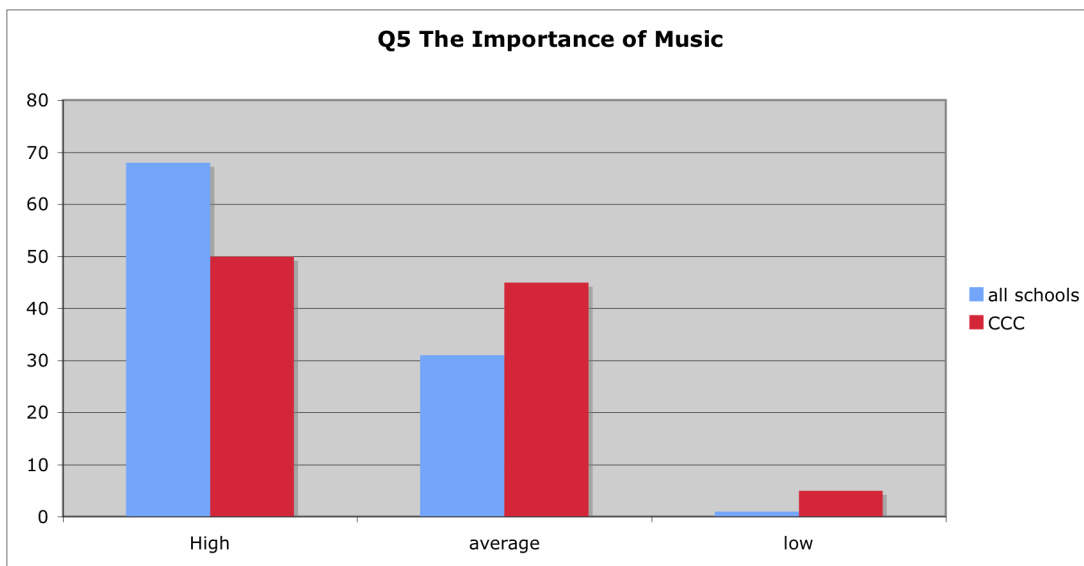
This first graph shows the distribution of male/female music students across all the schools. There are more girls playing instruments than boys.



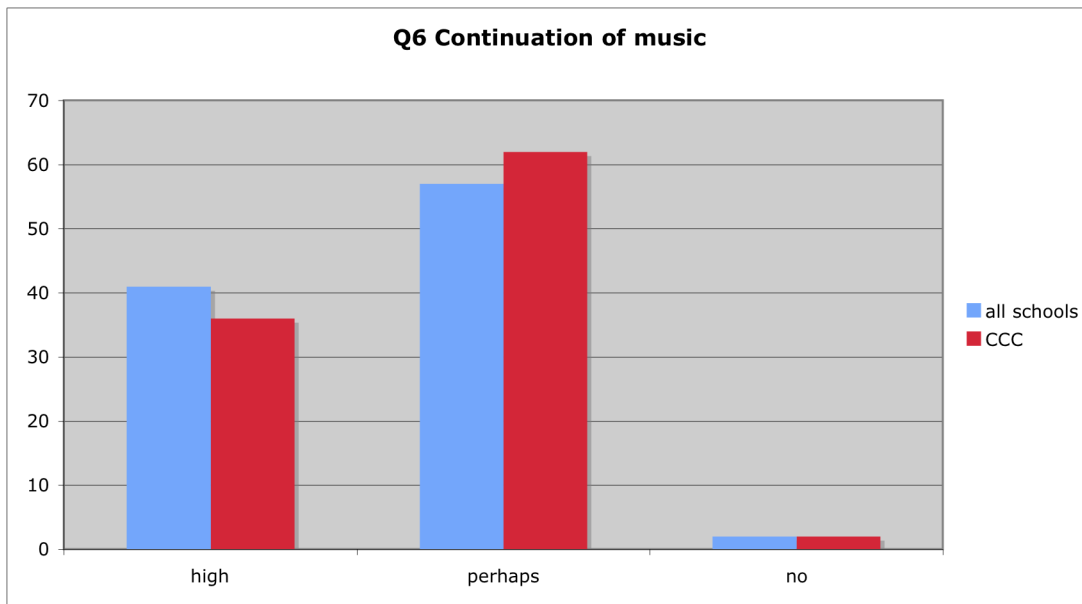
This graph shows the length of time, students have been learning their instrument. In most of the schools surveyed students had reached a high level of expertise because they have had tuition for many years. The high numbers at 1-2 years for CCC reflect the sample taken and the fact that CCC's students all study music at years 7 & 8.



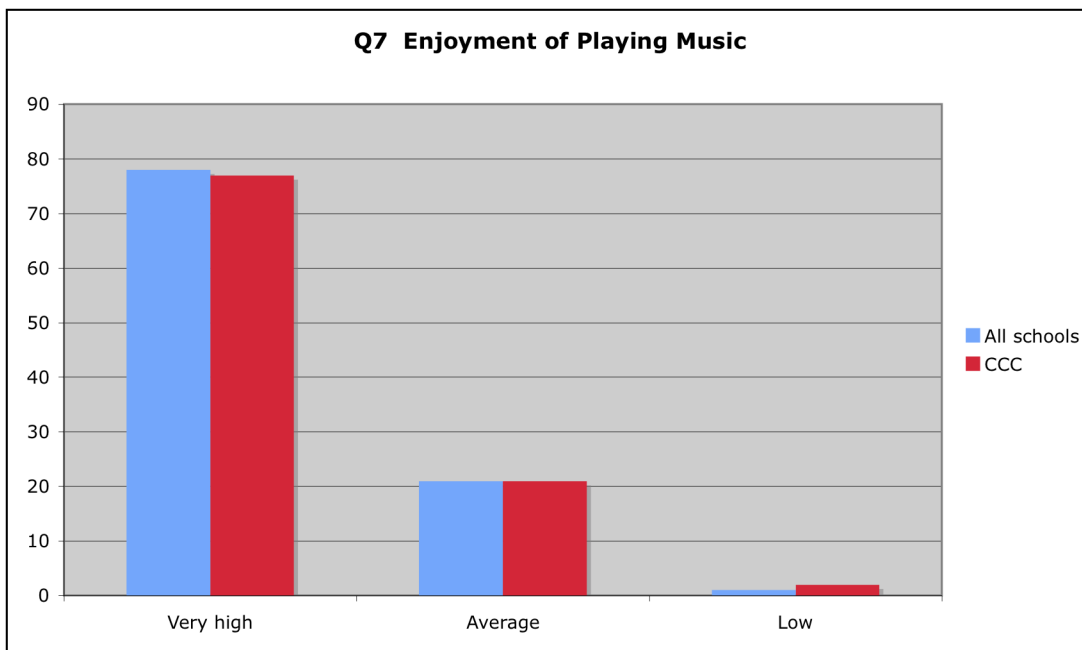
A considerable number of students have private lessons and have had these for a number of years. Of all the schools in the survey CCC has one of the lowest rates of private lessons indicating the importance of the college instrumental music program in providing opportunity for CCC students.



Almost 70% of students say that learning and playing music is highly important to them. While these students have chosen to take music, it is obvious that they derive a great deal of satisfaction and pleasure from their studies.

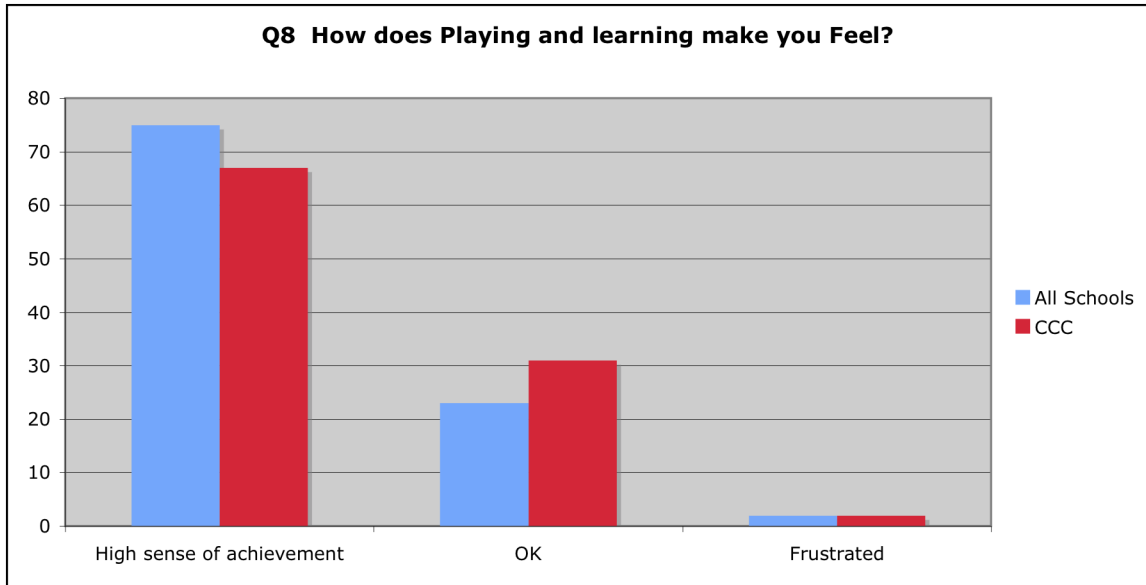


This question was designed to test student’s commitment to their music. Over 40% said that they would definitely continue with their playing and learning once they left school. For these students music is relevant and a life long pursuit.

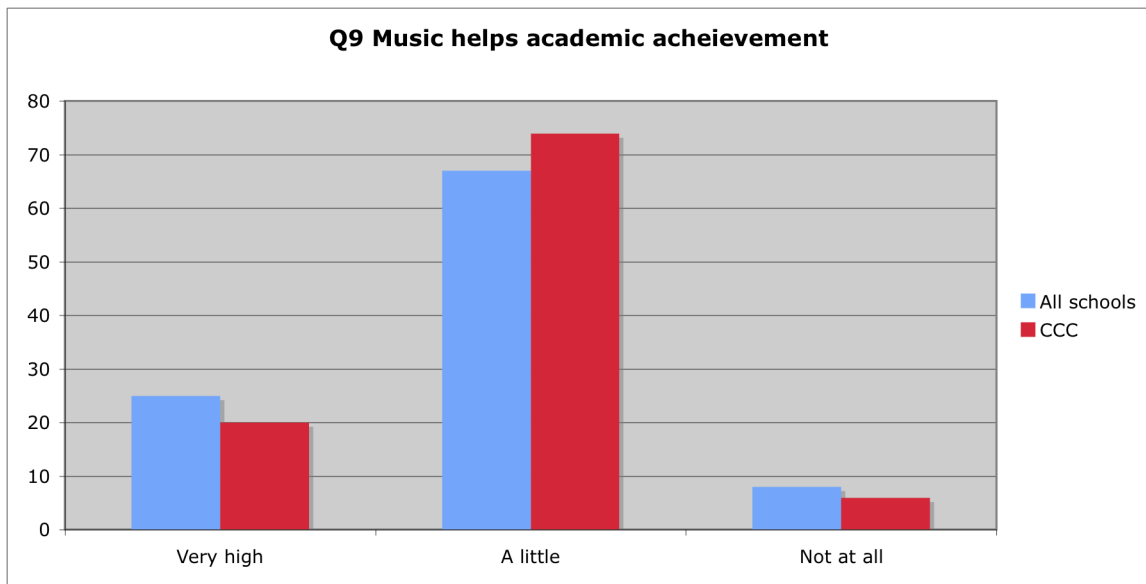


In answer to the question, “How do you rate your enjoyment of playing music”, nearly 80% of all students surveyed rated it “very high”. The figure for CCC is almost the same indicating the similar amount of pleasure the program is giving to CCC students.

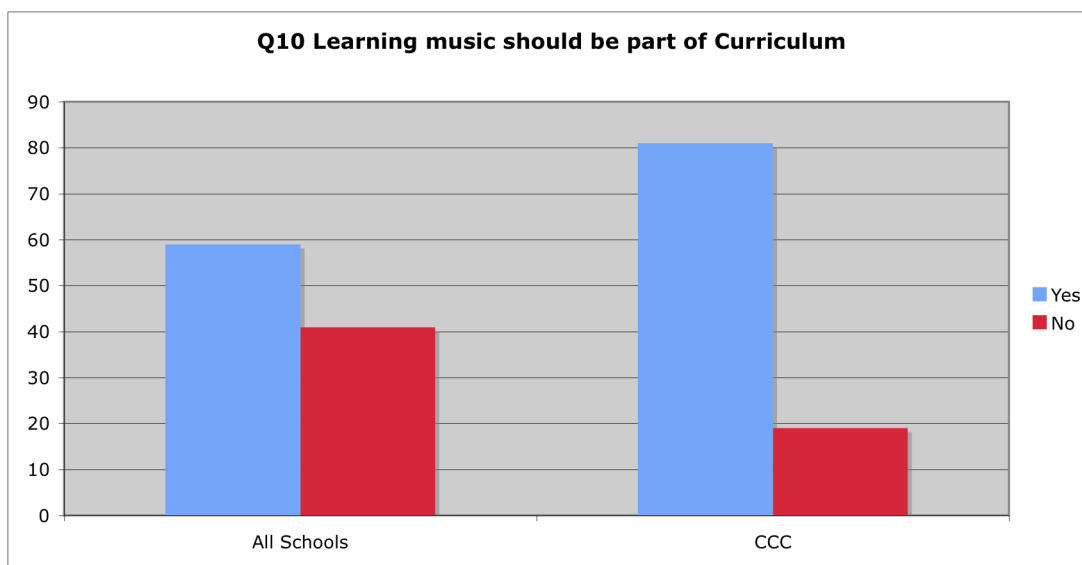




In answer to the question “How does playing and learning music make you feel?”, over 75% of students said it gives them a high sense of achievement. This result confirms the high regard students (including CCC students) have for their music studies.



This question was designed to see if the pupils felt that their achievement in Music was helping them do better in their other subjects. Overall 25% felt that this was highly significant for them with a further 67% stating it helped a little. This was a difficult question for students to answer and perhaps reflects a lack of knowledge about how one subject influences another – something that most students are not aware of.



In answer to the question, “Do you think learning a musical instrument should be part of the curriculum for every student?”, nearly 60% said yes, indicating their view of the importance of music as a curriculum subject. It is particularly marked at CCC with 81% agreeing. (The highest in the survey). This indicates the value and benefit that students perceive as coming from learning an instrument and the overall education advantage inherent in taking part in an instrumental program.

### **Student comments.**

In addition to the survey graphs, a large number of very enlightening and perceptive comments were made by students, across the 3 countries, in answer to the question; “*What does learning music mean to you?*”

Here is a selection:

- |  |                 |
|--|-----------------|
| “Learning music is a fun experience”   | 16yr old male   |
| “Everything – music is the most powerful thing in my life”   | 15yr old male   |
| “Everything – my life and future”  |                 |
| “Learning and playing music is integral to my education. Music has been a large part of my life from a young age. I enjoy music immensely” | 16yr old male   |
| “I strengthen different areas of thinking that most (other subjects) don’t. It is a very enjoyable pastime.”                               | 16yr old female |
| “It make me happy”   | 16yr old female |
| “It means the world to me”   | 16yr old male   |

“Learning music to me is life. I am very passionate about it and I hope to play until I am old. When I play music its kind of like I am in another world. Everything is good and I can feel the emotions in the music.”  
17yr old male

“Playing music for myself and others is very calming and soothing. Music to me is a gift given to our lives and playing is the greatest opportunity. It is an extremely hard process but it is worth it in the end when you please others and yourself”  
16yr old female.

“It means being part of something far larger than ourselves” 16yr old female.

“It means the world to me. It’s a way to express your inner self” 16yr old female.

“Learning music is something I believe is important because it really tests the capabilities of myself and challenges my mind, I can’t imagine living without having learned music”  
16 yr old female

“Learning music to me is like another school subject that is just as important as the rest of them”.  
15 yr old female

“Music is my life” 15 yr old female

“For me its like a whole different world that’s delicate and complex..... It’s like another way to speak but without words”  
15 yr old female

“People say music is the pathway to the soul and that’s what it is to me. Learning music is like being able to be part of something you cannot comprehend mentally, but spiritually”  
15 yr old male

“The world. I would be nothing without music. All my future plans revolve around music”  
14 yr old female

“It means a lot. Without it I don’t know what I would be doing” 14yr old male

“It means I accomplish something” 15 yr old male

“It means that I’ve achieved at something I really love and that means everything to me”  
14 yr old female

“It will make you smart” 14 yr old male

“It means to me words that can’t be said so we can express it through music”  
14 yr old female

“Music is a way to express your emotions through art – to me it’s the most important thing in my life....”.  
14 yr old female.

“Learning music is like going to a totally different world which is exciting and fun”  
15 yr old female

### Comments from students at CCC;

|  |                    |
|--|--------------------|
| “I love music and the music program at our school is amazing”  | 12 yr old female   |
| “Frustrates me because I can’t do it”  | 13 yr old male     |
| “It gives me a sense of value”   | 12 yr old female   |
| “It is important to have an appreciation of music”   | 13 yr old male     |
| “Getting to have fun learning different instruments”   | 13 yr old male     |
| “It is something I enjoy playing in my spare time”   | 13 yr old male     |
| “It builds my confidence up in public and it’s really fun”   | 12 yr old male     |
| “Music is cool and fun”  | 12 yr old male     |
| “To play beautiful music”  | 11 yr old male     |
| “Learning to play music gives you an opportunity to do something you haven’t done before”                          | 13 yr old female   |
| “It will also bring academic success if you work hard”   | 13 yr old male     |
| “A very enjoyable experience”  | 13 year old female |
| “I don’t think I could imagine life without music”   | 14 yr old female   |
| “It’s a part of my life”   | 13 yr old female   |
| “I love learning music at school because you are proud of yourself”  | 12 yr old male     |
| “I enjoy doing music at school because it is a big achievement for me”   | 13 yr old female   |
| “It’s a great way of self-expression. It means almost everything to me”  | 13 yr old female   |
| “Learning music is everything to me to me and is the main reason why I’m still in school – and its very enjoyable” | 18yr old female    |

## Discussion

This limited study of the considerable music research undertaken over the past 20 years illustrates the belief that music enhances intelligence. Some impressive research has concluded that there are compelling reasons for exposing children at an early age to the learning of a musical instrument. These researchers show that not only are there cognitive function benefits, but also considerable life skill advantages particularly for those students who have access to an inspirational tutor or teacher. Principals, teachers, parents and other educators are beginning to see these advantages and the importance of including a comprehensive music program in the local curriculum. They see the transfer of such skills as listening, observing, imitating, memorising, concentrating, performing and self discipline, from music to other subjects as being of huge benefit to the overall development of children.

In New Zealand primary schools, music is an inherent part of the curriculum. However, the quality of the program varies widely. The NZ Arts curriculum for years 1-8 is composed of three strands - Drama, Dance and Music. The music strand focuses on understanding music, exploring sounds and using a variety of instruments to demonstrate musical ideas. It also covers sharing music making with others and responding to live music. In many primary schools, percussion and wind recorders dominate the instrument scene. However some schools have elected to employ music specialists and itinerant music teachers, who are able to offer a wider range of instruments such as guitar, ukulele, violin, piano and flute tuition. This also ensures the children are getting a quality weekly class music lesson and/or individual instrumental lessons.

At almost all secondary schools music is an option and competes for students with Art, Drama, ICT, Technology, Media and languages. The music curriculum at years 9 & 10 concentrates mainly on theory and keyboard instruction. Any other instrumental learning is done on an individual basis with itinerant music teachers at school or through private lessons. A few schools (CCC among them) have instrumental learning fully immersed in the curriculum at years 7 & 8 and in doing so are able to provide a level of instrumental music instruction equal to that found in wealthier and private schools. A number of opportunities exist at local level in the form of music festivals, competitions and examinations, for students to display their talents and gain performance experience.

In the Australian schools visited, music is highly valued. At one private junior school of 360 students, 90% play an instrument. Tuition begins at Yr 1 with private lessons with parents paying for 30 lessons per year with an expectation that practice be mandatory before and after school. Naturally the level of musicianship is extremely high. At one private girls college, the level is so high that a yearly concert is held at the Sydney Opera House. Composition is taught to the girls by budding young musicians.

Performance opportunities abound at such schools with lunchtime concerts, hospital visits and short tours together with solo performances in front of peers. In such schools the music programs flourish because of the expertise and enthusiasm of the music staff and the support of the Principals. Involvement in music has helped create a wonderful spirit among the pupils.

In the two American Schools visited, a large emphasis is placed on students participating in music, particularly symphonic bands that are in effect marching bands. For this involvement, which is by audition only, students can gain academic credits in music (and PE!) The bands are very large, often of the order of 60 or 70 members and enjoy a high profile in the school.

There is excellent parental support for the band students and they are held in high esteem by the local community. Music is wider than this though as it also supports several large choirs and a heavy performing arts program that values full-scale productions.

Teachers comment very favourably on the music programs. They believe *“music is an essential part of living, giving great self-esteem to students and allowing them to reach higher and higher standards, making them smarter and better organised resulting in better academic success across the board”*. Other teachers say that *“the students love their music, it helps them academically, improves their focus in class and their motivation is high to succeed”*.

The comments by the students across the 3 countries are very similar and echo what the teachers are saying. They are almost universally positive about their music and believe in the importance of it to enrich their lives and the lives of those they play for. Some of the comments are very insightful and illustrate the deep feelings most of the students have about their music.

At CCC there is much evidence to indicate that the instrumental program is delivering to the students and to Maori and Pacifica students as well. Two Pacifica students who have been in the program since its inception were interviewed at length and both were in high praise of their experiences describing how their self esteem improved, they became confident performers in front of their peers and how they felt it helped them focus better and achieve more in their other subjects. They talked about the importance of the program in providing opportunities that students would not otherwise experience. Two year 7 girls (Maori, and PI) new to music, developed their clarinet playing to such level that they were invited at the end of their first year to join the CSM Junior orchestra. Three year 9 boys on trombones, were also selected for the CSM orchestra and one student won a prestigious scholarship to study cello under one of the city’s leading cello teachers.

## **Conclusions.**

This study set out to look at the links between playing a musical instrument and enhanced academic performance. This has proved to be a difficult assignment with the limited time and resources available. However the long-term research undertaken by others, clearly illustrates several important advantages for music students in terms of increased intelligence especially with spatial and visual ability.

What this study has shown however, is that there is a wealth of rich anecdotal evidence – based on the results of the 300 questionnaires, suggesting the following:

1. Students love learning music and especially playing an instrument. It gives them great pleasure, they feel good about themselves, they like to succeed and they have a positive attitude to school and to their other studies.
2. Music helps a significant number in their other academic studies.
3. Students who have been seen as failing, often experience an academic turn around after beginning to study music and learning to play an instrument.
4. Teachers are generally very positive and realise the enormous benefits that flow from good quality music programs. Where there are supportive Principals, these music programs and Performing Arts in general, flourish.
5. Many teachers believe learning a musical instrument enhances intelligence, contributes to self-esteem, and supports greater student self-management.
6. Music is so important in our lives that all students need the opportunity to be involved.
7. All schools need to re-evaluate their music programs and realise the impact and benefits learning a musical instrument can have on students' lives.
8. More long-term research studies need to be undertaken to investigate the importance of music in schools, especially in New Zealand.

## **Appendix #1            The schools**

### **Burnside High School            Christchurch    New Zealand**

A large 2600 pupil co-ed secondary school with an intensive music program throughout the school. Many orchestras, ensemble groups, bands and choirs.

### **St Andrews College**

A private college, co-ed with attached primary and pre-school. High level music program throughout school including orchestra and bands. The Highland Pipe band has an international reputation.

### **Ashburton College**

Large co-ed state school in South Canterbury. Itinerant music program and full orchestra.

### **Linwood College**

State co-ed school with an orchestra that is gaining wide recognition.

### **Catholic Cathedral College**

A 400 pupil year 7-10 co-ed school in central Christchurch. Compulsory instrumental music program operates at year 7 & 8 within the curriculum. Ensemble groups, full orchestra and choir.

### **Conservatorium High                            Sydney            Australia**

Small 140 pupil Co-ed state school based on a music curriculum. Entry by audition. High level performances. State of the art facilities.

### **St Marys Cathedral College            Sydney            Australia**

Private Boys school in central Sydney with a strong instrumental and choral program. Over 50% of the boys play an instrument. Public performance focussed.

### **Methodist Ladies College                            Sydney            Australia**

Private girls' college with 1200 pupils yr 1 – 12. Very heavy emphasis on high quality music at all levels. Achievement based with many performance opportunities.

### **Flintridge Sacred Heart Academy    La Canada, CA            USA**

Small private 400 girl school – small music program with an enthusiastic director. High level string ensemble.

### **Upland High School                            Upland, CA    USA**

Very large 4000 pupil state school with focus on symphonic bands. Audition entry, high level public performances in school and community. Well supported by school administration.



## Appendix #2      Questionnaire

**School:** (Optional)

Age:                       Male                       Female

1. How long have you been learning music?  
 Less than 1yr     1-2 yrs     2-5 yrs     more than 5 yrs
2. Did you learn music through private tuition or school?  
 School     Private     both
3. What instrument do you play?  
 piano     violin     cello     clarinet     sax     flute  
 trumpet     trombone     voice     other
4. Are you a member of an orchestra or ensemble group?  
 Orchestra     ensemble     both
5. How important is music to you?  
 Highly important     Average importance     Low importance
6. What is the likelihood of continuing your music after you leave school?  
 Very high     Perhaps     Not at all
7. How do you rate your enjoyment of playing music?  
 Very high     Average     Low
8. How does playing and learning music make you feel?  
 High sense of achievement     Ok     Frustrated with progress
9. Does your achievement in music help you with your other academic studies?  
 To a very high level     A little     Not at all
10. Do you think learning to play a musical instrument should be part of the curriculum for every student?  
 Yes                       No

What does learning music mean to you?

### Appendix #3

#### References:

Chan AS, Ho YC & Cheung MC, (1998), Music Training improves Verbal Memory, *Nature*, 396, 128.

Costa-Giomi, E (1999). The effects of three years of piano instruction on children's cognitive development, *Journal of Research in Music Education*, 47, 198-212

Crncec,R, Wilson,SJ & Prior M (2206). No evidence for the Mozart effect in children, *Music Perception*, 23, 305-317.

Lamb SJ & Gregory AH (1993).The relationship between music and reading in beginning readers, *Educational Psychology*, 13, 19-27

Orsmond GI & Miller LK (1999), Cognitive, musical and environment correlates of early music instruction, *Psychology of Music*, 27, 18-37

Rauscher FH, Shaw GL & Ky KN. (1993), Music and spatial task performance, *Nature*, 365, 611

Rauscher FH, Shaw GL, Levine LJ, Wright EL, Dennis WR & Newcomb R (1997) Music training cause long term enhancement of preschool children's spatial temporal reasoning abilities, *Neurological Research*, 19, 1-8

Rauscher FH & Shaw GL, Key components of the 'Mozart effect', *Perceptual and Motor Skills*, 86, 835-841

Schellenberg EG, (2004), Music lessons enhance IQ, *Psychological Science*, 15, 511-514

Schellenberg EG, (2005), Music and cognitive abilities, *Psychological Science*, 14, 322-325

Schellenberg EG, (2005), Music listening and cognitive abilities in 10 and 11 year olds; the Blur effect, *Annals of the New York Academy of Sciences*,1060, 202-209.

<http://www.childrensmusicworkshop.com>

<http://www.musiceducationonline.com>

<http://www.supportmusic.com>

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