

Introducing the Continually Adjustable Transmission (CAT): Developing pre-service generalist primary teachers' confidence in teaching music using a variety of music transmission methods

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Abstract

This paper introduces a method titled the Continually Adjustable Transmission (CAT) developed by the author to teach music to preservice teachers undertaking primary school teacher preparation programs which can be used in any other context where music is taught. To explore the effectiveness of the CAT method that comprises four interrelated elements Constant Evaluation, Adjustable Input, Systematic Transmission and Tailored Admission a pilot research study was conducted involving sixty participants. A number of common themes emerged from the thematic analysis of qualitative data and the findings of the study indicate that the CAT method has worked effectively for the majority of preservice teachers to develop their knowledge and skills of music and enhance confidence in teaching music to primary school students upon graduation.

Key words: Music education, Multicultural or world music, Generalist primary school teachers, Confidence and Pedagogical approaches for teaching music.

Introduction

In the Australian national and state curricular frameworks, the Arts disciplines are included as core curricular subjects to be taught in primary years of schooling. In most primary schools generalist primary teachers are responsible for teaching the Arts: Dance, Drama, Music, Visual Arts and Media Arts, and it is expected for them to possess necessary skill and knowledge to deliver these Art forms (Lowe, Lummis, & Morris, 2017; Russell-Bowie, 2009). Through a survey conducted in Australia, Duck (1990) found that most primary school teachers have little experience in these art forms in their own education and are not confident in teaching these Arts subjects. A number of researchers have pointed out that this situation still remains the same

especially with teaching music in primary schools (Garvis, 2010; Dinhan, 2011; Russell-Bowie, 2012; Lemon & Garvis, 2013; de Vries, 2017).

The focus of this paper is on music education and researchers and teacher educators have revealed that generalist pre-service primary school teachers lack confidence in teaching music. Hennessy (2000) points out that many student teachers believe that it is essential to possess musical gifts or talent, singing abilities and skills in reading music notation including skills in playing musical instruments in order to teach music. Confirming this notion of beliefs Russell-Bowie (2010) identifies that there is a correlation between the student's background and their confidence in teaching music and points out that many generalist teachers still start their

careers with little or no formal Arts education. This lack of confidence to teach music is also evident among in-service generalist primary school teachers (Holden & Button, 2006) and demonstrates the poor preparation of primary school teachers by tertiary institutions (DEST, 2005). The current situation remains the same and the evidence suggests that primary pre-service teacher education courses do not adequately equip teachers to deliver music education (Russell-Bowie, 2010; Education and Training Committee, 2013). Furthermore research indicates that classroom teachers themselves do not find that the current training provides them with a sound basis for teaching music in their classrooms (Education and Training Committee, 2013).

Researchers point out that teacher educators in universities are expected to support pre-service teachers to become competent to deliver quality music education often within a limited time frame with limited resources (Southcott & Joseph, 2007; Russell-Bowie, 2010). Similar to schools, universities also struggle with a crowded curriculum to allocate more time for music education (Education and Training Committee, 2013). Operating in such a challenging background with limited time and resources, the best way for tertiary music educators to tackle this issue is to boost the confidence of student teachers by making it simple and interesting for them to learn required skills for teaching music confidently in their future practices upon graduation. As a tertiary music educator working in two primary school teacher preparation courses, Bachelor of Education (Primary) and Master of Teaching Practice (Primary), I have modified my teaching to develop confidence in student teachers during the limited time available using a flexible and stimulating method titled the 'Continually Adjustable Transmission' (CAT). A variety of multicultural music pedagogies are used through the CAT approach to make it compelling and uncomplicated for pre-service teachers to engage in 'musicking' (Small, 1996) and learn how to teach common elements of music such as rhythm, pitch, expression and structure as a result. Transformational methods

of teaching can be learnt through multicultural music and the Australian curricular frameworks recommend drawing from a range of cultures when teaching and learning music in schools (ACARA, n.d. & VCAA, n.d.).

This article introduces the CAT approach and discusses how it was conceptualized and explores its effectiveness through the results of a pilot study. It is important to clarify that the intention of this article is not to feature the multicultural pedagogical approaches utilized in the process of employing the elements of CAT.

My background

The purpose of this effort is to enhance the self-confidence in musical abilities of pre-service teachers by using the CAT method with a variety of feasible learning and teaching strategies of multicultural music through a systematic procedure. I have used my prior experience and knowledge in this process including reflective approaches to teaching and learning. It is important to briefly explain about my background as it impacts the design of this unique method adopted from a different field. I come from a multi-cultural/ethnic/linguistic and religious background and have studied music genres of different cultures formally and informally through immersion (Nethsinghe, 2012). In this process I have lived and worked (performed) with musicians from multicultural backgrounds and have learnt authentic teaching and learning strategies from culture bearer practitioners (Nethsinghe, 2013) in countries such as Sri Lanka, India, Africa, Russia, Ukraine, Arab Emirates and Australia. In addition I have engaged in teaching music to students from a number of countries of the world which has contributed to broaden my knowledge about the learning styles of people from different backgrounds. As a result of these influences my musicking and music teaching practices naturally include elements of multicultural music that caters for various learners and audiences.

In tertiary teacher education courses Arts subjects are included in units as the Arts are embedded in

the Australian school curricular frameworks as a core curricular subject. As mentioned above in my current role during the last five years as a tertiary music educator and a unit coordinator, I have experienced the anxiety of students when they engage with the learning activities of the music component of the Arts units. During their first and second years students of Bachelor of Education (Primary) program undertake two arts units that include five Art forms: Dance, Drama, Music, Visual Arts and Media Arts. Students undertaking the Master of Teaching Practice (Primary) program are offered a single unit that includes the five Art disciplines mentioned above. Even though I have been using the notion of CAT before, in 2016 I formally trialed the CAT approach with the Master of Teaching Practice (MTP) students and collected feedback from them as a reflective approach to further enhance the method and my teaching. Before presenting the data I will provide an explanation about the CAT approach and how it was conceptualized in the following section.

Conceptualization of the CAT method

The Continually Adjustable Transmission (CAT) in Music Education was developed using the concept of the Continuously Variable Transmission (CVT), a transmission system used in the modern automotive industry. However, the original idea of the CVT transmission was conceptualized by Leonardo da Vinci more than 500 years ago (Naunheimer et al., 2014). Leonardo DaVinci sketched the first CVT in 1490 and now it has become a commonly used type of automatic transmission systems in modern motor vehicles. Instead of changing the ratio in stages by shifting gears as conventional transmission does, the CVT continuously vary the ratio or shifts gears to optimize engine efficiency and provide the most appropriate power input for a given situation. It provides more useable power, better fuel economy and a smoother torque-speed curve emanating a better driving experience than a traditional automatic transmission (Naunheimer et al., 2014). Adopting these characteristics from the CVT to achieve similar outcomes in knowledge transmission

the CAT was developed as method for teaching music. A variety of multicultural pedagogical approaches are utilized to provide a better and smoother learning experience for students (and boost their confidence) to efficiently and effectively use the most appropriate input of the facilitator/educator. However there is a difference between and CVT and CAT in terms of the input and output/s. In CVT an engine provides power to a single vehicle to achieve better performance but in education it is the common expectation for a single instructor to teach multiple students with different abilities during a single session. This is exactly the attribute in educational contexts that can be addressed through CAT due to its versatility for individualized teaching. The CAT employs a technique to constantly evaluate understandings about the content being taught and provide assistance (if needed) as required for each individual student scaffolding skills and knowledge to the next level ultimately to achieve the learning goals of a lesson also using phases of 'Cognitive Apprenticeship' (Collins, Brown & Holum, 1991).

The cognitive apprenticeship model has been developed by merging two concepts from different areas (Collins et al., 1989). Cognition is defined as the process of knowledge acquisition and interaction that occurs between an expert and a novice learner as the apprenticeship. In this process the expert assists the learner to become a master through "modelling, scaffolding, fading and coaching" (Collins et al., 1991, p. 2). Cognitive apprenticeship is the process of learning by doing in which a student is guided by an expert systematically reducing the input as the level of confidence increases. Fading is explained as "the notion of slowly removing the support, giving the apprentice more and more responsibility" (Collins et al., 1991, p. 2). As explained before the CAT method is built employing the above systems and includes a variety of qualities that effects student teacher interaction at each stage.

Elements of the CAT method

There are four elements included in the CAT method. These four elements are used as a cycle

spiral until the expected learning goals are achieved. It is the responsibility of the educator to implement them in teaching and enhance effective participation of students by catering for individual needs while conducting collaborative learning activities.

Constant Evaluation that includes arts based assessment strategies is used to analyse the understanding and performance level of learners which informs the required level of input by the facilitator/educator labeled as Adjustable Input. Adjustable Input allows the teacher to change the pace, complexity and techniques including the use of resources. Systematic Transmission involves the use of the best theories and pedagogical approaches appropriate for effective teaching. Tailored Admission enables differentiated learning through personalized scaffolding also permitting flexible engagement for learners as a result of considering Constant Evaluation. To enhance productivity employing the notion of CAT, the pace of delivery and complexity of a lesson can be adjusted through constant evaluation of student performance that will also gauge the most appropriate and efficient input by the educator/facilitator. The inputs need to be sourced from unrivalled learning and teaching methods and theories to provide an effective experience for learners. In this case of providing music education, effective teaching methods and theories are obtained from multicultural music / world music. Then modelling, scaffolding, fading and coaching from cognitive apprenticeship theory are used as necessary to manage the involvement or input of the educator.

The CAT approach was presented at an international conference in 2016 before the implementation for this pilot study and the results of the pilot study were presented at a music education conferences held by The University of Melbourne later that year (Nethsinghe, 2016). Audiences (music educators, researchers) at both events advised me to produce a text book that can be used for teaching multicultural music in tertiary institutions as new world music curriculum resource. Mellizo (2018) argues that there is a gap between theory

and practice in the area of world music education which is also called multicultural music education. In order to enhance the understandings of world music pedagogies among stakeholders Mellizo (2018) advocates for practising world music educators to share their unique perspectives and experiences.

Multicultural teaching methods used in conjunction with the CAT

In this section a brief description of some multicultural pedagogical approaches and techniques used to scaffold the learning of students will be provided. It is important to clarify that many pedagogical approaches used in multicultural music are not named and expert culture bearers practice these approaches as accustomed techniques. This adds another layer of difficulty to the process of introducing them. However I have attempted to explain how these pedagogical approaches are used for different activities in music making and learning below.

Multicultural techniques from aural and oral traditions such as Call – Answer (listen and imitate)/ Call - Response (responding through improvisation)/ Observe and Imitate (watch and do the same)/ Observe and Respond (responding with flexibility in other words joining when comfortable and improvise), Orff, Kodály plus many other methods and approaches including 'If you can sing you can play' technique (using mnemonics and rhythmic phrases) are used in planning teaching and learning activities.

Rhythmic activities: From rhythmic phrases and Rhythmic cycles (Kononokol), mnemonics to Beatbox in including Orff and Kodály methods.

Pitch, melody and harmony related activities: Group singing or communal singing (whole class approach), Section leaders, Call and response in singing and other multicultural approaches discussed above.

Performance activities: Voluntary participation; Section leader (mentor) guided performances/ singing.

Reading and writing notation: Scaffolding from nonconventional/ traditional notation (using symbols and words to convey a musical impression), graphic notation to conventional notation/standard notation.

It is important to remind that the intention of this paper is not to discuss about the multicultural teaching and learning approaches used yet to present the findings of a pilot study that investigated the effectiveness of a teaching method. However, to use these multicultural pedagogical approaches as a teacher, one must ponder and master appropriate knowledge and skills from reliable and authentic sources (Nethsinghe, 2013).

Research approach used for this pilot study

A phenomenological approach was used as the most appropriate method to explore the lived experiences of learners (Clarke 2009; Smith 2005; van Mannen, 2006). Sixty MTP students who participated in this phenomenological case study were from two tutorial groups and they undertook the same unit of Arts education which included music education as a component. This study was conducted two years ago and all the participants have graduated and left the institution now. Their names remain anonymous and ethical clearance was obtained as a part of a larger international cross institutional project titled *See, listen and share: Cultural practices in music teaching and learning*. Anonymous feedback collected at the

end of the delivery was analysed thematically for the purpose of this research (Kirn et al., 2017; Lorelli et al., 2017). Some selected segments of data supplied by a number of students will be presented below following the charts that provide some background information.

Figure 1 indicates the gender, prior qualification information (all MTP students are required to hold a bachelor's degree as the lowest entry qualification) and background information of participants. 12 males and 48 females with Australian qualifications with a local (Australian) background and 3 males and 2 females with foreign qualifications and foreign backgrounds participated in this pilot study.

Participating students

Confidence levels

Students enrolled in the two tutorials were questioned regarding their confidence to teach music at the beginning of the unit and at the end after the delivery of the unit. As indicated in Figure 2, 96% claimed that they have no confidence at the beginning of the unit. Only 3% indicated that they have no confidence in teaching music and 1% expressed that they are not sure.

It was found that their attitude towards teaching music has changed dramatically at the end of the unit and as it is evident below in the pie chart (Figure 3) 86 % of the students have indicated that they have gained sufficient confidence to teach music.

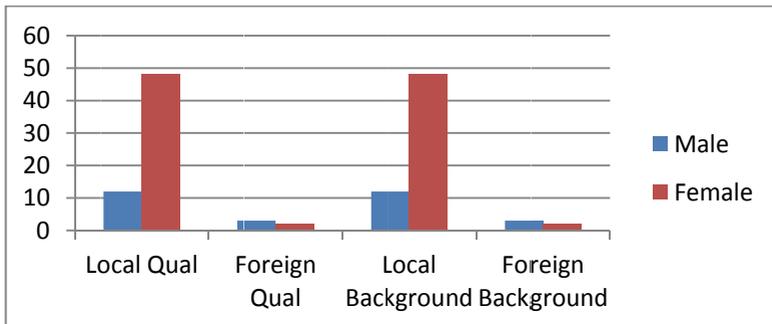


Figure 1



Figure 2

However it is possible to notice that 7% of the students were not sure and 7% of participants have not managed to develop sufficient confidence to teach music in their future practices.

Data: Student feedback

As mentioned before students were also requested to fill a feedback form at the end of the unit and as a reflective practitioner I always conduct such formal and informal evaluations to further improve my own teaching practices including the content taught. The evidence from feedback presented below demonstrates that the CAT method works effectively for a majority of students and the student teachers who participated are also interested in using the CAT in their own future teaching.

Student A

At the beginning of this course I was a little nervous and unsure of what to expect from 'This Arts course'. The area of arts, specifically music is not one of my strong traits which therefore lead me to the idea that I will not do well in the course. However my understanding about arts education has changed because it isn't about the degree of artistic skills you have, it's about how you can express yourself which potentially can further your learning.



Figure 3

The pedagogical methods used (with multicultural music teaching and learning approaches) encourage student engagement when they are given the opportunity to express their learning in a creative way. Most importantly it allows students to explore different cultures and gain insight to different interpretation of art (music) around the world.

Student B

Throughout the duration of this course I have discovered that I enjoy the arts program and have witnessed the effects of what art can achieve for a learner. I never considered myself to have a large skill base in art (or music), however I have learned that you don't have to be a great artist to teach art in primary schools. This course has made my friendships stronger as our levels of communication has grown through participating in creating artworks and music performances, along with establishing new friendship groups.

Student C

Throughout my own school years, I was never confident with music and didn't enjoy music classes. I remember the teacher would often just send everyone off to play around but didn't provide much scaffolding or teaching. I was therefore quite hesitant about participating in the

music portion of this course. However, as we went through the different activities I felt more relaxed. This may be due to the tutor scaffolding the class (using multicultural teaching methods) and allowing the students to participate as much or as little as they felt comfortable. By the time we were told to create a group performance incorporating music techniques, I surprising[ly] felt comfortable and thoroughly enjoyed the performance tutorial.

Although I am not an artist I believe I have the flexibility, motivation, resources and innovative mind to incorporate arts into my own classroom in the future. I also think it is important to acknowledge that it is not my strongest curriculum area and that it is up to me to participate in further learning and experiences to improve my knowledge and skills so that students are provided with a creative learning environment.

Student D

I always thought that arts/music education at schools could only be taught by specialists or people who have outstanding artistic skills. After doing the Arts in the Primary School course, I was actually proven wrong. I have learnt that it's not impossible for generalist teachers to teach Arts if they believe they can do so.

Student E

Before my re-education I had a lack of pedagogical knowledge and lack of confidence in teaching the arts particularly music. I have been fortunate to recreate positive experiences and to rediscover the importance of the arts through my education into the arts during this course. I no longer consider Arts education as something in isolation or something that has clear boundaries around that which defines it (Fleming, 2012, p. 96) but as something that "assists the 'emancipation' of students" (Nilson et. al., 2013). Kraay (2013) said that pre-service teachers would be fine in teaching the arts, but they don't believe they can do it. On the contrary, I now feel 'I can do it'.

Student F

Another major benefit I gained was knowledge about the way the arts are assessed and the open mind that teachers need to use when assessing these fields; not just following a quantifiable rubric and set of goals. Assessment methods (especially multicultural ones) in the arts give every student a chance to shine in their own way which strongly aligns with my personal beliefs on assessment. I feel as though this has greatly influenced my philosophy when it comes to assessment.

Discussion of findings

A number of common themes emerged from the thematic analysis of data and these themes are also visible in the examples presented above. The selected themes for this discussion are Inaccurate presumptions, Negative prior experiences, Anxiety for music, Lack of confidence in musicking and music teaching, Effectiveness of pedagogical approaches and Uniqueness of Arts based assessment strategies.

Inaccurate presumptions: Almost all students indicated that they thought that musical talent or abilities are an inherent requirement for teaching music. Most of them believed that music can be taught only by specialist music educators and artists/musicians. These presumptions were changed by the end of the course as evident from the above statements and the students were able to realise that they can facilitate music learning if they know required knowledge, techniques and resources.

Negative prior experiences: It was alarming to learn that most of the students had negative prior experiences with their music education. Most students have mentioned that their primary school teachers did not know what to teach for music. Some students have stated that they "hated playing 'hot cross buns' on the recorder for months during their school years". Such prior experiences have led to increase anxiety towards music making and teaching.

Anxiety for music: Only a very few students were confident in engaging in musical activities in the

beginning and the most students were having performance anxiety especially when singing. This notion of anxiety resulted in lack of confidence with engaging in music related activities including teaching.

Lack of confidence in musicking and music

teaching: A lot of students were not confident to engage in music making activities such as singing and playing musical instruments in the beginning and also were not confident in teaching music.

Effectiveness of pedagogical approaches

implemented through the CAT method: With the use of CAT method and multicultural pedagogical approaches, it was possible to boost the confidence levels of students to engage in musicking and music teaching. Their confidence level gradually increased as a result of using this combination of effective music pedagogies and the elements of CAT in cycles. It was mentioned that students have realised that “you do not have to be an artist to teach music” and they all liked the flexibility of participation facilitated through the employment of multicultural teaching methods and theories.

Arts based assessment strategies: Most participants highlighted the uniqueness of flexible assessment strategies used and introduced derived from multicultural approaches. As presented above, student F points out that “the arts give every student a chance to shine in their own way”. This is a strong statement that highlights the capabilities of arts education.

The first four themes presented above mainly demonstrate the background that the students had at the beginning of the Arts unit and the last two are related to outcomes of the unit after its delivery. It is possible to understand these significant changes have occurred as a result of employing effective multicultural pedagogies and theories through the elements of CAT.

Challenges and limitations

This is an ongoing research and data for the pilot study presented in this article was collected when

I taught the music component of the Arts course to MTP students in 2016. From 2017, I was involved in the coordination of the BEd program offered at a different campus and leading the global placements for preservice teachers at the School of Education. Even though I coordinated the Arts courses in both the BEd and the MTP programs, I had fewer opportunities to teach. I started teaching the performing arts component again from the second semester (July) of 2018 and feedback has been collected from both BEd and MTP students for further evaluations of the effectiveness of the CAT approach. I believe that teacher education courses/programs should offer more opportunities for Arts education including music education. Cabedo Mas, Nethsinghe and Forrest (2016) have urged stakeholders to pay more attention towards enhancing arts in education globally. However it is evident that this will be a challenging task in future due to the reduction of Arts course as a result of the current obsession for STEM in Australian educational institutions.

For the 14% of participants in this pilot study who indicated that they are not sure or not confident, there should be opportunities for Professional Development (PD) to further develop their skills and knowledge as all generalist primary school teachers are expected to include music in their teaching. There can be also differences of prior experiences with music education between Bachelor of Education (BEd) and MTP students as the most BEd students are fresh out from schools and most MTP students generally have worked in different fields for a considerable amount of time. This difference may also impact on their learning and engagement with music including the attitudes towards musicking and music education. I would like to acknowledge the limitations of this small data sample and make no statistical inferences or generalisations to other contexts.

Future prospects and conclusion

It is important to equip our future teachers and in-service teachers with required skills and knowledge

to teach their students. It is evident that varied teaching strategies and techniques improve student performance and also balance teacher energy consumption through efficient input that leads to productive outcomes. The CAT as a method can be used in discipline areas beyond music education with different pedagogical approaches and theories to provide effective learning experiences as evident from this study. In conclusion I would like to invite educators working in different educational settings and contexts to trial the Continually Adjustable Transmission approach in conjunction with effective pedagogical approaches that they prefer in their teaching to achieve productive outcomes.

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