

# The mediation of cognitive skills through music

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## Abstract

Often when asking a pupil what they have learnt in music we find that few can make any analysis of the process in which they are engaged. By adopting the principles of Reuven Feuerstein pupils are given the necessary tools to connect with this exciting process. In turn they begin to identify how they think, and see that this cognitive knowledge is transferable from one activity to another. By following the premise inherent in Feuerstein that all learning is transmitted through culture, we are also given a means to devise lessons that have meaning. By examining a four week programme at a secondary school it is possible to see the difficulties that arise as pupils grapple with an activity without having the cognitive tools to make this analysis. Feuerstein offers music teachers a means to revitalise the curriculum and develop pupils understanding of how they learn.

Today owing to the evolution of music education, performing, composing, listening and appraising are a recognised part of the music lesson. In order to implement this curriculum a wide repertoire of skills and strategies for learning are required which make many demands on the teacher and the child. Before addressing such strategies directly by looking at the application of 'thinking skills' in the music lesson, I wish to consider how the work of Reuven Feuerstein can be of value in music education.

Feuerstein ((Feuerstein, Klein and Tannenbaum 1991) views 'thinking' as something that emanates from a culture, through which children can achieve greater understanding in their learning. From his work with those who had lost their cultural identity, such as the victims of the holocaust (Sharron 1987), Feuerstein realised that from the parent the child learns not only language skills but what has 'meaning' in a culture. This knowledge of the values and meaning in a society is considered by Feuerstein to be one of the essential aspects of what he terms 'mediated leaning experience.' This term refers to the very beginnings of a mother child relationship. Smiling and hugging at the baby stage is when the child learns a sense of security in knowing that the mother is happy. As the child grows so that bond is tested and becomes a way for the child to gauge whether the mother is pleased or not. From the mother's behaviour the child learns what is thought of as good or bad. The act of sharing is learnt and the means of comparing values in the society are gradually absorbed into the child's cultural map.

## Adoption of Feuerstein's principles in Music Education

How then do Feuerstein's ideas play a part in music education by parents and teachers? To begin with so much learning in music depends on the foundations laid by the parent. This begins with the parent teaching the child how to sing nursery rhymes and chant word games along with related actions. Through repetition and constant listening and support by the parent, which is the modelling at this stage, the child starts to build up a knowledge of the tonality and rhythm patterns in the culture (Bamberger 1991). The learning 'through the culture' develops as the child's experience incorporates recorded music and, if they are lucky live performances.

Music is seen in different contexts in society; buskers, the marching brass band, music in the supermarket, ice cream vans, the music on television from advertising to film music. This shows the child how music fits into many different contexts of time and place. This aspect of music provides for the music teacher a way to introduce music of another country by pointing to where music is performed by whom how and why. Just as the children and teacher have a common understanding through their shared culture of where and when music is performed so this shared learning can be used as a vehicle for showing children how music operates in other cultures. This is vital as children become aware of a wider world than their own particular region or country. This is how they get to know more about music in other parts of the world and to make meaningful connections.

Another important aspect of Feuerstein's work is taking the learning in a lesson and identifying what can be thought of as general understanding that can be transferred to other subject areas. This 'bridging' of what has been learnt in one area and applying it to the other can again be brought into

the music lesson. Through 'talk' the children become aware of not only what they've achieved in the music lesson, but what general learning has taken place. If a child has persevered and worked at a piece in a painstaking manner, such as continually starting at the beginning and working through to the end (as so often happens when learning a tune by ear) the learning might be to encourage the child to practise not the whole song countless number of times but small sections. The bridging would be to think about working on one small section of a task, as in other activities in life, rather than repeating everything from the start. At the same time, the very process of producing or learning a piece of music emphasises the concepts of symmetry and sequence, of patterns and of connections, of beginning middle and end.

To summarise the application of some of Feuerstein's ideas to the teaching of music:

- (i) The approach taken to teaching should relate where possible to the children's cultural understanding i.e. what role music serves in a society, and what similarities exist between music in a lesson and music they understand and can associate with.
- (ii) Learning tasks should be presented or modelled so that the children can learn the skills and strategies to be utilised from a specific example given by the teacher but related to the current level of concepts, skills and understanding of the children.
- (iii) The value to children of music beyond the 'here and now' as an ongoing aspect of their lives and their general development as fulfilled human beings should be given emphasis.
- (iv) Other aspects of mediated learning experiences can also be brought to bear:
  - sharing, by singing and playing music together.
  - achieving a sense of belonging by performing in a choir or band.
  - goal seeking, setting and achieving, by composing and performing.
  - gaining self control, through the skill of playing an instrument.
- (v) The children should develop their own understanding of what they have achieved in the music lesson so that the skills and strategies learnt can be taken into other activities in the school.

### **Cognitive Skills in Education**

The Somerset Thinking Skills Course (STSC) (Blagg *et al.* 1993) represents a development of Feuerstein's earlier ideas in the development of thinking. In this course a division is made between 'cognitive skills' and 'cognitive strategies.' Cognitive skills are thinking tools that are employed in a task such as generating, discriminating, refining and communicating ideas. Cognitive strategies are the management of those tools through successful organisation, co-ordination and practical application of these skills.

Looking at this more closely in practice let us consider cognitive skills, as identified in the STSC and align them with the National Curriculum for Music.

### **Cognitive Skills in the Music Curriculum**

The following are skills which can be identified in the curriculum for music. These are similar to the cognitive skills and strategies as identified by Blagg (1993).

Recognising: The cultural context of the time, place, origins and the role of music.

The ability to discriminate: Pitch, duration, timbre, dynamics and tempo in a piece of music.

Performing: To play accurately, to rehearse, to perform in time, to perform with others, to perform authentically.

Listening: To perceive the concepts of pitch, duration etc. and their application, to classify the music using the correct terminology, to distinguish one style from another, to observe critically a performance, to listen with appreciation to other viewpoints.

Composing: To try out, refine, and generate new ideas, to re-design a piece if necessary, to see patterns and relationships in music, to work with several ideas at once in fitting ideas together.

Communicating: The use of verbal tools: To communicate thinking using the terminology of music.

To demonstrate a cognitive approach in practice I will describe and reflect on four lessons observed at a secondary school. The school was a secondary school with a class of 28 year 9 pupils, divided between two teachers. The project that I attended was a four week exercise based on 'Ragtime.' The class had received music lessons throughout the first four and a half terms of their secondary school career and were familiar with chords and were able to use separate tracks on the keyboards to record their work. That is they could record on one track then superimpose on

others different sounds e.g. track 1 drums, track 2 bass, track 3 piano sound and so on. Keyboards, with headphones attached, and pianos were available for the pupils who were going to be working in twos or threes. The following is a record of the four weeks examining the mediation by the teacher and the progress made by the class over four weeks.

Week 1: The class listened to a piece of ragtime and isolated the characteristics of ragtime i.e. four beats in a bar bass line played on 1 and 3, with chords played off-beat on 2 and 4. The melodic line was described as being jumpy which the teacher explained was syncopated. The class then clapped the top line to reinforce the 'jumpiness' of the melody and performed a ragtime arranged for them on tuned percussion and recorders.

Week 2: The teacher explained to the class the next stage of the project which was to develop their own piece of ragtime. Eight bars of music were to be composed for a keyboard or piano. The children were asked again about the elements of the ragtime and the class looked at a way of constructing their own music with given chords, in no specific order, and the option of writing the music on a conventional music staff or scored by writing the names of the notes under each other. The class planned out their pieces and tried out ideas on the keyboard, none could play through their piece by the end of the session, though some had thought out a composition in draft.

Week 3: The children were asked to 'fit together' the piece that they were working on. As they were doing so some of the groups encountered specific problems. One group of boys working on a keyboard could not perform their piece. They had written out the composition in letters and could just about play each part separately, but bringing the parts together proved impossible. Each time they played in one part on the keyboard the other seemed to go wrong. (They had two problems they had split the melody between the bass and the top of the keyboard and they did not have a secure sense of pulse in their playing). The teacher asked them what was the cause of the problem which they identified as the 'timing.' She then helped them by taking each line at a time and analysed the problem with their assistance. Another group who played their composition but had no syncopation in the melody. Some children worked out a tune but found that it didn't fit with the given chords, so they went back again to the task to write a new melody. Other groups had planned a composition but couldn't play what was written as they needed time to practice.

At the end of the lesson the teacher drew the class together for a discussion. The pair of boys were asked about the problems they faced when composing. Having described the problems they encountered they considered what they had learnt. One of the boys thought that they should have been more careful in recording each track as one track being inaccurate had led to all the tracks being inaccurate. They were asked by the teacher what this meant in terms of changes to the way they would work the following week. The boys saw that the strategy they had to adopt was one of taking one thing at a time getting that right before going on.

The group who wanted to improve their piece to make it more syncopated decided that they had to listen again to the recording of ragtime style and then construct a new melody. The group who had played a melody that didn't fit with the chords similarly realised that the way they had worked was wrong. What they had to do was go from the chord shapes and construct a melody according to the rules of harmony. Finally the groups who had planned their pieces but not finished rehearsing them requested more time to perfect their performance and asked for extra time to work separately the following week.

Week 4: The final week was an opportunity for the pupils to work on their pieces before recording them on tape. The group of boys who had been having difficulty the previous week tried again to work on their piece but after much time in 'thinking' and rehearsing still could not quite get the piece right and needed a lot of time discussing with the teacher before putting everything together.

The final half of the lesson was an evaluation by the children of the work over the past four weeks giving them time to write down how well they thought they had worked and what the learning outcomes were. The teacher went round the different groups and asked them what they felt about the work they had undertaken. The boys were still not satisfied but felt that they had improved and were grateful that they had at least completed the task even though it 'wasn't right'. The other groups spoke of their enjoyment and sense of learning in terms of improvement in the use of the keyboard and the ability to work with others and keep their parts going.

### **Relating the Cognitive Skills to the Music Curriculum**

The cognitive skills that the class employed can be identified in relation to their knowledge of music from a different time and place, including conventions employed in the style (referring to the bass, chords and syncopated melody.)

The class had to employ their 'ability to discriminate' pitch, duration and tempo in performing the teacher's ragtime and their own compositions. To know they were in style, the pupils had to listen and evaluate their work to decide on whether it was authentic or not, as was the case with the pupils who realised their rhythms were no longer syncopated and decided to listen again to the Ragtime model before re-attempting their composition. In performing, the pupils planned, rehearsed and played with others. In this process they had to evaluate carefully what they were doing through listening and achieve accuracy in their performance by working together. They also had to employ their skills in evaluating each other's work and their own compositions to obtain a stylistic piece of writing. Finally they communicated their ideas to others in the process of composing, rehearsing and performing using the terminology associated with the music.

### **The Teacher's role as Mediator**

What was significant about this approach was the attention paid by the teacher to how the class were working. Her questioning of the class and offering alternatives enabled them to isolate what they were not able to verbalise between themselves. The pair of boys were having extreme difficulty in analysing what was going wrong in their work. They were constantly playing over and over the music without communicating to each other what the problem was. They did not know how to identify what was going wrong and were not able to analyse and identify the difficulty in their process of working. The group who composed their melody taking no heed of the harmonic plan of the piece had to also 'think' about their work and how best to build up their composition. The group who were composing a ragtime that was unsyncopated had to go back and try once more. In each instance the teacher acted as mediator identifying the problems each group was encountering and enabling them by various means to move into what Vygotsky termed the 'zone of proximal development' Kozulin (1994).

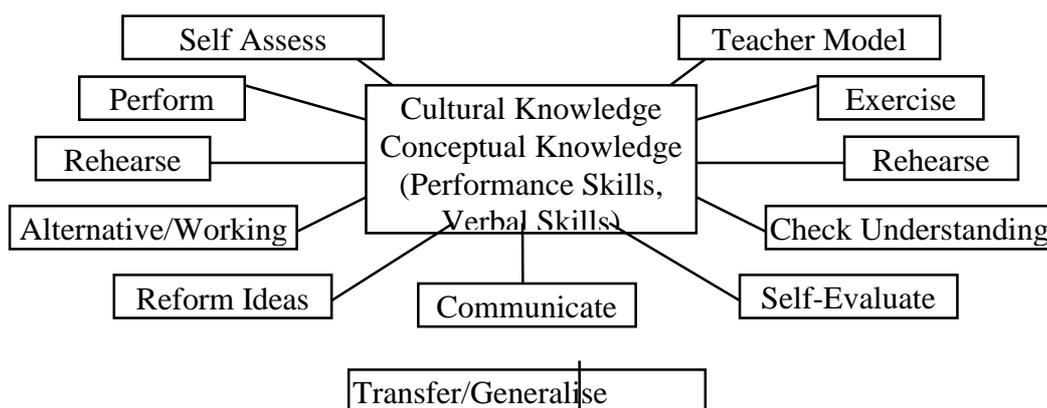
### **Transfer of Skills**

In each case the teacher asked the group about the general learning that could be derived from the lesson. The group of boys saw that breaking down the task into small manageable parts before continuing was important or as one of them said 'taking one thing at a time', was their next step. The group who composed the piece without thinking about the chord structure realised they had to 'sequence' more carefully their activities. The other group who had to think about the style went back to the 'original aims' of the exercise by listening to examples of the style. This was not simply reviewing the work in the class musically, but thinking about the general learning in the lesson that could apply to other areas of the curriculum.

To achieve this high level of transfer of skills and strategies from music to the other subjects in the curriculum the teacher needs to have the ability to mediate effectively, to foster this transfer by pupils. In doing so activities set have to be of an appropriate level for the class, and the skills and conceptual understanding of the children have to be taken into consideration in the assignment of tasks.

The diagram below is a schematic representation of the approach that was taken by the teacher in the sequence of lessons described.

## Thinking Skills in a Music Project



### **Cognitive Strategies in Music**

In setting up a music project the first consideration is to decide on the level of understanding and performance skills that the children possess. For example if the class can maintain independent rhythms then activities involving layering of rhythms can be undertaken. If they cannot keep a basic underlying pulse this activity will not be appropriate. A second factor is knowing how to develop children's ability to organise their own learning. In organising their work children have to decide on which instruments to use, the best way to develop their ideas and how to decide on when one person comes in and another drops out, or when to play together and individually. Planning is something often disregarded in music as it is considered, hopefully, as a doing activity. But there is a lot of planning that occurs in between attempts at realising a composition. Pupils will decide on how long an episode will last, how to manage the introduction of a melody over an accompaniment or how to maintain a regular steady beat by having two as opposed to only one person playing a basic pulse. Evaluating is more difficult and takes time. Sometimes a class will be satisfied with a performance and leave it at that, but at other times it is important to allow them time to see how they have constructed their ideas and the effectiveness of realising their plans and perceiving why they were not able to fulfil the task they set themselves.

The analogy of a football game is useful to illustrate the application of cognitive strategies. A team are instructed by their manager and subsequently employ their own skills of passing, kicking and throwing, while adopting the plan that has been provided by the strategist. This works well in the first half, but in the second half the opposition change their tactics. The team have not only to employ their skills in playing but must adapt their thinking and develop a new cognitive strategy to deal with the new opposition. Cognitive skills are doing and knowing, a cognitive strategy refers to the management of those skills in undertaking a task.

The employment of these 'meta-cognitive' strategies in music education will engage children in:

- drawing together the necessary information to demonstrate that they understand the nature of the task.
- reporting on how they approached the task as a means of demonstrating this understanding.
- evaluating the effectiveness of their approach by discussing its relative strengths and weaknesses with the teacher.
- communicating how what they have learned can be transferred to other more general situations.
- taking ideas from analysing the processes involved to inform the next stage.
- completing the task and making a final self-assessment.

### **Modelling in Music**

While English teachers may compose a poem at the same time as the class or provide a model to discuss the difficulties in construction of writing a poem, the music teacher can provide a model in music to show the class the difficulties that might be faced in a musical exercise. For example to write a melody using a particular chord pattern requires care and precision in manipulating the notes to form an interesting line. A teacher can show by producing their own realisation how to create a tune in a different style and as in the example provided start with the class performing the model.

The teacher may provide challenging but manageable tasks for the class to work on giving them alternatives or options to demonstrate how to start and develop ideas. The value of modelling is that the teacher can provide tasks that build on each other as the class gains in confidence and skill. In the lessons observed the teacher modelled the composition task by providing an exercise as a starting point. Having a short task to begin with of 8 bars instead of the traditional 16 bar phrase gave the teacher the option of extending the exercise if the class could complete the first composition. They could not in the time available go beyond 8 bars so the shorter length composition sufficed.

### **Conclusion**

Music is a subject that suffers in a number of different ways from time constraints. A limited number of hours are available within the Curriculum and as a practical subject time in the lesson has to be spent in organising space, instruments and a lot of people. Music teachers are concerned to make the best use of the lessons available and the idea of discussing generalised thinking with reference to the cultural context can be seen as beyond their remit. Yet from structured discussion and refinement of the learning process much more can be brought to the lesson. The class can have the time to think of alternatives, to question ideas and anticipate the results of their actions. By allocating roles to each other in the planning stage they can then evaluate their ideas as their work progresses. As organisers of how they work, they will be assessing the effectiveness of their process of realising ideas at the same time. Eventually the practice of generating ideas, refining thinking, testing out ideas, evaluating the work and then reformulating what has been achieved will start to become their usual way of working rather than one that's imposed. Having the time and the expectation that they will discuss ideas together will enhance the learning process. Hence less time will be spent next time the same problem is encountered as they have already realised how to solve the difficulty. Above all meaningful and supportive talk with the class will be of value to children who will be able to share their achievements and take their success into other areas of their lives. The presentation of music employing the shared cultural understanding of the child can reinforce a pupil's understanding of how other cultures operate. In time pupils may begin to perceive value systems in their own society and see their role within it.

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