INTRODUCTION

It is important when designing any music curriculum to provide opportunities for children to work creatively with the forms and structures of music. These opportunities help develop a sense of control and balance as children engage in aesthetic decisions during their music making. Through these "decision making" activities children draw links between the known to the unknown and "new knowns" are developed. They learn to apply both critical and creative thinking skills during this process of making musical decisions. This in turn develops their intuitive musical knowledge about deriving some sense of music around them.

This article reviews five studies that address the nature of decision making in music making. The various learning processes that allow students to actively and skillfully conceptualise, apply, analyse, synthesis and evaluate in music problem-solving task are described. The article also examines the various conditions of creative musical decision processes, and suggests ways in which teachers can arrange musical experiences that have real learning value for students.
REVIEW OF RESEARCH

Creative music decision making: representation and strategies

Jeanne Bamberger (1977) investigated how an individual's mental representation of a melody was created and changed during the creative process. The working processes of two high school students were described. The students experimented with the arrangement order of the tune blocks to arrive at a suitable melody. The blocks could be arranged in any order and used more than once. Students had to consider reasons for selecting various tune blocks to represent the beginning, the middle and the end of their arranged melodies. For example why certain tune blocks could, in their view, make a better "beginning melody", or "climax" or "finale". The results were keyed into a computer causing the music box to produce the configuration.

The researcher observed that as the students became more involved in the restructuring processes, they were more conscious of the melody as a whole. Initially, they focused on the pitch, duration and rhythm of individual tune blocks. Later they were able to consider phrasing, proportions of parts to whole and structural downbeats. Bamberger argued that shuttling between local and global considerations carry implications that cause one vista to affect the other.

She concluded that students had to discover their own priorities and processes of selection. She found that students derived their musical grouping and decisions by focusing on particular features and relations in the sequence of events as these transpired along the melodic line. Learning also occurred when students gained greater freedom to enrich their representation as they discovered new relationships within the melody arrangement.

In another study "Intuitive and Formal Musical Knowing: Parables of Cognitive Dissonance", Bamberger (1978) investigated the internal representations of knowledge and their relation to formal descriptions. She suggested that intuitive knowledge refers to a repertoire of spontaneous internal strategies that determine the nature of the interaction between an individual's sensory experience and descriptions of it. She termed those that focus on features of immediate, situational experience as "figural", and strategies that lead to the construction of systematic frameworks as "formal". Based on these psychological speculations she designed three tasks that allowed for an interactive relationship between a number of related cognitive domains.

Task 1:
The first task involved three college students: a beginning music student, a music major in a first-year musical analysis class and a performing musician. They were asked to describe their responses to a Scherzo:

- the beginning music student responded to the expressive import of the music, and relied intuitively on referential meaning as the basis for his response;

- the music major analyzed the music from a purely technical perspective;
• the performing musician elaborated on the transformation of a germinal figure by discussing various compositional devices used. These findings she purports, raise issues such as the level of context and content/knowledge of compositional devices that contribute to musical responsiveness.

**Task 2:**
In this task, Bamberger recorded the notations of two hundred children to a given clapped rhythmic pattern:

![Rhythm Pattern]

She categorized the varying expressions of similarity relations and extracted clues as to how children represented the figure to themselves.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Children's drawings</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type I:</strong> Pre-figural</td>
<td><img src="image" alt="Rhythm Pattern" /></td>
<td>Depicted the number and succession of events but not the distinction between or relations among events.</td>
</tr>
<tr>
<td><strong>Type II:</strong> Figural</td>
<td><img src="image" alt="Rhythm Pattern" /></td>
<td>Showed a greater differentiation among events and a further articulation of the grouping structure. Events that belonged to a different group were not compared in relation to other significant events.</td>
</tr>
<tr>
<td><strong>Type III:</strong> Durational</td>
<td><img src="image" alt="Rhythm Pattern" /></td>
<td>As in standard notation, measured events with respect to time; similarities among events were measured although events might have belonged to different clusters and were distanced in time/space.</td>
</tr>
<tr>
<td><strong>Type IV:</strong> Metric</td>
<td><img src="image" alt="Rhythm Pattern" /></td>
<td>Depicted the duration of each event, showed explicitly the underlying beat, revealed &quot;shaping of a phrase&quot; and the connections between these (p. 106)</td>
</tr>
</tbody>
</table>

Bamberger stated that Type IV children had decoded and invented a consistent way for accurately measuring and classifying musical events which can be applied to generally any rhythmic figure.
Task 3:
In her final experiment she asked an eight year old child to arrange a scrambled set of bells to form the tune “Twinkle, Twinkle Little Star” and noted how he provided written instructions for someone else to play the tune on the bells. His school described Jeff as a child who talked little, could barely read and whose only mathematical skill was counting. Jeff worked on white-base bells with pitches C, D, E, F, G, A and brown-base bells with pitches C, G, E.

He arranged the bells according to sequence of events on the tune (C, G, A, G, F, E, D, C). Same pitches situated in different immediate musical contexts appeared to be different for Jeff and he had to grapple with the meaning of this. Initially, his instruction for playing the tune was:

<table>
<thead>
<tr>
<th>Hits:</th>
<th>2</th>
<th>2</th>
<th>2</th>
<th>1</th>
<th>2</th>
<th>2</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bells:</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>G</td>
<td>A</td>
<td>G</td>
<td>F</td>
<td>E</td>
<td>D</td>
<td>C</td>
</tr>
</tbody>
</table>

He proceeded to name the bells according to their positions on the scale (C, D, E, F, G, A). He discovered that there was no spatial congruence between the tune, scale, and performed gestures. He was initially puzzled that the two pitches that were beside each other in the tune were so far apart in the scale.

Jeff reconciled the distinctions by coordinating the sequence of tune events with the sequence of ordered bells. His final notation had boxes that showed which bells to hit twice:

1 5 6 5 4 3 2 1

Bamberger argued that Jeff arrived at this formal representation by building “coordinating schemas” through which he could coordinate knowledge of the tune and scale. His formal description evolved from his problem solving experiences. Taking the above three cases as evidence, Bamberger contended that the ability to construct coordinating schemas, and to develop multiple perceptions of the “same” phenomenon are basic skills in learning how to learn. She emphasised the crucial role that intuitive knowledge and figural strategies play in musical learning and the necessity for interaction among intuitive knowledge, figural strategies and formal strategies. Thus the real value of Jeff’s experience lay not in his moving away from figural strategies but his acquisition of coordination between figural and formal representations.
Creative music decision making: characteristics and conditions

In a qualitative study DeLorenzo (1989) examined creative problem-solving processes of sixth-grade students while composing a 4-bar melody with given tones in a chord progression provided on a given Orff mallet instrument. Data gathered included videotapes, interviews with students and music teachers, field notes, and transcriptions of students' musical responses. The researcher assumed that problem-solving involved a series of choices and analysed the students' musical decisions from the perception to the solution of the problem. Four areas guided the musical decision-making processes of subjects' through this music composition project:

(a) perception of the problem structure, i.e. how students perceived the problem as suggesting many possibilities;

(b) search for musical form, i.e. how musical decisions determined the form of the music;

(c) capacity to sense musical possibilities, i.e. how acutely students developed and shaped ideas, and

(d) degree of personal investment, i.e. how students were engaged in creating.

These characteristics were used to describe and to compare students' creative problem-solving processes. DeLorenzo found that students' perception of the problem and the problem-solving processes were related. Students who perceived the problem as a venue for a variety of possibilities explored music at a deeper level and spent time in determining the structure of the piece. In contrast, uninvolved problem solvers saw their initial sound event as the product rather than a beginning for new ideas. Findings indicated that structured exploratory experiences with related discussion may facilitate higher levels of musical thinking.

Exploring children's aesthetic decision-making, Barrett (1996) analyzed children's processes in their musical discourse as composers. Her analysis focused on how children, aged five to twelve, worked with concepts of a beginning, middle and ending in their compositions. They were free to use any musical instrument. Notation was not compulsory. All completed works were transcribed on audiocassettes and these were transcribed into standard notation. Results showed that repetition was often used to develop the structure of the musical composition. Her research (see Figure 1) suggests that children structure their compositions via processes of "describing, analysing, interpreting and evaluating" sound combination (Barrett, 1996, p. 56).

Webster and Hickery (1995) implemented creative problem-solving projects in a fifth-grade music class. These projects involved music composition, improvisation and critical listening. The authors emphasised that the projects did not require technical virtuosity from students or teachers. However a liberal environment free from the rigid mentality of "one right answer" was quintessential.

- Workstations with a variety of musical instruments were set up to encourage improvisation and students discussed their use of instruments.
- Students also constructed melodies using a random process such as rolling a dice, to determine which numbers corresponded to specific notes.
Musical decisions were made for dynamic and rhythmic variation. Finally, students rearranged these melodies making it sound musically acceptable.

Students were encouraged to listen critically, attending to elements of rhythm, melody, tone colour and harmony. The authors also believed that creative thinking in music involves the ability to exercise imagination while listening to music. After listening, the teacher encouraged open-ended “why?” and “what if?” questions about elements in the music. Thus divergent strategies of sound manipulations could be synthesized into creative products, whether they were compositions, improvisations or listening analyses.

**CONCLUSION**

The studies reviewed show the need for students to actively reorganize and restructure musical schemata. Through these activities they are able to evaluate alternative choices and make meaningful understanding of their music. Self-directed inquiry allows individuals to encounter different musical problems that occur at different points during the problem-solving process. The ability to monitor one’s thinking, the task and strategies used are critical for a wide range of problem-solving and communication tasks. Problem-solving tasks set by music teachers provide the opportunity for students to acquire knowledge of music as contrasted with the knowledge about music. Asking children to solve musical problems will engage them in tasks that are fundamental to developing creative and critical thinking in music. How music is understood, the nature and quality of the problems and instructions and the evaluation of musical problems have significance in the development of musical experiences that have real learning value for students.
IMPLICATIONS FOR TEACHERS

1. Provide musical opportunities that will accommodate differences in decision-making approaches

The development of musical decision making skills is the result of the interaction with the environment, with musical thought and individual intellectual and personality traits. Each child is different and varies in the way she/he perceives, represents, organizes and solves a problem. There is no one way of making decisions and teachers should accept as well as provide, for a variety of strategies and solutions. For example: Incorporate music improvisation or composition activities in lessons which encourage children to develop and expand musical ideas. They can be called upon to improvise movements to music and compose music for dramatization and storytelling.

2. Provide a conducive environment to foster creative music thinking and making

Developing musical ideas works best when perception, processing and performance are integrated. Music activities should encourage exploration and manipulation of musical concepts and ideas, providing for opportunities for perceiving, self critiquing and feeling. For example: Encourage growth of ideas and craftsmanship by asking “open-ended” questions on various musical compositions, “What would you revise in this composition? Why do you want to revise it? How would you change it?”

3. Develop a student-centered model of learning

A positive, reinforcing and accepting climate is essential for nurturing creative behavior. Teachers should provide an optimal environment for self-learning, self-directed thinking and discovery. For some students, “blind” exploration of sound may be futile unless the teacher facilitates and guides. Teachers can encourage imaginative and divergent thinking asking open-ended questions such as: “what other ways can a composer end this piece?” For example: help young children build a repertoire of sound possibilities and techniques through free exploration and discovery - by exploring for instance, the range of sounds an instrument might make in terms of techniques (scraping, shaking, striking, rubbing, blowing, plucking, strumming etc).
SOURCES


