Assessing Creativity in Composing Music:

Product-Process-Person-Environment Approaches

Myung-sook Auh
Centre for Research and Education in the Arts
University of Technology-Sydney

Abstract

How do teachers and researchers assess creativity in composing music? Four approaches can be used: assessing 1) Product, 2) Process, 3) Person, and 4) Environment. The purpose of the study was: 1) to give an overview of research studies in each of the four approaches, and 2) to suggest a Product-oriented method for assessing creativity in composing music and story-telling by children, which was successfully used with high interjudge reliabilities in Auh & Johnston (2000). The overview should give a clear picture of assessment methods for creativity in composing music. The overview shows that: 1) Product - A most commonly used method for assessing music compositions is expert judges' evaluations using criteria. Computerized content analysis has been used for Western classical masterpieces. 2) Process - Compositional strategies used by Expert vs. novice can be described as Gestaltistic vs. Atomistic. 3) Person - Visual imagery stimulated by use of graphic notations in composing music made a significant difference in musical creativity, producing more creative compositions. 4) Environment - Creativity in the East versus the West can be described as intuition vs. logic. Cross-cultural studies of musical creativity show that musicians of non-western countries emphasize aural skills, improvisation, and opportunity to exercise creative potentials.

I. Introduction

There is an excellent review of assessment of musical creativity by Webster (1992), which is organized by content analysis of process and product rather than product-process-person-environment. This paper intends to emphasise the four focuses of creativity assessment. Therefore, the purpose of this paper is: 1) to give an overview of research studies in each of Product, Process, Person, and Environment approaches, and 2) to describe a method of assessing creativity in composing music and story-telling by children which was successfully used. The overview should give a clear picture of how creativity in composing music has been assessed and of methods that could be used by teachers and researchers for assessing creativity in composing music.

There are two kinds of methods for assessing creativity in composing music: 1) Quantitative and qualitative approaches, and 2) Product-Process-Person-Environment approaches. The former is by the data type to be collected, and the latter is by the focus of study. Quantitative
studies use various ways to collect quantified data for creativity, such as: 1) composition tests followed by expert judges' evaluations of the compositions using criteria (e.g. Auh, 1996, 1997, 1998, 1999; Auh & Walker, 1999; Kratus, 1994; Webster, 1979); 2) measures of creativity in music devised by researchers (e.g. Baltzer, 1988; Webster, 1987b); and 3) videotaping students' behaviours in composing music, which are codified using computer programs, such as the NUD•IST computer program (e.g. Brand, 2000; McPherson, 2000). Qualitative studies use: 1) interviews (e.g. Barrett, 2000; Freed-Garrod, 1999), 2) observations in music classes by teachers over a period of time (e.g. Carlin, 1999; Levi, 1991), 3) researchers' work with children for composing music in informal settings, 4) students' work on computer composing music by themselves, which is saved on computer and examined by the researcher (e.g. Folkstad et al., 1999; Hickey, 1997), and others. Qualitative studies report descriptively what is happening when composing music and researchers' interpretation of what it means in terms of creativity.

In the Product-Process-Person-Environment approaches, both quantitative and qualitative methodologies can be used. The main concern of this paper is the Product-Process-Person-Environment approaches, which are described below.

II. Product-Process-Person-Environment Approaches

Product

In the context of assessing creativity in music compositions, the Product refers to music compositions. A common method of assessing creativity uses expert judges' evaluations of compositions using criteria. Judges' evaluations have been frequently used among researchers since Catherine Cox used the method in her study of eminence for the first time in 1926 (Albert & Runco, 1999). Criteria commonly used in creativity research in music are either musical ones, such as tonal coherence and rhythmic coherence (e.g., Kratus, 1994) or those based on Torrance's criteria, i.e., Fluency, Flexibility, Originality, and Syntax (e.g., Webster, 1997). A basic assumption for the expert judges' evaluations is that creativity of compositions is the quality identified by expert judges in the area. Can the creativity of compositions be identified without experts' decision-making? Someone or something should decide whether a composition is creative or not; without such a decision, its creativity would not be known. How about lay persons' opinions? They could say something about creativity of compositions, but those comments will not be considered as reliable and valid.

A bold approach to studying creativity of music compositions was made by Simonton (1994), who used computerized content analyses of musical structures of western classical compositions. He investigated musical creativity and musical aesthetics on the basis of his computer analyses of compositions by Mozart, Beethoven, and others (Simonton, 1987, 1993). After conducting numerous studies of the kind, he concluded that the most popular western classical compositions tend to have medium levels of melodic originality (Simonton, 1994).

Some others (e.g. Auh, 1999; Davidson & Welsh, 1988) attempted to identify creative thinking through musical analysis of compositions. Auh (1999) emphasized that musically-correct compositions, i.e., those with tonal centre, regular rhythms, and following other musical rules, are not necessarily musically-creative. Davidson & Welsh's (1988) method is interesting in that the same question is given to all students and how students think differently in solving the question is investigated. The method can be applied in simple creating tasks in music classes. For example, a teacher gives a musical theme, and
students are asked to make a composition with it. Thus, the teacher can compare how creatively the theme was used in student music compositions.

Process

The Process covers from the beginning of intention to create to the moment when the music composition is finished. Creative process is described as consisting of four stages, according to Wallas (1926), i.e., Preparation, Incubation, Illumination, and Verification. Wallas's theory is still praised even after many decades, and Webster (1987a) used Wallas's four stages for his conceptual model of creative thinking in music. A slightly different way of describing the compositional process is Exploration, Development, Repetition, and Silence (Kratus, 1989). Kratus' four stages are specific for composing music, as he identified them through analysis of the composition time used by primary school students. Wallace's four stages are, however, for creativity in general.

Compositional strategies used in the compositional process were investigated. Several researchers found different strategies used by expert as compared with novice students in composing music. Davidson & Welsh (1988), Colley et al. (1992), and Irvin et al. (1999) found that expert students tend to use gestaltistic and holistic approaches to composing music by laying out a structure first and figuring out details later, while novice students tend to use atomistic approaches by composing sequentially filling out details rather than seeing a whole picture. Especially, Davidson & Welsh (1988) found that expert composers tended to be reflective thinkers, i.e., thinking about the whole music before writing it down, while novice composers tended to be enactive thinkers, i.e., they start composing without clear ideas and figure out as they go. Folkstad et al. (1998) found slightly different compositional strategies, probably due to their use of the computer for composing music. They found vertical versus horizontal strategies. Vertical means students compose music writing down several instrumental parts at the same time, thus moving from one section to another. Horizontal means students write down one instrumental part all the way through, and then work on another instrumental part. Vertical strategies are global approaches to composing music, while horizontal strategies are atomistic, because the former show that the student had already worked out all the instrumental parts, while in the latter students work one part at a time.

Kratus (1989), in his time analysis of compositional processes, found that successful students in composing music used more time developing musical patterns and repeating performance of their compositions than unsuccessful students who spent more time exploring. Auh and Walker (1999) showed that students used more varied kinds of compositional strategies when composing music with graphic notations than when composing with staff notations. Auh (1999) identified the kinds of compositional strategies used by secondary school students in Korea. For example: 1) To get a musical idea at the start, they explored by singing and humming or playing on an instrument, and recalled tunes that they had heard many times before; and 2) To develop musical ideas, they used detailed musical-analytical strategies, visual imagery, feelings & thoughts, and listening again & thinking about it. The findings suggest that not only compositional ability (i.e., expert vs. novice) affects use of compositional strategies, but also the tools used for composing music (e.g., computer, graphic notations) affect compositional strategies.

Person

The Person factors that have been investigated in previous composition studies (e.g. Auh, 1995; Kratus, 1994) include: musical achievement, musical aptitude, informal musical experiences, formal musical experiences, music self-esteem, academic grades, IQ, and gender. Musical achievement was found to be one of the significant factors for musical
creativity repeatedly (e.g., Auh, 1995; Baltzer, 1990; Webster, 1979). Unexpectedly, informal musical experience was found to be the best predicting factor for musical creativity of American primary school students among the first eight factors listed above (Auh, 1995). Interestingly, neither formal musical experience nor musical self-esteem was significantly related to musical creativity (Auh, 1995). Multiple regression analysis showed that a combination of informal musical experience, musical achievement, and academic grades accounted for 11% of the variance in creativity in composing music by American primary school students (Auh, 1996).

In addition, thinking styles and personality traits have been studied in activities of improvisation. Impulsive/reflective thinking styles were not significantly related to creativity in improvising music (Schmidt & Sinor, 1985). Among personality traits, excitability, aggression, independence, anxiety, self-confidence, curiosity, and imagination were significantly related to musical creativity, and a combination of imagination, curiosity, and anxiety accounted for 29% of the variance in creativity in improvising music (Swanner, 1985).

Concerning the use of graphic notations, the use of visual imagery for creative discovery is well-documented in Gruber's (1978, 1981, 1999) illustration of how Darwin came up with Evolutionary theory: Darwin used drawings of tree branches called "Tree of Nature" to conceptualize evolutions of species. To stimulate visual imagery in composing music by secondary school students, some researchers used graphic notations (Auh & Walker, 1999; Auh, 2000). When students were encouraged to think of musical ideas using a set of graphic patterns developed by Walker (1976, 1978), they came up with more creative compositions than those without using graphic notations. Aesthetic decision making was investigated in the context of composing music by young children (Barrett, 2000). It was found that the children could distinguish beginning, middle, and ending of their compositions; and their musical thinking was highly sophisticated. A similar result in terms of beginning and ending of children's improvisations was found with Italian children (Baldi & Tafuri, 2000).

Environment

The Environment factors that could play significant roles in affecting creativity when composing music are in 4 categories: 1) Home - significant others; e.g. parents, teachers, friends, siblings. 2) School and society - confirming vs. non-confirming environment; e.g. Asia is a confirming society while USA is a liberal society. 3) Country - political economic situations; e.g. The impact of Russia's communism on Shostakovich's creative thinking in music, resulting in dualistic musical style. And 4) Culture - cultural values of West and Asia; e.g. In the West, science and business are more valued than arts; In Africa, music and dance are functionally a part of their life style as they sing and dance in most social gatherings. The impact of the Environment factors might be different depending on the individuals, since the individuals are complicated-beings and thus would be different in absorption rate of the impact of the Environment factors.

A strong advocate of the importance of environment in creativity is Csikszentmihalyi. He suggested that rather than asking, "what is creativity?", we should ask "where is creativity?" (Csikszentmihalyi, 1988, p. 325). What he means is that creative individuals can be judged differently depending on where they are. They should be in the right time and right place to be recognized as creative. For example, Antonio Vivaldi was completely forgotten after his death until the beginning of the 20th century, when musicologists realized his great contribution to the Baroque concerto. And many other creative musicians (e.g. J. S. Bach) and artists (e.g. Vincent van Gogh) who were not recognized as creative when they were alive. That is, they were in the wrong time, and their time had yet to come.
Interesting cross-cultural studies on creativity have been reported. Creativity in the East and the West was scrutinized with a thesis that "Eastern approaches to creativity tend to be more 'intuitive', while Western approaches to creativity tend to be more 'logical’" (Wonder & Blake, 1992, p. 174). Taoism was interpreted in relation to creativity by Kuo (1996), employing his understanding of both Western and Chinese cultures and his knowledge on western psychological approach. He stated that in Taoistic creativity, Incubation [of the creative process], syntectic thinking, and the unification through the opposites are important concepts. Incubation is an important part of the creative process, since Taoistic artists would seek for spiritual transcendence through reflection before starting on their creative work. Also, he mentioned that Taoism is strongly related to artistic creativity, which requires more of intuition than of logic. Chinese and American students were compared to see if there are cultural differences in problem-solving approach with the Nine-Dot problem (Li & Shallcross, 1992). There were cultural differences: American students spent more time going through trial-and-error before arriving at a solution, while Chinese students spent more time reflecting on the problem and solution. The finding was interpreted that Chinese students' problem-solving approach reflected a Chinese saying, "Think three times before doing" (Li & Shallcross, 1992).

Cross-cultural study of musical creativity of non-Western countries, such as India, China, Iran, West Africa (Ghana, Nigeria), and Yugoslavia (Campbell, 1990) and southern India, sub-Saharan Africa, and Vietnam (Campbell & Teicher, 1997) show that: 1) Improvisation dominates the creative process and product in the non-Western countries. 2) Musical training processes of the non-Western countries are fundamentally different from those of Western classical tradition in that aural training dominates in the former while music notation dominates in the latter. 3) Musicians of non-Western countries learn frameworks of various musical styles, which are used when improvising with self-expressions. 4) A combination of aural skill development and creative potential is the common feature found among improvising musicians of India, Sub-Saharan Africa, and Vietnam.

III. A Product-Oriented Method of Assessing Creativity in Composing Music and Story-telling by Children

A method of assessing creativity in composing music and story-telling by 3 - 5 year old children is suggested here. The method was successfully used with high interjudge reliability for expert judges' evaluations in Au & Johnston's (2000) study as well as Au:h's (1996, 1997, 1999, 1999, 2000). Thus, this method is a Product-oriented approach and use expert judges' evaluations using 3 criteria. Deciding what criteria to use for such evaluations is tricky because researchers tend to use different criteria. However, criteria of creativity should be chosen on the basis of the definition of creativity that the researcher chose for his/her research.

Despite disagreements about definitions of creativity (e.g., divergent thinking ability, problem-solving ability, etc), there is one definition of creativity on which they generally agree. That is, "creativity is the ability to produce work that is both novel (i.e., original, unexpected) and appropriate (i.e., useful, adaptive concerning task constraints)" (Sternberg & Lubart, 1999, p. 3). Therefore, the two criteria commonly used in creativity research are: 1) originality, and 2) appropriateness. Appropriateness can be interpreted differently according to disciplines. In music, appropriateness means that the music has a structure and is not random, as music refers to organized sounds, distinct from noise. Another criterion should be added to criteria for musical creativity due to the "artistic" side of music, which is not an issue in other disciplines such as science and medicine. For example, expressions of
feelings are involved in music, while they are not in some other areas. Therefore, criteria for assessing creativity in musical compositions should be: 1) Originality, 2) Structure, and 3) Expressiveness.

I conducted research on creativity in musical compositions using the criteria of Originality, Structure, and Expressiveness and 5-point rating scales (Auh & Walker, 2000; Auh & Johnston, 2000), and found high interjudge reliabilities for the assessments. The interjudge reliabilities were $r = .71$ in Auh and Walker (1999), $r = .88$ in Auh and Johnston (2000). When the criteria were also applied to assessing creativity in children's story-telling, the interjudge reliability was $r = .72$. Therefore, the criteria of Originality, Structure, and Expressiveness were reliable for assessing creativity in musical compositions and story-telling by children. Then, are they valid criteria? In Auh and Johnston's (2000) study, I asked judges to describe the reasons for giving a certain mark for each of the criteria in evaluating musical compositions and children's stories. For example, for a composition with high marks of 5, 5, 5 on 5 point-rating scales (5 being highly creative), a judge was asked to describe why the composition is original, well-structured, and expressive. By asking judges for such descriptions, the evaluation method could prevent invalid ratings by judges.

IV. Conclusion

The overview of research studies showed important aspects of creativity in composing music, whichever approach was used, whether Product, Process, Person, and Environment. Thus, which method teachers and researchers would use for assessing creativity will entirely depend on which aspect they are interested in and the limitations that they have. The method of assessing creativity in composing music and story-telling, described above, is an example for such an assessment that geared towards Product and expert judges' evaluations.

It should be noted that due to the elusive nature of creativity, recent psychologists have introduced different approaches. Gruber (1999) focused on the aspect that he thinks is the most objective, i.e., how creative people work when creating. Gardner (1993) suggested a framework for an intuitive study of geniuses, which covers all major aspects of creativity systematically, and analyzed seven geniuses who are representatives of his multiple intelligence theory. Csikszentmihalyi (1999) suggested systems approach investigating the impact of society and culture on creative persons. However, there are still strong advocates of experimental studies of creativity (Runco and Sakamoto, 1999).
References


