Education with Computer Music in Colombia

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ABSTRACT

This paper is a description of various aspects about using computers on music education in Colombia, and suggests applying this techniques for teaching music in other third world countries with similar characteristics. The approach of computer music has proven to be successful within several groups of students at La Universidad de Los Andes in Bogota, between 1992 and 1997. Given that music education at an early age, and at high school levels is neither mandatory nor offered in many schools, makes it difficult to develop a high standard of musical culture in the country. Our belief is that this missing gap can be filled by learning about music from and electroacoustic point of view, and by using computer music techniques.

BACKGROUND

Electroacoustic music in Colombia has been active since the 1960s, and has been used by major composers ever since. The mixed and live electronics performance side has been limited somehow. Computer music has been on the minds of some engineers, and composers since the 1970s, and materialized during the late 1980s. At that time, compositions, and performances using computer technology, spread individually, and at some universities mainly in Bogota (Universidad de Los Andes and National University of Colombia), and in Manizales (Universidad Autonoma de Manizales). Manizales had the first computer music studio in the country. From there on, music departments at these universities offered courses in the history of electroacoustic music, algorithmic composition, live electronics, synthesis, and filtering.

MUSIC EDUCATION IN COLOMBIA

Music education in the country has primarily concentrated on two major aspects. First by teaching western history of music and technical skills for performance. Second by studying folklore. There has been a great effort to develop high musical standards, and traditional instrument skills by importing or mimicking methods from European countries, and the U.S. Folklore is studied from the compositional, and anthropological sides mainly.

STATE OF THE ART

The new college generations have been exposed to commercial, and technological developments around the globe. As a result, they have found some sort of identity, by shortening gaps with people in other countries. Therefore there is a better absorption rate between cultures, and arts from around the world. Among local artists there is an increasing interest in competing with colleagues in other countries, implying that, there is a need to communicate their art with high level standards.

By teaching music from an electroacoustic point of view, some preconceptions about the nature of music have been turned down. We have assumed that the essentials of music are the elements of sound and, performance. For most students, computer tools are at their reach, and feel secure by using them. Thus, we believe, computer music can help Colombians to be able to compete at a

worldwide level. Next are the results of using existing electroacoustic and computer music techniques.

FACTORS AND VARIABLES

The following factors were taken into account while developing music education with computers: The value of music, and other arts among Colombian society. The meaning of music for individuals ranging from a low level of education to those in managerial positions. The quality of aesthetic experiences of people interested in music. The relative influence on human behavior by different styles of music. The role of music instruction on such educational tasks as, organization, rhythm, and pace keeping. The concept that music fulfills different needs, and roles in human life. Roles I like, emotional expression, aesthetic enjoyment, entertainment, and maintenance of the cohesiveness. Music as a human behavior. The mental construct of differing levels within society, and its effect on what people do. The fact that this differences affect music preferences, and the use of music. The idea that music is something that people learn, just as they learn many other things in their lives.

MUSIC EDUCATION WITH MIDI

As part of the technological revolution abroad, MIDI has reached the hands of many music students. To avoid a lack of understanding of the relationship between music, its sciences, and technologies, a course describing the basics of computers and musical instruments was developed and taught at Los Andes since 1993. The goal was to induce most students to this methods. Subjects included: computer history, computer basics, algorithms and logic, the role of musical instrument, the synthesizer as an instrument, the MIDI protocol, and introduction to interactive systems like *MAX*. Students learned about operating, composing, performing with MIDI, and also about the computer - keyboard interface. Most of them acknowledged an instant gratification for listening to their own works at time of composition.

MUSIC EDUCATION AND THE AESTHETICS OF ELECTROACOUSTIC MUSIC

Perhaps this course has influenced the most. It was developed as part of the sequence of music histories, but rapidly changed to be part of composition, and music technology. It was first offered in 1993 , and was opened not only to music students, but to the university public as well (no prerequisites). Students from areas such as, engineering, psychology, the humanities, and fine arts have taken the course ever since. They have learned about definitions such as electroacoustic music, concrete music, electronic music, electric and electronic instruments, live electronics and computer music. Recordings of the great composers have also been analyzed. The most important discovery is the sound set approach, instead of the tonal or the chromatic approach.

MUSIC EDUCATION TRANSCENDS TO FINE ARTS

Through the electroacoustics course more and more students from fine arts became interested in sound as another of their plastic elements. Therefore a course involving sound was developed and introduced for the first time in January of 1995 at the fine arts department at Los Andes. The goal here was to suggest artists to work with sound as matter, and to produce a soundscape portrait. The problem, as with other technologies like animation, and video was the notion of time. Most students challenged it. The gorgeous atmosphere, not found among music departments, allowed to talk about concepts like acousmatics, sound projections, art-music, and sound installations. The role of sound in radio, video, animations, and performances were also discussed. For most artists computer music software packages like *Sound-Edit,* and *Pro-Tools* were very intuitive. The same

with filtering programs like *GRM-TOOLS,* and *HYPERPRISM*.

COMPUTER MUSIC TECHNOLOGIES AND MUSIC EDUCATION

As a result of previously described courses some students have gone beyond the basics of music theory, performance, the science of music, and have embarked on projects including various fields of computer music. The quality of an interdisciplinary school has helped to establish relations with the College of Engineering, and the Fine Arts Department. They have given some conditions, to carry on with computer music objectives . Following are the results of working on this various fields.

RESULTS IN ALGORITHMIC COMPOSITION

Students have learned to compose with machines and used tools from mathematical logic and physics. They have managed to compose for electronic instruments in no traditional ways. A sense for new interactive compositions has also been developed. In addition students analyze, and describe various styles of compositions, algorithmically. In practice, this method has resulted to be more operative than traditional composition. For computer science students, this has come as a turning point as to how to design better interfaces that musicians can use more effectively.

RESULTS IN COGNITION AND PSYCHOACOUSTICS

For the first time attention is given to the way people perceives music in the country. From the standpoint of cognitive sciences, a new meaning to musical expression has been explored. There is also a change to the way musical masterpieces are analyzed by means of perceptive processes instead of just plain musical theory. There are some attempts to find some relationship between musical structures, and artificial intelligence.

RESULTS USING ANALYSIS AND SYNTHESIS METHODS

Students can now create or design their own musical instruments. This approach gives them a different taste to the meaning of composition and expression . One advantage is that these techniques discover the nature of the physics of sound, and imply the relationship of music with science. From the analysis standpoint more attention is paid to timbre and spectrums of sounds. There is also a marginal approach to the Fourier transform. For engineers , this has come as to the idea, on how to expand the bandwidth of a sound, by quantizing, synthesizing, and processing it, in a practical way.

RESULTS BY WORKING WITH PHYSICAL MODELING

Physical Modeling has given the advantage of studying the musical instrument from the interface, and sound generation perspective. This implies an understanding of the behavior of the instrument, and its acoustics; very useful in traditional orchestration. Students can now think in terms of virtual instruments. For electrical engineers, physical models presented the challenge of researching in other filter designs, and new mathematical formulas for manipulating sounds, in artistic, and meaningful ways.

INTERACTIVE SYSTEMS

By learning about interactive systems students applied their knowledge to news ways of performance, new interfaces, and unconventional concerts, including machine performance, and performing with a machine. Artists learned to produce sound sculptures.

CONCLUSIONS

John Chowning writes in the foreword of the *Computer Music Tutorial:* " With the use of computers and digital devices, the processes of music composition and its production have become intertwined with the scientific and technical resources of society to a greater extend than before". To great extend this is true in Colombia, and can be applied to the many fields, or activities described before. Through scientific thought, we have been able to change the meaning of music, by giving a better understanding of what music is. Through an artistic perspective, we have been able to excite the senses of a broader audience, becoming something cultural, perceptive, and sensitive.

For those involved, the need of communicating with music has been truly materialized. This is because, the technical difficulties imposed by learning skills to play traditional instruments have been swapped with computers, digital gadgets, and algorithms. Therefore, there are different barriers between the musician and its audience. On our local context, these are more effective ways of composing, performing, and perceiving not only computer music, but traditional music as well. As a result these students seem not to be too afraid of music anymore. Many feel they have music at their fingertips.

The interaction between different fields of knowledge such as acoustics, music, computer science, psychology, arts, and music has forged an enviable atmosphere with no precedent at all. The people involved have enjoyed working under the scope of science and the arts. Not only new musical instruments, interfaces, or compositions have been created, there is also a growing computer music community, and we believe these are the footsteps for the new music generations in Colombia.

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