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The Music Education and his relations with Science, Technology, Society and Innovation

La educación musical y sus relaciones con la ciencia, tecnología, sociedad e innovación

Educação musical e a sua relação com a ciência, tecnologia, sociedade e inovação

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ABSTRACT
The contribution since the last century through the studies of Science, Technology, and Society together with innovation, favor the configuration and strength of different educational disciplines. The present article aims to analyze through a bibliographic sweep the contribution of these studies in the context of Music Education, which collaborate in different aspects that, based on other disciplines, favor the creation of new content, to the point of becoming subjects and specializations in Higher Education. In many Latin American and Caribbean countries, the relevance of artistic expressions, including musical genres, is glimpsed, to such a degree that they become national symbols as well as being part of their heritage, along with them are percussion musical instruments that today are taken into account in professional music training in Higher Education in various countries of the world

Keywords: Music Education; Science, Technology, Society and Innovation; Latin American percussion; Higher Education.

RESUMEN
El aporte desde el siglo pasado mediante los estudios de Ciencia, Tecnología, Sociedad junto a la innovación, favorecen a la configuración y fortaleza de diferentes disciplinas educativas. El presente artículo tiene como objetivo analizar mediante un barrido bibliográfico la contribución de estos estudios en el contexto de la Educación Musical, los cuales colaboran en diferentes aspectos que al fundamentarse en otras disciplinas favorecen a la creación de nuevos contenidos, a tal punto de convertirse en asignaturas y especializaciones en la Educación Superior. En muchos países de Latinoamérica y el Caribe se vislumbra la relevancia que poseen las expresiones artísticas entre ellas los géneros musicales, a tal grado de convertirse en símbolos nacionales como también al ser parte de su patrimonio, junto a ellos se encuentran los instrumentos musicales de percusión que hoy se tienen en cuenta en la formación musical profesional en la Educación Superior en varios países del mundo.

Palabras clave: Educación musical; Ciencia, Tecnología, Sociedad e Innovación; Percusión Latinoamericana; Educación Superior.

RESUMO
A contribuição desde o século passado através dos estudos da Ciência,

Tecnologia, Sociedade, juntamente com a inovação, favorece a configuração e a força das diferentes disciplinas educacionais. O objetivo deste artigo é analisar através de uma sondagem bibliográfica a contribuição destes estudos no contexto da Educação Musical, que colaboram em diferentes aspectos que, sendo baseados noutras disciplinas, favorecem a criação de novos conteúdos, ao ponto de se tornarem sujeitos e especializações no Ensino Superior. Em muitos países da América Latina e das Caraíbas, a relevância das expressões artísticas, incluindo os géneros musicais, pode ser vista, ao ponto de se tornarem símbolos nacionais bem como parte do seu património, juntamente com os instrumentos musicais de percussão que hoje em dia são tidos em conta na formação musical profissional no Ensino Superior em vários países do mundo.

Palavras-chave: Educação musical; Ciência, Tecnologia, Sociedade e Inovação; Percussão latino-americana; Ensino superior.

INTRODUCTION

The development of humanity has gone hand in hand with the different artistic expressions, through cognitive processes that involve mental operations such as perception, memory or language, which through disciplines such as axiology have provided the order of the school, dedicated to the formation of knowledge typical of society that instills in the citizen a critical sense, as well as provides values in training to be more human, which collaborates in coexistence in a context that is presented in continuous change (Yepes, 2019). These aesthetic and artistic knowledge have generally been preserved through languages, including written, pictorial and musical.

The socio- cultural needs and the approach of the various disciplines through technological and scientific advances make human beings acquire knowledge of their world through these languages, as ways to obtain knowledge. Education conceived as the transmission to prepare for a competitive world requires new paradigms such as the emerging ones, which provide a reflection of human reality for the construction of knowledge (Rodríguez *et al.*, 2018).

Artistic expressions have taken advantage of the continuous scientific advances applied to technology in their development and as a means to spread their knowledge, advantages that the different processes of dissemination and circulation acquire over each other. Hence, there have been several approaches to the relationship between academy and society that have taken these processes as a central element, on the one hand the force exerted by mass communication in society, and on the other, the new inequalities and associated risks to globalization, in which deficiencies arise and the need to adapt curricula to new contexts that arise from it, a characteristic that is reflected in the world with Music Education (López-León, Lorenzo-Quiles and Addessi, 2015).

This is how, in recent years, different scientific advances have contributed to technology along with its expansion, in such a way that they provide other alternatives to education, in times of global changes such as those experienced today. An example is the Information and Communication Technologies (ICT), being a sphere in the educational field that offers new scenarios and different learning spaces, by collaborating with the instructional process as a means and aid and to achieve the purpose delegated to him by the society linked to the school. In this regard, Sanchez-Andrade (2016) highlights the application of this technology in educational innovation, which must be aimed at using these means for its progress.

This refers to the Society information and knowledge society. Pérez, Mercado, Martínez and Mena (2018) state that they are expressions used in the educational field and involve the use of digital devices as means to facilitate the ability to store, transform, access and disseminate information, which in the university environment contributes in the teaching-learning process and integrates the necessary elements to solve problems and meet current professional objectives.

This makes that the new technologies in the classroom, with online courses, expand horizons without borders in improving the quality of education, creating changes in educational models of society, the basis of the advances of science along with technological advances. Its main input is the integrated information into daily life, which today is a source of power (UNESCO, 2017). In addition, its main objective is the construction of knowledge through scientific knowledge, which, due to its investigative nature, involves Higher Education institutions.

For this reason, universities are involved as responsible for solving teaching problems, with the help of educational research linked to the creation or improvement of the teaching-learning process, a need that goes hand in hand with the evolution of humanity. Likewise, it is important to prioritize science and technology education in its programs, to guide students in taking future actions (UNESCO, 2018).

By starting from the analogy between art education and science and technology education, the former seeks to create the ability to enjoy art and not to involve so that all students are painters, writers or musicians, along with the latter that allows making decisions about specific functions that you want on an objective. In this sense, elements are incorporated under an educational curriculum that provide the student with the ability to reason logically, understand different degrees of complexity, solve everyday problems and raise awareness in scientific practices, for the common good.

The proposal for the teaching of scientific knowledge must provide the student with means and criteria for understanding the why and for what purpose the development of certain scientific knowledge, its reason in society, the economy and politics, as well as the consequences of its technological application in specific environments. It starts from the educational approach of Science, Technology and Society (CTS), which contributes to the formation of citizens ethically committed to the future, society and the planet.

The objective of this article is to identify the main relationships from the musical educational field with science, technology, society and innovation. For this theoretical methods were used, among which are the historical-logic , for characterizing the evolution and its relation to science; analytic-synthetic, to study the documents related to music education in function of the research topic and the method inductive-deductive to arrive at generalizations from the study of music, which allowed to determine the relationships and the particularities can be set.

DEVELOPMENT

Starting from the Second World War, the western industrialized states created guidelines regarding the financing and development of basic science, with the slogan that technological progress would come in addition. However, at the end of the fifties, this perspective gave a change to the scientific-technological model that carried errors of ecological type. This creates the need to review this policy and emphasize its relationship with society, a process that in later years gave rise to environmental protection policies.

In the sixties, secondary education created some changes intended as an exclusive element for students interested in accessing university studies in science and engineering; twenty years later, as a critical reaction to these, the CTS proposals are displayed for teaching, publications from major associations of teachers in science. In European countries there has been an increase, over the years, the training of people enabled to understand the relationship, value and limitation of science and technology in favor of education together with social demands and needs (Cobano -Delgado, Llorent-Bedmar and Sianes -Bautista, 2018).

The techno- scientific competence contri butes to the coherence between knowing-doing through critical self-reflection and pedagogical knowing-being regarding wisdom, a process that points to the sciences of education in the social dimension of human formation, by emphasizing the Ethics in its broadest sense , as incorporated by Freire (2004) by raising awareness in the educator in the struggle to create strategies that collaborate in the learning of all individuals without discrimination of race, gender, social class or age.

The general objective of this educational modality is to create awareness in students about the social and environmental consequences that the development of science and technology implies. The usefulness of science education in citizens provides knowledge in a society whose relationship is very close with science and technology, an essential characteristic to understand and adequately face the new challenges of this time.

CTS studies in Musical Education from the 20th century

Science, Technology and Society together with Innovation (CTS + I) is the field of study and research that at the beginning of the 21st century includes the relationship and contribution of these disciplines. Its approach in Higher Education makes it possible to visualize their involvement in the social context and thus take them into account in decision-making in the training process, which as a social task enables people to improve their living conditions, based on the interrelation between scientific and technological development.

This approach represents a radical rethinking of the curriculum at all levels of education, which is based on the formation of values by promoting broad scientific and technological literacy, essential to understand and face the challenges of this century. In addition, this teaching starts from emphasizing attitudinal aspects, forming citizens, increasing their knowledge and involving relevant relationships and differences, attracting students to lean towards these activities and better understand their contribution to society by considering learning as an adaptation and transformation, by motivating oneself and solving problems in society through reflection (Yepes, 2019).

In this line ,the Bologna Process (Rodriguez, 2018) that, from a teleological perspective, has as objective the development of Higher Education, which aims to provide citizens of skills aimed at responding to problems social as well as to Current challenges is, from innovations in training and their implications is visualized. The role of Higher Education is preponderant, since it is aimed at the training of future citizens and trainers.

As a result of this, Europe established these studies in Higher Education, since greater importance is given to the individual needs of the student in the field of initial education; consequently, professionals need an initial training of quality that encompasses multicultural elements of society in today's Europe, which constitutes a key element in enhancing teacher training, by guiding them in solving and reducing certain difficulties in school, through contribution of tools that

allow to carry out a certain investigation when required or necessary in the professional activity.

Cobano - Delgado, Llorent- Bedmar and Sianes - Bautista (2018) consider that the era of knowledge centers on the university where, in addition to the traditional mission of preserving, transmitting, disseminating and inventing knowledge, its impact is reflected in the society and therefore in the economy; today there are two more challenges: cultural and knowledge pluralism.

The scientific-technical revolution has provided music and its education with tools that have marked changes in the acquisition of knowledge such as methodologies, theories and concepts. This has led to the emergence of their own categories that have become subjects, to be applied in music teaching. These studies have contributed in different ways depending on the contribution of each science that transvers to music and teaching, although for this a specific order is conceived, which is taken arbitrarily in instrumental developments, techniques execution and their education. It is possible that the order is different according to the case of the different discoveries that have arisen.

On the other hand, to implement quality education, UNESCO (2015, 2016) emphasizes on focusing the effectiveness of learning and research together with social inclusion that contributes to people's rights. Ceballos-Ospino, Rodríguez -De Avila and Pérez-Anaya (2019) postulate that, although research is unique to the graduate it should strategically implement content related to enable the new professional study, understand and offer solutions to problems of their future work environment. University and scientific research must be closely linked in Higher Education (Horrutinier, 2012), as well as fill the theoretical gaps in the need for knowledge of society (Álvarez, 1997), so it is essential for all professionals to learn to investigate.

A first objective is the obligation to develop capacities in students such as critical sense and reading comprehension; followed by this, provide basic tools such as research methodology and skills that involve problem solving. In addition, the student must incorporate an environment conducive to research, fostering attitudes towards it, under the point of the practice of didactics in learning by doing (Ceballos-Ospino, Rodríguez-De Ávila and Pérez-Anaya, 2019).

Also, in educational research, the teacher can simultaneously learn from his own experience as a way to improve education. The movement of teachers as researchers can start from their educational praxis, since research and teaching must be experiences that are closely related. For this, sciences such as didactics and their research methods are used, for the solution of problems that are manifested in everyday life, thus achieving significant findings that increase human knowledge.

It is stated that many of the investigations can contribute to other disciplines, for example, for Vernia, Gustems and Calde rón (2016) together with Sanchez and Morales (2017), since the last century there has been a great advance in establishing rhythmic education as a component of music education, which is based on principles of modern educational psychology, the reason for the shocking effect on the modification and development of basic human behaviors such as attention, coordination and psychomotor balance, through appropriate and well-managed employment of this education, which collaborate to awaken reflexes, automate mechanisms and mental development. In addition, it is important to highlight that all behaviors are acquired through teaching and their

result is learning; this process is the object of study of didactics as a science.

According to Álvarez (1997), didactics as a scientific dimension of education must focus on producing valid knowledge in constant development, just as society changes. In this context arises the thought that brings society to go to science and technology, whose contribution is reflected in the development of traditional disciplines such as art education, in search of alternative solutions to the classic paradigms; it can transform the current activity of the student to creating in it a look that , in addition to appropriate their culture, reflect in their art as a means of expression and creativity, where the way to find how to identified in a multicultural space prevails.

Also, the educator in its professional search, should consolidate and form creative researchers; It is made clear that this process is continuous and that it also collaborates in the construction of their professional identity through educational research, which by addressing various elements that intervene in it has an interdisciplinary essence, being a social object and providing new scientific knowledge adapted to the world in which they live and that in many cases do not replace the old ones, but rather that they concern them.

It is left in the hands of Higher Education to facilitate new strategies that use mechanisms and offer the possibility of filling certain gaps, involving the new paradigms of artistic teaching as a social factor, with an integrative, inclusive character, based on the community which is valued for its importance both in developing and developed countries (UNESCO, 2018).

The relationship between artistic education and its different languages, including music education with CTS + I studies, is reflected in this document along with technical advances such as research methods, which in their implementation and development contribute to an education of quality. Comprehensive education with rational and emotional aspects of the human being is highlighted, among them permanent education, since the aesthetic-educational process of art extends throughout life. In this regard, Estévez, Sanchez, Frómeta and Velázquez (2011) declare that in the formation of man, scientific and technological education is not enough, since there must be a complement such as artistic, which is used for the humanization of social and personal reality together with the enrichment of the imagination and sensitivity of the human being.

CTS + I studies have inferred musical evolution, in the foreground, with the improvement of musical instruments, by applying elements that involve their evolution and by being able to obtain more sound benefits, which leads to the modification or creation of interpretative techniques of new sound resources different from the traditional ones, among them, tuning mechanisms, the improvement of the materials for their construction or their transport, etc.. In many cases, the dissemination of this knowledge needs to be documented, so these studies have provided research methods that in some cases have been transposed and that help the historical position of the instruments; likewise, these new knowledge have required to be disclosed and to teach, both composers as interpreters, know the sound possibilities and engage in musical practice.

Artistic Education and science

Art in the history of humanity has constituted an expression of distinction of the human species; In addition, each and every one of its manifestations is legacy identity of civilizations and towns in general. It is affirmed, without a doubt, that an education that does not include these expressions among its contents is underestimating a powerful

way of educating reason and sensitivity aimed at today's society.

The various manifestations of art have been an educational subject since the oldest civilizations, precisely because they have accompanied the human being throughout its evolution and, although the hedonistic function of art related to entertainment was very strong in antiquity, it did not cease to be Since then, it is important in pedagogical conceptions and in educational systems, which for a long time orality or oral tradition was used, when referring to the oral educational method.

Today, arts education is part of the models of general education of citizens, and also of the vocational training in people potentially talented for all languages of art. Not all artistic languages are factors that attract society and, although at some point in life there is some relationship with any era of them, there are some more marked than others. In many educational centers, from primary to postgraduate levels, they are dedicated to teaching art with some elements resulting from science in its contents, methods and languages. Thus, this document defends that, of course, the artistic educator must know about his art, but it is emphasized that he must make an effort to know part of the sciences that with their special characteristics contribute to their epistemological features.

When different conceptual aspects of contemporary works of literature and art are analyzed, a link is displayed with different branches of science such as Physics, Astronomy, Chemistry, Biolo gy and Mathematics; all this developed in philosophical aspects or in the approach to the work of art. It is proposed that scientific work requires interdisciplinary relationships and their exchange to generate new knowledge, media, objects or materials, together with the flexible thinking of the educator and their creativity in breaking down obstacles between disciplines with the subject to be educated.

Many works of art can be examined by relating them to science and making some comments, showing their synergy, by using several organs together in order to create more relevant links between art and science; as long as you have certain knowledge in the appreciation of these. With the pleasure of having a more objective, dynamic and critical look, it could be said that science and art show a dialectical relationship, displaying complementary representations of reality, expressed with different symbols and meanings, which emerge positively in their technological and evolutionary evolution.

This leads to a chain of knowledges, where science as such is responsible for providing knowledge with theoretical and practical elements that are based on research; the technique refers to an activity based on scientific knowledge (which answers questions: what, how and why), therefore it is a know-how, related to the procedure, the sequence and, above all, the method that involves its scientific foundation and its development lead to a structured set of knowledge called technology.

In contact with science, music has become impregnated with elements that strengthen it, an example of technological development such as musical notation, which is used as an important resource for its preservation, as well as for its education. For Sanchez (2018), the Music Education is divided into two groups: massive music education aimed at comprehensive training in musical taste (schooled musicalization) and specialized musical education, dedicated to training professional art prepared in specialized schools such as conservatories or pedagogical centers. In both cases, a basic or main instrument is learned, where technical-musical elements are provided.

It should be noted that, in music education, the contribution of different elements that contribute to its technological development is visualized. An example is the sound files; Estévez, Sánchez, Frómeta and Velázquez (2011) affirm that, as an important source of cultural information, like written documents, they are invaluable witnesses of human becoming, since they represent a possibility for social, political and entertainment uses. These become very important in educational and cultural way, because in the mental processes that make up the cognitive activity as the sensory perception, memory, imagination and thought, these are developed with doing listening activities, vocal, musical, creative, corporal, dance, plastic, gestural, among others.

The new technologies and the development of the media have become popular instruments, genres and musical performers that have been taken as reference in educational practice, to contextualize and highlight in a certain way concrete examples, already existing, in which the student can be guided in such a way that the evolutionary and creative possibilities of certain contents are evidenced.

The use of new technologies such as the internet has contributed to education, and in particular to Musical Education, new possibilities and elements for its evolution. Although, it is worth mentioning that attention must be paid to the sources that are currently available in the various resources, because the disclosure of certain information cannot be related to its quality.

Music & science

Music is as old as man himself, giving it great importance in its evolution and development throughout its existence. Scientists say that it rises to the first attempts of man to blow his own body, to communicate using different sounds or create instruments that produce the sounds of nature and combine them with his own voice.

Since ancient times, great philosophers and scientists such as Pythagoras defended this notion of music as science, which affirmed that the use of musical properties was the model for the creation of the universe and that the celestial bodies produced sounds that, when combined, generated music. This relationship between man and his environment is visualized long before the emergence of science that studies musical phenomena such as musicology.

There are a diversity of studies that consider music as an educational element that affects the development of certain physical and mental capacities of the individual, which enriches them and provides them with elements for their realization as a human being, in a specific social and cultural context. ; Under this precept, the school must take on the challenge of integrating it fully into the curriculum for the formation of citizens.

Fundamentally it is guided by musicology, which is scientifically directed to the study of the theory and history of music. Musical learning in the different stages of human formation has been the object of study from different disciplines that involve pedagogy and psychology, as this is the one in charge of studying the processes that develop in the mind. Aesthetics provides the axiological analysis, together with the sound fact that is studied by acoustic physics; furthermore, musical organology is the science that determines characteristics of musical instruments.

Taking into account the above, the teaching of music is based on the previous sciences and, mainly, on sciences such as pedagogy, which Álvarez (1996) asserts that it is the science in which the object of study is the educational process in the general formation of the personality of man, together with didactics, where its

object of study is the teaching-learning process. Among the important aspects of this document, the CTS contribution in the Musical Education of traditional instruments stands out, together with the technological development in the sense of the contribution to the musical teaching of mechanics and technique, as well as musical notation, which it is used as an important resource for their preservation and education.

On the other hand, the last century created several studies that made known the collaboration that Music Education exercises in improving the learning of different disciplines such as reading, foreign language and mathematics among others, in addition to creativity, self-esteem, axiological skills such as critical sense, perceptual, psychomotor and social skills when involving multiculturalism.

Among these studies the theory of Gardner arises (2016), which questions the existence of a single intelligence and involves music as part of a group, where each of these intelligences has the ability to solve problems or create valuable products for a cultural or cultural context or a certain community in need of some kind of innovation. Each of these intelligences can be developed with its advantages and limitations, and what until a few years ago musical ability was taken as a specific ability of a few, researchers such as Malbrán (2003) and Rusinek (2003) assert that today by means of Scientific studies it have been shown that this ability can be educated and developed at all educational levels thanks to advances in didactics.

Within the musical skills, a priority is given to the auditory-rhythmic ability that for traditional and popular music makes it an indispensable point in the educational process to appropriate basic elements in the development of musical perception, interpretation and creation (Asprilla, 2015); and for the development of musical transcription to the link with literacy and as a teaching tool for Musical Education starting from ethnomusicology.

In addition, this research finds that another contribution of CTS + I studies is the implementation of musical literacy in contexts where it had not been included before, since these musical spaces have been educated mainly by oral tradition over time. In the opposite case to the Western Musical Education that Castillo (2018) declares, one of its characteristics is its great dependence on the essential musical reading for its reproduction, as well as for its education; this tool is essential in academic circles for the transmission of musical knowledge that comes from European heritage.

Music as an artistic language

Musical activity in humans has been studied from various scientific specialties. The advances and discoveries in the fields of anthropology, biology, medicine, psychology and sociology is corroborated by the increasing knowledge about the existence of attitudes and aptitudes strictly human to art involving sound. The existence of a specific brain anatomical substrate for musical perception and the ability to generate music is a space in constant investigation by neurology.

Sound is the musical phenomenon studied by acoustics, which involves tone as a result of the vibration of an elastic body; the intensity depends on the degree of force regarding the volume and the timbre is the characteristic sound of the emitting instrument. The rhythm, melody and harmony belong to constituent elements of music; Studies show cognitive benefits through its teaching, which collaborates with various disciplines from the audio perceptive sense.

Hearing and its close relationship with perception collaborate with sound

communication; for its study, through music, neurological sensations are stimulated. Research is based on the perception of rhythmic patterns that can contribute to the learning of musical language, since it involves musical compression from time to time.

In the case of musical art as another language, authors such as Navarro (2017), Vernia, Gustems and Calderón (2017) together with Guzman (2020b) agree that for its apprehension the paradigm of language teaching must also be used, which refers to using the methods or steps necessary to achieve mastery of a certain language in the process, with the active participation of the student. This universal language, when speaking analogically, has differences in its sound expressions similar to dialects, which start from expressive means of certain societies and which, as new research arises, is visualized in popular musical genres and even more so in its genesis as traditional musical genres.

The popular music category in Castillo (2018) does not emerge in specific rhythmic or melodic musical characteristics, but in the way in which the degree of acceptance operates in a social context; For its part, traditional music includes elements of national identity, in addition its education is carried out by imitation and orallity where the notation in score is very scarce or does not exist.

Taking into account the above, Sánchez and Morales (2017), together with Guzman (2020a, 2020b) state that for the apprehension of expressions, rhythmic education should be used together with percussion instruments, when visualizing their tribute towards the affective and experiential. The musician-instrumental education develops the sense of rhythm that refers to its precision, which affects the physical and motor training of the student, developing a better sense of balance, laterality and motor skills.

Sánchez and Morales (2017) state that the fundamental element of rhythmic education is rhythm, which does not depend on the other constituent elements, but is attached to the expressive means of music. For its teaching, body percussion and percussion instruments are used. Rhythmic education resulted in methods such as Dalcroze and Martenot; in addition, it is closely linked to its application with percussion. Another method that gives it a special treatment is the Orff method, which involves percussion instruments of African origin in the classroom along with other popular ones from Latin America and the Caribbean.

Nowadays, the good use of information sources has made it possible that in the last decades there have been more possibilities to contribute to scientific knowledge, for which Music Education is no exception; For example , from the percussion in the theoretical section of instrumental education there are different ways of beating the drum, among them is the one used in instruments that were adopted by the European tradition, such as those percussed with drumsticks, as well as the instruments struck with the hands used in other continents. In recent years, each has come to take elements from the other to create more comprehensive methods.

In Music Education at the higher level, the student is the one who decides the main or basic instrument in instrumental practice, this is part of their specialization and is inclined to develop aspects related to musical performance through the development of technical exercises and literacy of his most representative works. In the case of percussion as a subject, in the teaching-learning process of the main instrument it involves the set of instruments that are part of this group ; In some countries it is specified as Classical Percussion when referring to the group of musical instruments used in traditional European music that are played in the symphony.

Today it is seen in all levels of education the teaching of Latin American and the Caribbean percussion instruments, especially those with a large African influence with the contact with popular culture that, through its musical genres and formats, are located in a group that especially involves Cuban, Brazilian, Dominican, Puerto Rican and Colombian instruments, called Latin Percussion instruments (Guzman, 2020a, 2020b; Bedoya, 2021). Through their education skills are developed such as:

1. Sensory abilities: through awareness techniques and musical perception, which expand the ability to receive and differentiate sensory stimuli. Subsequently, an organization and interpretation of them and the production of the desired response is achieved.

2. Motor skills: that together with musical activities works on hand and foot coordination, balance, mobility and the development of functional motor activities. Motor coordination, range of motion, muscle memory, and breathing are improved.

3. Cognitive skills: with musical appreciation, higher functions are stimulated: attention, memory, alertness, orientation, recognition, learning and imagination.

4. Socio- emotional skills: receptive and active musical techniques facilitate expression, the sharing of emotions and feelings, while promoting interaction and social skills. The therapeutic use of music promotes self- knowledge of the person, allows an increase in self-esteem and a reduction of depressive feelings, anxiety and stress.

The education of percussion musical instruments has had its development in the face of new technologies; Along with them, different interpretation techniques and the ability to explore new sounds have emerged. The expertise of playing an instrument with advanced methodologies gives a performance to the musician in his development by leaps and bounds, where every day there is more instrumental expertise or virtuosity in many musicians worldwide.

CONCLUSIONS

The contribution of CTS + I studies involves different disciplines that contribute to the educational process of any science and it is possible to decide some changes in favor of society, as long as there is a theoretical foundation that supports it.

The innovation of CTS + I studies, as a social factor, must include development policies in pursuit of its own problems, therefore this perspective challenges Higher Education institutions to generate changes in their traditional ways of producing and disseminating knowledge with elements of their own resources, to taking musical traditions and Latin-American component as an element of study.

Art, and especially music, being an element that is present in many new technologies, is a language that reaches all ages, races, strata, genders and educational levels, it can be a factor of change through Music Education.

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