

Information and Communication Technologies (ICTS), Dance, and Interdisciplinary: Laconics Notes

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Abstract— From the intensification of the use of various Information and Communication Technologies (ICTs), in different social contexts that touch postmodernity, contemporary dance has undergone some changes within the artistic scenario. With this, the interdisciplinary dialogue that the dance establishes with the technology becomes the target of academic studies and possible cultural practices in different approaches. Given this scenario, this research aims to investigate the possible and recent interdisciplinary practices between contemporary dance and technology under different scenes and different forms of artistic appropriation. The present article adopted the bibliographic research methodology and is configured in a qualitative nature investigation. Therefore, the periodicals published between the years of 2015 and 2017 were analyzed in the Scholar Google search system. The obtained results indicated an ephemeral number of researches that explore the following themes: contemporary dance, technologies, and interdisciplinary. In the analyzes of the studies, it was possible to verify that the artistic practices surpassed the corporal sense, being classified hybrids, from the point of view of a virtual body, indicating the

notion of presence and the connection between the "being" and "being" in the world.

Keywords— *Interdisciplinary; Contemporary dance; ICT's.*

I. INTRODUCTION

When it's given light to dance as a cultural and artistic manifestation, as well as a form of language, it is possible to consider it one of the expressions which the body exerts multiple communications. In this context, contemporary dance, in its turn, is contextualized by inscribing itself in time and space, establishing relationships with the environment which it belongs, appropriating, perhaps, a dialogue understood as being interdisciplinary through the use of Information Technologies and Communication as a strategy for the construction of innovative artistic languages.

In this perspective, Information and Communication Technologies (ICTs) gain space in contemporary dance, as well as it propagated rapidly in different segments that touch the postmodern society. TICs have created new interactive interfaces providing different forms of communication between people, changing, consequently, the ways of cultural and artistic

appropriation through cyberspace. Therefore, the dialogue that dance establishes with technological means happens through the creative and interdisciplinary flow, typical of contemporary art, which in McLuhan's view (1964, p.22) "the" message "of any way or technology is the change of scale, cadence, or pattern that this way or technology introduces into human things". This interference generates new artistic productions, whether in dance shows that bring in digital elements and virtual bodies; whether in school environments through artistic pedagogical practices mediated by the use of digital technologies, or even from the production of choreographic videos for Youtube channels.

Based on the above, this study aims to investigate the latest interdisciplinary practices between contemporary dance and technology under different scenarios and different forms of artistic appropriation. In this way, it is intended to establish new relations with the language, the public, time, space and the dance itself under a postmodern perception.

II. METHODOLOGY

The present article implied an indirect bibliographical research methodology of qualitative nature. The work consisted in the use of theoretical references and collection of information already published for analysis and discussion of the subject. For Gil (2002), the bibliographical research is developed from material already published, consisting, mainly, of books, periodicals and other materials available on the Internet. The theoretical basis of the article, composed by the second and third sections, was carried out using books and periodicals. The collection of data about the theme of contemporary dance and cyber dance, present in the fourth section of the article, was made through the Scholar Google database.

It is worth mentioning that the interest of the research is centered on the exploration of the dialogue that the contemporary dance establishes with the ones next to the technological means. Therefore, the journals published between 2015 and 2017 were searched using the Scholar Google. The development of the results found in the bibliographic research, as well as the discussion about them, from the point of view of this research, will be highlighted in topic 4 of this article.

III. FROM THE ORIGIN OF DANCE TO CONTEMPORANEITY

The concept of the word dance has countless possibilities of understanding. In the context of the Portuguese Language, according to Ferreira (1999: 604), dance is "[...] a sequence of body movements performed in a rhythmic way, usually to the music sound". The authors Houaiss and Villar (2009: 594) define dance as

"art and/or technique of dancing [...], style, genre or a particular way of dancing ...". However, in the specific literature of the artistic language, dance historian Annie Suquet (2008) conceptualizes dance as "[...] transference of body weight in time and space" (SUQUET, 2008, page 528). Compacting with the polysemic idea of the term, Neves (1987, p.7) presents an understanding of dance in the following way:

The dance has several faces and is seen in several ways. Some people are interested in psychological and emotional aspects; others, with a more mechanical view, emphasize the functional elements; there are still those who seek to analyze the basic and universal elements that constitute the dance. Hence, to the date, it is difficult to find a sufficiently comprehensive and complete definition of dance.

Dealing with dance by a contemporary bias, dance is considered an art in constant transformation and growing popularity for not being bound to esthetic standards, such as classical ballet. In this bias, as Trindade (2011, p. 136) states:

Contemporary dance does not have an established unique technique, all kinds of people can practice it. Its technique is so comprehensive that it does not delimit styles of clothing, music, spaces or movements. There are no mechanisms defined, there are, in advance, processes and forms of creation. A new notion of corporality emerges, seeking a more experimental meaning, less stratified. There is no ideal body but a multicultural body that has several references. What matters is the transmission of feelings, ideas, and concepts.

The researcher San José (2011), in a study about Contemporary Dance, highlights how his development began, mentioning choreographer Merce Cunningham. According to the author, this artist was considered the pioneer of "postmodern dance", which in the 1940s started this new dance genre from experimentations with different ideas and "body vocabularies". Its intention, at the time, was to move from a modern structural dance, turning the dance into something innovative, developing a new concept of movement. The choreographer considered that any movement could be a material for the construction of choreography, that is, any corporal procedure would become, in this way, a method for dancing.

One of the main characteristics of Contemporary Dance is that it does not have a specific dance technique, nor there is a specific costume, that is, there is no dress that exemplifies dance. This modality values the innovation and gives importance to the concepts and ideas that its choreographies propose, allowing the creation and

the choreographic composition, transforming it into a unique and revolutionary manifestation. This type of dance also includes other artistic elements, such as video, photography, the visual arts, and digital culture, allowing real movements to become virtual and vice versa (Matos, 2012).

Referring to the studies of San José (2011), it came to the conclusion that from the 50's, there were new "looks" about dance, combined into the good mood, the musical genres mixing and using improvisation. In this way, the dance began to be associated with physical actions and everyday gestures.

Also from the chronological point of view from the 70's when Steve Paxton¹ created "Contact Improvisation", a technique that sought the stimulation of an inner sensation through movement, proprioceptive properties and synesthetic sensations that stimulated its creation. Contact dance is a "technique widely used as research and didactic material for improvisation and as content for the composition of contemporary works of art" (SÃO JOSÉ, 2011). In this period the dialogue and the interaction between different artistic and physical languages are initiated through the insertion of interdisciplinary and performance, mixing dance with music and theater, constituting a style.

For Sá (2013) between the 50s and 60s, some foreign artists settled in Brazil due to tours and the wars. Thus, Brazilian artists came into contact with this new experience, with their ideas and influences, consolidating the Contemporary Dance in the country. The choreographer Klauss Vianna, stood out creating his own method of physical destruction, body awareness, and variations of rhythm, besides a work aiming a greater spatial organization.

Following a historical perspective, Louppe (2000, p. 31) points out that in the early 80s there was a loss of lineages, that is, the dancer's formation was no longer happening by a single practice. From this, hybridization arises, which for the author "[...] is the destiny of the body that dances, a result both of the demands of choreographic creation and of the elaboration of its own formation."

In the same way, in Brazil, there are great contemporary Dance companies, such as the Black Swan Cia. De Dança and Cia. Déborah Colker, which continue to this day. In Brazil, there is a great influence of classical and modern dance in contemporary dance. However,

nationally, there is a great interference of the national folklore, with elements characteristic of Brazilian popular dances (Guarato, 2016).

IV. DANCE AND TECHNOLOGICAL MEDIATION

From the advance of the ICTs, one notices in our postmodern society a progressive movement of a redefinition of the relations and reorganization of the diverse sectors that touch the contemporaneity. In this sense, it is possible to perceive that the distances and chronologies are no longer the same. These, on the other hand, underwent changes as ubiquity brought the immersion of the virtual connection into our daily life, resulting in new speeds, spaces, and rhythms through cyberspace. This, according to Lévy (2001), is characterized as a projection and representation of social relations in the network, a virtualization of reality, from the real world to a world of virtual interactions through the global interconnection of computers. The term cyberculture, however, specifies the set of techniques (materials and intellectuals), practices, attitudes, and ways of thinking and values that develop along with the growth of cyberspace.

In the artistic scope of dance, exposed to the locus of cyberspace, the various forms of language associated with digital technologies, such as interfaces, software, videos, and apps, enable the syncretic language to perceive different spatialities and imaginary temporalities (Diniz, 2015).

In his research, Santana (2006, p.33) deepens the debate between dance and technology, reporting the expression "technoculture". The author explains that "techno" is part of the culture as the mind is part of the human body since technology carries the thinking and the various conceptual systems. However, the above-mentioned author considers that:

[...] dance with technological mediation should not be considered as a stylistic innovation of a dance that uses the new media indiscriminately and naively, in the form of facilitating or decorative tools. Technological mediation dance is an artistic manifestation that emerged from a 'hopelessly' random world [...] that allows us to understand the environment-individual relationship as a mutual implication. An implication that consolidates the presence of the computer in the daily life and, therefore, modifies the body that deals with him during the time of that conviviality. Hence, one should not lose the connective specificity implied in it, under the risk of trivializing what distinguishes it.

¹ Phoenix, Arizona, USA. Dancer, teacher, and choreographer. His initial training was gymnastics, modern dance and classical ballet. He danced for three years in the Company of Merce Cunningham (1961-1964). In 1972 gravity and inertia to explore the relationship between two dancers.

In this way, cyber dance² or web dance goes beyond mere use as an end in itself, capable of understanding sociocultural knowledge under the influence of new technologies and languages inserted (DINIZ, 2017). Therefore, dance with technological mediation can add thought and reflection to the body, allowing to go beyond the "choreographic construction, technical performance of the interpreters, lighting, costumes, fruition and other known technical attributes" (FARIAS; ROMERO; GODOY, .9). It is essential in the XXI century to modernize dance to advance and discuss "discuss editing of images, computer programs, representation, simulation, biomechanics, supernumerary body, absence of body, subjectivity and other issues that emerge from the relationship of dance with cyberculture "(FARIAS; ROMERO; GODOY, 2016, p.9-10).

Given the above, it is inferred that technology-mediated dance is embodied in virtual relationships and technical innovations that must be adopted in a critical way, giving rise to new languages and plural assumptions of the body of dance mediated by digital technologies.

V. RESULTS AND DISCUSSIONS: INTERDISCIPLINARY PRACTICES BETWEEN CONTEMPORARY DANCE AND TECHNOLOGY.

As a result of this article's bibliographical research - which intends to investigate the latest interdisciplinary practices between contemporary dance and technology under different scenarios and different forms of artistic appropriation - the following keywords were searched in Scholar Google: "Contemporary Dance" + "Technology" + "Interdisciplinary". The temporal cut used was limited to the most recent periodicals published in the last three years, that is, from 2015 to 2017. From this, 6 results were found, considering the keywords in any part of the article. In this search, were discarded the articles that, although present to the three keywords, only deal, effectively, with one of the themes, as well as articles that are not related to the objective proposed by this research. From this, only 3 articles were considered.

Table.1: Presents: i) the three selected articles; ii) the purpose of the research; iii) the scenario; iv) artistic appropriation.

² The concept of cyber dance unites cyberspace and dance (BENEDIKT, 1992 apud PIMENTEL, 2000).

Table.1: Selected articles based on the objective of this research.

ARTICLES	RESEARCH'S OBJECTIVE	SCENARIO	ARTISTIC APPROPRIATION
Studies of an interactive digital interface in PIBITI-Dança (REGO, LACERDA, 2017)	Create a choreographic work using software Isadora programming to develop interactive environments and describe new teaching-learning processes in Dance.	Applied practice in the initial training of teachers in the Higher Diploma in Dance Course of the Federal Institute of Education, Science and Technology of Brasília (IFB) through the Institutional Program of Technological Initiation Grants (PIBITI / CNPQ).	Through the software Isadora ³ was created a choreographic work from the interventional projection and motion capture.
The varieties of the presence of expanded dance and telematic dance as a case study (SANTANA, 2016)	The article aims to reflect on the notion of presence in configurations of the expanded dance, that is, the dance mediated by the digital technologies. In this way, the objective is to investigate how these various presences of physical and virtual bodies are perceived in dances composed in real time.	Three contemporary dance shows were analyzed: "Versus" (2005), "e_Pormundos Afeto" (2009/2011) and "Embodied in Various Darmstadt" 58 "(2013/2014)	<p>"Versus" (2005): the music danced by the dancers was created in real time, the dancers, in turn, danced from different places, to be known, Salvador and Brasília, in other words, attended "presence states" coupled through technological mediation.</p> <p>"E_Pormundos Afeto" (2009/2011): the Internet public had the possibility to participate in the performance through the virtual environment in which it entered as a n avatar</p> <p>"Embodied in Various Darmstadt58" (2013/2014): the environment was projected in one of the cities - Barcelona - and the final image, which was composed in real time and displayed on the Internet, showed the integration between all the places including the virtual platform with the public (Brazilian city with image of the local stage and of Spain in the background).</p>

3 Choreographic tool that provides "[...] interactive control over digital media in endless possibilities to the creative process. It allows the editing of scenes and movements in real time, constructing dialogues between dancers, public and virtual images (REGO; LACERDA, 2017, p.03).

			(SANTANA, 2016)
Augmented reality systems as environments for contemporary dance (MISI, 2015)	To propose the possibility of implementing Reality Systems (RA) as environments for Contemporary Dance.	Creation of experiments of this nature developed by the Graduate Program in Dance of the Federal University of Bahia, between 2014-2015 years.	Sharing an experiment on the creation of experiments of this nature, in order to present the interactive installation in increased spatial reality <i>IsthisBrazil?</i>

Source: Elaborated by the authors, 2018.

As identified in the previous table, contemporary dance is developed in varied ways and styles, presenting texts, creations, analyzes, studies and own methods influenced by numerous sociocultural actions from technological mediation.

In the study of Rego and Lacerda (2017, p.9) in the scope of training future dance teachers, formative stages were developed for the adoption of software Isadora as a didactic and creation tool of a choreographic work. The graduating registered the experience through articles, reviews, and logbooks, in order to associate the theory with the practice, besides recording all the steps of adoption of the proposed software by a tutorial. The different interactive interfaces of Isadora were explored to develop their own programming, with the help of a mobile projection screen as a background for the interventional projection and motion capture for later programming in the software. With the study, it was possible to perceive that the software Isadora can be considered a powerful digital artifact for the artistic and pedagogical production of choreographic works, besides proposing a "new discussion about choreography, subject and work, environment, body-image, creation in real time, interactivity and digital culture" (REGO; LACERDA, 2017, p.9).

In the analytical study of Santana (2016, p.75) the following artistic performances of contemporary dance were approached by the author: i) "Versus" (2005); ii) "e_Pormundos Afeto" (2009/2011); (iii) "Embodied in Various Darmstadt58" (2013/2014). It should be noted that these shows are considered expanded dances, the author explains that:

In the friction with digital acculturation, it was confronted with other aspects and forms of exploration of intermodality, finding

unprecedented possibilities of occurrence and existence. The interactivity, the coupling of sensors, the construction, and exhibition by audiovisual support, the relation with robotics, among other articulations, are part of this intermodality in dance that makes it, like the cinema, an Expanded Dance. Its exhibition, diffusion, and reception were also modified due to technological mediation.

The main purpose of the "Versus" show was to create strategies for exchanging dancers based on the imagistic construction of narratives produced by means of video dances or in their image shows (pre-recorded or captured in real time). This experience resulted in the formulation of a storyboard⁴ that recorded all participants' remote movements and inputs and outputs from cameras and projection media. In addition, Versus' artistic experience served as support for the creation of the software Arthon⁵, created by the Digital Video Laboratory of the Federal University of Paraíba, for the transmission of telematic dance shows.

"E_Pormundos Afeto" explored time with one of the main aspects of network art. This show was the first project to adopt the international network as technological mediation. In the same direction, the "Embodied in Various Darmstadt58" also adopted the international

4 The storyboard in its essence is basically a visual guide narrating the main scenes of an audiovisual work.

5 We suggest reading the article by Melo et al (2010) "ARTHON 1.0: A tool for remote transmission and management of media streams". Available at: http://sbrc2010.inf.ufprgs.br/anais/data/pdf/salao/st02_01_salao.pdf. Accessed on: 01 Jul. 2018.

network. However, the major focus was the interaction of the dancers through the sonority and not the visuality, crossing borders. Santana (2016, p.81) points out that:

The image, which previously served as an articulating element between all the remote points and followed the structure of layers to construct the narrative in real-time, was now helping to give place to a meeting of sonorities. The visuality was then at the service of this relationship between the organic, acoustic and synthetic sonorities explored in this work.

As a result of this experience, it was inferred that it was possible to maintain the organic, acoustic and synthetic body as elements for the construction of the narrative in real time. In addition, the relationship with the musicians of each city became more integrated and cohesive in the aesthetics of the choreographic work.

Finally, Misi (2015, p.12) brings up the discussion about digital dance, as a "choreographic thinking different from the traditional way of composition in dance and its modes of enjoyment, which do not contemplate their technical specificities, nor their practices and poetic." In this way, the author emphasizes that contemporary dance through its choreographies encompasses new spatial dimensions, as well as sculptures, lights, video projections, sensors and interactive digital signal processing in real time.

The researcher appropriates of Augmented Reality (RA)⁶ as an instrument for contemporary dance. For her, RA promotes a "hybrid space constructed between the real and the virtual, in which ideas are intermediated" (MISI, 2015, p.17). Facing this, the above-mentioned author presents a practical experiment of RA as an environment for dance, *Is this Brazil?*. This software enables artistic interaction with different Brazilian scenarios, in order to know the dances of each region. Misi (2015, p.17-23) points out that the software:

It is an environment built on Augmented Space Reality (RAE), also known as projection mapping. The technique for this type of work is to map the three-dimensional surface, defining the lines of the objects' contours, and, on these delineated surfaces, to apply textures with a light

projection or video images, in order to modify the colors and patterns of the original objects. [...] Interactivity in the installation *Is this Brazil?* happens in the artist / programmer-computer relationship, in the process of creating the RAE system, in the planning of the communication form between the synthesis images and the physical space, through video capture and the use of animation and editing software.

After several procedures of test and configuration of *Is this Brazil?*, it was possible to conceive movements seeking different angles and, exchanging comments among the interactive public, which divides this space, communicating their ideas and interpretations, creating a relational and performative space. The public needs to move around the place to discover the hidden spaces and unveil possible sociocultural and artistic contexts produced in the virtual environment, mixing dances, gestures, reality, and virtuality (Misi, 2015).

Thus, the three articles analyzed bring contemporary dance artistic experiences from technological increments. All three surveys bring to the surface, directly or indirectly, the condition of being here-and-now, implying the notion of presence. This has been much studied nowadays by virtue of the development of virtual and augmented reality, simulations, among others. According to Obana and Tori (2010, p.3), the concept of presence has two categories: presence (feeling of someone) and social presence (feeling of someone with another person). These two categories involve the real or virtual environment, emphasizing that the greatest perception of presence is when one is physically and psychologically in a place in the real world, since

[...] presence is considered as a psychological state that occurs independently of the use of technology and the execution of actions between technological or real objects or entities. It is clear, however, that features such as virtual environment verisimilitude and medium response time improve the perception of presence.

From the perspective of dance, Gumbrecht (2010) emphasizes space as the main dimension of the culture of presence among human bodies, a relationship that can be constantly transformed. In this sense, the author establishes associations with time as a condition of presence in real time.

Therefore, it is possible to infer that contemporary studies of contemporary dance are directly related to the experiments that have connections with the ICT's. Consequently, the presented works have in common the interdisciplinary, since they associate in their

6 Brian Mullins and Gaia Dempsey, in the introduction of the book: *Understanding Augmented Reality*, of Allan Craig (2013, p. 15), affirm that the "augmented reality é an environment, composed by a set of combined technologies combined with a set of content convention. The way that the people experiment augmented reality is different from everything that came before and, therefore, requires new ways of thinking and production processes.

projects the art, the dance, the performance, and the technology.

VI FINAL CONSIDERATIONS

The results obtained by this study indicate that the current panorama of research related to contemporary dance, technologies, and interdisciplinary are still little explored by academic studies. In this prospect, the need to build foundational bases that allow the orientation or the more accurate discussion regarding the contributions and forms of adoption of the ICTs as an artistic appropriation in the diverse contexts and scenarios of the contemporary dance was evidenced. It should be highlighted that ICTs in their different interfaces associated with artistic performances, more precisely with contemporary dance, allow interdisciplinary approaches, since they make interconnections between communication, art, and even education, enabling a branching of experiences beyond their own gestures.

Lastly, the contemporary dance from technological and digital increments allows us to reflect on the ideas of time and space, potentializing dance as a cultural manifestation capable of inciting the construction of innovative and diversified forms of language, surpassing the common body sense of the real state, and transforming itself into a virtual body, to favor the notion of presence and its connection between being and being in the world.

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