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Research Article

Thinking Minds, Virtual Bodies

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With the emergence of the pandemic, the world adapted virtually; dance education and performance were no exception. Particularly, Indian classical dance (ICD) education and practice garnered mixed reactions due to the deviations from the intimate personified practices which are inherent in the traditional ICD system. Therefore, certain changes in the system became mandatory. With reference to the ideal tenets of arts pedagogy as mentioned in the ancient performing arts treatise *Natyashastra*, this paper provides specific significant methodologies which can benefit the knowledge exchange process in ICD especially in the online environment. Derived from the training in the sciences, this paper is an attempt to inform the virtual ICD scenario regarding complementation of and improvements in the traditional ways of knowledge acquisition and dissemination. These ways will appreciably enrich the desired purposes of the "felt" and "embodied" which may have been lost with the shift to the virtual scenario.

*Keywords***:** Indian classical dance, Odissi, virtual, *Natyashastra*, science research

Introduction

My own journey into the world of Indian classical dance (ICD) began at the same time that I was in pursuit of understanding and applying concepts from my training in Biochemistry and Microbiology. Having enrolled in a Ph.D. program in the USA, my long hours at the lab kept me challenged both physically and mentally. My foray into the world of Odissi was very interesting as I struggled with working my mind into learning something so beautiful and yet so "traditional". As an adult learner, questions about embodiment and structure would often be encountered but were not usually conveyed to the whole class. The teacher or the *Guru*, as dance teachers are referred to in the Indian classical dance (ICD) sector is revered and considered an authority in the relationship with a disciple or the *shishya*. In ancient India, the *shishya* was offered a holistic experience in the learning of ICD by the *Guru*, wherein the *shishya* lived in the *Guru's* home to gain much more than just the knowledge about the art form. This *Gurukul* system has been analyzed by dance scholar Ananya Chatterjea (Chatterjea, 1996), through the eyes of the ancient Indian society to the modern-day privileged dance training experience. Chatterjea through her sources delves into the pretext of dance training in the *Guru-shishya* system which cannot be replicated today, but yet argues that without it the training may be incomplete.

In an unforeseen turn of events over the past year, the ways that ICD is taught and learnt underwent a drastic change following the onset of a pandemic and a subsequent 'lockdown'; and it looks like that the system is here to stay. The online or the virtual medium took over all aspects of life and dance education was no exception. This has for the most part been very successful and there is not a single moment wasted or an opportunity lost to learn or teach through the screen. Numerous practitioners, teachers and dance companies have gained lot more fan following through the ability to reach each other and the audiences in any part of the world. But, this idea of information on finger tips came with a price. Some revered practitioners were averse to the idea of a virtual medium and some students could not come to terms with the concept of learning intricate dance movements by gazing at a tiny screen. In a personal interview, Cleveland based Kathak danseuse and teacher Antara Datta, comments that many teenagers whose parents were skeptical about this new medium of pursuing a deep learning process dropped their kids out of class, while many including younger children started the ABCs of Kathak in front of a screen, never to have felt the presence of their teacher in a real classroom. In contrast, my experience in front of the screen had to deepen with every class. I increasingly felt the need to innovate and approach my learning in ways that would enable me to overcome the inherent challenges of the virtual medium. I toyed with the idea of inculcation and incorporation of certain integrated principles in my own practice in front of the screen over the years and these thoughts took a more coherent shape when the pandemic struck. My more than fifteen years of scientific training made me aware of certain possibilities which could go beyond the traditional system of learning and teaching Indian classical dance, and could provide articulated avenues for an experience in parallel with the difficulty of the current scenario. Interestingly, a monograph on the *Natyashastra* by Apparao paraphrased by Chatterjea (Chatterjea, 1996) states certain virtues which when present in the *Guru* and *Shishya* make the process of knowledge exchange a profound and a successful one. Apparao states and as is quoted by Chatterjea; "Bharata taught the dictum of the *Natyashastra* to his disciples "who were intelligent, sharp, bold, industrious, steadfast, and were endowed with the faculties of *grahana* or reception, *dhaarana* or retention, *jnaana* or absorption, and *prayoga* or expression." She also states that:

> "Also implicated in this traditional system are the Vedic ideals of *sravana, manana, and nididhyasana*, the three steps in the attainment of knowledge …

A guru's greatness, therefore, lies in his facility in the exposition of the texts, and learning can be said to have happened when the student recognizes the applications of such knowledge in the practice of the art" (Chatterjea, 1996: 72-73).

Endowment of the above faculties is not trivial and in the traditional system these arise with the assumption of the *Shishya*'s constant association with the *Guru* and also vice versa, the *Guru* in association with the *Shishya*. This system being entirely diverted in the modern era, cannot sustain the deeper involvement in the arts demanded from a serious learner or teacher of ICD. Changes in the reception, retention, absorption and expression by a student or teacher in charge of imbibing these faculties become imperative and should not be overlooked. Through the deep involvement in science research, I propose to draw a parallel between the pedagogical and learning principles employed in the sciences and the arts and how they may benefit the exchange process between the teacher and the student in the new age virtual environment. In this study, I delve into the known and unknown changes and challenges that have resulted from ICD having moved to a dominant online mode and arrive at some possible positive alterations in the modality without hopefully deviating from the essence of the felt depth of the classical arts. I corroborate these observations with my research through the process of questionnaire responses and subsequent interviews. My respondents consisted of ten established ICD practitioners and/or teachers who have or are pursuing a parallel career in the field of scientific research primarily in the United States. All of them have shifted to online learning or teaching over the past year. I sought to understand their thoughts on the processes of dance pedagogy/ learning and the possible incorporation of scientific research methodologies in the traditional, the modern and the current virtual medium through written answers to a questionnaire. Few of them chose to elaborate on their thoughts through an interview, or more appropriately a discussion, which helped me gather cohesive evaluations. All responses pointed towards the incorporation of principles and techniques which are being actively utilized by ICD learners and teachers to encourage creativity in the process of virtual pedagogy. I discuss these processes through the lens of my own findings in the online environment and established research on effective dance communication.

Virtual perception and reception

The traditional method of engaging in the mastery of any Indian classical dance form is through the exchange and flow of movements and gestures through the faculty of sight from the teacher to the student. Movements of the body can be mimicked through the emulation mechanism by which the student observes and replicates the patterns. With respect to movement emulation, teaching and learning through the online medium is anything but traditional. This medium clearly lacks the clarity and precision to justify the traditional pedagogy process. Specifically, it suffers from incompleteness of the entire bodily movement perception along with absence of any connective exchange. Therefore, I argue that mimicking movement through the screen is extremely arduous, unless the movement can be thought about "differently". To further evaluate this "different", I bring about the concept of embodiment in the learning and teaching of movement. Eeva Antilla proposes that the embodiment in dance is a process that has several layers integrated into it. Along with mere movement, embodiment encompasses inner bodily sensations, experiences and physiological sensations (Antilla, 2018). She further elaborates, "From a learner's perspective it could also have tremendous potential to make a difference in the social environment. The embodiment is a combination of interactions between the body and mind, body

and environment and the environment and mind" (Antilla, 2018: 6). She also explicates that this process is holistic and it exists within an entire human and between humans. This is where reality is judged through the experiences of actual tangible movements, inner feelings of the body, social interactions and physiological changes (Antilla, 2018: 6). In the traditional mode of knowledge exchange in ICD sector, imitation is a norm and the cognitive processes involved in the embodied imbibement of the complex movements are often taken for granted. Dance scholar and an educator, Dr. Rohini Dandavate comments how her late teacher, *Guru* Shri Kelucharan Mohapatra was almost a constant companion in her dance journey right from the days she started learning the complex classical dance form of Odissi (Personal interview). This felt experience became crucial in her dance journey, where incorrect movements were taken care of by the *Guru* immediately, hardly to be questioned or analyzed. The perception and therefore the method of reception of intricate movements could never be investigated at a level beyond the obvious. In opposition, perception and reception by the student in the online medium will require considerable analysis beyond the typical. In the quest to incorporate the movement intricacies and the felt nuances of ICD, it becomes rather imperative for 'acute observation' and 'critical analysis' to be incorporated as a pedagogical principle alongside the direct emulation of tactile movement. My personal experience in inculcation of the above principles have changed the way I perceive my teacher's body through the tiny laptop screen. Unlike other genera or species, where subspecies may exist where the body geometry often change, the human species (*Homo sapiens*), are remarkably similar. But, theorizing on the skill of acute observation, I feel it is increasingly important to realize that everybody moves uniquely in spite of the geometric similarity. A certain Odissi *Pallavi,* a rhythmic exploration of melodic modes, with the exact same steps will manifest differently in different bodies. In this regard, research from the University of Jyväskylä, Finland attempts to identify individual dancers using motion capture technology through machine learning. Exploring the response of individual dance movements to musical genres, they observe that classification based on individual movement patterns were remarkably accurate (Carlson, Saari, Burger and Toiviainen, 2020). Another study determining perception of movement and emotion of dancers through point light display observes that "all were easily able to determine dancer traits and emotion from dances, but fine discriminations among the dance movements during fast, happy dances were typically made only by those who had dance training and were attuned to minute motion differences" (Brownlow, Dixon and Egbert, 1997) …. "More importantly, this work has shown that dance is indeed an art that involves the mastery of movement in the human body in an attempt to evoke emotions, to inspire feelings, and-ultimately to communicate (Brownlow, Dixon and Egbert, 1997: 419). Therefore, in the absence of embodied experience, heightened observation skills in dancers learning virtually play a vital role in the way movement is accessed.

Supplementation of information gained by acute observation with thinking about that observed movement will lead to better understanding to approaching critical analysis of movement vocabulary and self-awareness. One may also appreciate that the principle of critical analysis may be utilized by both the student and teacher to make it a collaborative experience. Keeping in mind the common goal of inculcating a somatic and holistic discipline in the form of Indian classical dance education, it will promote a mutual path to *dharana*. Kaustavi Sarkar, a North Carolina based scholar and educator specializing in Odissi, lays down several techniques she has devised to enforce the desired receipt by the student. Deemed as transferrable skills, she uses connections to everyday lived experiences, feelings, social and cultural awareness to convey dance movements like gestures, postures and expressions (Sarkar, 2020). I propose complementary skillsets important in apt response to the above employed pedagogies. Critical analysis therefore, will include a mindful ability to gauge sensory perception. While the

information from a teacher is seeping in through the screen, a student's heightened awareness of his or her own body to the principles of anatomy, space, depth, breath, balance, energy, flow, structure and formation can ultimately lead to the inculcation of analytical approaches to solve reception problems through a space/time/touch lagged environment. Dr. Shriya Srinivasan, a trained biomedical engineer and a current postdoctoral researcher working in neuromodulation of the gastrointestinal tract and a professional Bharatanatyam dancer and teacher comments on the ways she has incorporated her knowledge about proprioception and sensory feedback into her pedagogy. She insists on the scientific analysis of movement from her students, e.g., she describes how angular momentum is involved in the maintenance of body balance, activation of particular muscle groups etc. (questionnaire interview). This method of inculcation of analytical thinking can be delivered at a more simplistic level, if only the teacher student collaboration agrees to do so. On Dr. Sarkar's lines, Dr. Rohini Dandavate comments on the importance of associations of everyday experiences with movements. Taking a more practical approach, she insists on the importance of a dance curriculum to incorporate the changing times geared towards the pedagogy of Indian classical dance (Dandavate, 2011). This may pave the way for a definitive delivery method instead of mere mimicking. It will also make for a deeper understanding of movement and emotions with the effect of continuity in the learning process during challenging periods.

Virtual Retention and absorption

Given the nature of the current scenario and the global reach of ICD as a mainstream art genre, the process of retention (*dharana*) of the techniques and the absorption (*jnana*) of nuances for subsequent intellectual assimilation or immersion may need to undergo a significant reform. The challenge of 'immersion' inherent in classical arts is a very prominent one in the online medium. In depth immersion in a classical form is a lengthy process and sometimes is considered abstract and is often held as something that a student is eventually familiarized with in the course of his/her dance training. One can therefore recognize that retentive learning through intuition and assimilating of intricacies through innate intelligence would a part of the *Guru Shishya parampara*. But the education process through the online medium is bound by certain limitations. The foremost one being time. The nature of one-hour weekly sessions through 'zoom' will make it hard for a learner of ICD to retain the movement or the expressive intricacies. This will directly affect the immersive process. Relating the faculties required for the deep learning of science and the arts, scholar and educator Rohini Dandavate identifies that both fields need rigor and discipline. She also points out that the reason why some students take up learning classical dance today has changed a great deal than what it was when she was a student of *Guru* Mohapatra. They are geared more towards performance and learning items (choreographed pieces for solo performance) and less towards the inner assimilation of the values that the classical arts strive to identify with (questionnaire interview). Linking intuition with the creative process in the arts and sciences, Bharatanatyam exponent Savitha Sastry and a trained neuroscientist says that, "Intuition plays a significant part in the creative process and in Science. The outcomes of these fields are differently purposed and Art has allowance for subjectivity and interpretation - which Science does not afford" (questionnaire response). Therefore, allowing concrete and logic in the pedagogical process of ICD, may be the need of the hour especially in the virtual scenario. How can we approach this? Conforming to fidelity in traditional pedagogy, Monica Dalidowicz explains the emergence of creativity in pedagogy in the field of Kathak. Having no set rules to the way Kathak is learnt, the Chhandam school of kathak in California led by Chitresh Das developed unique ways to help students learn the elements of Kathak like *taal* and *chakkars*. Having also developed the Kathak yoga, she states "The American context provided a space in which this 'innovation' - which itself a recombination of traditional techniques - could be presented and

elaborated" (Dalidowicz, 2015). This creativity was required as a means to embrace tradition in the diasporic context (Dalidowicz, 2015). Regarding the importance of dance education accessibility for the K12 sector, author Judith Lynn Hanna details the numerous intellectual faculties that dance learning can bring about- linguistic, musical, logical, mathematical, spatial, intrapersonal, interpersonal and naturalist (Hanna, 2008: 495). Dance pedagogy therefore should not be an extra-curricular affair, but instead have the capacity to create a distinctive yet generic curriculum, if delivered properly. The shift of the education in the virtual format demands a given set of rules critical for the delivery of the material just like the sciences. As both the fields are practical based, it seems rather imperative that the dance sector can adapt to certain pedagogical changes in order to flourish. I analyze certain approaches to circumvent the limitations of the online medium in order to create a rigorous and disciplined mindful learning space from both the teachers' and learners' perspective. The rigor and discipline will arise through the indulgence in the depth of ICD leading to a mindful and embodied experience not only in the conscience of the performer but also recapitulating in the audiences' reception.

Separating this experience from the just physical aspect of dance training is not beneficial for the teacher or the student. Touching upon the aspect of embodied emotional connections, Dr. Shriya Srinivasan, explains the intricacies of training *abhinaya* to her students through Zoom, "I try to follow a Socratic method while teaching. I try to make the student analyze his/her own actions by asking them questions. This comes a lot from my scientific training. When they start thinking about very simple questions like, … "what is the height of the nayika and therefore where should your eyes be looking?... What do you think *Krishna* is thinking in this particular scene?" (Questionnaire interview). This method of questioning, which forms the basis of scientific research, stimulates critical thinking in the minds of the students making them more aware of their own self and thoughts. Constant inner dialogue is essential in portraying a story through dance, but while training virtually, a constant verbal dialogue between the teacher and student becomes crucial. The dialogue process leads to rational thinking in that one-hour time frame even without the possibility of tangible connections. This exercise may be more feasible in a one-to-one setting, and many dance exponent educators seem to be only wanting to train, one or maximum two students over the online platform. Commenting on the critical design of an *abhinaya* class, Aadya Kaktikar approaches pedagogy with a student centric methodology:

> "The class was designed so that learning in the class was driven neither by the teacher nor the curriculum, but rather by the student. It was a teaching strategy which placed the learner at the centre of the pedagogical process. Knowledge was produced through dialogue, interaction and reciprocity between the concept/text, student and teacher. It required a constant assessment of how the students were responding to the material and attentiveness to the questions that may be verbalized or physicalized in their bodies. My goal was to teach in a manner that responds to differences rather than to demand that differences disappear". (Kaktikar, 2016: 124)

The regular dialogue and questions asked and answered create mindful connection between the teacher and the student creating a holistic and enthusiastic learning experience bringing rationale and logic to movement. An established cosmologist and Odissi dancer Dr. Uranya Bastt (https://satyagontcho.space/), who restarted regular training during the pandemic with a well-known Odissi *Guru* describes how the relationship between them worked out so well and she could connect with her even through the virtual screen. She states, "My *Guru* is very open-minded, she practices tremendous generosity when it comes to the sharing of all the knowledge, context, notes and experiences about a particular piece that we are learning. I could therefore act like a sponge with regards to all she decided to pass onto me, all the while developing a special understanding with her and being able to feel a spiritual connection through learning and practicing her compositions. Even when I learnt a very simple pure dance item, I could feel the immersion I had developed while training with her" (questionnaire interview).

Elaborating on the fact that training in the classical dance sector lacks goals, Uranya also adds the need to plan out the learning process. Aligning with the scientific methodology of planning an experiment and setting a particular goal and then acting on it and investigating the results and drawing conclusions, online dance training especially can benefit from practicing these ideologies. Working with the teacher to chalk out a plan, setting short term goals and checking back to discuss the success of that goal will go a long way in understanding progress. Uranya states that, "Some teachers may not be very receiving of this type of a scientific process in teaching dance, but this process does not necessarily have to hurt the tradition of *Guru Shishya parampara* but still can be implemented through a mutual understanding and practicing a partnership in the relationship rather than a hierarchy." (Questionnaire interview).

Lastly, I want to underscore a scientific approach at the individual level that can benefit the assimilation of nuances in ICD. My personal growth in learning of expressive dance (*abhinaya*) had undergone a significant shift when the classes converted to the virtual world. The limitation of screened resolution is debilitating and cannot replicate the in person intimate experience. Therefore, emoting and capturing emotions through the screen remains a significant hurdle. At this juncture, one may benefit tremendously through documenting the embodied and the emotive state of the dance. I argue that documentation need not be a monotonous process on the part of the learner. In fact, it has the power to become a productive tool which can lead to deep investment in knowledge and assimilation and can be self-paced. Citing my own example, as suggested by my teacher, after every zoom session, I write down a story line of the class that was taught. The stories are many a times my own interpretations of movement and emotions which help me to accentuate my personal practice. In this scenario, my teacher's recitation of a story while teaching, formulates a clear trajectory for my writing after the class. While telling the story, my teacher communicates verbally only, so the sense of hearing and thereby assimilation is heightened. This single sensory perception possibly makes the process of learning very specific and intense even without the bodily presence of the *Guru*. This can lead to be deeper investment in the pedagogy and learning and has the potential to overcome the time and picture quality barrier of the virtual environment.

The techniques I investigated in this section namely, verbal communication, goal setting and feedback and thorough documentation of learning will aid in the rationalization of thoughts, irrespective of movement or expression. Therefore, the disciple will be more detail-oriented and specific in approach, leading to internalization of the principles. The collaborative habitat thus created will make the student aware of the depth of the process, to adequately retain (*dharana*) and absorb (*jnana*) even in the virtual platform.

Expressing dance through the screen

Emergence of virtual pedagogy and the proliferation of online dance festivals has had a profound impact on the way performances are received and perceived by the audience. This is because experiencing performances is now not limited by the time or space constraint. Inadvertently, therefore, with the boom of social media and data available on the cloud, watching a live in-person performance may be a forgotten experience. I want to take a bottom-up approach to discuss ICD expression and its effects and methodologies and will therefore start with the expression of the self. Nandini Sikand in her book, "Languid Bodies, Grounded Stances", carves out the concept of "Odissistan", describing a "sacred" space, which starts from the individual, continuing to the communal to designate a sense of belonging (Sikand, 2017). It is this space that is spiritually mobile and resides within the dancers themselves. The dilemma that now arises is whether the establishment of this space in the form of a computer screen is a reasonable one or not. Left with few choices owing to the inability to travel or access the studio space due to the pandemic; conquering the "sacred" within the virtual space becomes rather mandatory. It is possible that peers and teachers are not able to exploit this space to the fullest extent, it remains the responsibility of the student of dance to develop the sacredness of the space in which they may be confined in. Reflecting on the self on the part of the student can best be achieved through archiving techniques, and not undermining the value of one's own self. Video archives have long been used by art historians and practitioners to preserve the value of the arts. But author Rupa Srikanth also notes that India has been lagging behind in preserving its dance through the form of archives and elaborates on its significance (Srikanth, 2017). The first step in archiving is intent (Srikanth, 2017) or the purpose of the archive. In the current situation, the purpose of archiving will be self-reflection and self-reproducibility. Keeping this intent in mind, similar to an equipment which records readings in an experiment, the camera is the best piece of artistic equipment. Likening the camera to an artist's guinea pig and with the absence of in person opportunities to perform, the last year I archived my learning through recording videos in my apartment living room "Odissistan". Watching the videos over time had given me time to reflect on my movements and expressions and chances to improve upon them. This archival technique and the annotation of the self-proclaimed sacred space does not only hold true for the self, but can also affect the potential with which an external viewer will perceive the said "room". This skillset acquired will be useful in perceiving other bodies other than one's own self in a more critical way, sometimes probably the only way through which I could effectively learn movement in the virtual setting.

I have also seen how my own kinesthetic expressions improved over time with this technique, the standards of improvement being judged by my teacher. But the improvement seems to have a time factor problem, where I have noticed certain movements being not consistent overtime performed on my own body. I denote this phenomenon as the problem of self-reproducibility. In scientific research, reproducibility holds key to experimental discoveries and implementation. In ICD, due to the embodied uniqueness, one has to strive for self-reproducibility, subsequently maintaining it in spite of the addition of artistic layers. In the online setting, space can be upheld as one of the variables which could be affecting non-reproducibility. Therefore, due to the limited options available to dance on, it becomes essential for a performer or a learner to explore the spatial and temporal variables of their space and relate these variables to their own practice and expression.

Dance training is a very specific endeavor which can be distinguished from other kinds of training like music, as reviewed by F. Karpati *et al* (Karpati, Giacosa, Foster, Penhune and Hyde, 2015). While discerning the effect dance training has on the brain, the group describes studies

where dancers have their spatial and the temporal segments of the brain linked to the action observation system activated compared to non-dancers while watching a performance (Karpati, Giacosa, Foster, Penhune and Hyde, 2015: 141). This means that the potential use of the archives and documentation may possibly work better for dancers who have been trained in the traditional setting for a few years at least. For new online only learners of ICD, it would be a totally different brain activity which could be potentially detected. Whether they will be able to gauge themselves better than experienced learners remain to be determined. Despite the fact that classical arts practice and training is a self-reflective inward journey helping to connect with the spiritual realm, it cannot be overlooked that the public portray of the sweat in the form of live performances is what most artists thrive on. Investigating the lived experiences or the phenomenology, and their effect on self and public performances, there are two aspects as dealt with in a scientific approach of felt experiences. One is the emotions and physicality or both of the performer, and second is the connection of those emotions and physicality with the spectator and the spectators' experience of the felt (Braude and Shulman, 2018). Synthesizing what movement means to a performer through their own mental abilities will change the way movement is perceived by the audience.

Describing Damasio's neural model of dance expression, Dr. Pashman comments, "It should now be clear that when a spectator watches a dance, the doubleness of kinanesthesia that occurs in the dancer is mirrored as a double effect in the spectator. In the dancer, there occurs the empirically measurable micro-movement of stretching muscles and their spindle cells, *and* the subsequent, subjectively-experienced, affect, the perception or feeling of that stretching. Within the spectator–whom we now understand to mirror the dancer's movements as brain traces of muscle tensions throughout his own body–we discover the resultant representations in the spectator's consciousness, his own felt emotion" (Pashman, 2017). Linking this model to the Indian aesthetics and the "*Rasa* theory", it is indeed a question to ponder upon when it comes to online viewing of performances. In the online festivals, recorded performances are danced in front of a camera and few if any personnel; and the degree of kinesthesia felt within performers is debatable. Adding to the differing camera angles and positioning, dance viewing through a screen can be considered as an entirely different neural phenomenon. On the other hand, different senses may be heightened during recording a performance in front of a camera. Through my personal experience, I felt a sense of calm and composure and being able to think through my own body's cells instead of the audiences' or the co-dancers' in a live or a group performance setting. Therefore, the audience viewing me will not have generated the same neural responses compared to in a live program. Again, these experiential differences may reflect the level of the dancer and their exposure to the form before going virtual. Investigating the "*Rasa* theory" and the amount of time required to generate the felt kinesthesia within the performer and the audience, author Kalpana Ram (Ram, 2011) explains:

> "To be a rasika is to inhabit the time of the present in a very particular way. The modalities of this temporality stand out in the world of modernity. Rasa theory makes it very explicit that this is a world in which time is slowed down to the time it takes for good flavours to be released" (Ram, 2011: S162) …. "What the audience experiences as a result of this training is

not the simple repetition of the past, but an artistry that makes apparent the open-endedness of semiosis working against the traction of certain closures: a given line, a raga, an episode" (Ram, 2011: S168).

The point I want to arrive is at the tenet of self-reflective maneuvering of time through constant research and development which incidentally also form an essential component of successful scientific research endeavors. The methodological utilization of time through self-reflective documentation could possibly overcome the anxiety of "flavorless" dance performances on the screen. These personal engagements without the compulsory intervention by external stimuli may help alleviate stress of not being able to participate in a tangible learning or performative environment. Nandini Sikand expands on the importance of practice or *sadhana* and the role of the *Guru* in tying it up with the demanded classicism and the required innovation in ICD (Sikand, 2017).

As students and teachers begin incorporating these methodologies in the virtual dance space, some variations arising in the traditional dancing body and mind may be inevitable. But that may not justify a hindrance or an incompetence in the practice of the sacred ICD. In fact, these variations may help practitioners delve deeper into the meaning of ICD through which could emerge appreciable changes benefitting the field of ICD. A fine line exists between these and only time will tell the boundaries that each of them could surpass.

Conclusion

In this article I present specific ways in which the scientific concepts can complement and support the rigor and transcendence of arts, especially ICD through the lens of the four faculties of *Grahana* (perception), *Dhaarana* (retention), *Jnana* (absorption) and *Prayoga* (expression) mentioned in the *Natyashastra* as facilities which when endowed with made for ideal disciples (Chatterjea, 1996). The notion of the 'ideal' has undergone an inevitable change with ICD training and performance converting to the virtual mode through pedagogy happening on online platforms like 'zoom'. Isolation and alienation in terms of teacher-student, performer-audience and student-student interaction began to lead to loss of sustenance of enthusiasm and subsequent involvement, which are required to fulfill the above-mentioned faculties and therefore, uphold the value of the arts. Through the inculcation of scientific principles employed in research, which are based on practical set of methodologies like journaling and archiving; I provide specific problems and pragmatic solutions to the difficulties of perceiving, retaining, absorbing and expressing the elaborateness and complexities of ICD within the online setting (see Table 1).

Each of the faculties can benefit from a tailored and structured approach and it can be a collaborative experience even when working within the impediments of disturbing time, space and energy lags. Through conversations with research scientists engaged in ICD pedagogy and learning, I evaluate the current situation. Considering the issue of effective perception, a learner of the ICD will benefit from critical analysis of movement and expression outside of the class. The role of the *Guru* in this undertaking needs substantial self-reflection and circumstantial revision. A constant dialogue between receptive and curious teachers and students is essential to ensure the success of these methodologies. Through the development of acute observation skills, one can imagine the possibility to deal with complexities and make learning an embodied and mindful experience. The incorporation of collaborative communication and documentation will make for a detail-oriented learning process and assist in better retaining and internalizing the nuances of ICD.

Understanding the value of the self and diagnosis of one's own progress in the online space can subdue the lack of articulative expression and therefore benefit the experiential probabilities of the classical arts. In the United States, the passing of acts for the development of land grant institutions made a pathway for the arts to be included in the mainstream curriculum. The defined curriculum meant inclusion of arts education as a vehicle for the economic and spiritual growth (Van Delinder and Sisson, 2014). Therefore, separating the fields of science and arts on the basis of economic value is not well justified. We can also appreciate that the four faculties (Table 1) that I discussed in this article intermingle with each other, creating ample scope for development of a complete curriculum. Savitha Shastri, Bharatanatyam exponent, who in her previous life researched on neuroscientific questions says that according to her, science and dance cannot be labelled as separate entities. Both act as complementary sides in harmony with each other. [3, questionnaire response]. In another interview for India Today, she says, "All art and science do have a common ground which is the search for perfection. I am pursuing the beauty of human expression in Arts, as I was pursuing the truth behind nature's expressions in Neuroscience," (Chakrabarty, 2020). When asked about how I could pursue something so meaningful and intricate like Odissi along with my PhD studies in the sciences, my thoughts about the marriage of arts and sciences gained strong ground. Interestingly, some of the respondents of my online survey echoed my thoughts. Krishnakali Dasgupta, a scholar in developmental biology and a passionate Manipuri danseuse from New York credits her success in both fields to her early arts education at Children's Little theater at Kolkata, India, which places equal importance to continuing the studies in school subjects along with the professional training in the arts. Her future teachers with whom she has started imparting education now, had a very structured and planned way of delivering dance pedagogy. It seems that this amalgamation needs to take concrete shape in the new age virtual dance pedagogy and learning, and this study is an effort towards the same. Dance as an art form, does have the capacity to be specific in its approach and this specificity does not need to be acquired by compromising on the kinesthetic, embodied or the phenomenological dimensions of ICD. In this respect, Lauren Butler has provided a comprehensive outline of how the arts can inform science and vice versa (Butler, 2018). In the book entitled "Extraordinary partnerships", two collaborators, one a biologist and another a dancer came together to create a production on the conservation of water in a goal to reach the social message to a wide range of audience. Spotting the similarities between how experiments are conducted and how choreography is developed, the dancers in this project had an embodied understanding of what water is at the molecular level, while the scientist had an understanding of the movement vocabulary that represented water (Enos-Berlage and Jane, 2020). Therefore, the integrated tenets of scientific acumen can very well complement and improve the general system of the classical arts especially when the traditional setting is compromised. This partnership has the capacity to benefit both the fields, thereby establishing a valuable experience for both the connoisseurs and the practitioners of the classical arts. Coming back to the faculties of a student dictated in the *Natyashastra*, it is quite clear that the dramatic nature of the current situation needs changes through a major outlet in the form of a defined set of feasible and constructive methodologies that can aid in the conservation of the artistic enthusiasm that is integral and often considered as default in a traditional setting.

REFERENCES

Anttila, E. (2018) The potential of dance as embodied learning. *UC Irvine: A Body of Knowledge Conference, 2016 conference proceedings*. Retrieved from https://escholarship.org/uc/item/3s7118mr

Braude, H.D. and A. Shulman (2018) 'What If …': A Question of Transcendence. *Back to the Dance Itself: Phenomenologies of the Body in Performance*, edited by SONDRA FRALEIGH, University of Illinois Press, Urbana; Chicago: Springfield, pp. 183–204.

Brownlow, S., Dixon, A.R., Egbert, C.A. *et al.* (1997) Perception of movement and dancer characteristics from point-light displays of dance. *Psychol Rec* 47**,** 411–422.

Butler, L.M. (2018) Dance and Mixed-Media Performance for Building Scientific Understanding and Environmental Respect. *Consilience*, no. 19, pp. 183–195.

Carlson, E., Saari, P., Burger, B., and P. Toiviainen (2020) Dance to your own drum: Identification of musical genre and individual dancer from motion capture using machine learning, *Journal of New Music Research*, 49:2, 162-177

Chakrabarty, R. (2020) Why this neuroscientist changed her career to perform and teach Bharatanatyam for free, https://www.indiatoday.in/education-today/featurephilia/story/savitha-sastry-neuroscientist-changed-career-perform-teach-bharatanatyam-for-free-1739806-2020-11-10.

Chatterjea, A. (1996) Training in Indian Classical Dance: A Case Study. *Asian Theatre Journal*, vol. 13, no. 1, pp. 68–91.

Dandavate, R. (2011) Indian Dance Education in changing times, https://www.scribd.com/doc/55956733/Indian-Dance-Education-in-changing-times

Dalidowicz, M. (2015) Crafting fidelity: Pedagogical creativity in kathak dance. *The Journal of the Royal Anthropological Institute, 21*(4), 838-854.

Enos-Berlage, J., and Jane H. (2020) Body of Water: Merging Biology and Dance to Reach New Communities. *Extraordinary Partnerships: How the Arts and Humanities Are Transforming America*, edited by Christine Henseler, Lever Press, pp. 233–266.

Hanna, J. L. (2008) A Nonverbal Language for Imagining and Learning: Dance Education in K-12 Curriculum." *Educational Researcher*, vol. 37, no. 8, pp. 491–506.

Kaktikar, A. (2016) Dancing in-between spaces: an auto-ethnographic exploration of an *abhinaya* class, *Research in Dance Education*, 17:2, 113-129.

Karpati F.J., Giacosa C., Foster N.E., Penhune V.B., Hyde K.L. (2015) Dance and the brain: a review. *Ann N Y Acad Sci*, 1337:140-6.

Pashman, S. (2017) Feeling Is Movement: Damasio's Neural Model of Dance Expression. *Dance Research: The Journal of the Society for Dance Research*, vol. 35, no. 2, pp. 258–273.

Ram, K. (2011) Being `Rasikas': the Affective Pleasures of Music and Dance Spectatorship and Nationhood in Indian Middle-Class Modernity. *The Journal of the Royal Anthropological Institute*, vol. 17, pp. S159–S175.

Sarkar, K. (2020) Indian Classical Dance Education in Diaspora, *Dance Education in Practice*, 6:3, 6-14.

Sikand, N. (2017) Choreographing Tradition and the Practice of Sadhana. *Languid Bodies, Grounded Stances: The Curving Pathway of Neoclassical Odissi Dance*, 1st ed., vol. 9, New York, Oxford: Berghahn Books, pp. 72–109.

Sikand, N. (2017) Odissistan: Embodying a Sacred Space. In *Languid Bodies, Grounded Stances: The Curving Pathway of Neoclassical Odissi Dance* (pp. 177-202), New York, Oxford: Berghahn Books.

Srikanth, R. (2020) Are we guilty of neglecting the importance of archiving in the performing arts? https://www.thehindu.com/entertainment/dance/saving-history-as-it-happens/article32348373.ece

Van Delinder, J. and B. Sisson (2014) Role of the Arts, in Sterbberg (Ed.), *The Modern Land-Grant University* (pp. 301-314). West Lafayette, Indiana: Purdue University Press.

NandyMazumdar (2020) **Thinking Minds, Virtual Bodies**

<u>**Annex 1**</u>
<u>**Table 1 : A summary of potential modifications to the four faculties of the disciple.**</u>

A brief description of the traditional methodologies employed along with the potential benefits and examples of scientific principles which could be employed for better teaching and learning of ICD.

Faculty of disciple	Traditional methodology	Scientific methodology for online delivery and learning	Benefits	Specific examples
Grahana (Reception)	Imitation Emulation	Critical analysis Acute observation	Evaluative interpretations Embodied perception	Analytical assessment of body weight for purpose of balance Mindful measurement of angles utilized during limb movement
Dhaarana (Retention)	Intuition Innate intelligence	Rationalizing approach to movements and expression	Better assimilation of techniques	Eye movements based on judgement of character/object parameters
Jnana (Absorption)	Abstraction	Collaborative Communication Goal setting Documentation	Internalization of movement and expression nuances	Vividness in imagination of the story line for natural expressions
Prayoga (Expression)	Enthusiasm Motivation	Self-reflection Self-reproducibility	Improvement in self and audience reception over time	Effective communication with audience through deep immersion with self.