

**DEVELOPMENT OF COGNITIVE SKILLS OF THE PERFORMING ARTS
IN THE CLASSROOM**

***DESENVOLVIMENTO DAS COMPETÊNCIAS COGNITIVAS PRÓPRIAS DAS
ARTES CÊNICAS NA SALA DE AULA***

***DESARROLLO DE LAS HABILIDADES COGNITIVAS PROPIAS DE LAS
ARTES ESCÉNICAS EN EL AULA***

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ABSTRACT: Memory, attention, active listening and teamwork are skills exercised at a high level in the performing arts. Dancers are able to remember choreographies, their movements, their positions and displacements in space, while listening to and following the music and the rest of the dance body. A musician memorizes or reads the score, previously studied, while executing it, meeting the technical and expressive requirements: being attentive to the rest of the orchestra members and the conductor. The actors express the meaning of a memorized text while interacting with the rest of the cast, the scenographic objects and the scenic space itself. The aim of this paper is, from the analysis of the learning and action strategies of different disciplines, to design a methodology of classroom application that allows the development of these skills.

KEYWORDS: Music. Dance. Theater. Cognitive and non-cognitive skills. Education.

RESUMO: *A memória, a atenção, a escuta ativa e o trabalho em equipe são habilidades exercidas em alto nível nas artes cênicas. Os dançarinos são capazes de lembrar coreografias, seus movimentos, suas posições e deslocamentos no espaço, ao mesmo tempo que ouvem e acompanham a música e o resto do corpo de baile. Um músico memoriza ou lê a partitura, previamente estudada, enquanto a executa, atendendo aos requisitos técnicos e expressivos: ele está atento ao resto dos membros da orquestra e ao maestro. Os atores expressam o significado de um texto memorizado enquanto interagem com o resto do elenco, com os objetos cenográficos e com o próprio espaço cênico. O objetivo deste artigo é, a partir da análise das estratégias de aprendizagem e ação das diferentes disciplinas, projetar uma metodologia de aplicação em sala de aula que permita o desenvolvimento dessas habilidades.*

PALAVRAS-CHAVE: *Música. Dança. Teatro. Habilidades cognitivas e não cognitivas. Educação.*

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RESUMEN: *La memoria, la atención, la escucha activa y el trabajo en equipo son habilidades que se desarrollan a un alto nivel en las artes escénicas. Los bailarines son capaces de recordar coreografías, sus movimientos, sus posiciones y desplazamientos en el espacio, a la vez que escuchan y siguen la música y al resto del cuerpo de baile. Un músico, tanto si memoriza como si lee la partitura previamente estudiada, mientras la interpreta satisfaciendo las exigencias técnicas y expresivas, está atento al resto de los miembros de la orquesta y al director. Los actores expresan el significado de un texto memorizado mientras interactúan con el resto del elenco, con los objetos escenográficos y con el propio espacio escénico. El objetivo de esta investigación es, a partir del análisis de las estrategias de aprendizaje y actuación de las diferentes disciplinas, proyectar una metodología de aplicación en el aula que permita desarrollar estas habilidades.*

PALABRAS CLAVE: *Música. Danza. Teatro. Habilidades cognitivas y no cognitivas. Educación.*

Introduction

The memorization of a song, a choreography or a dramatic text is only the first step, the basis from which interpretive perfection is sought for the viewer to enjoy the show outside the succession of notes, steps or words that compose it. Although learning strategies are different in each discipline, the types of memory and the way information is stored to automate it are common for actors, musicians, and dancers.

The seven types of musical memory according to (BARBACCI, 1965) are extendable to dance and dramatic art. Muscle memory in musicians and dancers is responsible for automating discrete movements that respond to technical demands. In the case of the actors, it has been shown that they remember better their text relate their interventions to movements, which do not have to agree literally with the word (NOICE; NOICE, 2001). The auditory memory provides the dramatic and musical artist with the ability to discern and cherish his performance while for the dancer, listening to the music alone can remind him of the movement. We should also consider the importance of auditory memory for musicians who "play by ear". Visual memory is common for musicians and actors when it comes to learning the score or text, while dancers use it to remember the choreographer's movements. Musicians and dancers also share visual memory when they use it to remember positions in the instrument or body positions that, in the case of dancers, recover from their image in the mirror. Verbal memory stores dramatic texts accurately, as well as concrete terminology of a step or note. Rhythmic memory structure and distributes the movements of musicians and dancers within a certain rhythm and underlies the cadence of a text especially if it is versed. The dancers are exhausting in this memorization procedure, because they count the pulses of music, distribute them in bars and

attribute to each movement a number of this musical computation. Analytical memory collects the information obtained from the formal analysis of a score, text or choreography. And finally, emotional memory, essential in the three disciplines, which brings together the characteristics and interpretative nuances defined, chosen and meditated during the study or essay.

The way to store information according to standards that are elaborated with the knowledge of a competition, as well as the efficiency and speed of access codes and the retrieval of this information from long-term memory, corresponds to the Specialized Memory Theory (WILLIAMON; EGNER, 2004). Standards in musicians and dancers are a sound-motor association, while according to (NOICE; NOICE, 2001), in the actors the process is external. In the analysis of the text, the dramatic intentions are distinguished, a storage unit is assigned and the work is done during rehearsals in which the actor must be involved emotionally.

As the memorization process progresses, either in the individual study or in the trials, an opening of attention occurs. Without losing focus on the main task when monitoring it, the interpreter pays attention to more than one stimulus or activity at the same time. The actors interact with the rest of the cast, with the scenographic objects and with the scenic space itself; the musicians follow the conductor and hear the different musical voices synchronizing with them; and the dancers become aware of their positions and spatial displacements while integrating into the dance body. Group awareness and teamwork are essential to achieving interpretive perfection.

When you get to the stage, all these aspects are so internalized having worked exhaustively during rehearsals that, the performers are prepared to solve any human failure that arises during the performance without the audience noticing any anomaly. The ability to process information quickly and automatically, as well as the ability to adapt to changing situations are other skills that are fostered with dedication to the performing arts.

The proliferation in recent years of research that from the perspective of neurosciences endorses the development of the brain and cognitive abilities of the performing arts, especially music, serve as an argument to defend its inclusion in education (PEÑALBA, 2017). Only in the field of music can we find studies that relate the learning of an instrument with the development of skills such as auditory perception, visual memory, planning, processing speed or cognitive flexibility (HILLE; SCHUPP, 2015); verbal comprehension and fluency, spatial cognition, cognitive flexibility, perceptual velocity, reasoning, numerical cognition or memory (HELMBOLD; RAMMSAYER; ALTENMÜLLER, 2005). In particular, the relationship between memory development and music has aroused great interest among researchers: (HANSEN; WALLENTIN; VUUST, 2012), (JAKOBSON; LEWYCKY; KILGOUR;

STOESZ, 2008), (LEE; LU; KO, 2007), (RIBEIRO; SANTOS, 2012).

The examples of neuroscientific publications in which the cognitive abilities of musicians and non-musicians are compared are numerous and, in my opinion, generalists in terms of the definition of musicians themselves, since it covers from children who attended classes of some instrument, adults who at some point in their training studied music, students of the conservatory superior to professional musicians. Although this topic needs a careful review, we can find a quantitative analysis of neuroscientific research related to music published between 2005 and 2010 in (PETERSON, 2011).

In the present work, it is not so much intended to justify the presence of the performing arts in education for the cognitive skills they develop, but to make available to teachers and students, a series of activities focused on promoting these skills that, from the neuroscientific point of view and my experience in the performing arts, are improved. The germ of some of these activities comes from the theatrical formations directed by Hassane Kouyaté, an actor in the company of Peter Brook, who later adapted to teaching in the classroom and taught both in teacher training courses and in the graduation in Educational Sciences. The proposals have musical, dance or theatrical touches, always framed in a playful context.

Ten activities are proposed and in each of them it is indicated for which aspects is intended: memory (auditory, visual), attention (focused attention, divided attention, inhibition and motorization), reasoning (planning, processing speed, response time and cognitive flexibility) perception (auditory perception, recognition, visual perception, visual digitization and spatial perception) and coordination.

For the proper functioning of the activities, it is advisable that the number of participants varies between 8 and 12. Although there is no upper age limit to enjoy these proposals because they are accessible to children, young people, adults and the elderly; the age to start, although there are always exceptions and adaptations can be made, would be at least at 7 years.

Activities

Activity I

Divided attention, inhibition, active listening of the team and problem solving.

Students stand in a row, side by side, but without physical contact and look forward. Without any sign they have to get off the line by taking a step forward one by one. If more than one exit at a time everyone goes back to the line and starts the activity again. Once they managed to get off the line without matching, the game resumes and this time they have to leave two for

two. Progressively the number of people who have to leave at the same time will increase, 3, 4, 5 ... until they can take a step forward all together. With this activity, group listening is worked and the premise "I don't want to, but I can" is put into practice. That is, for any teamwork, decisions or proposals cannot be imposed without first assessing whether the environment of the whole is in accordance with the proposal. In this activity, if the disposition of the comrades has not been previously heard, the unilateral decision to take the step forward cannot be taken. But at the same time, you have to have the flexibility and speed to act so that when, for example, the guideline is to leave three by three and it is observed with the peripheral look that only two leave the line, to quickly join in favor of the team and the game. Similarly, you have to be able to inhibit the will to get out of line if the necessary participants have already advanced. Also, you have to have the ability to make decisions and not always expect others to take the step forward. In this game, the different functions that are usually adopted in teams are clearly outlined: those who are always willing to collaborate to solve a situation, those who impose their opinions without listening to the group, those who never risk, leaders who when they make a decision always have the support of everyone and those who are able to evaluate the ideal time to launch their suggestion while they are always willing to collaborate for the sake of the group.

Activity II

Divided attention, inhibition, active listening of the team, spatial perception, visual scanning and short-term auditory memory.

The first phase of this activity is similar to the previous one only that the distribution of students varies. All members of the group walk through the classroom occupying the entire space and avoiding circular formation. One by one and without matching, they stop until no one else is on the move. Once the whole group is still, without any prior notice, they resume the march one by one and without coinciding with another participant. To this activity in which we rework attention, inhibition and group listening, we will add short-term auditory memory, digitization and spatial perception. The mechanism is the same: the whole group walks through the classroom and when one by one they stop they say objects that are in the classroom without repeating. When resuming movement one by one, they have to renumber the objects not being able to mention what they said in the previous sequence.

Thus, they develop the visual scan when searching for objects in the environment, expand the visual perception having to be attentive to the movements of their classmates when

locating the objects and occupy the entire space of the classroom avoiding the tendency to walk in circular formation, increase the listening of the group so as not to make the decision to stop or start unilaterally without taking into account the rest of the members, they learn to inhibit impulsive actions that are to the detriment of the team and put into operation the memory to remember the objects that were cited both not to repeat them and to name them again when returning to the movement.

This activity can be used to learn content from different subjects. For example, citing South American countries during the sequence in which they stop and their capitals when they resume the movement, preventing the same person from saying the capital of the country he previously named. It is advisable that the topic to be discussed is not so complicated that students focus their attention on the subject and neglect the rest of the aspects, starting to walk in a circle, coinciding in the parade with other people, or repeating words that have already been cited. If this happens, a simpler option is made, such as quoting words that begin with a certain letter or listing objects from a known environment, etc. It is important that the chosen theme be communicated to them when they are already walking or when they are all at rest so that they do not have time to prepare their word, thus implying in the activity the processing speed and response time.

Activity III

Auditory perception, recognition, divided attention, processing speed and response time.

Participants are circled. Without a specific order, each of them says a word about a particular subject, for example, mammalian animals. As in the previous proposal, topics can be chosen according to the content of other subjects, but always preventing your difficulty from canceling the performance of the activity. The series is practiced several times remembering the order of intervention of each participant until it is performed with a certain fluidity and speed. We then start with a new series on another theme, such as fruit types. Again, randomly, the work order is established avoiding that of matching that of the previous series, and the sequence is repeated until a certain ability is achieved. This is the time when the first series is retrieved simultaneously for both. The goal is to recognize the stimulus, that is, the word that precedes our intervention, and continue the series as soon as possible. As there are two series at stake, attention should be directed to two different stimuli. Once a certain comfort has been achieved and the two series are maintained for a considerable period of time with agility, we

add a new one in a different theme. The activity does not have a serial limit, but will depend on the arrangement and characteristics of the group. This activity, like the rest proposed here, is not a final goal, but a learning process. The goal is not to make the game right the first time or judge the participants by their mistakes, but to achieve with the practice and repetition of the activities that the performances are improving. In fact, once the game is done comfortably it should be discarded because it has no more interest. Thus, returning to the activity in question, a group that at first may present certain difficulties to maintain two series simultaneously, can end up combining five. Consider that as the number of series increases, we also involve memory having to remember more and more words that act as stimuli to our intervention. It is common that when the difficulty increases, body tension is generated in the participants, which is highly counterproductive, since an instantly blocking occurs that inhibits any ability. You have to control this effect by trying to relax between games and creating an environment in which frustration and opinions among participants are avoided. It is preferable to decrease the difficulty of the activity before discouragement instills the classroom.

Activity IV

Perception and memory.

This activity is done in pairs, one acts as a guide and the other remains all the time with its eyes closed. The driver walks with his partner holding his hand across the room and shows him objects and people he has to recognize by touch. Once the tour is over, the participant who kept his eyes closed has to list the people and objects he has groped. It is advisable that this activity be carried out by a single couple at a time to avoid accidents and for the rest to witness the successes in recognition. Once all couples have enjoyed the experience, the roles are exchanged. With this game, we foster trust among colleagues by activating tactile recognition and exercising memory.

Activity V

Auditory perception and discrimination, inhibition and processing speed.

This activity is a continuation of the previous one, since the pattern of double work is maintained where one of the participants cannot use the sense of vision. Each of the couples will choose a sound that can be, vocal, body, coming from an object or even, if available in the classroom, a musical instrument, thus taking advantage of the activity to recognize and

differentiate different timbres. Participants with their eyes closed are placed at the starting line of a linear path that they have to complete. It is preferable that the displacement is carried out by crawling on the floor to avoid mishaps. Each of the participants can only move when the stimulus he has previously agreed to with his partner sounds. Partners who emit the sound will not be able to do so continuously, but will have to produce the stimulus concisely and clearly, making sure that their partner is receiving the signal accurately, while they must make the appropriate decision to continue or momentarily stop the stimulus to prevent their partner from colliding with other participants. To develop trust in pairs, the driver has to take responsibility for the well-being of his partner. All couples play at the same time and once the tour is completed the roles are exchanged. With this game we will develop auditory perception and discrimination while the guide develops its speed of reaction and inhibition of actions that are not in accordance with what is expected when one has to adapt to a changing environment.

Activity VI

Speed of processing and response, inhibition, monitoring, auditory memory, perception, auditory recognition and discrimination, planning and cognitive flexibility.

Following the line of the two previously proposed activities, the pattern of playing in pairs with one of the participants with their eyes closed is maintained, but this time the activity is performed by a single couple in each turn. A route is built on the ground with small obstacles to overcome (passing over a backpack or under a table) and different directions that can be taken preventing the trajectory from being linear. Each pair projects a sound code that responds to all the movements that must be made to complete the route: forward, backward, turn left, turn right, turn right without moving to the right and left, raise a leg to overcome an obstacle, advance laterally to the right and left, get down to pass under an obstacle, sit or stop immediately.

The choice of sound to be assigned to each movement is essential to comfortably execute the route. The sound source has to be easy to differentiate, execution has to be simple to be precise and the complete code has to be simple to memorize to avoid confusion from both sender and receiver. Each pair will have time to design, memorize and practice the code and its movements, first with their eyes open and then closed. When the participants are ready, the receiver with his eyes closed at the head of the route and the sender at a fixed point in the classroom that he will not be able to leave to give any kind of indications.

With this activity both are developing planning skills and auditory memory. The person

who will make the trip with his eyes closed will increase his auditory perception by having to recognize the sound codes and respond with the assigned movement. On some occasions, the simple fact of closing the eyes and being attentive to the auditory stimulus, causes the participant to become disoriented, paralyzed or begin to confuse stimuli. At this point, the sender's ability to react is critical to solving the situation and its processing and response speed, its inhibition ability and its cognitive flexibility will come into play. If the sender notices that the receiver has confused one signal with another, he or she can quickly vary it by adapting to the error, or instruct him or her to stop immediately and continue slowly. In any case, make a decision and monitor yourself to detect if the error comes from its issuance, as it can also confuse the codes. To avoid being angry with each other, blaming each other and instead of resolving the confusion, before starting the activity it should be emphasized that the resolution of the conflict needs both parties.

Activity VII

Memory, perception and visual scan.

This activity is performed individually by the participants. All but one are placed in a row. The partner who is out of training has to memorize the position of each of the members. After a few moments and out of sight of the observer, they redo the formation with another order between them. The mission of the participant who is playing is to redo the line with the original order. If we want to relate this activity to art, instead of forming a line, the characters and their positions within a given painting would be reproduced. Similarly, the characters in the painting would swap their roles and positions and the observer participant would have to remake them to their original posts. In both cases, with the line or with the painting, visual perception and scanning, as well as visual memory would be worked. Once all students have experienced the activity, their difficulty could be increased by having to reconstruct two lines. They are distributed in the first formation, the student who is out memorizes, they are rearranged into a second row that is memorized again and they build a third with new positions. The student will have to rebuild the first training first and then the second.

Activity VIII

Divided attention and coordination.

In this activity they have to create a story among all while performing a sequence of four movements: lying on the floor on their backs, sitting, lying face down and standing. Sequence movements can be varied for each occasion. The participants form a broad circle in which everyone has eye contact with each other and with the master of ceremonies, which is the role that one of the randomly chosen students has to play and which other classmates will perform in the successive stories. Everyone has to follow the master of ceremonies who will change position at will. Meanwhile, at a certain point in the circle, a story begins to be told that will be transformed and created as it passes through all participants. In no time can you simultaneously stop the story with the movements of the sequence let alone at the turn of the creation of the story.

Activity IX

Attention and memory focused.

Participants are listed from one to ten and a body-based rhythm is established for the whole set: two leg blows and two slaps, i.e., four blacks on a four-by-four compass. It is important that the rhythm is simple so that the pulse remains constant and does not accelerate when attention is diversified. Students move around the room, avoiding walking in a circle and performing this rhythm. At a certain point they begin to be called one by one with the numbers that were previously assigned as follows: the number itself is made to match the blows on the legs and the number of the person you want to call is said at the same time as the tapas. For example, if number 1 wants to call 7, it would say, "one, one, seven, seven." And the number called would answer by calling in turn another: "seven, seven, two, two" and so on until someone neglects your attention and fails. The person who failed is eliminated without saying what number he had, forcing the rest of the participants to stay tuned and remember the numbers of all teammates and, above all, those who are eliminated, since if when resuming the game, an eliminated player is called the player that the player also has to leave the game. As can be seen, the difficulty increases inversely proportional to the number of participants and again it will be necessary to control the state of body tension that will become evident through an increase in the speed and intensity of the rhythmic pattern. The increase in these two parameters complicates the activity because, on the one hand, it implies a higher speed of response and, on the other hand, if the volume grows excessively, students stop clearly hearing who they are

calling.

Activity X

Divided attention, memory and auditory perception.

This activity requires two more preparations. First, we will work on the ability to listen to and serve more than one conversation at a time. One participant is placed in the center and on each side two people begin to speak freely. After a maximum of one minute, the participant located in the center has to tell everything that his colleagues have told. When everyone has experienced two conversations, the number of people who speak simultaneously without limit of conversations is progressively increased. In this activity we are developing divided attention and memory to be able to retain the basic information of each of the conversationalist.

The second phase of the activity consists of maintaining a rhythmic dialogue in pairs. One of the two proposes a small rhythmic sequence that the other repeats and vice versa. On the next corner, the one who has just repeated proposals and his partner imitates. The result should be a continuous dialogue without pauses of two people proposing and repeating rhythms.

Once the previous two phases have been carried out, the participants will be grouped four by four. It is advisable that the quartets follow each other and that they do not perform the activity at the same time. Within the group, a couple will maintain a rhythmic dialogue as they have practiced before, while the other couple's goal is to interfere in this communication by speaking without interruption each one freely. After a maximum of one minute, the couple who maintained the rhythmic dialogue have to be able to relate what their other two companions were talking about. If it is very difficult for the two speakers to speak at the same time, it can first be done with only one to increase the number over time. All participants should experience the different roles to experience the diversity of stimuli they will receive. On the one hand, rhythmic ones, who will remember only the time needed to reproduce them; and, on the other hand, the information of the conversationalists who have to memorize until the activity ends. In addition, they have to combine this diversity of attention and memorization, with the creation of a new rhythm every time they have to propose in dialogue.

Final Considerations

Currently in Spain, the performing arts are not part of the Basic Education curriculum, so their learning and enjoyment are linked to a series of socioeconomic conditions of the student's environment: from the interest of families for these extracurricular activities, logistical issues to economic aspects that allow investment in the materials needed for their performance.

The proposed activities aim to share through play the own skills that are developed with the practice and learning of dance, music or theater with the entire educational community; while enhancing and enhancing these skills in children who study performing arts in a extracurricular way.

The continuation in the near future of this work would be to implement the activities that were reflected here as a pilot experience in school-age children. Reach agreements with public institutions to conduct a longitudinal study to analyze the impact of the intervention comparing cognitive performance before and after stimulation. For this, all families and children from the identified institutions would be invited to participate, randomly establishing a control group and an intervention group; and a battery of cognitive tests would be developed that would serve as an evaluation tool before and after the intervention.

A positive result would detest the effectiveness of the proposal, while a negative would support the need for the presence of the performing arts in basic education for the development of certain cognitive abilities.

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