

RESEARCH REVIEWS.

What is Music?

The book "Mozart Effect" by Don Campbell brings out some of the beneficial effects of certain types of music such as: it improves test scores, cuts learning time, calms hyperactive children and adults, reduces errors, improves creativity and clarity of thoughts, heals the body faster, integrates both the sides of the brain for more efficient learning and raises the IQ score by 9 points.

In a particular research study, rats were placed in two different boxes. Rock music was played in one of the boxes and Bach music was played in the other. The rats were able to switch the boxes through a tunnel which connected both of them. Majority of the rats chose to go into the box in which Bach music was played, even when the type of music was switched from one box to another.

In 1968, Dorothy Retallack investigated the effects of music on the growth of plants by using different music styles such as classical, jazz, pop, rock, acid rock, East Indian and country music. She found that jazz, classical and Ravi Shankar's music proved to be most helpful in their growth. Plants with rock music withered and died. The acid rock music also had a negative effect on plant growth.

Music and Self-Esteem.

Research has proved that music has a positive influence on the cognitive skills such as spatial reasoning and memory on the young minds. In one particular research conducted by the "Nemours Foundation" founded by Alfred Dupont, to improve the health of children, it was found that those children who are actively involved in music: do better in reading and maths, are able to focus better, and develop higher levels of self-esteem.

In a pilot project which investigated music attitudes and self-esteem (Nolin and Vander rk,1977), It was found that students with music education, had significantly higher self-esteem score when measured by the Coppersmith Self-Esteem Inventory as compared to the non music students.

Music and Academic Performance.

According to Carma Haley Shoemaker, music lessons help to strengthen the links between the brain neurons and thus build new spatial reasoning says psychologists " Francis Rauscher" at the University of Calafornia- Irvine.

Research was conducted to investigate how music improve memory and performance. It was found that Mozart's music and baroque music, with 60 beats per minute beat pattern, activates the left and the right sides of the brain. The simultaneous left and right brain action maximizes learning and retention of information. Listening to music facilitates the recall of information. According the Centre for New Discoveries in Learning, it was found that learning potential can be increased a minimum of 5 times by using this 60 beats per minute music.

Dr George Lozanov designed a way to teach foreign languages in a fraction of the normal learning time. Using his system, students could learn upto one half of the vocabulary and phrases for the whole school term (which would come upto about 1,000 words of phrases in a day) Dr.Lozanov's system involved using certain classical music pieces from the baroque period which have around a 60 beats per

minute pattern. He has proved that foreign languages can be learnt with 85-100% efficiency in only 30 days by using these baroque pieces. His students had a recall accuracy rate of almost 100% even after not reviewing the material for 4 years.

In 1982, researchers from the University of North Texas performed a three-way test on post-graduate students to see if music could help in memorizing vocabulary words. The students were divided into three groups. Each group was given three tests—a pre-test, a post-test and another test a week after the first two tests. All the tests were identical. Group 1 had to read the words with the 'Handel's Water Music' in the background. They were also asked to imagine the words. Group 2 had to read the same words with 'Handel's Water Music' in the background, but were not asked to imagine the words. Group 3 had to only read the words. They were not given any background music, nor were asked to imagine the words. The results from the first two tests proved that Group 1 and Group 2 had much better scores than Group 3. The results from the third test, taken a week later, indicated that Group 1 performed much better than Groups 2 and 3.

Research has proved that background music in itself is not a part of the learning process, but it does not enter into memory along with the information that has been learnt. Recall is better when the same music used for learning, is used during recall. Also, tempo appears to be a key component of music effect on memory.

O'Donnell, Laurence conducted research on music and the brain. The article emphasized on the power of music on learning and memory. It was observed that people who study music are higher achievers than those who aren't in music. It includes the fact that Hungary, Japan and Netherlands, the top three countries in the world, all place a great emphasis on music education and also participation in music.

Sara Kirkweg conducted an experiment to study the effects of music on memory. 60 subjects were exposed to three different conditions: the Season's ie: Spring Movement by Haydn, the Holier Thou by Mettallica and the White Noise. Each group was made to study a picture for 30 seconds with the specific music in the background. It was found that in the white noise group there were least memory errors made, while the Holier Thou group made more errors. The results obtained in this experiment contradict a lot of research done on the effects of music and memory, for instance, it was found that the noise outside the tasting area was not controlled. Besides the subjects were also talking to each other about the questionnaire while filling it up.

Lutz Jancke states that music evokes strong emotions which in turn enhance memory processes. Music has been found to create memories about episodes and information associated with a particular kind of music. It has been found that memories and emotions are often evoked when hearing musical pieces from one's past.

Bridgett and Cuevas conducted a study to find out the effect of listening to Mozart's music and Bach music, on the immediate performance of a mathematical test. 61 participants were randomly assigned either to the Mozart's group or to the Bach group. The participants were then administered a mathematics pre-test, followed by listening to the selected music for 10 minutes and were then administered a mathematics post-test. Results indicated an increase in their score.

In another study to investigate how improves memory and performance, it was found that Mozart's music and baroque music with a 60 beat per minute pattern activates the left and the right

hemispheres of the brain. The simultaneous left and right brain action maximizes learning and retention of information . Thus listening to music facilitates the recall of information.

Ramos et al recorded the electrical activity of the left and right central, temporal and parital cortex, in 14 amateurs of classical music during silence, pleasant (a piece of music) and unpleasant (recording of an infant crying) stimulations. The theta relative power was significantly higher while listening to music and lower during crying. Beta relative power did not change across the conditions. There was no change found in the interhemispheric correlations.

Denie Riggs states that music study has been found to enhance higher brain functions required for reading, mathematics chess, science and engineering. Music helps to facilitate creativity.

Nina Kraus states that music brings about several changes throughout the auditory system. Music training helps to improve certain memory capacities such as the musicians tend to show improvement in auditory visual memory and auditory attention, but not visual memory and visual attention.

A Study conducted by Nasser Rashidi and Farman Fahan, on Iranian students in an English institute in Iran, to examine the effects of of classical music (Mozart Sonata) on the reading comprehension. The students were divided into two groups, over a period of 3 months. The experimental group was taught reading comprehension with music in the background and the other group had no music played in the background. The results indicated that the group that was taught reading comprehension with a music background outperformed compared to the group that was taught with no music in the background.

Rauscher et al (1993), through their study examined the effect of music (Mozart Sonata) on the IQ of college students. It was found that the students who were exposed to 10 minutes of Mozart Sonata scored higher on spatial-temporal reasoning tasks.

In a similar study conducted by Rauscher et al (1998), Mozart music made rats complete the maze faster and with fewer errors. This proves that classical music not only helps humans, but even rats to improve performance.

Retallack conducted a similar study on plants. He found that the plants exposed to soothing music grew abundantly and were found to be extremely healthy.

Merrell (2004) asserts that particular combinations and frequencies of sound s have some positive effects on certain parts of the brain, bringing calming effects to the students. When music was being played in the classroom, there were noticeable changes in body temperature, blood pressure, breathing rate and pulse rate of the students. Music helped them to become calmer and more obliging. Thus he believes that music can reduce the levels of anxiety and inhibition in learners.

According to Stansell (2005), music therapists use both types of music: music to soothe or music to arouse and energize) in order to relieve different typed of psychological and physiological stressors.

Hallen, Price and Katsarou (2002) claim that as compared to non-music condition, calming music has a better effect on the arithmetic and memory task performance of children.

In a study on cognitive content drawing of children, Gur (2009) suggests that classical music has a positive effect on the cognitive ability in children.

In a study by Schellenberg (2004), two groups of students were given two different lessons ie: music lessons and drama lessons. Prior to the experimentation, the IQ of the two groups was measured. After the music and drama lessons, when the IQ was measured again, the music group scored greater increase in IQ as compared to the drama group.

Liapis, Giddens and Uhlenlorok (2008) examined the impact of lyrical and non-lyrical music on reading comprehension. Participants were divided into two groups. Each group had to read the same comprehension under two different musical conditions: one group while listening to a song with lyrics (lyrical condition) and the other while listening to the same song without lyrics (non-lyrics condition). It was found that participants in the non-lyrics condition obtained better scores than those in the lyrical condition.

Research done by Dr K. A. Adalarasu et al (2011) proved that music has a significant effect on the body and the mind. It positively influences the hormone system and allows the brain to concentrate more easily, accumulating more information in less amount of time, thus boosting learning and enhancing the cognitive skills. Studies have proved that silence between the two musical notes triggers the brain cells and also the neurons that are responsible for the development of sharper memory.

In 1996, the College Entrance Exam Board Service conducted a study on all the students appearing for their SAT exams. It was found that students who sang or played any musical instrument scored 51 points higher on verbal position and an average of 39 points higher on maths.

In an experiment, conducted at the University of California, at Irvine (1993), researchers asked the college students to listen 10 minutes to either Mozart's Music or a relaxation tape or silence. After 10 minutes of music or silence, the students were given a spatial reasoning test from the Stanford-Binet Intelligence Scale. It was observed that after listening to the Mozart tape the students' scores much more as compared to either the relaxation tape or silence. Researchers thus believed that memory improved because music and spatial reasoning, both shared the same pathways in the brain.

According to Bancroff (1985), music and musical instruments serve therapeutic purposes rather than aesthetic ones. It is believed that musical training is a very potential instrument than any other, since rhythm and harmony find their way into the inward places of the soul, on which they mightily fasten, making his soul educated gracefully.

Mora states that a child can imitate the rhythm and musical contours of a language much before he can actually speak words.

Palxi Del Campo (1997), a Spanish music therapist, states that in any oral interaction only 15% of the information corresponds to verbal language, while 70% of the message is performed through body language and the final 15% belongs to intonation, the musical character of language.

Regina Richards proves that music, rhythm and movement create a link between the right brain's processing of music and rhythm and the left brain's processing of verbal information.

Music as a Technique to Help Children with Learning Disabilities.

Jenny Macmillan states that music is highly beneficial for dyslexic children. Music lessons have a positive effect on the various areas of academic achievement. Children with learning difficulties who learn music show both: cognitive as well as emotional development, improvement in co-ordination, language, concentration, attention and memory.

Register, Standly and Swedberg (2007) proved that music helped to improve the reading skills of students who have reading disabilities.

Another research also showed that music can help children with learning disabilities. The study proved that music provides a soothing effect, which helps in relaxation. The lyrics in music can increase the child's vocabulary and help with speech. Songs can be used that incorporate academic lessons in music so that children will find the learning process more interesting, enjoyable and easier.

Music can Help Slow Learners to Memorize Better.

Music therapy is a time tested intervention, especially for those children with special needs or for slow learners.

Dr. T. Mythily, a trained classical vocalist, cognitive neuropsychologist and music therapist at Apollo Hospitals, Chennai, has done extensive research on music therapy. Music therapy brings about behavioural changes in autistic children, helps slow learners improve their concentration and enhances creativity and intellect. She says that active music therapy helps lower hyperactivity over a period of time, improves fluency in those with speech difficulties, enhances verbal memory (by listening to lyrics) and stimulates imagination.

Dr. P. K. Partheeban, Director of the Swabhimaan Trust in Chennai, explains that people with special needs have disturbed body-mind-soul relationships, which can be strengthened by bringing rhythm into their lives. Rhythmic music which is in conjunction with the heartbeat can be really soothing and rejuvenating. Good rhythmic music, whether it's drums, guitar, flute or veena, can stimulate the mind, depending on how the music is presented to the children.

What is Concentration?

Research has proved certain techniques used to enhance concentration skills can facilitate performance on a task.

A) Mudras.

'Mudras' is one of the techniques that helps to enhance performance. The director (the Achaya) of the Vivekanand Yogashram in Delhi states that there is a tremendous flow of energy in our hands. Each of our fingers represent one the five elements. The thumb is 'agni' or 'fire', the forefinger is 'vayu' or 'air', the middle -finger stands for 'akash' or 'ether/sky', the ring-finger is 'prithvi' or 'earth' and the little finger represents 'jal' or 'water'. An imbalance in any of these elements is the root cause of all the problems or ailments. This can be corrected with the help of 'mudras'.

In another study, Ramesh Shah claims that there is no fixed or essential posture to practice 'mudras'. They can be done by standing, sitting or even while walking.

Concentration, Memory and Academic Performance.

Jeffrey Gitterman states that everything in this world is made of energy. The more tuned in you are to this source of energy in the universe, the more you can actually accomplish in life. The benefit of learning to disengage your attention through meditation and concentration techniques, from our thought stream, is that we can apply our minds more readily towards more constructive things such as accomplishing one's tasks and goals in life.

In order to improve memory and performance Pat Wyman states that we can make use of stress buster techniques. Making use of meditation or relaxation techniques can help to boost memory processes. Certain concentration techniques can also be used to add to improved performance.

Music and Concentration Together Influence Academic Performance.

According to Dr T. Mythily, music helps to enhance concentration and memory. The swaras/notes of the selected ragas are played in such a way as to activate the potential chemical agent. There are a number of chemical substances involved in the memory molecule. The ragas help to activate the neural circuit and enhance the concentration of the individual.