

# CHAPTER 1



## INTRODUCTION

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## 1.1 INTRODUCTION

Man is endowed with a natural love of beauty. This is an exceptional attribute. In developing this attribute he develops widely varied interests. In this context, music in particular and the fine arts in general play very important role.

Music can be extremely helpful in the alround development of the child. This is one subject which, single-handedly imparts balance, imagination, insight, comprehension, spontaneity, self-expression, discipline and dynamism while entailing physical training. Through the medium of music, the child can be inspired to develop interest in academics. This is why educational psychologists have emphasized the principle of Hedonism in Infant education in which the children are trained through the medium of music and rhythm besides play way [1]. Music is not merely a form of recreation, but it helps strike an ideal harmony between intellect and imagination. Its implications are unlimited. It is a powerful medium of cultural exchange. The importance of music in education, especially at school level, cannot be denied.

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[1] Kundu C.L. and Tutoo D.N.; "Educational Psychology",  
pub: Sterling printers, New Delhi, 1985.

Apt training and worthy teacher are the basic requirements for acquiring skill in any art. Music in particular is a subject that requires constant practice and dedication. Perfection in the subject is completely dependent on the right training. It will, therefore, be in order to study how Music Education began and in what manner it was developed in the context of institutional education.

#### 1.2 A brief history of teaching music (Hindustani) in Institutions.

In the ancient India music took roots in hermitages in the form of the sacred sacrificial rites (yajnas), hymns and religious ceremonies of all descriptions. The teacher or guru himself selected worthy pupils and acquainted them with the details and finer aspects of swaras and rhythm together with the hymns of the Samaveda. This educational system of the "gurukulas" continued uninterrupted for centuries.

But times change. Foreign invasions changed the traditional mode of Music Education. The art of music that had germinated and hitherto flourished in the hermitages came to the royal courts and became the non familiar "Darbari Sangeet" of the Muslim era, that is now so familiar. The Mughal princes were lovers of the arts, so music continued to flourish under their patronage. New ar-

tistes were born and the "Ustads" continued to obtain the inspiration to perpetuate their art. It was Darbari Sangeet that gave rise to various schools of music called the "gharanas".

These "gharanas" were formal centres in music in which the "Ustads" - the experts - imparted training in a particular form of singing learnt from their own gurus or "Ustads." The "Ustad" of every gharana had his special style of singing and his special matter for each Raga, which he taught to his pupils. The training of these gharanas depended solely on the wishes and grace of the teacher and so it was highly personalized. To some extent, this tradition is still present in our musical education.

After the fall of the Mughal empire, many of the big and small principalities ( Riyasat ) that mushroomed in the British regime extended their patronage to these professional artistes. In this period both vocal and instrumental music became limited to a handful of these "gharanedars" or "scions of gharanas" and only those fortunate few who could access to the princely courts could enjoy the pleasures of this art. These very ustads patronized by the princes were the music teachers of the day but their art became irrevocably tied to wealth, splendour and personal prestige. This had adversely affected the teachings of the gharanas. Time and curriculum

were no longer of any importance. The pupil was made to work very hard and whatever was taught was a very exact imitation of the ustad, but the quantity and form of the matter to be taught depended entirely upon the relationship of the ustad and pupil and the ustad's whim.

The British considered the Indians to be uncivilized and uncultured, so they took no interest in the music of the land. The social status accorded to music at that time was no less deplorable. The society that held in reverence the subjects formally taught in schools and colleges considered music to be less than dispensable and, what is worse, were indifferent to it. But in the same period certain efforts, both collective and individual, were made, which gave invaluable fillip to music education both directly as well as indirectly.

The latter half of the nineteenth and the first half of twentieth century was the age of national consciousness and awakening - a period of renaissance. While there were national movements for independence, a class of cultured and educated music lovers were endeavoring to enhance the prestige of music. Through their efforts there came into being a national movement for cultural unity through music which gave strength and status to music. Some great names in this context are: The Late Vishnu Narain Bhatkhande, Surindramohan Thakur, Chhamman Sahab,

Thakur Nawab Ali, Abraham Dikshit, Wadilal Rajabhaiya, Appatulsi, Shri Narainrao Ratanjankar, Prof. S.L. Joshi, Faiyaz Khan, Shri Vishnu Digambar Paluskar, Sayajirao, Madhavrao Scindia, Balwantrao Scindia, Madan Mohan Malaviya, Rabindra Nath Thakur, Clements, Deval, Bhalchandra Sukthankar, Shankar Rao Karnad, M.Fredlis etc.

It was through the incessant efforts of these great music lovers and artistes that music was able to regain its lost prestige in society. The entry of well educated personalities into the field of music broadened the scope of intellectual and constructive efforts in this area which in due course of time, left its mark on the system of music education. At the same time institutions like the "Poona Gyan Samaj" and "Bombay Gayanottejak Mandal" blazed a new trail in the advancement of music education. The Poona Gyan Samaj was established in 1874, with the dual objective of studying the theoretical and practical aspects of the Hindustani Music and awakening the interest of the people in music. The Bombay Gayanottejak Mandal was established in 1890. It was an institution endowed by some wealthy parsees who were lovers of Hindustani classical music. Their principal aim was to give incentive to great artists and organise programs in which the lovers of Hindustani classical music could hear

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them. This institution also employed music teachers for instructions to the interested. In 1886 a music school was established under the patronage of Baroda government which later came to be known as the "Baroda State Music School." It was run by Maulabaksh Ghisse Khan who was a celebrated vocalist and music teacher. He taught with the help of textbooks containing original compositions by himself. His school may be called the forerunner of the present day music schools. Efforts of this kind gradually gave new direction to the development of music instruction in schools.[1]

Many such random efforts were already being made in the direction of the development of music instruction of school level but the credit for achieving this goes to two stalwarts - the late Vishnu Digambar Paluskar and late Vishnu Narain Bhatkhande. Shri Vishnu Digambar founded the 'Gandharva Mahavidyalaya Mandal' at Lahore on May 5, 1901. The style of instruction followed in this school was a mixture of the present form of school level music instruction and the former gharana system. With this new system, he trained celebrated artistes like Pt. Omkar Nath Thakur, Pt. Vaman Rao Padhyey, Pt. Vinayak Rao Patvardhan

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[1] S.N.Ratanjankar, "Bhatkhande Smriti Granth", ch.1, Indira kala sangeet vishwavidyalaya, Khairagarh, 1966.

with the aim of spreading elite and elating music.

These musicians helped spread classical music and the new methods of instruction in it. Shri Vishnu Digambar developed and polished the notation system and published about 50 books on music, some of which are cited below:- Sangeet Bala Prakash, Bala Bodha, Sangeet Shikshak, Raga Pravesh (Parts 1 to 20). On the one hand, then, Shri Vishnu Digambar returned to music its own glorious status in society while perpetuating it by establishing music schools and equipping them with new modes and methods of music instruction.

It will not be an exaggeration if the late Pt. Vishnu Narain Bhatkhande is given the entire credit of making a complete study of the tradition of music in all its entirety and timely composition of profuse literature on the subject to give it its classical footing. Music had already been divested of its prestige by then. During the British rule society, then educated in alien mores had become a complete stranger to the musical traditions and the rulers were not interested in fostering it in the least. The protection and patronage of the nobility and the wealthy was also fast fading. In the dark future looming ahead Bhatkhande shone like a beacon and prevented the entire tradition of music from being engulfed in it. He felt that the classical theory of the music then prevalent



in society was not systematically paraphrased and that owing to this it lacked systematic development. In his own words:

"To learn music is to learn the Ragas set down; this much is quite clear. It is not as if our society today is totally ignorant of music. Music is practised among the people but they are not as proficient in the theory of classical music as they should be. When we say classical music, we are simply alluding to a fairly systematic classification of the Ragas and Raginis which are in vogue. This is just to say that no effort has yet been made to explain with some clarity the rules of what we sing." [1]

Hence Bhatkhande organised the First Akhil Bharatiya Sangeet Parishad in Baroda in the March of 1916 in conjunction with the government of Baroda with a view to bring some uniformity to the form and rules of the Ragas and Raginis as they were sung - in general the practical aspect of the music. Such national conferences inspired by Bhatkhande were organised in Delhi, Benaras and Lucknow as well. Vocalists, instrumentalists, connoisseurs

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[1] "Jeevan Charitra" by N.Ratanjankar, p.11 " Bhatkhande Smriti Granth", pub. Indira Kala Sangeet Vishwavidyalaya, Khairagarh, 1966.

and scholars from all over India met in these conferences to discuss various aspects concerning music, so that the classical music could be systematized and given a classical basis. The idea of holding music conferences was a contribution of Bhatkhande.

By composing and collecting abundant literature in a notation system and by authoring many books on both the theory and practice of music [1,2] Bhatkhande cleared the way for group instruction of classical music in society and provided the general public with facilities to learn and understand classical music. Bhatkhande delivered a long speech on appropriate facilities for music education in the All India Music Conference held at Lucknow. It was entitled "The Modern Hindustani Raga System and the simplest method of studying the same." Excerpts of this speech are produced below.

Bhatkhande told in that lecture that when one stresses the necessity of having a well defined system of music education, people start asking questions like, "Where are the text-books for that? Where is that well defined system? Which is that system and how to give such education? Bhatkhande ji told that for people who

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[1] Sangeet Shastra ( 4 volumes ) by Bhatkhande

[2] Kramik Pustak Mallika ( 6 volumes ) by the same author.

love music he had seen to it that they get enough literature. He further told that people no more like to spend years, in the old Guru-shishya system to get education. Simply to get the name that one is a disciple of certain Guru, and wasting unimaginable amount of time at the Guru just for getting a partial knowledge of one or two ragas is not acceptable to anyone today. No one is satisfied by such an indefinite teaching system. Apart from this, this system is not suitable for mass education. Wasting time this way is unpardonable. Now several authors have taken it upon themselves to make the music education available to all those who are interested. In that speech he also told that the only thing required now is that the public be awakened about the necessity of this subject and there should be an unanimous demand that the music be taught compulsorily in all educational Institutes.[1]

His words make it amply clear that he wished to spread collective education in classical music. He held the school to be the most appropriate place for this. He firmly believed that the musical society should fully be equipped with the most modern thinking on education, if

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[1] Prabhakar Narain Chinchore, "Krantikari Shiksha Shastri-Bhatkhande; article in book: "Bhatkhande Smriti Granth", p.79, pub. Indira kala Vishwavidyalaya, Khairagarh

the art form is to progress. To this end, he desired to put the future of the subject in the hands of well trained and devoted musicians. He evolved a novel education system that might render facile and effective the teaching music and put it within the reach of all, and to fulfill his objective he also arranged for the music teachers to be trained in the new system. The various syllabi for various classes at various levels, the abundant material for examinations for popularising the study of music - all are the fruits of his untiring efforts. He was the pioneer of the collective music education. It was his ardent wish that music should be raised to the level of a University subject. He pinned his hopes of a bright future of music on educational institutions.

With this object, Bhatkhande established Music schools in several principal towns to impart instruction in music through the Gharana system as well through the new methodology evolved by himself. The efforts of the two "Vishnus" ultimately resulted in setting up a certain pattern of classes, curriculum and mode of examination. This greatly helped the general educational institutions to offer it as a subject.

In the first half of the twentieth century many graduates of these musical institutions established other musical institutions through the length and breadth of

India. As a result, people in general developed an interest in classical music and musicians regained their lost glory in the society.

Music was not taught as a subject in educational institutions prior to 1929. But at this time there was a general awareness in educational matters and there was an ever growing demand to include music in school curriculum. As a result, in 1929 the attention of the government was drawn in this direction. In this year, on the recommendation of the "Primary and Secondary Education Samiti", it acknowledged the importance of music in education. Although, music was included as a subject in the first, second and third classes for girls, it was prescribed only as an optional subject for boys in the same classes and it was optional for girls in fourth and fifth classes. The expense incurred in the teaching of this subject was to be borne by the school.

By 1947, music was included as an additional subject with many professional subjects in syllabus of the S.S.C. examination. But so far as music education went, most schools had no definite teaching methodology, books or any definite planning and there was hardly any coordination among them. Nor was any well-defined syllabus for music proposed by the Department of Education.

In the post independence era, came a general

awareness in matters of cultural progress and development. As the people became more and more culturally conscious the government felt it incumbent upon itself to promote development of Indian Art and Culture at the school level. At that time Shri B.G.Kher was the Chief Minister of Maharashtra who was a great enthusiast of cultural uplift. Seeing the plight of contemporary music, he formed the Sangeet Shiksha Samiti in 1948-49 to redress the ills that had befallen music in those times. It was headed by Shri G.B.Jatthar. This committee is also known as "Jatthar Samiti" and was entrusted with the survey of the entire musical education system and was asked to give appropriate recommendations regarding its various aspects; namely -

1. The place of music in the education system at different levels.

2. Information regarding the proficiency and qualifications of the music teachers in the school at various levels.

3. Grants in aid.

4. Information regarding the syllabus prescribed in various schools.

5. The syllabi of the PSC and SSC examinations.

6. The development of a uniform system of notation for Indian Music.

The committee gave many valuable and practical

suggestions on the basis of this survey.

On August 29-30, 1949 the Education Ministry of India organised an All India Conference on Art, to which were invited the foremost artistes and art critics of the day. The conference was presided over by Maulana Abul Kalam Azad. In his presidential speech he described the importance of Art in education in the following words:

"It is today realised that no education can be complete which does not pay proper attention to the development and refinement of emotions. This can be done best through the provision of facilities for training the sensibilities by the practice of one of the fine arts. . .

. . . The obvious implication of this is that a society is healthy and well balanced if training in and appreciation of arts are wide spread among its members. The modern malaise of society in which individuals are torn and divided and society riven with a hundred conflicts is the result of the fact that the arts have been divorced from intimate contact with life at a thousand points." [1]

In short, after independence the government of

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[1] Arvind Vishwas and Suren Agarwal, "Indian Educational Documents since independence", Acad. pub. (India), New Delhi, 1971, p. 385

India fully recognized the importance of fine arts in education and seriously started contemplating its inclusion in the educational curricula.

As a result the "Mudaliar Commission" on Secondary Education was set up in 1952-53 in order to study all the aspects of education at present; one of the recommendations resulting from this survey was that, like other subjects, music too should be included as a subject in secondary school. An extract from their recommendation is:

"In the past our schools have left whole areas of the pupil's personalities untouched and unquickened - their emotional life, their social impulses, their constructive talents, their artistic tastes,..... It is in view of these serious shortcomings in our educational programs that we have recommended .... that a place of honour should be given to the subjects like Art, Craft, Music, Dancing and the development hobbies."

The Education Department of U.P. adopted the multifaceted education system based on the report of Mudaliar Commission and categorised the prospectus into arts, science and commerce and only then Music found a place in the secondary education of U.P.

Although the recommendations of the commission

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[1] p.383 *ibid.*



on secondary education did lead to Music being offered by schools as an optional subject in many states together with other subjects, it did not really receive the status enjoyed by other subjects.

The government had set up the Kothari Commission in 1964-66 to give recommendations on the formulation of general policies and principles for the development of education at all levels and in all its aspects. Taking into consideration the most unsatisfactory situation of the fine arts in the curricula of secondary education, the commission made important suggestions. Excerpt of the report is given below.

" Unfortunately, the fine arts are too often regarded as frills added to real education and are neglected because they are not examination subjects. Adequate facilities for the training of teachers in Music and the visual arts do not exist. The neglect of arts in education impoverishes the educational process and leads to a decline of aesthetic tastes and values. We recommend that the Government of India should appoint a committee of experts to survey the present situation of art education and explore all possibilities for its extension and systematic development." [1]

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[1] p.383 *ibid.*

Through the untiring efforts of the government and the educationists music received prominence as a subject in the secondary schools. By and by, music came to be taught as a subject in the higher secondary, inter, degree as well as post graduate levels. The government made commendable endeavours in the twentieth century. Setting up Radio and T.V. Network and establishing Sangeet Natak Akademi and organization of programs of cultural exchange between various regions of the country as well as foreign countries and encouragement in diverse forms given to classical music and folk-arts were some of the means by which the government effected the spread of music education. Various Universities, with the help of the University Grants Commission, organised, Sangeet Sammelans, seminars and symposia from time to time and at present much research in music has been undertaken by many universities.

Music education is currently being promoted by the following ways.

1. The pupil learns under the patronage of a particular guru.
2. Various Music schools and colleges teaching the syllabus prescribed by the music committees like the Prayag sangeet samiti or Gandharva Mahavidyalaya Mandal etc.
3. Special musical institutions -

i) Music Colleges affiliated to Universities like The College of Indian Music, Dance and Drama, (Vadodara), Faculty of performing Arts, Department of Musicology, (Benaras), etc. are such colleges, which, while affiliated to some Universities teach music at various levels and also award degrees of the said universities.

ii) Experimental Institutions like the Bharatiya Sangeet Anusandhan Sansthan under the ITC where widely varied research is conducted and training is imparted in the Gharana style.

4. Independent Universities - The Indira Kala Sangeet Vishwavidyalaya where an attempt has been made to blend the ideals of the gharana system with the current mode of training.

5. Music being taught as a subject in schools and colleges.

### 1.3 The status of Music in Educational Institutions.

Although by now much progress has been made in music as in other cultural fields, all the same the subject Music is still facing a stiff struggle to gain footing in educational institutions. At the secondary and degree levels, it is still customarily taught only in girls' institutions and hardly offered in boys' colleges, although there are no official restrictions. Even now, there are negligible efforts towards a well planned cur-

riculum, appealing and psychologically inspired teaching methods or effective group training. Hence, the standard of this subject is still poor.

Great musicians of our country encouraged the music education in schools primarily because they themselves were well acquainted with the importance of music and they spared no effort to make it widespread and popular. Even today, educationists acknowledge the indispensability of music. In the words of Sri R.Srinivasan:

"As for the educational and emotional nature, which is a very important part of our nature, very little attention is paid to it. And it is in this connection that I should like to make a plea for the introduction of Music as an integral part of our educational system.

Art in general and music in particular exerts a potent influence on our lives. It is one of the most natural and at the same time effective modes of self expression. . . . The value of Music Education in school can never be over estimated. Music is a great purifier. It cleans the schools as it does our homes of all that is ugly to our senses. It gives a real tone to all that forms part of the school life." [1]

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[1] Gauri Kuppaswamy, " Indian music - a perspective", Sandeep Prakashan, Delhi, 1980. p.182.

It is unfortunate that the hopes which led our scholars to make music a part of formal school education is far from fulfilled and much remains to be done to achieve the objectives set by them. Thus, no other subject or art is faced with such hardships as North Indian Music Education. The ustads of the gharanas firmly believe that music is just incapable of being taught in schools.

According to them music teaching is "Seena Bas-seena Taleem." It can be learnt only sitting at the guru's feet. There is no doubt that the traditional classical music in its present form has been handed down by these very gharanas. If this trend in music had not been handed down as a tradition the ancient literature on music could hardly have been of much help and this is the principal reason why the Guru - Shishya or gharana system is still held as ideal. But, if we consider the problem with an open mind, we find that the aims and objectives of the gharana training and school education are different. In the gharana system training is traditionally imparted by the guru to the pupil. Thus, the methodology is highly personalized and unconstrained from limitations of time and extent of knowledge, whereas in school, music education is given to students in groups strictly within the constraints of time and a specific syllabus. The gharana system attempts to enhance the skill of the pupil in one

discipline - vocal music, instrumental music or dance- to the heights of perfection and raise him up to the standard of the artiste, but the aim of formal education is the all-round development of the entire personality of the student and to give him adequate knowledge in several subjects. The school also aims at developing the special talents, aptitudes latent in the student. At this level, the student may be encouraged and he may be given the opportunity to display his talent and he may be motivated to become an artist. But, it is certainly not the task of the school to make him an artiste.

Dissimilarity of their objectives dictates corresponding difference in teaching methods. Hence, it has become all the more necessary to reflect on how to make the training system more and more effective in the context of the formal education system.

To be able to evolve remedial measures, it is necessary to study the format of formal school education. In schools, just as other topics are conveyed to a class, (which may comprise of 50 students, or more) in the space of 35 minutes, so is the rendering of khyaaals, dhrupad and dhamar taught. Paucity of time prevents the teacher from imparting individual training. A limited number of Ragas from the syllabus are taught somehow and examinations passed. Thus, only a few exceptionally talented candidates

come to the fore. Music the subject, is beset by a horde of problems in educational institutions. Some of these are as follows:

1. Lack of adequate techniques for group training in music.
2. Lack of proficiency of most teachers and apathy towards the evolution and use of new and more effective techniques.
3. Paucity of adequate class room facilities, such as, audio-visual material, books etc.

There are many other problems impeding the progress in this subject. In this deplorable condition, very little solid and practical effort is being put in to remedy the ills, even though artistes, scholars and teachers have always been well aware of the circumstances.

The celebrated Indian music scholar Ratanjankar had also observed the lack of adequate teaching techniques in music. According to him, the students pass examinations by merely memorising the Ragas and Khayals prescribed and the teacher too thinks that he has done his duty but this system is proving extremely harmful.

Teaching techniques applied in formal school education are but a highly distorted version of the guru-shishya system. No new or different technique has really ever been evolved. On the other hand, the present changing

socioeconomic conditions have rendered it impracticable to sustain the guru-shishya system. In an Akashvani broadcast, Shri Ratanjankar expressed these very thoughts thus:

"In today's socioeconomic conditions it is almost impossible to teach or learn music in the ancient system. No student of music can afford the money or the time that would enable him to practise tunes, month after month, year after year under the tutelage of the Ustad." [1]

The views of Ratanjankar are echoed not only by musicologists at home, but also by western music scholars who have made a deep study of our music. Thus, here are the words of Wim Vander Mier spoken at a national symposium on classical music education held in Burdwan University (West Bengal) in 1984:

"The traditional system of teaching Indian music requires a very long period of apprenticeship. The simple fact that knowledge of compositions, style, techniques and raga-interpretation is transmitted orally implies that if an artiste has taken twenty years to accumulate such knowledge he will need the same amount of time to transmit it. Basically, I have not much to add what I have said in

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[1] Ratanjankar, "Lakshya Sangeet", Composition broadcast on A.I.R., Dec., 1957.



my book, "Hindustani Music in the Twentieth century" (The Hague, 1980, pp.138-144). Probably, the most important point is that the basis of the Indian teaching system is copying. It is precisely this that is so time consuming. For, in every lesson only a limited amount of material is transmitted, so that a very intensive training is required to transmit a vast knowledge. Nowadays no one has the time nor wants to take the time to acquire this kind of knowledge. . . . To sit at the feet of the master the whole day, every day, for years and years, is rapidly becoming a social and economic impossibility.[1]

Wim made it clear that the ancient teacher disciple system entailed long and hard apprenticeship and practice. So that, it is quite clear that this technique can hardly be adequately applied in educational institutions. In this same symposium Jayshree Benerjee held that classical music teaching techniques were faulty and pointed out that these have not been changed with the times and circumstances and hence they have become inadequate. In her words:

"The present profile of Indian classical Music Education, one must be frank, does not put up a devilishly

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[1] Wim Vander Mier, "Teaching Indian Music: Coping with a changed environment", Sangeet Natak, Jan-March, 1986, p.53.

splendid picture. For one thing, its teaching method - and there is a whole chaos of facile practices here - has not been planned out exceedingly well; and our music education, we shall soon see, easily gives out and reveals a largely confusing scenario. This is but a reflection, to a large measure, of changing times. Caught between our regrets for the past and our fears of the future, we have been making do with many an uncertain and unthinking practice in the teaching of our classical music. It is time then to pause and ask questions. It is time, indeed, to consider the historical causes of the present unenviable state of affairs in the realm of our music teaching and then plan for the future." [1]

Jaysri Benerjee's deliberations make it abundantly clear that our education system suffers from lack of coherent and systematic planning. Hence the world of music education suffers from utter confusion and delusions.

Problems arose in the field of musical training in schools because neither the traditional Guru-shishya tradition could be adhered to nor any steps taken to evolve a new and more adequate system. This resulted in

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[1]Jayasri Benerjee, "The methodology of teaching Indian Classical Music", p.11, Sangeet Natak, No.79, Jan-Mar 1986.

abysmal descent in standards in classical music in schools. North Indian music teaching techniques are based on emulation. If the teacher is capable, the student might gain something from emulation, but if the standards and level of knowledge of the teacher himself are inadequate, there would hardly be words to express the pitiable state of the student. Besides, blind and unthinking imitation of the teacher delimits the full blossoming of the innate talents of the student. To make matters worse, it is the misfortune of music that extremely superficial knowledge and training is imparted in schools. This aesthetic subject, bound by the rigidity of the syllabus, is fast losing its identity in the crowded class rooms. It is a sad fact that music-education has become nothing more than a facile means of obtaining a degree, for the students often opt for it for no other reason but that it is a relatively easy practical subject which gives good returns by way of marks. In the absence of adequate guidance he remains a stranger to his own aptitude, talents and worth. Thus, though there is no dearth of quantitative appreciation of music, quality is sadly on the wane.

It is necessary to attract attention to the importance of music in life. Music is a helpful tool in the adjustment of the personality of the individual. Freud's psychoanalysis bears out this fact. According to him many

forms of religion, culture and art are the means of starting suppressed latent sexual urges.[1] In his opinion, art is the expression of suppressed psychological urges and conflicts into socially acceptable forms. If the psychological importance of music and the age-group and sentiments of the students are given due consideration and adequate programs are drawn up in the realm of music and the musical aptitude of the talented is duly fostered with the help of adequate training many personality problems can be easily and naturally resolved at the same time raising the quality of music.

Shri Chaitanyadeo expressed this very opinion in a symposium on music education, in these words -

" Music to children is a delicate and necessary part of education. However, the organisers of schools never turn their minds to this, if they turn their minds to music at all. More often than not, the child is overburdened with scholastic lessons and work which form no part of his personality and environment, nor of any profit to him as an intelligent adult.

. . . This neglect of the emotional life is a socio-economic problem which, as a society, we have not dared to

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[1]. Freud S., "An outline of psycho analysis", W.W.Worton Co. Inc., New York, 1949.

touch. 'Learning' and 'Education' (which in reality are only memorizing and getting a degree ) are so closely associated with making a living that everyone tries to pursue the money-making courses - technology, medicine, law, etc. . . .

. . . Naturally, this has meant an enormous social neurosis. As there is no socially and aesthetically acceptable outlet of those unknown desires of the mind, men turn to vice for satisfaction - the greatest of them being power - the bureaucratic power, the military power, the power of fame and recognition.

While such neurosis has to be understood immediately and absolutely by the individual and hence the society, much of its sting can be mitigated by proper emotional outlets through music, dance, etc." [1]

students can derive full benefit from the subject of music only when appropriately improved and effective teaching techniques are employed. It has been rendered unbearably dry and uninteresting by being limited and bound into hard and fast rules and their analysis. Hence, there is urgent need for reform in this field. Reform can come only if new experiments are undertaken fearlessly. Currently, even

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[1] Chaitanya Deva, "Symposium on Music Education", Indian Music Journal, No. 15-20, 1972-74, p. 52

though there is no dearth of means, there is a lack of experimentation in education. Many music scholars have felt the same. In his book "The Music of India", B.C. Deva has thrown light on this subject in the following words:

"First and foremost, it is an experimental approach. Experiment does not necessarily mean that we should deal only with physical objects and complicated apparatus. What it means is that the phenomenon in nature have to be observed, systematically recorded and the general laws behind them described. The experiment may be physical, psychological, and even parapsychological. What is essential is the spirit to observe dispassionately and as free from personal prejudices as possible.

Today, the situation is not so very satisfactory. More has been written on ancient music than about what we actually sing, play and hear. What we now are in need of is the application of newer knowledge and newer techniques to music and to open newer records in musicology." [1]

Like Shri B.C. Deva, Shri G.H. Ranade, Pt. Deodhar, Shri V.V. Sadagopan, Shri S.S. Avasthi, Shri P. Sambha Moorthy and many educationists have expended considerable

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[1] B.C. Deva, "The Music of India - A scientific study", Munshi Ram Manohar Lal publishers, New Delhi, 1981, p.2.

thought on the problems of musical training but very little has been done practically in this direction, some work done in the field of music education is as follows.

#### 1.4 Survey of Relevant Literature

Shri A.C. Chaubey of Indira Kala Vishwavidyalaya in his thesis "Uttar Bharat Mein Sangeet Ke Sansthaगत Shikshan Ke Vikas Evam Unnati Ka Nirdharan" has put forward the following salient points:

The evolution of the institutionalized education system in music was jointly a result of the faults that had developed in the guru - disciple tradition and need of the modern times. This institutionalized teaching blossomed in -

- [a] Purely music- teaching institutions.
- [b] Ordinary school syllabi containing music as an optional subject.
- [c] Musical institutions based on the guru-disciple tradition.

Although the first two types of institutions helped in popularising and spreading music, quality was lost to a great extent.

This resulted in the rise of institutions of the third genre. In these, the desirable qualities of the guru-disciple tradition were retained although the format

of the music education remained institutionalized.

It was the manner that, in accordance with the genre of music, the faults of the institutionalized form of music education were sought to be removed by limited group teaching.

If we wish our music to maintain high standards, we have to raise the standard of the present institutions. Due attention must be paid to limited group teaching and allied topics.

There is still need for music is to be included properly in all universities as part of the curriculum of ordinary education. All institutions are yet to include it as a compulsory subject in the primary classes; and as an optional subject at the lower secondary, higher secondary, degree and postgraduate levels. At the same time, wherever it is already part of the curriculum, due importance and attention must be paid to quality and reforms made accordingly.

All this is possible only when society and administration both display an equal keenness in this matter.

Shri S.S.Avasthi has compiled material on "A critique of Hindustani Music and Music Education."

The principal objectives of the investigation made by Shri S.S.Avasthi were as under -



" There is a crying need for a systematic survey in the field of music education, especially in Hindustani music, because in the field of education, instruction is being carried out in a manner that is far from satisfactory. Inadequate and inappropriate syllabi, ill-qualified teachers, improper selection of students, faulty teaching techniques and lack of proper training facilities for teachers are some of the aspects of music education that require close scrutiny."

With this objective in mind this investigation sets forth information obtained from the survey of music syllabi, library facilities in educational institutions, audio-visual material, qualifications of teachers etc. at different levels. Four techniques have been outlined-

[1] Facts related to the investigation were collected from relevant literature, encyclopedias and books.

[2] Systematic survey.

[3] Experiment.

[4] Formulation of questionnaires to evaluate the current state of affairs as far as music education goes. Some knowledgeable authorities in the field of music education were also interviewed.

As a follow up to the survey, important suggestions have been put forward to make music education more effective.

Suggestions for school students were mainly as follows -

[1] The teacher must set well-defined objectives, aims and targets,

[2] During teaching, pitch, intensity, quality and rhythm must be duly stressed,

[3] Folk songs should be taught before instruction is imparted in classical music, and

[4] The use of audio-visual material, organization of music competitions and attendance at music conferences and programs should form an integral part of teaching techniques employed.

Shrimati Kusum Dodia of Rajasthan University has conducted research on "Techniques in The System of Music Education," in which she has thrown light on the various systems of instruction in music.[1]

Shri Mohan Charan Sengupta of the "Akhil Bharatiya Gandharva Mahavidyalaya Mandal", Bombay has worked on "Some Approaches to the Education of Hindustani Vocal Music", Shrimati Madhurima Kishore [Delhi University] has done research on "Problems of Music Education With Special Reference to Pedagogy of Indian Music." [1]

Shri Prem Prakash Johri has presented a

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[1] Information from Sangeet Karyalaya, Hathras.

dissertation jointly with Praveen which is entitled "Primary Education On Psychological Basis." [1]

Therein it has been discussed in detail how instruction should be imparted to children.

Among the research work being currently conducted on music education is a work on Education System of Hindustani Music by Shanta Rani Hegde.

Another work is being compiled by Lakshmibai E.K. under the auspices of Madras University. The topic is "Musical forms for Initial Training in Music." [1]

In all the research work cited above, all the researchers have put forward original ideas and have thus made valuable contribution to the development of music education but the problems are too deep-rooted, varied and wide spread and there can be no two opinions that much work still remains to be done. [1]

#### 1.5 Genesis of the Problem

Experimental work done in the field of music education is next to non-existent. This researcher being a teacher, is well acquainted with this problem. A study of these problems does throw more light in new directions but real success will remain elusive as long as experimental ventures in music education are not undertaken in

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[1] Information from Sangeet Karyalaya, Hathras.

the educational institutions. With this in mind, this investigator has conducted some experiments in this field.

In 1976, this investigator has tried this experimental teaching technique on the girl students of M.A.[Previous] for one full year. The new factors involved in this new method of teaching were -

(1) The investigator paid careful attention to the fact that each student received regular instruction and guidance individually.

(2) All the students in the class were directed to maintain diaries wherein general instructions regarding practice as well as specific individual directions were entered.

(3) Each student was required to maintain a record of her daily practice at home. These included obstacles and difficulties encountered in practice. This enabled the teacher to give appropriate directions.

(4) The vocal recital of each student was recorded once a month and the recordings were played, heard and a group discussions were held on them.

Although no scientific analysis of this experimental technique was undertaken, yet there was a clearly discernible and highly satisfactory improvement in their standard of performance.

Next, the investigator drew up a plan of survey

on the state of music education in the educational institutions of the Agra city, and implemented it in 1979.

Since 1985, with the help of grants received from UGC, the investigator in working on a comprehensive large-scale plan to develop a wide range of audio-visual material to be used in instruction of music.

In 1983-84, the investigator, in her capacity as supervisor prepared, in conjunction with an M.Ed. student, a dissertation on Music teaching techniques in the Junior High School.[1]

As per this dissertation, the results of the experimental teaching method as applied to Junior High School classes were found to be highly satisfactory. Hence, the investigator felt encouraged to conduct a similar investigation on the effect of the experimental techniques on music education in High School classes. There were many reasons why High School Classes were selected -

Classical music is first offered as a full fledged subject only in High School. The chief aim of the

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[1] Charulata Bhatnagar, "Junior High School men Sangeet Shikshan hetu Drushya shravya samagri par adharit navin shikshan vidhi ka vikas evam unki upadeyata ka adhyayan", M.Ed. Thesis 1983, D.E.I., Dayalbagh, AGRA.

investigator's study was to study in what manner classical music can most effectively be taught as a subject. Hence, the High School [class IX] appeared to her to be the most appropriate choice.

The results of any experimentation or change are the most pronounced in the first or formative stages of learning. But, when the state of learning is more advanced, changes become much less discernible. Adolescence is the most sensitive stage when the learning process is most influenced by psychological teaching.

In this thesis, investigation has been carried out on the extent to which teaching methods employing audio-visual techniques can make both theoretical and practical music psychologically more stimulating, interesting and assimilable.

#### Development of audio-visual education in India - brief overview

Audio - visual aids have always been an integral part of education right from the beginning. But organised efforts at employing these are only of recent origin. The spread of education and the spiraling increase in the number of the students have rendered imperative use of all means at our disposal, to make academics easy, attractive and effective.

A brief discussion on the recent developments in

audio-visual education in our country is in order.

This subject was first taken up in the All India Educational Conference in Jan 1948. Within a few months of this, the government of India set up a committee to study the problems related to audio-education at various levels.

The National Assembly of Audio-visual education was set up in 1952. It convened in May 1953. This meeting put forward many recommendations, laying great stress on the production and use of audio-visual aids in schools.

Great importance was given to audio-visual education during the First and Second Five year plans and as a result, rapid progress was made in the field, both qualitatively and quantitatively.

Under the Second Five Year Plan, audio-visual education was also started in training institutes for teachers and many plans on the subject were discussed and approved.

Under the auspices of Education Ministry, the National Assembly of Audio-visual education continued to convene from time to time. Many plans for the development and use of audio-visual material in educational institutions were formulated and approved.

The National Assembly of Audio-visual education was dissolved in 1964 and many development plans were sought to be implemented in secondary and higher educa-

tional institutions with the help of audio-visual aids by setting up either various state assemblies or through the education department.[1]

This brief history of audio-visual education amply establishes the fact that the government of India and all schools have recognized the impact and importance of audio-visual aids in education and so the present investigator became interested in its role and impact in music education and proposed this thesis.

The object of this investigation was to determine if the learning process would be significantly affected if, in addition to ordinary traditional teaching, varied sources of information in the shape of audio-visual material, instead of the single teacher, were made available in the classroom.

Myriads of idealistic proposals may be put forward as solutions to any problem, but only those can be of any use, which are practicable. There are three aspects of education - the student, the teacher and the subject. If we study them one by one in the context of music education

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Sujeet Chakraborty, "Bharat mein drushya shravya shiksha", Ist chapter, I ed., 1962, pub: Sujeet K. Chakraborty, 15-C, Madanpal lane, Calcutta-25. ( In cooperation with Ministry of Education)



and draw up an assessment of their present state, we can say -

#### Student -

In most educational institutions students opting for music are admitted without proper selection. There are several reasons for this.

(1) The principals of most schools are ignorant of the nature of music and its problems. As a result, they treat it just as another subject and consider it a mark of signal success to have as great a number offering it, as possible. In the survey plan mentioned before by the investigator, the number of teachers was found to be only 55 while the number of students was 3759 in the institutions comprising the sample selected. The teacher- student ratio thus comes to 1:68 whereas ideally the ratio should be 1:1 or 1:2.

(2) Music has always been treated as an easy subject and as a result the selection of students with an eye on their aptitude has never been given serious thought.

#### Teacher

The proficiency of teachers in secondary schools of U.P. is unsatisfactory. There is lack of adequate training and the teachers are not at all enthusiastic in the matters of self-education, enhancement of knowledge or regular practice.

### Subject

In this triangle of problems in music education neither can the number of students be reduced by being selective nor is it easy to induce the teacher change their attitude. Hence, regarding the only remaining vertex the subject, such auxiliary material may be made available, which both teachers and students might profit. This seems the easiest way to resolve the impasse. The interests of the teachers may be increased in a good teaching technique and the students would benefit from the auxiliary aids and material. In this hope, the investigator resolved to study the problems of teaching techniques in music and conduct new experiments on this subject.

Owing to the rapid social and scientific changes of the age, education deserves fresh thought and drastic changes have become necessary. In this matter, science has proved a boon. If we think with an open mind, the aid of modern technical education can be enlisted to achieve great reforms. Music is a practical subject. Unlike all other practical subjects that have their own laboratories with all kinds of equipments, and unlike the library facilities for theoretical subjects, music education lacks any such facilities in most schools. The investigator, in her afore-mentioned survey of educational in-

stitutions of Agra in 1978-79, collected the following information regarding books available.

Table - No. of Books on Music in secondary schools

No. of Books	No. of Schools
Less than 25 books	6
26 to 50 books	4
51 to 75 books	1
76 to 100 books	1
Over 100 books	2

The above table amply brings out the fact that the quantity of literature on music available in secondary schools is highly inadequate. The teaching period devoted to this subject is pitifully short and devoted to group teaching, at that. Hence, it is imperative that students be provided with auxiliary material in the school to supplement their teaching classes. With this view, the investigator compiled some work on an audio library. It is also necessary to consider seriously the possibility of re-writing the text books on music in a more presentable and interesting manner. With this aim, the investigator composed a picture book on music and a cassette.

Scientific progress has brought many changes in our life. The TV, Radio, Video, Tape Recorder etc. have rendered it easy to hear different kinds of music. As a result, folk and classical music programs have reached out

to the common people. This has resulted in the increase of general awareness of music, directly or indirectly, in the society, but when we consider and analyse music as a subject, and treat it from the point of view of teaching, it becomes important that the material available on music, particularly classical music, be compiled and arranged in such an effective manner that the student may comprehend and assimilate it with facility. Hence, this investigation also deals with experiments on the compilation of such material in such a manner as to appeal to the level of the student so that it may make significant impact: For this purpose, the students were provided with audio-visual material and the effect on the learning process observed. The entire audio-visual material developed by the investigator was divided into three categories from the point of view of teaching -

(1) Audio-visual material related to appreciation of beauty.

(2) Audio-visual material on knowledge of music.

(3) Audio-visual material dealing with the practice of music.

The investigator concludes that just a little modification is necessary to render the present mechanical system of teaching much more interesting. The emotional aspect of music should receive precedence over its techni-

cal aspect in school education. If the children too are involved with the technical aspect right from beginning, they cannot develop an understanding of the spirit and that will limit the enrichment of their emotional selves through appreciation and enjoyment of music. Too much stress on the technicalities will be likely to throttle the children's interest in the subject. The object of the teacher should be to train the emotions of the child through music. To this end, in this investigation, provision was made to acquaint students with pleasing tunes, folk songs, raga-based songs and the sweet compositions of celebrated artistes.

Audio-visual material related to general as well as specialised knowledge of music was developed. One picture book containing brief description of famed artists was developed. Another book on various musical instruments, classical dances and practice of vocal music was also developed. A collection of the most appealing compositions by celebrated instrumentalists and vocalists, cassettes on various schools of vocal music, charts on pitch and quality and guidelines on practice of music were included in the material intended to enhance the general knowledge of the students. Material on specialised information included charts relating to the prescribed syllabus, a collection of compositions relating to the ragas

included in the syllabus, and cassette entitled "Ek Raga Anek Roop" [i.e. One Raga-several forms].

Music is a practical subject, hence while developing the practical knowledge of the student, instructions must also be given on the "how's" of practice. In other words, the exact systematic approach to practice should be taught step by step, and above all, the students should be motivated to practise. Practice is basic to music. Faulty modes of practice become an impediment to the progress of the art and ultimately result in the students feeling frustrated. Keeping this in mind, cassettes dealing with practice were also designed. Techniques of practice based on voice-culture have also been compiled into a series of cassettes entitled "Kalakaron Ke Riyaz", a cassette containing ten indispensable tips on practice of music, in order to provide guidance to students. Today it has become imperative that music teaching techniques should undergo a sea-change and that they should be made much more effective, more tasteful and systematic.

To determine the most adequate teaching technique for music and its utility, the investigator took up the problem outlined below -

#### 1.6 Statement of the problem -

"Development of Audio Visual aids for improving Music Education and to study their effect."

### 1.7 Detailed description of the problem -

For the present study, girl students of class IX of the U.P.High School were chosen as the sample, and the results of a new teaching technique in vocal music (Hindustani School) based on audio-visual material were observed.

To make the process of study acceptable and well-defined it is necessary to provide detailed definitions and classifications of certain relevant terminology.  
Audio-visual material -

According to the Encyclopaedia / dictionary and Directory of Education [1971] -

"Audio-visual material means the use of that material with the help of which the student obtains accurate knowledge of concepts by audible and visual means [media]."[1]

According to Macon & Roberts, " The teacher, by the use of these instruments activates more than one of the child's senses to make the subject matter easy, interesting, clear, effective and lasting"[2]

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[1] A.Vishwas & J.C.Agrawal, "Encyclopaedia Dictionary and Directory of Education", Academic pub., Delhi, 1971, p.17.

[2] Kamta Prasad Pandey, "Shiksha mein mulyankan", Meenakshi prakashan, Meerut, 1968, p.88.

In other words, audio-visual material includes all such educational material which, by its audible and visual character makes the syllabus clearer and more assimilable to the child.

#### Practical Definition

In the context of the present investigation, the definition of audio-visual material by Macon and Roberts has been adopted, but it has been taken to mean not only various musical instruments such as the 'tabla,' 'tanpura,' 'harmonium' but also the material, by the use of which the abstract form of music can be transformed into concrete, thereby, making it more assimilable and interesting. This material chiefly includes - the tape recorder with audio cassettes, picture-books on music, charts etc.

#### Music

According to the Third New International Dictionary -

"Is music science or art? Vocal and instrumental musical notes synchronised cleverly give pleasant experience. It has a definite structure imbued inseparably with rhythm, sweetness and swaras for thousands of years." [1]

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[1] Philip Balcock Gov and Mirium Webster, "Webester's Third New International Dictionary", G & C Mirium Co., Publishers Springfield, Mas. USA (1967) p. 1490.



According to Ahobal Sangeet Parijatah [1],

" गीतवादित्रनृत्यानां त्रयं संगीतमुच्यते ।  
गानस्याऽत्र प्रधानत्वात्तत्संगीतमित्येवम् ॥"

This means that vocal and instrumental music and dance - the trio are referred to as "Sangeet" or music. The words sangeet has prefix "sam" which gives it meaning "together with" that is to say vocal music singing together with its accompanying actions - playing instruments and dancing - which are part of it, is called "Sangeet". Singing being the chief of these three, the trio is called "Sangeet." Hence, it is clear that among these arts, the vocal art is given importance.

#### Practical Definition

In the present study, the word music or sangeet has been used in the sense given above. That is, sangeet has been used for vocal music.

#### Teaching Techniques

According to the Hindi Shabdkosh, "The method by which the teacher imparts knowledge to the student is known as teaching technique." (English Translation) [2]

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[1]. "Sangeet Spokti Suman" Pt. I (1986) Mahavir Prasad "Mukesh", Sangeet Sadan Allahabad, p.147

[2] Hindi Shabdkosh (1969) Nagri Pracharini Sabha, Varanasi

### Practical Definition

"The formal methods which are adopted in imparting knowledge of music to students in the class-room are referred to as teaching techniques."

The topic of the present study deals with the comparison of traditional and new techniques of teaching music. Therefore, two techniques were chosen for teaching-

#### (a) Traditional technique -

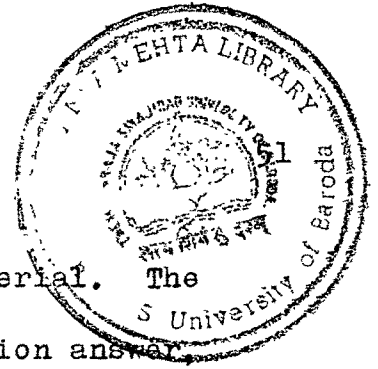
This refers to the technique which is generally used in the teaching of music. In common class room teaching, demonstration technique, question answer technique, and lecture technique are used to explain both the theory and practice of music. The practicals are taught by use of demonstration technique, in which the teacher demonstrates by singing himself/herself, following which the students learn by the technique of emulation. By using the question-answer technique, the characteristics of the Raga are explained during the course of practical teaching.

Lecture method is used in teaching theory and the facts are made clearer by using question answer method.

In this investigation, a new technique for teaching practical music has been experimented with.

#### (b) New technique

The new technique, in the context of the



present study, was based on audio visual material. The traditional technique of demonstration, question answer, etc. were all given a place but the subject was attempted to be presented in a more assimilable and interesting manner by extensive use of story telling technique, game technique together with audio visual material developed for the purpose.

#### 1.8 Objectives of the study

Clear delineation of objects and targets gives impetus to work and imparts success to research. The objectives of the study have been divided into two classes.

(1) Major Objectives.

(2) Minor Objectives

##### Major objectives

- I. Development of audio visual material for teaching music.
- II. Development of innovative teaching techniques for the improvement of music education.
- III. Study of the changes in vocal achievement, interest in and comprehension of music in the students due to the use of the innovative teaching techniques and the audio visual aids and to compare with the normal teaching.

### Minor objectives

(1) Giving right guidance to the students in the field of vocal music and improving their performance by acquainting them with their faults.

(2) Motivating students towards correct singing practice and enhancing their knowledge.

(3) Developing appreciation of beauty, self expression and independent singing ability in the students.

(4) Constructing tests on interest and comprehension of music in order to compare the two techniques of teaching.

(5) To bring qualitative improvement in the field of instruction in music.

### 1.9 Delimitation of the problem

The scope of any research work is almost unlimited, hence it becomes necessary to limit the problem. This helps to explain the problem clearly. If the problem is well-defined and clearly delineated it can be studied thoroughly. Hence, to ensure validity, reliability and utility of the results, and from the point of view of ease of study, the present study has been delineated with reference to the following.

#### Music

(1) The present study deals with vocal music alone.

(2) The teaching technique developed in the present study has reference chiefly to the practical aspect.

#### Syllabus

Only the following topics have been selected from the High School syllabus (U.P.) for class room teaching.

- (1) Practice of swaras and alankars.
- (2) Practice of Tal and Laya.
- (3) Practice of only Bandishes of all the ragas included in the syllabus.
- (4) Bhajans, folk-songs etc.
- (5) Theoretical knowledge of the elementary concept of music and brief theoretical study of all the ragas prescribed in the syllabus.

#### Institution

The present study was only limited to four schools of Agra city owing to constraints of time and facilities.

- [1] Prem Vidyalaya.
- [2] Ratanmuni Jain Girls' Inter College.
- [3] Anglo Bengali Girls' Inter College.
- [4] Murari Lal Girls' Inter College.

#### Sample

The present study was confined to girls studying in Vocal music class IX.

#### 1.10 Variables of study

##### (1) Independent variables.

The traditional and new teaching techniques of teaching in music.

##### (2) Dependent variables.

Achievements in the performance of the girls in the matter of singing and interest in and comprehension of music.

##### (3) External variables.

(a) Sex.

(b) Age.

(c) Prior achievements in music.

#### 1.11 Hypothesis -

The following hypothesis were set up in the present study. **in singing**

(1) The proficiency of students/will remain unaffected by new techniques.

(2) The interest and comprehension of music of the students will remain unaltered on being taught by the new techniques.

#### 1.12 Audio-visual material

The following aids were used in the present study -

- (1) Charts,
- (2) Picture books, and
- (3) Cassettes.

#### 1.13 Various tests -

Tests applied in the context of this study were-

- (1) Practical test on singing.
- (2) Test of interest in music.
- (3) Test of comprehension of music.

#### 1.14 Technique

The experimental technique was adopted in this study. The Single group design was used. In this design, first of all music was taught to the selected group by traditional teaching technique. Thereafter, the same group was taught by the proposed new method.

#### 1.15 Duration of experiment

The entire experimental teaching was finished within the course of a year.

#### 1.16 Variable control

In this present study sex, age and proficiency owing to prior learning were the controlled variables.

The variables mentioned above were controlled by

the selection method for the most part..

#### 1.17 Statistical Techniques

The following statistical techniques were used for analysis and processing of data and drawing inferences therefrom -

- (1) Mean
- (2) Standard Deviation.
- (3) t-value

The data obtained was processed and analysed and inferences drawn on that basis. The statistics calculated for the purpose were the mean and standard deviation. The hypothesis were tested with the help of the t-test.