



# RESEARCH METHODOLOGY ON THE STUDENTS' ATTITUDE TOWARDS SCIENCE & TECHNOLOGY IN PURBA MEDINIPUR DISTRICT, WEST BENGAL

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## ABSTRACT

That science is a unique subject among all its academic counterparts there is no doubt in this matter. And science aims at creating future scientists, engineers, environmentalists, academics, technologists, and in a word, every intellectual of whom we are proud today. The ideas, theories and the various doctrines of science are of great importance to us and the importance is increasing with the passing of time. If the study and cultivation of the study of science is to be made sufficiently interesting, our achievement in this field of knowledge will become immense and the knowledge so earned will be a perennial asset of the human race. Learning of Science in the school enhances the spirit of enquiry, creativity and objectivity. It aims at developing ability of knowing the unknown and doing something in a practical way.

The district of Purba Medinipur happens to be a rich field for any kind of research work because the attention of other districts and the states and also of the other countries of the world is now concentrated upon this region after the it was proved beyond doubt by the recent results of Madhyamik and Higher Secondary examinations that this place, once unknown to other parts of the world, is the place where the students of this district reading within the schools (secondary and higher secondary), colleges, both general and professional, and those outside the district and state that the pupils of this place possess some extra capacity to imbibe the essence of life and its education. The Present research work highlight that there have no correlation in science attitude between rural and urban but have significant correlation between male and female among the rural and also among the urban but not between male of rural and urban and similar for urban. Its means that male and female can not affect the attitude towards science. There is no significant difference between the attitude of rural and urban students. It is seen that rural student are more interested to study the Science and Technology than urban students.

**Key Words:** Implanted, Methodology ,Direct method, Indirect Method, Attitudes, Agriculture ,Pisciculture, Juggernaut & Schema.

## INTRODUCTION

To collect various data exact sampling technique will be adopted carefully. Groups will be formed on the basis of parents' education (less or well- educated) gender (male or female) and locality like rural or urban. Stratified sampling technique will be adopted in the collection of data. Various groups will be formed on the basis of gender (male/female) and locality (rural/urban). Thus, the present research will be based on 2 X 2 functional designs. For the collection of data, ten schools have chosen from rural and ten schools from urban areas of Purba Medinipur District. In the present research, 50 students of the each secondary school have been selected and 20 science oriented question have setup to judge science attitude.

## METHODOLOGY

### Measurement of Attitude

Attitude is implanted response or pre-disposition to object, persons, ideas values or situations in the social surrounding. They are essentially converting tendencies. If we want measure to draw them, there must be some means to draw them out or name the manifested form of overt behaviour. This can be done in the following two ways such as:-

### Direct Method and Indirect Method

Direct method is related to the verbal report of the attitude of the students.

Indirect method refers to the interpretation of the attitude from the unsaturated or indirect responses of the students.

### Generally the following devices are used for the purpose:

- Asking the individual directly how he feels about a subject – like questioning
- Asking to mark those statements from a list which he is in agreement with ( Checklist);
- To indicate his degree of agreement or disagreement with a series of statements dealing with the same subject.
- Questionnaire with item analysis or reliability or validity.

### Indirect Method of Measurement of Attitudes:

The process of inferring with the attitude directly from the verbal report or expressed opinion has many limitations also. One may conceal one's real attitude and may not really know what one feels and is unable to know one's attitude about a situation in the abstract. To avoid this problem it has been tried to make use of the measurement-method that are indirect or disguised in nature. In these methods, the subjects are given opportunities to structure their own responses without letting them know the real purpose of the task. There may be a combination of verbal report and interpretive technique.

Sorenson remarks: "Such factors as social experiences, propaganda, education and personal experience with different attitudes do make for modification and shift in people's predisposition towards objects, persons' ideas and situations is their environment." This above statement was published by Sorenson in the year 1977."

The main aim is to study of an interest of the students in the subject or Topics of Science and Technology in the areas of village of Purba- Medinipur, West Bengal. The researcher hopes that the results will be helpful for the development of the Science and Technology curriculum in the Secondary school level.

### Formation of a Student's attitude towards Science and Technology in childhood:

A person's attitude is not made automatically. It takes a long time to take shape. A child is only born inheriting some human capabilities which it inherits from its parents at the time of birth, but thereafter they undergo many ups and downs and additions and alterations to reach a point where the child, may be at a grown-up stage of life when he/she is mature enough to take a crucial decision, takes a stand on a particular matter, his decision about pursuing the future course of study. The formation of attitude to science and technology is not otherwise. Like the child's attitude and his/her idea of others things, in the matter this attitude to science and technology is also the product and the sum-total of his/her notions of the thing so far achieved adding them to the inherited concepts inherited from his/her parents and forefathers.

Attitudes are to a great extent responsible for a particular behaviour of a person towards any subject. One's attitude towards a subject is an acquired tendency or a deposition. We may, therefore, assume that attitude as a determining factor or conception. It is an acquired tendency which prepares a person to lead one in a certain way towards natural objects or a class of objects, preventing the circumstances.

## Crucial Decision

Now, a student reading in a secondary or higher secondary school has his/ her eyes and ears open to the activities of the outside world. The secondary student at one time realizes that at a certain point of his/her academic career he/she has to take a firm decision about his/her further course of study. After passing the secondary exam, s/he is not supposed to study all the traditional subjects of language, literature, the art and the science subjects simultaneously and s/he must take a particular stream of study: arts or science or commerce or vocational stream of education. It is perhaps the most crucial point in the career of the student for, once the decision is taken, it will not be easy for him/her to convert to other stream(s) and if s/he must do it, s/he has to admit the lapse of some academic years, which may or may not be always possible for him/her.

The teachers always lend their helping-hands to their students. Attitudes are achieved only through one's own experiences also. An attitude, once formed, can also be changed but it takes time if their deep concern in the psyche is found or impressed strongly.

### A Decision not Entirely Personal

Though the student's decision about taking up a particular branch of learning, science, technology or otherwise, is his/her own and it is s/he who will bear its brunt, positive or negative, all his/her life, the boy's or the girl's decision, nonetheless, is not hundred per cent his/her own. His/her resolution is influenced by many others persons and factors that are no less crucial in this decision making. The student may consult it with his/her parents, teachers, friends, neighbors, etc. The advices given may also vary from man to man, for the advisers are not all equally equipped in their personal fields of study or action. Their counsels are sure to be laced with their own choice of subjects, their prejudices, and also their own liking of the fields of study.

The progress of the students' attitudes towards science and technology will change in future if the personal parameters of the academics are not up to the level of the secondary or higher secondary school- level teaching capability.

### Family Background

At this time the student must also think about the financial condition of his/her family. He/she has to take into account the fact if his/her family will be able to bear the cost of his education or not. If he/she takes up science and technology, he/she has to defray higher costs of education than other subjects of learning. He/she may have to live in a town or a city for the purpose of his/her studies and, therefore, has to spend a large amount every month. If the student is from a poor or middle class background, the student may backtrack although he/she has the ability and necessary competence to read a subject belonging to the science technology stream. The family background and its financial standing, thus, is a crucial player in the formation of the attitude of the student to science and technology early in his/her academic career.

Faculty members or teachers are the main resources of the students in moulding their attitudes towards the learning of science and technology that can bring immense development of the society. They are also equally responsible for their effectiveness in the teaching-learning process of science and technology.

### Fear of Discontinuation of Education:

Counsel of friend is also very vital in the choice of a student's subject. If a Madhyamik pass out, finds that many of his/her close friends are taking up science subject in the higher secondary level and if he/she can tag up with them in a college, in any town or rural college, his/her studies will get a greater boost, the student may take up the study of science. The student at this juncture of time thinks a lot and consults as many people as possible before taking up a decision. If the student is mediocre, he/she does not need much thinking, but if it is a subject related to science and technology, the student has much to think over. At the one hand there is the lure of a richer and greater career with a better life full of ease and comfort, and on the other there is the fear of giving out the studies midway for want of money and also his/her own incompetence to cope up with the science and technology syllabus which is much heavier than his/her Madhyamik syllabus.

At the Madhyamik level, the student had to study the elementary basic things of science and technology, but now he/she has to study widely and deeply in the subject concerned. The vastness of the syllabus may also land him/her in trouble. The student, therefore, gives the matter a serious thinking before taking up a firm decision.

The attitude of the students, who have positive or negative concept towards their subjects, and the way the teachers teach is directly related to a great deal of the school's work. Their attitude may or may not motivate their accessibility to the subjects and act as a motivating factor towards their courses of study. Their attitude sometimes determines their judgment and interest towards a particular subject and sometimes a topic too.

## **An Overview of the Recent Progress of Science and Technology in Purba Medinipur District**

That science is a unique subject among all its academic counterparts there is no doubt in this matter. And science aims at creating future scientists, engineers, environmentalists, academics, technologists, and in a word, every intellectual of whom we are proud today. The ideas, theories and the various doctrines of science are of great importance to us and the importance is increasing with the passing of time. If the study and cultivation of the study of science is to be made sufficiently interesting, our achievement in this field of knowledge will become immense and the knowledge so earned will be a perennial asset of the human race. Learning of Science in the school enhances the spirit of enquiry, creativity and objectivity. It aims at developing ability of knowing the unknown and doing something in a practical way

The present researcher has avidly followed the progress of the Purba Medinipur District for the last 15 years since his college days but is now feels fascinated more than ever by the recent statistics available in the matter. That the eastern part of the then undivided Midnapore district is greater in many respects and richer in talent and merit has now been proved by the present statistics available. Midnapore District was bifurcated in 2002, and after this division it was noticed clearly that Purba Medinipur District is far ahead of its western counterpart in all respects, in science and technology in particular. The pace of development is at present prominently felt after the division of the erstwhile Midnapore District.

The fascination of the young generation towards science education, the opinion of their parents and guardians along with the data collected from individual houses in both the urban and rural areas of the 223 (two hundred and twenty three) village panchayats of the 25 blocks under four subdivisions of the district: Tamluk, Haldia, Contai and Egra subdivisions, etc., all go to strengthen the view that the craze of the people towards science and technology is greater than those living and working in the semi-urban and remote rural areas where the light of education and civilization is not that bright.

### **Methodology:**

Sampling technique will also be adopted to collect the data exactly. Various groups will be formed on the basis of parents' education (less or well- educated) gender (male or female) and locality like rural or urban. Thus, the research will be based on 2X2 functional design. Hence, there will be eight sub-groups and in each group there will be 50 students of the Secondary school of Purba Medinipur District from where the collected data-attitude and the scale will be used positively.

During the British Raj For the sake of the clarity of the matter we may go direct into the heart of the matter. During the British Raj, Calcutta (now Kolkata) and its adjoining districts of Howrah, Hooghly, 24- Parganas and Nadia saw a greater light of development in science and technology. The Englishmen had greater enthusiasm in commerce and industry than the real development and progress of the people. However, they saw that the production and supply of raw materials were profuse in the region and, for earning quick monetary benefit; they imported the technology prevailing in England and Europe during the Industrial Revolution under the reign of Queen Victoria. As the waves of industrialization spread further, they reached the district of Midnapore through the riverine routes of the Hooghly and the Rupnarayana, on the banks of which ports came up in a very short time. The Haldia port was the outcome of the commercial and industrial ambition of the British Raj. As industrialization needs the help of science, the science education also got a Philip less by the attitude of the British colonizers to science and technology, but more by the enthusiasm of the people of Midnapoe, the dwellers of its eastern part in particular, which today is known as the Purba Medinipur District.

### **The Leading Light**

That this researcher's claim is not a worthless figment of his imagination is proved by the fact that this Purba Medinipur District is now the best district in the state of West Bengal in education and culture. We may have a detailed view of the results of this Purba Medinipur district's Madhyamik (Secondary) and Higher Secondary Examinations in the last few years. The statistics of the results show that the students of the primary schools, (lower & upper), secondary and Higher Secondary schools are far ahead of those of the other districts because the students here are better in science subjects of mathematics, physics, chemistry, biology, botany, anthropology, psychology, physiology, mechanics, etc. That does not mean that they are all far behind in the subjects of humanities. The study and pursuit of science subjects has conferred upon the young brains a kind of analytical skill that has helped them do better in arts subjects also. In other words, their principal pursuit of science has also made them stronger side by side in arts and literary streams.

**The Urban Lead:**

The 2 (two) blocks of Tamluk and Haldia of the district are an index of the development of industry, the upshot of science, in the Purba medinipur District. Haldia is famous in the industrial map not in the district and state alone, but for its geographical location and its commercial importance, it is famous in the whole of the Asian continent. The name Haldia port is well known in the industrial circle of Europe and the USA, the two industrially developed continents of the world. Coal, natural gas and other minerals would not find such a wide market in the world if there were no such port as Haldia in India. We may also take the Kolaghat Thermal Plant off Mecheda station of the district. This thermal plant provides electric power to the local industries of the region. This thermal power plant has thus contributed greatly to the development of the region. The Thermal Power Plant and the Haldia Petro Chemical Complex not only cause improvement in the progress of the district; they also generate a kind of enthusiasm among the students of the schools (Primary, Secondary & Higher Secondary) of the region. Students know that these two industrial hubs need colossal manpower that will come up from the student community of the district or the adjoining districts or state and the companies will be forced to import the said man-power from abroad which will not be very pleasant for the economy of the developing country. Much money, in that case, will be drained out of the land.

Now that a great portion of the district's and the state's and also the country's talent is going abroad in spite of the manpower deficit in the land itself, the country cannot afford to allow the brain-drain any more. In view of the lure of rich job opportunities near at hand; the young generation has leaned towards the study of science and technology with a renewed vigour. The Leading Light: That this researcher's claim is not a worthless figment of his imagination is proved by the fact that this Purba Medinipur District is now the best district in the state of West Bengal in education and culture.

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**Professional Viewpoints:**

The present researcher has made a thorough study of almost all the pockets of the district: urban and rural. Everywhere the craze for reading science has been noticed. The picture is almost the same in the urban blocks of Haldia and Tamluk and the semi-urban blocks of Panskura and Kolaghat and the remote and backward areas of faraway Ramnagar, Khejuri, Patashpur and the agricultural blocks of Nandigram, Bhagwanpur and the two Nandigram Blocks (I & II). The doctors, nurses, paramedical staff of the aelopathic, homeopathic and ayurvedic colleges have been consulted and they have all expressed their opinion in favour of the study of science. The medical practioners also admit that the students who are admitted in the different hospitals and nursing homes of the district with any ailments are seen to be such students who study science subjects in the various schools, colleges, and universities of Vidyasagar and Calcutta Universities which are on the district's western and eastern sides respective.

**Domestic Inspiration:**

Moyna Block is solely dependent on agriculture where the sole crop is paddy, but the students there are very avid and they are also much ahead in expertise and the results which they perform in the 15 colleges of the district which are affiliated to Vidyasagar University. The students of this Moyna District may be seen scattered all over the state and the country and even the Far East and the west where they are spreading the merits of science in alien lands as opportunities were not available to them in the past, though it is now available in the wake of the country's low-key industrial revolution. Only a few years ago the soil of the block would be tilled by manually operated plough drawn by cattle, but now the same fertile land is cultivated by power-tillers and tractors and these inventions of science have expedited the economic growth of the block. The students, the children mostly of farmers, know the worth and contribution of science to the economic growth of their parents and naturally they become motivated to take up science and technology as their future course of study.

## Agriculture & Pisciculture Scenario:

It is a fact that the district is situated on the coastal areas and that there are much waterbodies within and without the district. People, the fishermen, till the other day, used manually operated country boats to cross the rivers, the Rupnarayana or the Hooghly or to catch fish in those rivers and the nearby Bay of Bengal. But they now use mechanically operated boats and trawlers. The recent spurt in the fishing of Digha and Shankarpur is the result of the fast improvement of science, and the students of this district admittedly are eager to contribute their share in the district's development and they can do it by first acquiring the relevant knowledge in these fields of fishing or pisciculture.

Thorough study was also made in the economics status of the minority population of the district. The statistics of the students appearing at the secondary and higher secondary exams show that now-a-days there are many Muslim students who are reading science subjects. Girls are also not backward in the respect. The 1000 odd girls who were interviewed after the publication of the Secondary and Higher Secondary results some 6 hundred and 13 girl students were found to be such girls who hail from economically backward Muslim communities as weavers and fishermen. The long and short of the whole scenario is that the attitude of the people, both professional and lay people, has undergone a quick change in the recent few years and if this positive attitude is retained in the years to come, India will not lag far behind China and Japan that in recent times have posed a violent threat to the erstwhile industrialized and scientifically developed countries of the west, and the Purba Medinipur District with its skilled work-force duly equipped with sophisticated knowledge in the fields of science and technology will lead the state and the nation in its path of success and progress.

### The Recent Progress

The present researcher has pinned his notice upon the progress of The Purba Medinipur District for the last 15 years since his college days but is now feels fascinated more than ever by the recent statistics available in the matter. That the eastern part of the then undivided Midnapore district is greater in many respects and richer in talent and merit has now been proved by the present statistics available. Midnapore District was bifurcated in 2004, and after this division it was noticed clearly that Purba Medinipur District is far ahead of its western counterpart in all respects, in science and technology in particular. The pace of development is prominently felt after the division of the erstwhile Midnapore District.

In fact the modern civilization is mainly based on science. Our daily life obviously rests on it. One must, therefore, know the main principles and have a primary conception and knowledge of science without which man cannot live well in our developing society today. As a result, he cannot live in the society as a dutiful and honest human being without the basic ideas of how science acts or going to act.

For the sake of the clarity of the matter we may go direct into the heart of the matter. During the British Raj, Calcutta (now Kolkata) and its adjoining districts of Howrah, Hooghly, 24-Parganas and Nadia saw a greater light of development in science and technology. The Englishmen had greater enthusiasm in commerce and industry than the real development and progress of the people. However, they saw that the production and supply of raw materials were profuse in the region and, for earning quick money, they imported the technology prevailing in England and Europe during the Industrial Revolution under the reign of Queen Victoria. As the waves of industrialization spread further, they reached the district of Midnapore through the riverine routes of the river Hooghly and the Rupnarayana, on the banks of which ports came up in a very short time. The Haldia port was the outcome of the commercial and industrial aspiration of the British Raj. As industrialization needs the help of science, the science education also got a Philip less by the attitude of the British colonizers to science and technology, but more by the enthusiasm of the people of Midnapore, the dwellers of its eastern part in particular, which today is known as the Purba Medinipur District.

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### **Technology for the Young:**

There is no denying the fact that the benefits of science and technology is meant for all and sundry, and not only for any particular class of people or some specific nations that are ahead in the race of development and culture throughout the world. Rather, it is the other way round. Some nations, the already developed ones to be more specific, may not always be in the frontline of inventions and discoveries and those that lag behind will always be left far behind. If we have a close look into the recorded figures of scientific progress, will see some wonderful and mind-boggling facts about the inquisitive mind of the young generation of the district of Purba Medinipur of the state of West Bengal. Any scholar or researcher or even any sensitive person who has time to make regular or occasional forage into the heart of the rural district may see that the young generation of the district, whether they are students of science and other science related subjects, are doing pretty singular innovations for the acquisition of their livelihood and the fact, known or unknown to them, are making valuable contribution to the already rich treasury of universal science.

The present researcher, during his collection of data of his thesis one day came across a young farmer who at that time was busy nursing his small plot of flower garden in the remote village of Pataspur block of the district of Purba Medinipur. The youth was very poorly clad, only with a piece of dirty towel on and he had no time to attend to the queries made to him by the stranger, the present researcher, who had heard that this youth, Viswanath Guchhait, had innovated a novel way of rearing sun-flowers with the minimum use of human labour, water and fertilizer. The few words that could be extracted showed the advancement of science and technology is not confined to the urban aristocratic pockets of the district, state or the country, and they are practiced with equal or in some cases more zest in the remote rural areas of the country and by some young people, who, far from the glare of limelight, are serving science and technology in their own simple manner.

The study (Ayodele & Olatunbosun, 2015) revealed that there was no significant difference between students' gender and achievement in Basic Science. The study also showed a fruitful relationship between the students' attitude and achievement in Basic Science. Present researchers found significant and positive relationship between attitudes and achievements in different subjects respectively.

In 2013, Pratichi Institute In association with UNICEF, Kolkata in 'Secondary Education in West Bengal: Prospects and Challenges' highlights that Secondary education has not received much attention from the policy makers. It is only recently, following the wide expansion of elementary education resulting in a higher demand for secondary education, that expenditure on the secondary education has started increasing at a higher rate.

### **Role of science in various aspects for the development of students:**

This research work was undertaken solely for the purpose of ascertaining the quantum of the people's attitude towards science and technology of the students of Secondary and Higher Secondary level of education of Purba Medinipur District. But with the progress of the work, peculiar facts began to come to light and the researcher could not resist his temptation to accommodate them in this thesis because they might surely stand in a very good stead of the other researchers in this rich field of the most educated and intellectually and the most advanced district of the state.

### **Science & Technology for Mankind**

The cultivation of science and technology may here be discussed block-wise, village-wise, caste-wise and profession-wise. The researcher has very diligently pursued in course of his research which has taken him to the remotest areas of the district and it has also brought him in contact with people from all walks of life, high and low and literate, semi-literate and a few of them completely illiterate, for, though the district is ahead of its other counterparts in the matter of education, there still are a few, who are without letters in the true sense of the term. (How the most educated district came to be the address of the few illiterate persons will be discussed later on). Here we are focusing only with the views and opinions of the students, their guardians and the academics who are engaged in the profession of teaching and learning.

## Promising Talents

Children are children after all. They are the future citizens of the county. It is in them that we can imagine the future development of the nation. It is true that the children of Purba Medinipur District can be no better than the those of other districts or other states or other countries of the continent or the whole world as a whole, but any serious observer of the behaviour of the children of the district will believe that there surely is some speciality in the children of this district. Whatever may the psychologists may say, there certainly is some excellence and promise in the younger citizens of the district now studying in the primary, secondary and higher secondary schools, and its colleges and universities of Vidyasagar, Calcutta, Jadavpur, etc., or in the professional colleges and universities of the medical and engineering streams across the nation. Their cases are referred to here because the dignitaries in the different fields of life working in the county and abroad were themselves at one time, during their school and college days, promising students and they surely were inspired by the rich scientific and technological heritage of the district.

### The Forecast

School students of the district are far ahead in their prior knowledge of the subjects of science and technology. The fact is well reflected in the science fair and science seminars held in the towns of the district from time to time. In the wall magazines and printed journals published from the district and the adjacent A-1 city of Kolkata bear clear marks of the burgeoning talents of the district, who, when grown up, bid fair to light up the various fields of human progress. The tempo of the thought of the tiny-tots is also an index of the children's leaning towards the study of, and devotion for, the knowledge of science and technology.

### Computer Enthusiasts

The students of the district, after the completion of their Madhyamik or Higher Secondary exams, do not idle away their precious time. They spend their valuable time, prior the publication of their results, in gaining some basic knowledge of computer science, which, they think, would help them much in the way of their future studies which they are to pursue in their coming days. The present researcher made forages into the ubiquitous private and public computer centres of the district imparting basic knowledge of computer to the young learners and he saw that most of the young learners there were either Madhyamik and Higher Secondary students passing their time in this constructive path of knowledge gathering in the run up to the publication of their results. There are both boys and girls among the learners but the numbers of boys are a little more than that of the girls. But whatever may be their gender, they are all young enthusiasts eager to pursue the study of science and technology or other subjects related to these two dynamic streams of human knowledge. Such hubs of the computer learning are numberless in the ever developing towns of Haldia, Tamluk, Contai, Panskura and Mahishadal. Now that the district is going have its own university with its administrative offices and campuses located at Mahishadal or its near-about, the district is on the threshold of getting another big Philip in its path of progress in the fields of science and technology.

### Women in Science Classes

Women form more or less the half of the total population of the district and they are also maintaining an adequate proportion with their male counterparts. The offices of the colleges, both govt. and private, were visited time and again in order to gain the statistics of students studying science subjects (and the college authorities provided necessary statistics generously) and from the facts available from the roll strength of cases ( both science and arts ) it was doubtlessly established that, though boys outnumber girls in science classes and the vice versa, the overall tendency of the learners is in favour of science subjects.

### Self Help Group

As in the other parts of the world and in the country itself, not excluding the other districts of the state, some women invariably are there who have to earn their and their families' livelihood by the sweat of their forehead. Thousands of working women in the district work as tailors in the garment making factories. Asked how they enjoy and earn their livelihood, many girls and the elderly women cutting across the barriers of class and religion, came out with the strange revelation that their work now is much easier than it was before. Till a few years back, they had to ply operate their sewing machines manually spinning the wheels of the machines with legs, and they could not work for long hours with this strenuous job which exerted much strain on their bodies and nerves, but with the introduction of the electrically operated machines, their labour has been eased much.

Formerly they could not work more than four or five hours at a stretch, and had to either suspend the day's work at the end of this period or were compelled to take rest before commencing the next session of the work, but now many of the women, and some of the are well above 50, are working for 12 or 13 and in some few cases, for 15 hours or more a day. And a few girls were found to be college students who were earning the expenses of their studies by working overtime in these privately owned tailoring houses.

People's general tendency towards and devotion for science and technology were also remarkably discernible in the presence of women working in these tailoring shops. The women today are not lagging behind their male counterparts and they also are thus contributing to the national wealth of the country along with the maintenance of their families. The long and short of the matter is that the devotion and the people's respect to the progress of science is here to be seen in the men and women of the district.

### **Sea or Marine Life**

There is a vast stretch of sea in the south and south-west of the district. Many people of the vast coastal areas of Contai and Egra sub-divisions depend on this sea-scape for their livelihood. A large section of the sea-goers were seen to be students of science during their school and college days. As somehow they could not follow their dreams of becoming doctors, engineers, scientists or teachers or professors of science subjects, they started their occupations depending on their knowledge gained through their studies of science subjects achieved during their school and college days. The houses of the fishermen of the coastal areas of the Bay of Bengal at Digha, Mandarmani and Shankarpur were visited during the collection of data of the present research and strange cases of people's love and leaning towards science were available. They show both the people's eagerness for the knowledge of science and technology and their proneness to use science for human progress along with the financial progress of their own, Many women living the coastal areas of the district venture into the sea during the monsoon when hilsha fishes are caught and marketed in a large scale thus bring much money to the finance of the state and the nation. The fishery business of the state and the district was not as lucrative as it is today till the near past before the introduction of motorized- trawlers used in fishing.

### **In Classroom**

Modern science and the latest inventions in the field of technology are making revolutionary changes in the educational institutions: Primary, Secondary and Higher Secondary schools of Purba Medinipur District. Till the closing years of the last century it was the general practice of the teachers in the class to deliver lectures and sometimes write a few words and diagrams on the blackboard of the figures and pictures he/she was teaching. As the space in the blackboard is limited, he/she had to delete portions of his/her writing to accommodate further writing. The students, the backbenchers and the less intelligent, could not follow the lesson so written by the teacher on the blackboard. Besides, it was a nuisance and a cumbersome matter for the teacher to go on writing on the black-boards thus dirtying his/her hands with the dust of the chalk. The geography teacher sometimes would sometimes bring maps and globes to show the students in the location of the places, hills, rivers, etc., and there surely would be some gap in the realization of the lesson in the part of the students in general. But now a revolutionary change is discernible in the process of teaching-learning in the class-rooms.

Smart classes using KYN devices have been also introduced in some schools. The present researchers visited some schools where he came across many modern teaching aids piled up in the corners of labs and libraries. Computers and laptops have thus replaced the former use of blackboards, chinks, globes, maps, etc., and the students and the teachers are all finding it the consequence of the inventions of modern science. Now this way the young learners in childhood are generally attracted to the studies of science and technology from the very early age. Now that they immensely imbibe facilities of modern science from the very childhood in later life this love for science and its facilities are strengthened.

### **Science in the Service of the Poor Minority**

It is said that those who are the most hungry clamor for food more. The veracity of this dictum may well be felt in the remote pockets of this district inhabited by the members of the Minority Communities and the poor people who, having not much food stuff near at hand for their sustenance, have to depend on the natural wealth available in and around their wild habitat, and are compelled to use the little natural raw-materials that they find

around them. In their hard life also they may be found using some basic items of scientific and technological inventions. This researcher once visited a hut of a poor member belonging to the tribal community of the newly formed Jhargram District where a poorly clad youth was seen working on his simple machine of making sal leaf plates from the leaves of trees that are abundantly available in the forests of West Medinipur, Jhargram and the adjacent Bankura and the Purulia districts. People, mostly women and children, were found busy from dawn to dusk collecting the sal leaves from nearby forests and heavy sacks of sal leaves were being brought to these small factories to be turned into leaf-plates very neatly and very quickly and neatly and with the minimum labour was needed for the job. Formerly such leaf-plates were also made by the people manually but now they are made using the knowledge of science in their homes. They have been doing this job for generations, but the job prior to this forage of science and technology was not as fast and neat and comfortable as it is now.

The method of this manufacture of the Sal leaf plate, in short, is something like this: The sal leaves, green or dry, are first brought, sewn together in a tailoring machine sideways (and this tailoring machine is run electronically). The Sal leaves thus stringed together sideways are arranged upon a plate in twenties at a time. Thereafter, a heavy steel plate with sharp, round ends are stamped upon the leaves beneath it. The rough peripheral ends of the leaf-plates are cut out and, what emerges from under the heavy steel plate, are well-made leaf-plates ready for use in hotels of the towns and cities, not of the country itself, but those abroad where such Indian country-made sal leaf-plates are high in demand now-a-days and the demand of this Sal leaf-plates is increasing day by day although there no dearth of plastic and thermocol plates in today's super-markets.

The use of the same techniques may well be found in different rural professions in the far flung areas of the Purba Medinipur District, in the villages of Khejuri, Ramnagar Blocks and those of the Contai sub-division in particular, where poor villagers put into service the advantage of modern science in making small household materials using raw-materials collected from their environment. Cocoanuts are grown in plenty in this district and after the use of the cocoanuts; people use the cocoanut shells and the fibre within it to manufacture various useful materials either for their domestic use or for sale in the market. The roads of the district including the busy National Highway No. 41 leading from Mecheda towards Haldia and those from Digha towards Conati and the coastal areas of the adjacent state of Odisha may be seen lined with huge ricks of discarded cocoanut shells. Those shells are meant to be sold to whole-sale dealers, who will buy them, from the owners at a reasonable price and export them to mills in the in mills of Howrah and the two 24-Parganas districts where there are sophisticated factories of making mattresses out of them. The mattresses thus made are high in demand especially in the wedding seasons when brides' parents have to buy wooden furniture including cots made of costly timber sal teak, etc. The manufacturers of the fancy beds use the cocoanut fiber at the bottom of the mattresses covering them with soft sponze foams over it and the technology used here is ubiquitous among the carpenters of the district.

The students of the secondary and Higher Secondary schools of the district, particularly those who belong to the localities of these cocoanut growers and carpenters, are very much motivated with the manifold use of science and when they enter their higher studies later on.

### **Science & Technology in the Service of Agriculture**

The district of Purba Medinipur, like many other districts of the state and the country where agriculture happens to be the main occupation and source of income and livelihood of the people, has a vast majority of population that is engaged in the farm related works all round the year and the works of growing paddy, jute, ground nut, pan (betel leaf) and flower in the vast areas on both the sides (north and south) and also on both the sides of the part of the South Eastern Railway stretching the Panskura Railway Junction to Haldia and Digha, is a huge area of fertile land teeming all round the year with farm works. In these rich fields farmers would cultivate the land manually with plough drawn by pairs of bullocks or buffalos and other farm related appliances such as the spade, scythe, hoe, etc., but now the said land is ploughed and the soil and the seed-bed is prepared for not with the traditional and primitive means of bullock-drawn ploughs or the manually operated with spades, sickles, hoes, etc, but with mechanized tractors, power-tillers, etc.

The peasants had to spray their fields with spray-machines which they had to ply with hands and the work was slow and time-consuming. But now they do the spraying with such mechanized tools that do not need the manual operation for they are automatic tools of spraying the insecticide. The work, now, is much rapid and easy and the cost involved in it is nominal. They have only to buy the insecticide from the dealers and with them and the spray-machine fitted to their back, they proceed straight to the farm land and return home after having finished the spraying of vast areas of farm land within a very short time. That time perhaps is not very far when the farmlands of Purba Medinipur District will be sprayed with insecticide with the help of small aircrafts as it is now done in the fields of the USA, Canada and the developed countries of Europe, China, Japan et al.

The researcher found that many of the present-day young farmers are educated people who studied science during their school and college days, and as they found no jobs in the govt. offices or in any other private offices or corporate houses, they took up the farming of their ancestors and now they seemed to be happy because, in their opinion, the progress of science and technology has made their job easy and their income is far more than ever. Modern tools of agriculture are now widely used in almost every field of the district and the researcher was struck with amazement to see the extraordinary development in the occupation of the people of the most important profession of the district. Now, this opinion of the wise farmers will no doubt influence their children who go to schools and colleges for their studies. Many of them who fail to end up being great scientists, doctors or engineers are sure to become great farmers growing crops easily and at a minimized cost of production.

### **Science and Technology in the Service of Transport**

The transport operators of the district of Purba Medinipur are to a great extent dependent on the various modern inventions of science and technology. The National highway 41 is a proof of this. Thousands of vehicles: buses, trucks, lorries, mini buses, taxis, trekkers, magic vans, Totos and other modes of transport, run through this busy high road stretching from its intersection at Kolaghat to Haldia and Digha, round the clock. Many of these vehicles come from far off places in the state and even from other states and the neighbouring countries of Bangladesh and Nepal. Tourists from across the country and keep pouring into these two most important places of the district: Haldia and Digha.

A large number of the drivers of these vehicles are first timers, and being new to the unknown roads, they do not know the direction of the places. Formerly, such drivers had to ask people on the roadside for the route-direction at every cross-section or turn of the road. But now science and technology have come to their aid. The newcomers now just install a mobile set in front of the vehicle after the switching on the right kind of App, and the route direction is done automatically. By the movement of the arrow (cursor) of the route-director in the cell phone, they get the direction of which way to follow in order to reach their destination: Haldia or Digha or any place beyond that in the southern states of Odisha, Andhra Pradesh or Tamil Nadu.

This researcher have asked many such transport operators, the young drivers and the owners of the vehicles, and they have confided in the researcher and the young reporters of the local media that they were science students during their school or college days and, finding no other job of their choice in these days of cut-throat competition, they have taken to driving vehicles as their profession. A handful of these drivers are school drop-outs with little knowledge about the fast changing world outside, but their experience has taught them that knowledge of science and mechanics and the idea of how machines and tools work has a great advantage in these days of fast changing world. These young people may not have become great scientists or doctors or engineers or other stalwarts in their fields of the society, but they certainly have been able to use the little knowledge of science that they learnt early in their life in the school or college.

### **The Importance of Mobile Phone**

The cell phone is perhaps the most important gadget and it may be seen in every hand and every pocket of almost every citizen of the world irrespective of his/her class, age or occupation. Some people even own a number of such phones installed with more than one SIMs. It is a common knowledge that this mobile phone has brought a revolution in telecommunication and the people Purba Medinipur, the avant-garde in the state's

and the country's education and culture, do not lag behind in gleaning the maximum benefit of the modern inventions of technology. In a sophisticated category of the mobile phone there are many options of doing everyday work: from calculation to photo-taking, from booking railway or plane tickets or applying online for an international passport or any admission to a college or university: almost everything is now done by the little gadget people carry cozily in their hands, pockets or sometimes in their bags.

Young passengers in trains, buses, on railway platforms, in the roadside stalls and almost everywhere may be seen sitting with their headphones of mobile plugged to their ears. It is true that most of them listen to songs or see popular dance sequences on the phone, but there are also some serious people, the members of the business class, etc., who collect useful information about their work from the internet. Now the state has taken to e-governance. In the offices, both of the government and the corporate sector, all works are done through the computer. Paper work has given way to the e-governance. The work of administration has become quick and is looking clean without the cumbersome job of writing with pens on paper. The offices of the banks are perhaps the most ideal places to observe the marching triumph of science and technology. The banking system is now the fastest, the easiest and the most free from cumber. It is the same with the railway booking counters where only a few booking clerks can do the job of many people with computer sets each in front of them.

Admissions in colleges are now done online. Those days are not far when the voting in the election will be done by just a click of the mobile phone. The young generation of today keeps its close eyes on this all pervasive use of science in almost every walk of life. Being thus inspired by the holistic use of modern scientific methods, the wise people, now wiser about the advantages of modern science, motivate others: their children and neighbours, etc., to take up the study of science in their studies in the institutions. Those who can, become professionals in the field of science, and those who cannot, use their little knowledge of science in other professions, as was seen the cases of drivers and others on the roads of Purba Medinipur district.

### **Impact of Science Fair & Processions**

The town of Haldia in the District of Purba Medinipur is a constant hotbed of cultural activities. Science fairs and other cultural activities are held here all round the year, but more in the dry seasons of the winter, spring and the summer seasons. Meetings and seminars are held in public halls and community workshops. In the evening processions are taken out by the local people. It is interesting to note that most of these meetings and seminars are held on the topic of the use and the advancement of science and technology. The present researcher has made extensive tours of the state and in other states but such enthusiasm was nowhere seen. The dry months of the later part of the year 2017 and the early months of 2018 saw a tremendous spurt in the holding of such science seminars in the district, particularly in the Haldia township.

The present researcher had the opportunity to attend and walk with the procession its of the town on 14.04.2018 on the eve of Bengali (1425) New Year's Day. Walking with the procession and attending the science Seminar prior to it in a community hall called the Geetanjali Sanskritik Sadan of the Tamluk Unnayan Samity at Nimtouri beside the National Highway 41 many interesting things about the attitude of the students of the district could be known. The children of the district are born in an almost natural scenario of the advancement of science. The culture of the district is varied and hetero generous. There are different sections and castes of people. While some are very rich, others are the members of the middle-class and some are very poor so that they live from hand to mouth. A large section of the populace of the district are members of the minority community and the few who can study in the schools and colleges, continue to read, but others who cannot thus carry on with their studies migrate to other states and sometimes to other countries. The destination of youths of the minority communities of the district in most cases is the nations of the middle-east, where they say, their income is more than that in other places of the globe.

The progressive minded young people of the district are engaged in the occupations of masonry, carpentry, tailoring, goldsmith, etc. The few young carpenters who were interviewed during the research said that the work of masonry or carpentry or tailoring or embroidery, etc., is not that much difficult now-a-days. There are different types of machines and appliances available in the market that facilitates their job to a large extent. Their manual labour has much been eased by the use of appliances invented by science. The present researcher

was taken to the house of Enayet Khan of Nandigram, who has a furniture shop in Dubai and he has come home on a leave of one month during the holy Muslim month of Ramadan. Mr. Ali has brought from Dubai some ultra-modern tools used in carpentry. The sawing, boring, drilling and the joining of wood and subtler works of carpentry is now all done by modern machines. This Mr. Ali said that he has passed the Madhyamik examination with good marks in science subjects including mathematics, but his family circumstances compelled him to drop out after the annual examination of class eleven (science) and accompany his uncle (a science graduate) to Katar where he was a rich carpenter at that time. It took Mr. Ali about two years to learn the art of carpentry, and thereafter, he went to Dubai where he opened a furniture shop of his own, which he is now deftly plying till date. Mr. Ali is all praise of the modern tools and appliances of science and technology and he now is so motivated by the advancement of science that he now persuade all the children of his and his relatives' families to study science upto the graduate level at least, and thereafter they may like to join the business of their elders if white collar jobs do not come their way.

### **Earth Work**

It is now a truth doubtlessly acknowledged that the benefits of science and technology are fast reaching to the grass-root levels of human development both in the urban and the rural areas. The truth of the matter has to be seen in the remote pockets of the Purba Medinipur district where earthwork of all kinds are being carried out with the help of machines. Formerly all kinds of earth-digging was done manually with such petty tools as the spade, shovels and other appliances made of strong metals, preferably iron. Farmers and wage-earners in the countryside would dig the earth with these spades and other digging appliances. Farmers of all ages: old, young and even their children would be compelled to do all digging with spades. They had to make the earth loose with spades, fill their small baskets made of bamboo reeds or strong water weeds, lift the heavy baskets on their heads and carry the soil to the lower parts of their field in order to fill a ditch and thus level the ground. Country roads were all made in this way.

During the summer, when the earth was dry, large numbers of labourers would work the whole day, sometimes till late in the evening with the members of their families, to make the rural roads that led to the far-flung villages linking the villages together and the nearby towns and the distant cities. Huge work-force was required for thus making the country roads. After the making of these earthen roads they had to level the rough roads smooth with spade manually, that again needed much time and human labour. And when finished, the earthen roads stood the risk of being washed away by flood at the peak of monsoon in the months of July, August and September and sometimes even in October. The washing away of the roads led to heavy loss of human labour and valuable money spent by the government in such rural development works. And it is a fact that floods are common and frequent in this part of the state and the country.

Those days of the loss of human labour and national wealth are now no more and science has now made all such works easy and durable. The modern inventions of science and technology have made these works of rural development and national progress much easier and much loss-proof. Floods cannot be checked here altogether because Purba Medinipur District is a flood-prone low-lying area and, being situated near the Bay of Bengal, it stands on the zone of the cyclones that sweeps the district often on their way to and from Bangladesh in the east and the Odisha coast in the west. But the roads at least may be made strong and high by being made by high-power machines of earth digging and road-making. Now the digging, filling and leveling of the roads, etc., are all done by huge pay-loaders operated by a single driver in each machine. Long and strong roads may now be done mechanically and within a very short time. There now has been a quick development in the villages linked by concrete roads and all these roads are made in a wonderfully quick pace with the help of sophisticated machines. The mixing of stone-chips, sand and cement, etc., are all done by a single machine. It may be seen that all the roads of the district that have been constructed in the last few years are the product of these modern machines invented by science and technology.

The fact is that, the operators of these machines, the pay-loaders to be more precise, are all young people with a background in science education. Quite a few of them, who could be communicated with by this researcher, were all praise of science and technology. In their childhood, and later in their college and university days, they were great fans of science subjects. Many of them later had to drop out in the middle of their education for want of money necessary for the continuation of studies, and many of them could not find jobs even after the completion of their studies. They may not have got suitable high profile jobs suitable to their education, but now they are in a kind of mental satisfaction in being able to make some use of their knowledge of science during their education in schools (Secondary and Higher Secondary) and colleges and, in some cases,

in the universities. When asked about the continuation of their esteem for science and technology some of these youths, the operators and the owners of the pay loaders and leveling machines, quite a few of them confirmed that they would certainly make their children study science subjects if their missions are not otherwise thwarted. It was also known that some of the great admirers of science and technology already have their children studying science subjects in their schools in this district of Purba Medinipur or the nearby districts of Paschim Medinipur, Howrah, etc., or the capital of the state, Kolkata, and even in the other states and other countries.

In a recent trend of the district's development it is seen that the vast areas of the district's low-lying areas are now being turned into fish-ponds called the Bheris. Such water-bodies called the fish ponds (Bheris in local dialect) may be seen in a large number on both the sides of the South Eastern Railway from Panskura Station to Kolaghat and also on both the sides of the National highway No.-6 between Mecheda and Nimtouri. Very huge fish-ponds have come up in the recent years in Bhogpur area of the district and near RamTarak and Netaji Nagar lining the sides of NH No.-6. The making of the Bheris (fish ponds) took a wonderfully short time because they could be made with the engagement of high power digging machines called the pay loaders.

The fact is that, these areas of the district are low-lying grounds that remain submerged with water most of the year. Only in the dry months from December to March, only a little boro paddy crops can be raised there. For the other months of the year the field remains under deep water. No cultivation is possible in such low-lying areas. So, some rich fish merchants are taking these lands from their owners on a lease basis and doing Pisciculture in those fields turned into fish ponds. The owners of the land, who incurred heavy financial loss formerly, are now getting some dividends from their landed property. The matter is almost the same in the Moyna Block of the district. Until a few years ago, the whole block would remain underwater and no crop could be raised there. Thereafter, only the boro crop (paddy) could be cultivated early in the year: January, February and March. Now there are many a fish pond in the whole block and these fish-ponds have almost all been made mechanically by digging machines called the pay loader. It is not that this quick change of the surface of the earth from paddy-fields or fallow lands to lucrative fish-ponds have not left any mark on the fertile brain of the inhabitants of the districts. The people, the young generation to be more precise, is highly motivated by this fast development of the district and that is possible only by the use of the modern machines and appliances of science and technology. The district, the leading district of the state in education, is fast becoming leader of the nation and humanity.

Communication was made with the science departments of Contai Pravat Kumar college, Contai, Tamralipta Mahavidyalay, Tamluk, Panskura Banamali College, Panskura and Midnapore college, Midnapore and the other new government-aided and private colleges of the district and the students studying science subjects like physics, chemistry, biology, physiology, mechanics, etc., and almost all the students cutting across the male-female dividing line expressed their satisfaction in being able to study science. When asked about the reason behind their respect of science subjects, the vast majority of the science students said that they could not think of any other branch or subject of learning than science. And when the views of the arts subjects reading (Pass or Hons) in such subjects as Bengali Vernacular, English, Sanskrit and the social sciences like history, political science, etc., were sought, the students, mostly female deemed it their bad luck for not being able to pursue studies in science subjects.

The merits and benefits of science and technology may seem to be the most imbibed by the young generation of the district and flourish of development may be detected in every walk of life including cattle farming and Pisciculture as also in the fields of botany and fruit cultivation. Gone are the days when there would be small country cows in the sheds of the villagers of the district. Being small, the cows would give small amounts of milk every day. The span of milk giving in the part of the cows would also be very short. There would be long gaps between cows yielding a calf and be able to provide milk. Now the small country varieties of cows are very few in the cow-sheds of the district. In place of these small native cows there are larger hybrid cows capable of giving larger quantities of milk and many more times during their life-span.

The matter is more or less in the sphere of plantation. In this age of scientific boom a tremendous growth may be noticed in every field of agriculture and vegetation. The hybrid variety of rice and wheat has brought revolutionary change in the production of fruits and vegetables. The Singapore variety of banana is imported from Singapore, it is right. But it is also not wrong that almost the same variety of banana is now produced in

this district side by side with other parts of the country including Tamil Nadu and Assam. In the science and agricultural fairs that are held from time to time in the different parts of the district, there may be found wonderful varieties of fruits and vegetables that, however exotic they may seem, are the products of the district and all of them are the rain-children of the resourceful farmers of this district. It has been confirmed by repeated forages to the ago-farms in different distant pockets of the district the farmers are mostly of such families that have some amounts of science and technology backgrounds.

### **Science in the Service of Religion**

The influence of tradition and history is undeniable in the culture of mankind. The majority of the population of this district is Hindu and the Hindus are idolators. They worship 33 crore deities all round the year though only a few of these gods and goddesses are worshipped with great zeal than the others. Not only at the homes of the people, but many community halls and pockets Shiva, Durga, Saraswati, Laxmi, Viswakarma, Karreator in the kartik, etc., are worshipped at different times of the year. Quite a large number of artisans are engaged in the manufacture of the deities. Many people pursue idol making as their dynastic occupation. Muslims are not idolators. They pray to their Creator, almighty God, in their shrine called the mosque. There also we see the use of the blessings of science and technology. The call of their holy prayer, 5 times a day and those during the holy month of Ramadan (Ramzan) and the annual prayers of Id-ul-Fitr and Id-al-Azha are announced over the public address system. The need of a microphone is also an essential need during their religious meetings popularly called the Jalsha. The use of this microphone and the audio or video recordings of the holy religious occasions has facilitated the observance of the followers of Islam as it has also done in the case of the majority Hindu and other minority communities of Christians, Jains, Buddhists, Parsis, etc.

Now that there are many Muslims among the teachers, professors, doctors, engineers and the followers of other professions, it may be safely concluded that the minority Muslim community of the district is not immune from the powerful impact of science and technology. A considerable number of educated people belonging to the minority Muslim community of the district were taken into consideration and they almost all expressed their positive opinion in favour of the study of science.

### **Science Juggernaut**

The juggernaut of science and technology goes ahead in an unthinkable pace today and, in the first half of the twenty-first century, there is not even one single nook or corner left which is not influenced or affected by the ubiquitous effect and influence of science. Human child first and foremost is the offspring of its mother and it knows its mother the best and the most, because it is its mother who held it 280 days in her womb before delivering and, after birth it was she who introduced her baby with everyone else including its father and other kith and kin, neighbors and with the various things and ideas of the earth. The mother is thus the child's first educator, its friend, philosopher and guide. From the time of its looking into the things of the world the child enjoys the vicinity and affection of its mother and after that it is introduced to anyone or anything else. In the past most mothers were simple housewives living at home the whole day doing the household chores although there were some few mothers who were engaged in white-colour jobs like that of teachers (in schools, colleges and a very few of the in the universities). Barring the few cases of the women thus engaged in white-colour jobs, most mothers were simple women staying at home and doing the domestic works and rearing their children. Formerly there would be no family planning as of now, and one couple would give birth to many children. Now that human productivity has been checked on economic and demographic reasons, the influence of mothers on children is as usual or may be more. The mother exercises the maximum influence upon the child and her impact upon her baby is certainly more than her husband's or any other else's. Now also any behavioral change in the mother is sure to motivate the baby and later the child early in its growth and development.

The women of this district of Purba Medinipur, though most of them live in rural areas and some of them live and work in the most remote areas of the district, are very alert as the development of science and technology in the outside the world through the ever widening network of the multimedia. And their like and dislike of things are transmitted to their children through hereditary lines. In the kitchen of the housewives of the district one may see the presence of such sophisticated gadgets as the grinder of spices, and the machines capable of manufacturing snacks and loaves within a very short time. Even in the houses of the poor people of the Minority Muslim community today such modern gadgets of cooking may be seen.

We may also take into account the playthings that the children get from their parents and play within their childhood. Formerly, children who visited the occasional fetes in their locality, would get from their parents simple toys like the rubber balloons, or a few other toys made of rubber and plastic. But now a revolution has come upon the manufacture and use of the children's playthings. Many of today's toys are electronically operated. A little expensive they may be, but most middle-class parents now-a-days are capable of buying their children a few such sophisticated modern

Now using the highly sophisticated and electronically operated dolls and toys in their infancy, and seeing their mothers using such wonderful gadgets as the grinders of spice and the heater that prepares the food within a very short time, the children begin to fall in love of science and technology from their infancy and their fascination for them grow proportionately or more with their growth in age. The motivation of the present generation of secondary and higher secondary students today is thus the outcome of their mothers' vehement influence upon them exercised in their infancy and childhood. Many young people, the students to be more precise, who were made contact with by the present researcher during his collection of random data admitted to their having been influenced the most in their childhood by their mothers, whatever big or little their education and capabilities might be.

### **The Schema**

The schema, the prior knowledge and idea of the children about anything, is also an effective determiner of the students' motivation in favour of science and technology of the students. It is not otherwise in the case of the students of this district. The children who take admission in the primary, secondary and the higher secondary schools in this way come to their institutions with some prior knowledge or rather some motivation about the study of science subjects. The basis of their fascination for science education gets a philippic they go on learning the tit-bits of science up to the 10<sup>th</sup> standard and the Madhyamik examination after which they must take the firm decision of following their science education. Not only the best and the mediocre students of the district opt for science subjects at the time of their admission in the higher secondary schools, some of the marginal and below standard pupils also seek and get admission in science related subjects.

If they fail to get admission in science, they seek admission in vocational courses and there also we see the priority of science subjects over those of the arts commerce or any other subjects belonging to the social sciences. It was seen during the collection of random data by the present researcher that thousands of the Madhyamik drop-outs are pursuing vocational education in different semi government, non-government and privately operated concerns under the auspices of the open universities or otherwise. Such institutions being run by Netaji Subhas Open University in different parts of the district, for example at Panskura, may serve as an example and specimen. A considerable number of students, both male and female, are now undergoing such vocational courses and quite a few of them have qualified for school (high) teachership qualifying in the last SSC (School Service Commission) Examination. When asked almost all of them expressed their satisfaction for having pursued the science related vocational education leaving aside any other course of studies that were also open in front of them at the time of taking decision to follow science or non-science related subjects of further education.

### **Science as Saviour**

It is fact supported by evidence that many of successful candidates of the state's SSC Examination are from these vocational streams imparted in vocational study centres under Netaji Open University across the district. This science-related studies have proved as boon to a considerable marginal poor students of the district of Purba Medinipur. "If it were not this opportunity, our career would run into rough weather," asserted a girl who has comfortably qualified for the last year's SSC Exam. The environment exercises a tremendous influence upon the growth of the child-mind. As soon as it opens its eyes and learns to identify the different sights and sounds of the earth, it immediately begins to react to them. The cognitive faculty of the child may vary depending upon the merit or demerit its cognitive process just after being born and opening its eyes and starting its audio-visual process of learning. This acquisition of knowledge is unconscious and the baby does not have to exercise much energy and intelligence to acquire the knowledge thus learnt. If the child is born in the family of a nomadic community moving from place to place in search of food and habitation, the boy or the girl learns the process of how its parents procure food for themselves or arrange for their rest at night. The baby unconsciously learns how to live fighting against the fury of nature: the storm or the earthquake. Living under the sun or the rain and constantly moving from place to place the children with their parents also learn the various tools, machines and other modern gadgets used by members of the upper class rich society. The nomads may be

illiterate, they may not have learnt the essence of human inventions in the fields of science and technology, but they are not at all bereft of human faculty. They more often than not supplant their lack of bookish knowledge with the one they gather from the world of nature.

During the dry seasons from December to May many tribal clans are seen to put up their tents at various vacant places of the district. They know that natural calamities may occur at any time, and they may be caught unawares by the fury of nature. So, they take precautionary measures beforehand. In most cases they put up their tents near railway stations, high roads, on college grounds, etc. And the tents of these nomads are now visited regularly by scholars of Midnapore College, Mahishdal Raj College, Mahishdal Girls' College and even some of the reputed colleges of Kolkata and some even from Europe and beyond the oceans. A few very scholarly researchers whom the present researcher had the opportunity to talk to and exchange views with were all emphatic in their praise of these backward Indian tribes whose lifestyle may supply many food for thought of the highly advanced masters of science and technology of world.

Science and technology have now penetrated to every remote corner of the day to day life of the people of all classes in the district and there do not seem to be any aspect of human life free from it. When the whole society is thus in the grip of the all-round development of the fast advancement of science, its impact is sure to fall on all citizens including the students. The students, in the capacity of their being inquisitive for truth and their interest in everything, are sure to pick up their attitude from the environment which in this district is highly surcharged with the spirit of science.

Purba Medinipur, in its capacity of being in the forefront of education and also in its capacity of being both an agricultural and to some extent industrial belt, is thus a rich field of any kind of research, particularly in such subjects as are directly or indirectly related with the all-round development of the whole human race. Science or technology is now not only the property of any particular nation or country. Any small ripple that rises in any remote corner of this district spreads through the net its impact upon the whole gamut of the scientific and the technological world and any big discovery or invention made in any other part of the world also leaves its rich impact felt among the meritorious students and scholars of this district. When a particular human labour-saving agricultural tool like the harvester or the grinder or the insecticide sprinkler is invented in China or the life-saving medicine that will immunize humanity from cancer is invented in Cuba of the East Indies, the students of this district, like their other meritorious counterparts in other parts of the country and the world, are highly inspired.

This insemination of the information of the inventions of science and technology influences the scholars and academics of this district of Purba Medinipur it is almost certain. Now there is no dearth of educational institutions in the country and the state or the district. Many schools, colleges and universities are coming up every day. First some minor arts subjects like Bengali vernacular, English, Education, History, Political Science, Philosophy, etc., are taught in the newly opened schools, Colleges and universities, and only after a few years after the inception the schools or colleges the organizers are up and doing to upgrade their institution with the opening of science subjects. The pressure upon the schools and colleges is such vehement now and more and more non-government and private institutions are being established. In the last few years many such private schools and colleges have been established at the instance of persons interested in education and in these cases also the founders of the institutions are in favour of imparting science and technological subjects to their students. So, teachers of science subjects are also in much demand. The marginal students who neither can crack the Joint-Entrance or the NEET or any other Para-technical courses including the Para-medical and polytechnic courses, take up any science subject that are available to them, Physics, or chemistry, or botany, or anthropology, physiology or any stream that come handy to them. During his random collection of research data for the last few years, the present researcher did not come across many such people who said they studied philosophy or history or political science because of their sheer love of the subjects.

Whether this inference is cogent or not that is another matter, but one thing is doubtlessly true and it is that the overall general tendency of the students of the district is tilted towards the study of science. This inference is free from any partiality in favour for the urban areas of the district over its rural areas and it does not depend or vary from to man or caste to caste or any social consideration that makes one person different from others.

### **Science in the Service of the Unemployed**

As in the other parts of the state and the country, a large section of the young generation of the district constitute the mass of the unemployed people. The collection of data of the present researcher has shown that the unemployed young people are mostly those who studied subjects not belonging to science or technology. A

student with some science background is sure to make mark in any field of employment. Some will become doctors and engineers, others will study at the IITs and there are still others who will follow any other stream of education that has relation, in greater or less degree, with science and technology. Only those with unscientific background studying the arts or the commerce subjects will either end up being school teachers or will be lost in the wilderness of acute unemployment. And the students of the district are intelligent enough not to fall into the bottom of job opportunity in these day of cut-throat competition world-wide.

The present researcher talked to all types of unemployed people of the district cutting across all lines of caste, creed and social classes. There were among the interviewees both boys and girls as there were people from all the majority and minority communities of the humanity. The brilliant students of the affluent sections of the society are no doubt the admirers of science education, for having close connection with the outside world they know the value and status of science in the march of human civilization, but even the petty artisans and some Muslim women who procure their livelihood by doing menial job of domestic hands in many houses, want their children to study science subjects in their schools and colleges.

For last 5/6 years the present Ph.D. aspirant have contacted and talked to guardians of Madhyamik and higher Secondary examinations in various parts of the district, particularly during the Madhyamik and the HS Examinations of the West Bengal Board of secondary Education and the CBSE and ICSE central boards, and the average outcome of his enquiry is more or goes like the following:-people from all walks of life.

On each day of the Madhyamik and the H.S. Examination many guardians of the examinees are available near the centres where their children are giving the exam. The guardians pass the time in the nearby tea-stalls or the verandah or at any place that they find suitable for passing the time. There are the fathers and mothers and also there are some siblings of the examinees busy writing their paper in the halls of exam. There are people from all walks of life. Farmers, govt. servants, doctors, engineers, businessmen and many are the people with their many occupations. When asked what course of studies they would like their children to pursue after exam most of them, about 72%, expressed their opinion in favour of their wards studying science subjects. Almost all of them said that their children will start learning science subjects like Physics, chemistry and biology from the leading home tutors or the leading coaching centres available in their locality. Only a handful of such parents revealed their opinions in favour of English because, in their opinion, English is a must in the studies of science subjects. It was almost the same during the H.S. Examinations that are held just after the said Madhyamik Examination.

The present Ph.D. aspirant changed his venue of the data collection every day. The Exam centres that were visited were both in the urban and the rural areas. Such centres were in the towns of Tamluk, Contai, Haldia and Mahishdal as they were also in the rural pockets of the Nandigram, Bhagwanpur, Moyna or the Ramnagar, Panskura Blocks.

The results of the major examinations of the different boards, councils and other academic examinations are generally published in the months of April, May and June and the break up of the results bring many thing to the fore. It may not be of great importance to the boards and councils and the students themselves, but results are certainly some indexes of the over-all attitude and tendency of the students towards any particular subject or any particular stream of education. It is sometimes seen that the students of the science stream have done better results than those of the arts and commerce streams. And sometimes it is also seen that arts students are ahead of those in the science stream. If in a particular age, decade or century it is seen that science students are doing better than their counterparts in the arts or commerce group, a safe decision may easily be done that humanity has tilted towards the study and use of science. We now belong to that particular age of science when science and technology are preferred to any other subjects of the non-science and non-technical subjects.

The results of the ICSE Board that was published recently showed that a girl, Koushiki Dasgupta Choudhury had stood first in the examination with 99.50% marks. All the electronic and print media of the state and the nation published the success story of this Bengal girl in their publications. Her percentage of marks obtained in the different subjects also shows the triumph of science over arts and commerce. Koushiki has secured 1000% in all the science subjects though it is not the case in the arts subjects including the language ones.

This same trend, the preference of science subjects to the non-science ones is seen in most of the recent years, when the students of this state have done better in the exams. Koushiki Dasgupta Choudhury did not hail from the city of Kolkata. She was from the North 24-Parganas district, not the Purba Medinipur District. There may be much difference between the mentality and attitude between the students and the general people, the

culture of the district to be more precise, but there are also much similarity in their mindset. Both the districts are parts of the rural Bengal and both of them are both agricultural and industrial districts. North 24-Parganas are nearer to Kolkata than the North 24-Parganas District. Being nearer to the state capital and the former capital of the country during the British Raj, the two 24-Parganas have enjoyed better connections with the changing attitude of the outside world. Purba Medinipur, though neither very far nor very near, has shown more in this regard.

Many English Medium secondary and higher secondary schools have recently come up in the sprawling 25 blocks of the district. The students who read in these schools are mostly the residents of this district of Purba Medinipur. Their guardians, and sometimes they themselves know that English in their window to the world of science and technology. So, they take admission in these English Medium schools for their entry into the greater world of science and technology. Such English Medium institutions affiliated to the CBSE and ICSE boards have been laying emphasis on the teaching and learning of science subjects. The present researcher has talked to many guardians and the students and also the teachers and the members of the management of these schools and the essence of the interviews are clear signs of the people's emphasis on science and technological subjects and not on the other subjects of the social science and those of the languages.

The making of the plans and the projects and building of the outline of a project is perhaps the most important thing in any matter of a life-time implication. First, the outline of the future action is well-made and then it is executed piecemeal over the years, even the whole life. The students of the Purba Medinipur District make this plan and project in time, early in the childhood, and once the target is fixed, there is no moving away from it. The students doggedly run after this goal and are not daunted by any petty obstacles that may appear in their way from time to time. This is perhaps the most special feature of the scholars of this district.

Man's curiosity about the sky and the space as also the depth of the sea and the ocean is as old as his origin in this planet. It is part of his thirst for knowledge in every field of the universe. It is this curiosity about everything that has resulted in the inventions of science made down the ages. Human civilization is the sum total of all the inventions made by our intellectual forefathers who were goaded by the mysteries of the universe that have an eternal and perennial beacon for our scientists. Alongside the intellectual people all over the world and the ones in our country, the scholars of the Purba Medinipur district is always in the frontline of the inventions and the advancement of the humanity, and the contribution of the scholars of the district is not to be underestimated while calculating the whole achievement made in the world of science and technology. Of the achievements in the sphere of science and technology some are very excellent as there are some that are not that spectacular, and some even of almost of no value. But the scholars and the students of this district are always in close touch with the people who are in the frontline of the advancement of science and technology throughout the world. When one Kalpana Chawla or another Sunita Williams make a high mark in the field of space travel and space research, the matter does not go unnoticed by the clever students and scholars of the state. It is evident now that many students of the district have joined the reputed science research laboratories of the NASA and the ISRO and, when contacted for comment, most of them acknowledged the contribution of their families and the general atmosphere of the state and the district behind the building of their attitude in favour of their favourite subjects of science and technology early in their childhood when they were in secondary and higher secondary schools.

The present researcher once, during his collection of data across the district, met a person whose disclosure was something very astonishing for an admirer of the subjects of science and technology. That he was motivated from his early boyhood by his fascination or computer science was not known to his family members of which do white colour jobs in different govt. offices and schools and colleges. His parents and his well-wishers had all expected him to be a doctor. He also cracked the Joint entranced examination both in its state and the central categories, but he declined to study medicine. It is a fact that the profession of the doctor is a very lucrative occupation judging from the other fields of the studies. A few years ago, it was also the engineering trade that deemed to be an alluring profession, but now-a-days the demand of engineers has suffered a little decline, and parents are now opting for such jobs and such education that will fetch an instant income. Seen from these standpoint of income and livelihood, the professions of medical science and engineering are the best professions of all. But the young man who had cracked both the medicine and the engineering branches and had also been successful in the all India IIT exam., never heeded to the implorations of his parents and the elder siblings and studied Computer Science NIIT, Durgapur, West Bengal, in which he

made a roaring success and is at present an architect working for a very big multinational concern based in Bengaluru.

Such is the motivating level of the students of the secondary and the higher secondary levels of this district of Purba Medinipur. The children are motivated in their childhood inspired as they are by the factors of both heredity and environment. Such may also be the fact with the people of other districts of the state and the country, still, the grit and the tenacity that is found in the students of this district in the matter of their choice of science subjects is very remarkable and spectacular. Purba Medinipur is the only district in the state and the country where the cultivation of science and technology is the most and many people, the science minded ones to be particular, whole-heartedly believe that in the near future this district of Purba Medinipur will provide the maximum number of science enthusiasts to the country.

Everything has its time. It is a fact that time constantly moves on in its own sweet will and we humans use it in our own personal way depending on our need and mood. Still, the importance of some particular moments in the mass of never-ending and ever-flowing time cannot be totally gainsaid. There are a few things which can easily be done and with the minimum efforts while those very things need much more efforts at other times. That's why our learned authorities in every field of work or administration make a schedule of human activities fixing some auspicious moments of performing great deeds. There is no denying the fact that all the months of the year and all the days of the month are almost no different except in their duration and temperature lever, still some months are given more importance than the others, and some days are also of more significance than the others. January is important as the opening month of the year and Monday, in the same way, enjoys the privilege of being able to open the week. The month of April is considered the first month of the financial year and, as such, July is acknowledged as the opening month of the academic year, at least in the colleges and universities, in higher education. The present researcher has been much benefited by the data which he collected at the end of the academic and financial years and the academic ones as also at their beginnings.

The results of the different boards and councils and some of the universities that have the distance education mode in them are generally published in the month of May. There was no exception to this rule of the publication of the board, council and some of the university's results in the month of May, 2018. When the results of the West Bengal Joint Entrance Examination (WBJEE) were out, the whole nation saw her utter astonishment that ten students from Kolkata had topped the merit list and the most of these students were from the district of Purba Medinipur.

Now this Purba Medinipur District provides the greatest number of students to the medical and engineering colleges of the country. When asked about their future course studies, more than 50% of the qualifying students of WBJEE said that their first preference was IIT and thereafter they would think of joining any other course, medical or engineering. It was not otherwise in the results of the Madhyamik Examination of the West Bengal Board of Secondary Education and the H.S. Examination under the West Bengal Higher Secondary Council. Everywhere the triumph of science students was to be prominently noticed.

Now that such an environment for the teaching and learning of science and technology prevails in the whole country, state and the district, the young generation of students of the District of Medinipur will not lag behind. They are sure to be biased in favour of science and technical education, which, they think, is the only means of survival in the highly competitive market and is involved with the question of their life and livelihood. Avinandan Bose of Kolkata's South Point school, when interviewed, were all praise of the science stream of education, without, which, he admitted, there no way open to other nations in the neck-break competition and make quick progress working within the country or abroad. It was almost the same opinion of the other nine brave-hearts of West Bengal who confessed their right choice of studying science though they were no inferior in other subjects of the humanities and commerce streams. The qualifiers of the WBJEE and their siblings and parents as also the neighbours seemed to be over-charged with the spirit of science following the publication of these major exams of the sate: Madhyamik, H.S. and the WBJEE. The minor students of this district, at such juncture of time, seem also to fix their target at this time of the year when the results of most of the major exams are published and their elders run in an hectic manner for admission in colleges mostly the IITs, and the medical and the engineering colleges that teach science and technology.

A right decision taken at the right time and at the proper age is sure to have a tremendous positive effect in the life of a person ant that of a nation. The students of Purba Medinipur who are studying science and by their choice motivating others of their younger generation today will leave a far-reaching effect in the agriculture, industry and economy of the state and the country and will, by their general contribution to the progress of the

humanity as whole, will indirectly control the fate of humanity on the planet. Many of them will soon be working as scientists, doctors, engineers, architects, pharmacists and other mechanics in their respective fields. It is also true that all of their labour will not bring a roaring success and all of them will not change the shape of the world at once, but their little successes, major or minor, will certainly enrich the general treasure of the already rich treasure-trove of the human races

It is here noteworthy to record the fact that the NCTE (National Council of Teacher Education) has recently resolved to introduce a four-year integrated bachelor degree course in order to bring motion and relevance to the undergraduate course of education. In this course also there will be a greater weight age given to the teaching and learning of science and technology education. The education of the country and the world is moving into that direction of state of

The whole world right now stands highly digitalized. This digitalization, though it is not free from some unseemly side-effects, is a boon of modern science that is capable of turning the world overnight. Digitalization has many advantages. The good effects of the e-governance and the digitalization of almost every walk of life have made our life easy and lessened much of human labour. Now much workforce is needed to run the nation. Until a few years ago or election process, an important pillar of our democracy, was a highly cumbersome process requiring much paper-work needing many more officers. The counting of the votes were also a long-drawn and tedious affair. All the ballots, and lakhs and sometimes crores of them had to be counted manually over a long period of time. Then there was the possibility of human error involved in it. Now the matter of the universal franchise and the counting of votes are all done by some light and handy electronic voting machines (EVM). Those who operate these EVMs and are aware about their benefits must be vocal at home and other social gatherings about the benefits of science and technology. From their encomium many more people including their children and others must be motivated to take up science and technology as their future course of studies. So, the juggernaut of science and technology goes on at higher and still higher speed with the passage of time.

### **Block-Wise Patronage of Science and Technology.**

The Industrial Revolution that took place during the reign of England under Queen Victoria, seemed to move the very base and foundation of the august mansion of science and technology throughout the world. And the wave of this English Industrial Revolution spread far and wide to reach the farthest nook and corner of the world including those large and small dominions that were the English colonies at that time. The waves of the inventions in the fields of science and technology moved in a faster speed in the waterways for the roadways were not that developed at that time and the airways were not heard of, though they were spreading their wings in some countries of Europe.

### **Tamluk**

Tamluk, which is the administrative hub of the district, along with the other leading districts and the states and even the whole nation in many matters, political or otherwise, also serves as a leading light to the students, scholars and those who think about the future of the inhabitants of the district. Now, this Tamluk town, and it is not unknown to the people of the country, is a town of ancient culture, which shot into media headlines for being the hotbed of national politics during the British Raj. It is here that the first rebellion against the British colonizers was made vocal by the brave-hearts of the district. The matter is that the soul of the whole district was roused by our dear leaders' call of independence and most of the respondents of this countrywide freedom call was students, then reading in the upper secondary and higher secondary schools of the district. Education was not very widespread at that time.

Tamluk and Contai had only the two colleges towards the close of the British Raj, and the few students who were enrolled in these few seats of education and culture were mostly science students coming from the educated aristocratic royal or middle-class families of these two blocks along with Nandakumar and Mahishadal. This Tamluk is still now the hotbed of science and technology as it is the home to thousands of scholars who are either engaged in different professions dealing with the various benefits of science and technology or are future fans of these two popular subjects, in the making. This Tamluk town has some advantage so far as the origin and expansion of Indian culture in the eastern India. It is situated on the western bank of the river the Rupnarayana, which, from the ancient times has been the lifeline and in important means of communication with the prosperous countries of the west from time immemorial in general but during the peak years of the British Raj in particular. England during the most part of the Eighteenth, nineteenth and the

first half of the 20<sup>th</sup> century was the most prosperous country in the world, although the same rank of prestige has now gone to the United States of America. During the Victorian age and just before and after it, England made a tremendous progress in the field of science.

Any scholar of history not excluding the science and technology enthusiasts will believe that, the fruits of the inventions of science and technology made in the western countries of Europe and America reached at one time on the banks of this river touching the Tamluk town, travelling long though the labyrinthine routes of the Atlantic, the Pacific and the Indian oceans.

Tamluk town had the advantage because it could enjoy an easy rapport with the scientifically and technologically developed nations of the west. That's why the present researcher laid the greatest emphasis on the ever-growing culture the science and technology in the district rather than its other counterparts. During the collection of data of the present research very amazing facts have come out that no other researchers have so far come near in the past and the present, and those of the future will be inspired by the singular contribution of the district in the over-all development of science and technology through-out the world and down the ages cutting across the limits of history and geography. .

### Sutahata

The advantages and benefit of Bio metric machine regarding maintenance of attendance of the employees and the officers are **immense** and far better and more scientific than the manual system of keeping. Attendance Registers where the employees and the officers had to put their signature mentioning arrival and departure but this system is faulty and not without corruption Bio metric machine is a **wonderful** contribution of modern science.

Most of the people living in the south and south eastern part of the district of Purba Medinipur are either fisherman or farmers though many of them are educated and have graduate and post graduate degrees but they have to maintain their livelihood either by **fishing** in the deep sea at cost of their life or by cultivation.

### Haldia

The 2 (two) blocks of Tamluk and Haldia of the district are an index of the development of industry, the upshot of science, in the Purba medinipur District. Haldia is famous in the industrial map not the district and state alone, but for its geographical location and its commercial importance, it is famous in the whole of the Asian continent. The name Haldia port is well known in the industrial circle of Europe and the USA, the two industrially developed continents of the world. Coal, natural gas and other minerals would not find such a wide market in the world if there were no such ports as Haldia in India. We may also take the Kolaghat Thermal Plant off Mecheda station of the district. This thermal plant provides electric power to the local industries of the region. This thermal power plant has thus contributed greatly to the development of the region.

The Thermal Power Plant and the Haldia Petro Chemical Complex not only cause improvement in the progress of the district, they also generate a kind of enthusiasm among the students of the schools (Primary, secondary & Higher Secondary) of the region. Students know that these two industrial hubs need colossal manpower that will come up from the student community of the district or the adjoining districts or state or the companies will be forced to import the said man-power from abroad which will not be very pleasant for the economy of the developing country. Much money, in that case, will be drained out of the land. Now that a great portion of the district's and the state's and also the country's talent is going abroad in spite of the manpower deficit in the land itself, the country cannot afford to allow the brain-drain any more. In view of the lure of rich job opportunities near at hand; the young generation has leaned towards the study of science and technology with a renewed vigour.

The present researcher has made a thorough study of almost all the pockets of the district: urban and rural. Everywhere the craze for reading science has been noticed. The picture is almost the same in the urban blocks of Haldia and Tamluk and the semi-urban blocks of Panskura and Kolaghat and the remote and backward areas of far away Ramnager, Khejuri, Patashpur and the agricultural blocks of Nandigram, Bhagwanpur and the two Nandigram Blocks (I & II). The doctors, nurses, paramedical staff of the aelopathic, homeopathic and ayurvedic colleges have been consulted and they have all expressed their opinion in favour of the study of science. The medical practioners admit that the students who are admitted in the different hospitals and nursing homes of the district with any ailments are seen to be such students who study science subjects in the various schools, colleges, and universities of Vidyasagar and Calcutta Universities which are on the districts western and eastern side respective.

### **Moyna Block**

Moyna Block is solely dependent on agriculture where the sole crop is paddy, the students are very avid and they are also much ahead in expertise and results which they perform in the 15 colleges of the district which are affiliated to Vidyasagar University. The students of this Moyna District may be seen scattered all over the state and the country and even the far east and the west where they are spreading the merits of science in alien lands as opportunities were not available to them in the past, though it is now available in the wake of the country's low-key industrial revolution. Only a few years ago the soil of the block would be tilled by manually operated plough drawn by cattle, but now the same fertile land is cultivated by power tillers and tractors and these inventions of science have expedited the economic growth of the block. The students, the children of the agricultural families know the worth and contribution of science to the economic growth of their parents and naturally they become motivated to take up science and technology as their future course of study.

It is a fact that the district is situated on the coastal areas and that there are much water bodies within and without the district. People, the fishermen, till the other day, used country manually operated boats to cross the rivers, the Rupnarayana or the Hooghly or to catch fish in those rivers and the nearby Bay of Bengal. But they now use mechanically operated boats and trawlers. The recent spurt in the fishing of Digha and Shankarpur is the result of the fast improvement of science, and the students of this district admittedly are eager to contribute their share in the district's development and they can do it by first acquiring the relevant knowledge in these fields of fishing or pisciculture.

Thorough study was also made in the economics status of the minority population of the district. The statistics of the students appearing at the secondary and higher secondary exams show that now-a-days there are many Muslim students who are reading science subjects. Girls are also not backward in the respect. The 1000 odd girls who were interviewed after the publication of the secondary and Higher Secondary results some 6 hundred and 13 girl students were found to be such girls who hail from economically backward Muslim communities as weavers and fishermen.

In view of the added acumen of the students of the district the present researcher was attracted to this district and not others of its near or far counterparts. This Purba Medinipur District is neither very urban nor also very culturally rural for there are very cultured towns like Tamluk, Contai and Haldia as there are also very rural areas like those of its south-western corner of Ramnagar, Egra and Khejuri blocks. Not only that, there are also very undeveloped rural areas near these developed towns of Tamluk, Contai and Haldia blocks. The students who read in the schools and colleges of the district, when asked about their choice of subjects of education, mostly came out with the reply that science and technical subjects invariably have some edges over the other subjects of studies including the arts, commerce and vocational streams of studies. The positive trend to science and technology was affirmed by some detailed discussion with the students of Tamralipta Mahavidyalaya, Tamluk; Contai Prabhat Kumar College, Contai and the Haldia Government College, Haldia.

### **Tamralipta Mahavidyalaya**

Tamralipta Mahavidyalaya is the oldest degree college of the undivided Midnapore District. Being nearer to Calcutta, the capital of India during the British Raj, Tamluk enjoyed some advantages over other educational institutions of the district and states. Many of this Tamralipta College's pass-outs are now serving in higher posts in the administration of the state and the county and quite a large number of them are also serving as eminent doctors, engineers and other technical hands in the countries abroad. The present researcher had the opportunity to talk to some of them and all these people holding higher posts in the administration and laboratories within the country and abroad have admitted that they could not rise to those eminent heights if they were to study other subjects than science and technology. The opinions of these academics were sought because they were also at one time students who had to take their timely decisions at two very vital points of their academic career; (i) first after passing the Madhyamik Examination and again (ii) after passing the Higher Secondary exam.

The people who were thus interviewed came from almost all strata of the society. There were people whose parents were extremely poor. There were also people coming from the middle class background. Only a few of them were found to have come from the rich and the solvent families. Some of the persons interviewed had not much difficulty in choosing their subjects of study (scientific or technological subjects) for they had people in the family who played decisive roles in the fixation of their choice of streams of their pursuit of education. Their family had also not much difficulty in providing the cost of their science education. But the case of the students belonging to the middle class and poor families had a tough time in making the decision. In most cases

the choices were their own and at times they did not know if at all they would be able to complete their studies which they had chosen taking greater the risks in their own hands. It is also a fact that some of these respondents could not complete their science or technical education and had to either change the course midway or were forced to take up other menial jobs for survival. But the respondent from both the sides of successful academics, doctors and engineers and the drop-outs all admitted that science subjects were their first preference and it was their firm belief that if at all students are to sign in life in a financially developing but technically backward country like India they must follow science and technical subjects taking the risk of financial and other problems whatsoever.

A large number of the people of the district belong to the minority communities. An authentic statistics has been calculated after detailed consultations with the students of this district belonging to the Muslims who come first in the series of minority population and a few of the other minority communities: the Buddhists, te Jains, and Anglo-Indians, but the few students of these sections of the people who were available for interviews expressed their likeness in favour of science and technical subjects. Some 10/11 families were visited where the students have either signed as bright students or are serving in higher posts in different fields. The facts that were available during the interviews sometimes with the students and academics themselves and at other times with their parents and siblings were all pointer to the fact that science and technology related subjects are far ahead of other arts, commerce or vocational streams so far as the matter of livelihood and job-satisfaction is concerned.

It was a great pleasure to be able to conduct the research work on such an important topic of the preference and spread of science and science related subjects and that in a district which has recorded its credit as the most advanced district in the state in education and academic activities. Its geographical location, its transport facilities, that is, its communication advantages with the state capital through the National Highway No, 41, its political involvement during the Independence movement of the country and its fast developing port a Haldia along with the growing popularity of Digha as a sea resort, etc. Through Haldia port the district is connected with the major sea-routes of the world and through National Highway No. 41 it is well connected with the other parts of the world. It was seen that with the Calcutta port gradually losing its importance, Haldia on the other hand became more and more important and the impact of the development all over the world oozed into the country through this district, particularly through the Haldia industrial town.

Some very wonderful characteristic features of the students of this district and they were also found to be fascinating. The student community of this district is constituted of children coming from different walks of life. The 25 blocks of this district under the four sub-divisions of Tamluk, Haldia, Contai and Egra are a home to people belonging to various religious groups of the Hindus, Muslims, Christians Jain and Parsees. Though Hindus constitute the major part of the population of the district, there are also Muslims who equally enjoy the educational facilities available in the government, government-aided, private and other religious educational institutions. Many of the students of all these communities are equal in every respect but only the economic factor, etc, made the probe very interesting and thoroughly enjoyable. It is a common knowledge that religion puts no hurdle in the way of education. It has been seen that the few students who read in the schools: particularly, the secondary and higher secondary schools are properly aware of the high benefits of science-education and the spread and progress of the science and technology in the outside world.

Many poor guardians were also found to be eager to see their wards reading the science stream. A large number of students: teachers, both of secondary and higher secondary schools, medical and engineering colleges and other vocational streams are from the Muslim community. Some people from the Sikh, Jain and Parsee communities were also approached and they responded to the queries put to them with due gusto and their responses were mostly in favour of science education. A few elderly people were so much emphatic in their praise of science subject in comparison to other streams of studies that they cited many wonderful inventions made by the scientists of this country down the ages. It was a very nice experience to hear from the people in the remote areas of the rich past of this these areas with their parents at home and the elderly people in the villages are engaged in various professions of agriculture, fishing, pisciculture, floriculture, etc, and the members of the majority community and the masons, hawkers, embroiderers, richshaw-pullers, toto, bus, truck and lorry drivers, etc.

### **Mahishadal, Contai and Bhawanpur ( I & II )**

A comparative study of the outlook of the students of three important blocks of the district: Mahishadal, Contai and Bhawanpur (I & II) may be taken into account to ascertain the rate of difference in the attitude to science of

the students of the district making a contrast between the urban and rural students. Mahishadal block is flanked by the two towns of Tamluk in the north-west and Haldia in the south. But it is the district, which, like Contai, is far ahead in the estimation of the people of other blocks in the districts because it has made very quick progress in the last few years. Mahishadal had a great role to play during the country's struggle for independence and Contai is recognized as the most educated block of the district. The students reading in the colleges of these two blocks are constituted of those students coming to study mostly from affluent middle class section of the society. Many of them study science subjects, but the few students coming from poor families are also almost at par with them. In some cases students from very poor and illiterate families have shown remarkably in science subjects afterwards becoming eminent doctors, engineers and scientists and they are at present serving the nation and foreign countries in various capacities.

The Bhagwanpur (I & II) block of the district has made tremendous economic progress in the recent times. Side by side with agriculture and small business many people of the block have taken up the hair trade as their main occupation. The small-scale industry called the hair trade is the major livelihood of many families of the block at present. And those who do the brisk business dealing with human hair are from the Muslim community. They gather abandoned human hair from the people of the villages and they process the hair so collected with some small machines. Now these machines and these small factories are no different from the inventions of science and technology used during the Industrial Revolution in Victorian England that made England the most affluent industrial country in the world. The students of the urban towns of Contai and Mahishdal in most cases lag far behind the students of Khejuri and Ramnagar blocks where people see less fruits of science being used expect the minor agricultural apparatus of power tiller and the insecticide sprayer.

### **Contribution of Science**

Science plays an important role in the continuous progress of civilization. The more a country is enriched with the blessings of science the more the country is advanced in civilization; science is at the root of education which cannot be perfect and complete without science. All branches of education are indebted to science, science is the maker of engineers, doctors, writers, mathematicians, intellectual, academicians, environmentalists, astronomers and with not. Without high quality of science education Modern civilization depends totally on science common people must have the knowledge of science without which normal daily life cannot be led. Science removes all sorts of conservations and superstitious concepts and broadens and enlightens our outlook. Development in agriculture, industry, trade and commerce fully depends on science. Even fine arts, music, dance and all other cultural activities greatly owe to science contributions of science in Medical science are immense, recovery from mortal diseases is possible for science.

Attitudes both of human beings and all other animals are influenced by environment, attitudes are acquired. Through the experience of association with our fellow beings. The environment in which human beings or other animals are born and brought up influences their attitude. None can escape the influence of environment. Children usually imitate the attitudes of their parents and others members of the family and the society. An attitude is what one thinks, feels, does, interacts, behaves, speak and reacts. Attitudes are one's mode of dealings with others and one's conduct, behaviors, temperament power of forbearance all of which are the outcome of one's environment and association with the company one mixes. Attitude is a psychological condition of one's readiness. Attitudes always vary and they may be positive, negative, mild moderate and strong.

Secondary students of science group are motivated by science study for developing well defined abilities in cognitive, affective and psychomotor domain, study of science increases curiosity, enquiry, creativity and objectivity. Attitudes are acquired by association with various types of people and environment.

### **The Dynamism of Science & Technology**

Science and technology are the most dynamic subjects of study and this simple idea is perhaps the best imbibed by the secondary and higher secondary students of the Purba Medinipur District of West Bengal. With the rest of the humanity and with the all round development taking place in the world, this district of Purba Midnapur, before partition and even before that, must have been as undeveloped or under-developed in the past recent or far. The progress that has taken place over the years is not the result of a day's or a month's or a century's output. The process in the field's science and technology with the advancement of civilization around the world is a normal matter. But the pace of development is different. It is a fact that Purba Medinipur today is not an industrially very developed district in the state or the country, but the attitude of the students of this district

towards science and technology is perhaps the most positive and the people are head in all matters of scientific development.

The students of the secondary and higher secondary schools of this district are habitually eager to study science subjects. It was found during the collection of data that even small children studying in the primary and elementary levels are aware of the benefits of science, and they become mentally prepared to take up science in their higher classes. It being an agricultural district, a large section of the students reading in the schools are from such houses that are completely dependent on agriculture for their livelihood. The children on holidays and on other school days in the morning and afternoon assist their parents in farm works. When they work with their elders in the fields, they see that the soil of the district is very rich and fertile and it is suitable for any crops. But the old and the primitive appliances of farming are being used by the farmers, their parents and elders. If modern technology is used in the farming, the output is sure to increase. This high idea is always there in the minds of the young generation of today and depending on this popular zeal the district is making fast forward steps ahead in every field of human development.

It may be seen that the young people who are engaged in different fields of work and occupations are great fans of science subjects. And in whatever field they work, they show tell-tale signs of their higher bend of mind and richer quality of thinking. Now all this is an index of one thing: the environment of the whole district is highly charged with the spirit of scientific fervour and it is now difficult to be different and think or work otherwise taking the mind away from science and technology. The present researcher became aware of the demand of science and technology as the subjects of studies among the school students and was astonished to see that the environment of a region may also play an important role in the all-round development in the field of education and economy. Now that the Mahatma Gandhi University is going to be established at Mahishadal, the demand of the students for the studies of science and technology will be known better. There is likely to be a greater emphasis on the study of science rather than on other branches of learning.

A university of its own was a long-standing demand of the district, and now that the demand has been fulfilled, the district is all set to make faster progress in the twin departments of science and technology. There would be an inward flow of talents from outside the district and the state into the country and the export of scientifically rich brains of the district would be checked to a large extent, for the young science and technology experts will either remain here to work in the university or study in it. Thus the whole district will be very much benefited by the establishment of a university in the district. Private and public science and engineering colleges in the district and they are scattered in all its 25 blocks.

A university is no doubt a valuable asset and a prized institution in a region. The whole area may develop with its assistance. Those students who will study here will get employment in the industries of Haldia and Kolaghat or in the other units that are fast coming up in the district soon. The purpose and objective of science and technology and their practitioners to make life easy and comfortable and make the world a better place for human living. The elements of progress and improvement lie scattered in the world of nature and the soil and the geographical situation of the district are all much more fertile than the other parts of the country. No less fertile is the brain of the young generation of the district. The young people of this district are capable of doing anything and everything. From the rapid pace and the fast pace of development in the district in the recent years one thing is very clear; in near future this district will be the leading light of the state and the young people who are reading now in the schools and colleges will lead the nation towards a richer goal of prosperity.

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