

## ROLE OF ICT AND TELEVISION IN LEARNING SCIENCE

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### Abstract:

*The use of ICT in the classroom teaching-learning is very important for it provides opportunities for teachers and students to operate, store, manipulate, and retrieve information, encourage independent and active learning, and self-responsibility. **ICT is a New and emerging media for effective science learning especially reference with Television.** In this paper, the discussion is focused on the role of ICT and television as a medium of instruction for School education in India.*

*The objectives of this study is as-*

- 1. Find out the use of ICT and television as a new and emerging media for effective science learning.*
- 2. Find out the result that how to make effective use of different types of television programs in learning of science.*
- 3. To teach science subjects and improve the quality of instruction in sciences.*
- 4. To overcome the dearth of adequately qualified secondary school teachers.*
- 5. Learning science without extra resources.*
- 6. Use television as a low cost teaching material.*

*This Study was done for the secondary school students studying in Government Excellence School Shajapur, Dist-Shajapur Madhya Pradesh.*

*As result of study it concluded that use of ICT and watching TV program are intended primarily to educate learners and provide additional sources of information, support face-to-face teaching and learning. Use of ICT and Television programs provide better opportunity to develop learner's knowledge and understanding of the science. However role of ICT and television is neither fixed nor easily tangible and measurable. The role is directly related to the question of how the planners are serious and determined to use television.*

*ICT and television can help to achieve the following objectives:*

- 1. Social quality in education.*
- 2. Enhance quality in education especially in science education.*
- 3. Reduce dependency on verbal teaching and teachers.*
- 4. Provide flexibility of time and space in learning.*
- 5. Stimulates learning*
- 6. Provide mass education opportunities.*

*As far the impact of ICT and television in education should rather be studied in more narrow and specific areas in concern with learning science.*

**Key words-** ICT, television, learning science, academic achievement, classroom teaching,

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## **INTRODUCTION**

The use of ICT in the classroom teaching-learning is very important for it provides opportunities for teachers and students to operate, store, manipulate, and retrieve information, encourage independent and active learning, and self-responsibility. ICT motivate teachers and students to continue using learning outside school hours, plan and prepare lessons and design materials such as course content delivery and facilitate sharing of resources, expertise and advice. This versatile instrument has the capability not only of engaging students in instructional activities to increase their learning, but of helping them to solve complex problems to enhance their cognitive skills.

ICT can also be used to promote collaborative learning, including role playing, group problem solving activities and articulated projects. ICT allow the establishment of rich networks of interconnections and relations between individuals. In other words, ICT extend teachers and students' capabilities, and their well determined use can transform roles and rules in the classroom. The use of ICT facilitates learning, critical thinking and peer discussions.

The whole purpose of using technology in teaching is to give better value to student. ICT has the means to aid in the preparation of learners by developing cognitive skills, critical thinking skills, information access, evaluation and synthesizing skills. In addition, ICT provides fast and accurate feedback to learners.

ICT in teaching-learning process in schools include the following benefits-

1. ICT has introduced new method of learning called E-learning (Electronic learning) where students study while they are at home or work place without going to the school. This makes many workers or employees to enroll and upgrade themselves easily.
2. It has also made communication easy through the internet e.g. E-mail, chatting, Skype, teleconferencing, video conferencing, etc.
3. ICT led to easy and quick access to information which are stored in the server or remote computers. This saves the users time compared to file system which is time consuming.
4. Most respondents also agreed that ICT has reduced burden of keeping hardcopy since most of the data or files are kept in soft form.
5. ICT also exposed teachers and administrators to modern world through searching, reading and connecting with resourceful people throughout the world with the help of the internet.
6. It has made it easy for the teachers to update teaching-learning materials by reading and learning more about the latest materials which improves their work.

The use of ICT has brought remarkable changes in integration by teachers in teaching-learning process. Teachers and administrators have strong desire for the integration of ICT into science education but they encountered many barriers to it, like how to reach to masses. But the **television** is the only tools that can be used for learning science at various levels very easily.

The television has reached to remotest of villages in far-flung areas. It has been accepted and perceived as a medium of communicating socially desirable messages, as also programs of information and entertainment value.

Television entered India six decades ago on September 15, 1959 as a pilot project funded by the Ford Foundation. It started with 20 TV receivers in and around Delhi and transmitted one hour educational and developmental programs twice a week. Thirteen years later the second television centre came into existence at Bombay on October 2, 1972. Between 1972 and 1975, four more *Doordarshan Kendras*

(Television Centres) Srinagar (January 26, 1973), Calcutta (August 9, 1975), Madras (August 15, 1975) and Lucknow (November 27, 1975) were commissioned.

Educational programs constituted a part of the telecast from the very beginning of regular television service in the country. At present, supplementary educational programs are being telecast for the students at the primary, the secondary and the higher educational levels.

In this paper, the discussion is focused on television as a medium of instruction for School education in India. I shall try to analyze the role of television in learning science.

## WHAT IS ICT?

ICTs stand for information and communication technologies and are defined, for the purpose of this primer, as a **“diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information.”** These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony.

Tools and technologies that fall under the category of ICT.

No.	Information	Technologies
1	Resources	Internet- You-tube, E-books, Blogs, online forum
2	Creation	Computers, Digital Camera, Scanner, Smartphone
3	Processing	Calculator, Computer, Smartphone
4	Storage	CD, DVD, Pen drive, Microchip, Cloud
5	Display	Computer, Television, Projector, Smartphone,
6	Transmission	Internet, Teleconference, Video conferencing, Mobile technology, Radio
7	Exchange	E-mail, Cell Phone,
8	Teaching Learning	Interactive White Board, Educational Games, Television,

New and Emerging Media for Science Learning are-

- Cloud Computing
- MOOCs
- Learning Analytics
- 3D Printing
- Virtual and Remote Laboratories
- Tablet Computing
- Open Content
- Game-Based Learning
- Wearable Technology

## OBJECTIVES

The objectives of this study is as-

1. Find out the result that how to make effective use of different tools of ICT and television program in learning of science.
2. To teach science subjects and thus improve the quality of instruction in sciences.
3. To overcome the dearth of adequately qualified secondary school teachers.
4. Learning science without extra human resources.
5. Use ICT and television as a low cost teaching material.

## **PURPOSE OF THE STUDY**

The current research paper was designed to examine the "**ROLE OF ICT AND TELEVISION IN LEARNING SCIENCE**" and this study is performed in Govt. Excellence School Shajapur, Dist Shajapur of Madhya Pradesh, India.

## **HYPOTHESES OF THE STUDY**

The following two null hypotheses were developed:

1. There is no significant difference between the performance of control and experimental groups on pre-test.
2. There is no significant difference between the performance of control and experimental groups on post-test.

## **MATERIALS AND METHODOLOGY**

### **Participants-**

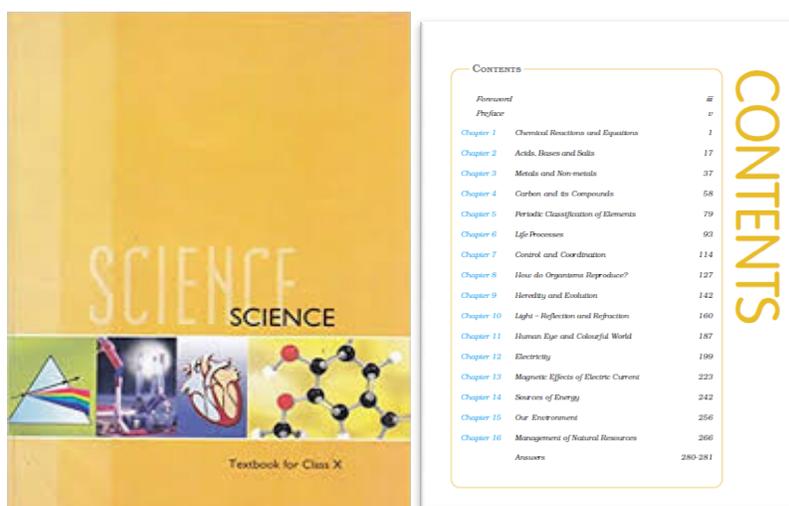
The target population of the study was the secondary school students studying in Govt. Excellence School Shajapur, Dist Shajapur Madhya Pradesh. As the study was experimental in nature therefore only hundred students of Class 10th studying in School were taken via simple random sampling for experimental treatment.

### **Delimitations of the Study-**

Due to experimental nature of the study, the study was delimited to students of 10th of Govt. Excellence School Shajapur, Dist Shajapur Madhya Pradesh. The study was further delimited to the subject of Science. NCERT Textbook and the following 3 chapters were taught during experiment:

**Table 01: Showing the three chapters of Class 10th Science**

<b>S. No.</b>	<b>Chapters</b>	<b>Content</b>	<b>Page No.</b>
01	01	Chemical reaction and Equations	01-18
02	08	How do Organism Reproduces?	140-155
03	10	Light Reflection and Refraction	176-206



### Research Design-

The study in hand was experimental type and that is why “Pre-test-Post-test Equivalent Groups Design” was considered suitable. Through this design, participants of the research study are allocated to experimental and control group using simple random sampling. Further this design is explained through group “A” and group “B”. Each group having 50-50 students who were chosen randomly.

### Research Instrumentation-

As it was an experimental study therefore I have choose pre-test post-test technique for data collection. In order to compare the academic achievement of students of both groups, two different questions papers were prepared in subject of Science for pre-test and post-test purpose. One paper was administered among the participants of both group ‘A’ and ‘B’ before treatment and the other paper was administered after the treatment. Here treatment means group “A” was taught by conventional methods and use TLMs. While the other group “B” was taught by classroom teaching along with using ICT and TV program/videos of related topics. In this way, data was collected through pre-test and post-test technique

**Table 02: List of students who participate in Pre-test and Post-test**

Group “A”				Group “B”			
No.	Name of students	Pre-test	Post-test	No.	Name of students	Pre-test	Post-test
		(MM 30)	(MM 30)			(MM 30)	(MM 30)
1	Abhishek Patidar	7	21	1	Abhay Pal	6	23
2	Amanullah	6	22	2	Ajay Jamliya	5	23
3	Ankit Sharma	6	18	3	Aman Ansari	7	24
4	Ajay Parihar	8	15	4	Aman Rajput	6	21
5	Bhawna Dabi	6	19	5	Anil Parmar	7	23
6	Bushra	5	20	6	Ankit	6	25
7	Chetan	5	24	7	Ankit Gurjar	5	26
8	Deepak Pal	6	21	8	Arjun Gurjar	6	25
9	Devendra Bual	8	21	9	Ashish Kalmodiya	5	24
10	Devendra Singh	6	19	10	Azim Khan	4	25

11	Farheen Shah	7	28	11	Balram Solonki	6	25
12	Firdosh Shah	8	23	12	Golu Banjara	8	26
13	Goutam	8	25	13	Gourav Patidar	6	25
14	Hariom	5	24	14	Gourishankar	5	23
15	Harish Jain	6	21	15	Govind Singh	7	21
16	Harshvardhan	8	23	16	Hari Dalodiya	7	24
17	Hitesh	6	24	17	Hariom	6	25
18	Kuldeep	7	24	18	Harsh Soni	7	23
19	Kuanal Makwana	7	23	19	Hemant Patidar	8	26
20	Mansih	6	21	20	Jatin Malak	6	24
21	Mohit	4	22	21	Kanha Sharma	5	23
22	Pankaj Acharya	5	23	22	Kapil Gomar	5	24
23	Pawan Kilodiya	7	23	23	Kaptain Singh	6	25
24	Rahul Raman	6	24	24	Kuldeep Malviya	6	23
25	Rahul Rajoriya	5	23	25	Makhan Malviya	6	24
26	Raj Varma	4	22	26	Mohit Sharma	7	24
27	Ravi Mewada	3	21	27	Neeraj Rathore	8	28
28	Ravindra Sharma	3	23	28	Nilesh Yadav	6	22
29	Rohit Nayak	5	22	29	Pawan Gurjar	7	24
30	Rohit Malviya	4	23	30	Prabhat Machal	7	26
31	Sandeep Malviya	6	25	31	Praveen	6	23
32	Sandeep Mourya	4	21	32	Rajkumar	3	24
33	Sapna Malviya	3	19	33	Rajpal	4	23
34	Surendra	4	18	34	Rambabu	6	25
35	Suresh Chandra	3	19	35	Ravi	7	24
36	Surya Prakash	6	21	36	Rizwan	6	24
37	Surabhi	7	22	37	Rohit Kushwah	3	23
38	Suhani	5	22	38	Sachin Goyal	4	23
39	Shubdha	4	21	39	Sanjay Kumar	6	24
40	Shivam Patidar	5	22	40	Savariya	3	24
41	Siddarth	4	21	41	Shivam	4	22
42	Tanzila	3	21	42	Shubham	7	22
43	Udeshy Badal	4	22	43	Shubham	7	25
44	Vaibhav Sharma	6	22	44	Sitaram	5	24
45	Vandna Jaat	7	19	45	Viakas	7	23
46	Vijay	6	18	46	Vinay	8	28
47	Vipin	6	22	47	Vishal	4	24
48	Yash	7	23	48	Vishnu Gurjar	7	25
49	Yaswant Barod	8	22	49	Vivek	6	23
50	Zuber Ahemad	8	21	50	Yuvraj Bhilala	5	23
	<b>Total Marks</b>	<b>283</b>	<b>1083</b>		<b>Total Marks</b>	<b>294</b>	<b>1200</b>
	<b>Average Marks</b>	<b>5.66</b>	<b>21.66</b>		<b>Average Marks</b>	<b>5.88</b>	<b>24</b>

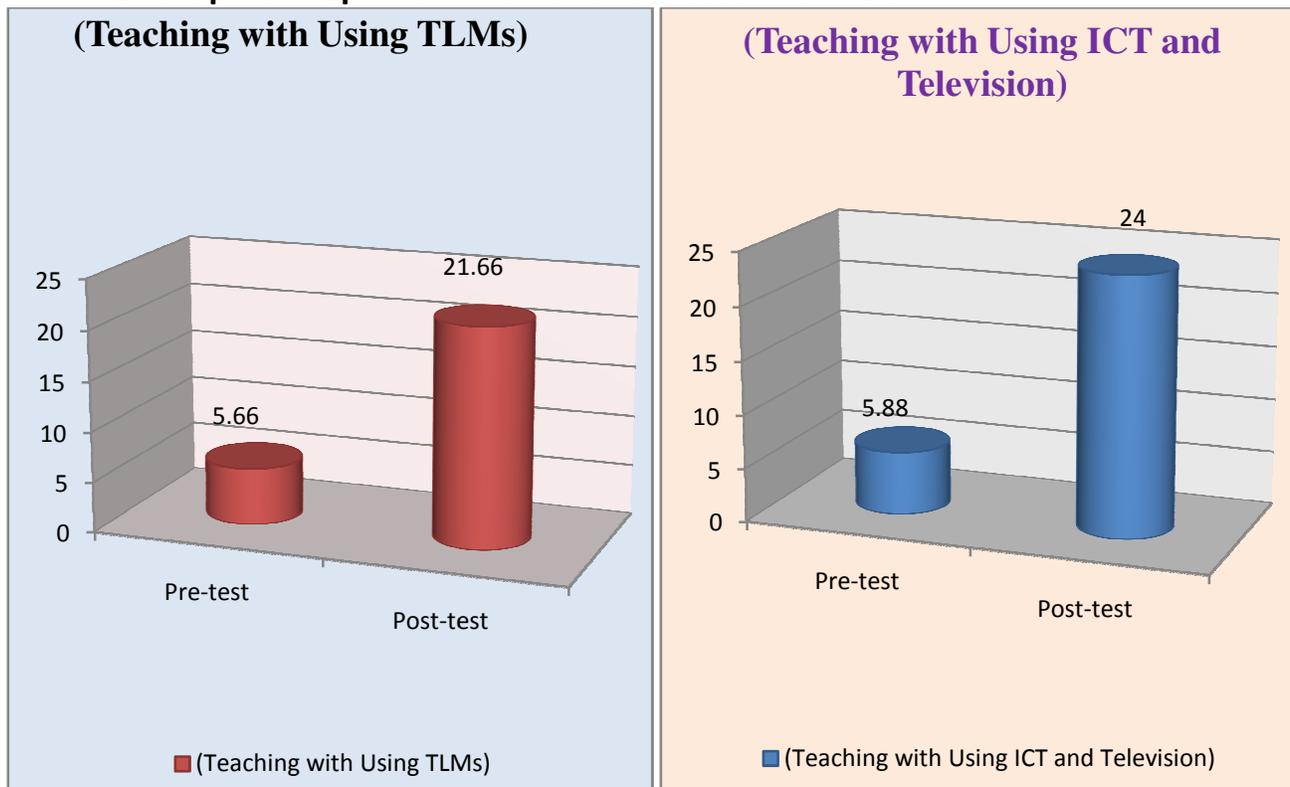
## RESULT

Results of pre-test and post-test are as mention in table for experimental group. As the average result of pre-test and post-test I find that group “A” got average **05.66** marks in pre-test and **21.66** marks in post-test. While group “B” obtain average **05.88** marks in pre-test and **24** marks in post-test.

## DATA ANALYSIS AND ITERPRETATION

In order to analyze data statistically, raw scores of the both tests were organized and tabulated properly. Then present it in graphical form as –

**Table 03: Graphical representation of data listed in table 02**



As the result of this experiment we can say that the group “B” is performed better than group “A” which was taught through using ICT sources and TV programs along with the classroom teaching. TV programs are intended primarily to educate learners. These programs are primarily supplementary in nature, and provide enriching experiences for the learners. Thus, these programs, as additional sources of information, support face-to-face teaching and learning.

Many TV programs contain interactive elements to actively engage children. Other program can be valuable in children’s learning. For example, documentaries, which have a factual basis, may inform us about how the human body works or illustrate the advances in understanding our Earth and beyond. Natural history programs provide us with striking visual examples of environments, ecosystems, habitats and genetics, in all parts of the world, which could not otherwise be observed. News and current affairs programs introduce topical science issues, and can support understanding of the

importance of ethics, opinion and debate within science. For example, programs may provide an insight into alternative energy sources or how food production and habitats are changing in different parts of the world. Hearing real-life personal stories and experiences also helps children to understand how integral science is to our everyday life

## **CONCLUSION**

Some may regard watching a television program in the classroom as a form of passive learning, but as the result of this study one can strongly disagree. Television programs provide us with the opportunity to develop our knowledge and understanding of the world. We become engaged with narrative and visual explanations, discussion, interviews and entertainment in a format that is accessible and relevant to our life experiences. Through scientific programs in the television, we can see the place that science has within our world, both at a local and a global level. The challenge in using television as an educational resource may arise in finding suitable material within the huge variety and quantity available. For effective learning to take place, the program needs to be relevant to the lesson and to bring another dimension or viewpoint to the learning experience.

ICT and television is an effective teaching tool then certainly it is helping hand towards, achieving the aim and objectives of education. Media is an agent of boost cultural economic and social development activity. Television, as an important mass medium disseminates education through formal and information methods.

However role of ICT and television is neither fixed nor easily tangible and measurable. The role is directly related to the question of how the planners are serious and determined to use television. The role could either be enormous or, on the contrary very meagre depending upon the specific tasks and available resources. Generally television can help to achieve the following objectives:

- a) Social quality in education
- b) Enhance quality in education especially in science education
- c) Reduce dependency on verbal teaching and teachers
- d) Provide flexibility of time and space in learning.
- e) Stimulates learning
- f) Provide mass education opportunities.

As far the impact of ICT and television in education should rather be studied in more narrow and specific areas. In the world of scam; TV is more effective in teaching mathematic, science and social studies.

## **SCOPE FOR FUTURE WORK**

Media are constantly changing. More and more online content is becoming available, and the focus on making television accessible and interactive may mean that in a few years' time our television schedules are individually tailored to our specific desires and needs. A growing amount of video material is available online. This may be condensed versions or extra features from television programs, or user-generated content, as more people make their own videos to upload and share with others. Using this online video material in learning is helpful in providing bite-sized chunks of information in a visual and memorable way. I believe that by carefully choosing appropriate programs and clips we can make science more relevant and enhance children's engagement and interest in science learning. They constitute another resource which can stimulate ideas, enquiry and discussion relating to science. Through embracing these advances in technology, children can learn informally,

from each other and from their social environment. Although not the subject of this article, radio broadcasts also provide an alternative way of presenting information and are well worth exploring. Finally, some of the most engaged and focused learning from television and radio arises from giving children the opportunity to make their own programs. Using a digital camera, Digital Blue Movie Maker or even a Dictaphone, transforms children from the role of 'learners' into 'teachers'. Children can plan, conduct and evaluate their own science investigations, and this alternative form of recording is exciting, inclusive and interactive. Once the children have made their recording, set aside a transmission time to watch the programs together as a class and discuss them. This sharing of ideas and thoughts between peers develops understanding, the use of scientific vocabulary, and the children's ability to reflect on their own learning.

## **ACKNOWLEDGEMENT**

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## Anexure-1

### List of Programs prepared by Telecasted Ministry of Ministry of Human Resource Development (MHRD), GoI

No.	Name of the Program	Description
1	<b>Swayam Prabha</b>	The SWAYAM PRABHA has been conceived by Ministry of Human Resource Development (MHRD), GoI as the project for using the GSAT-15 satellite to run 32 DTH channels to telecast high quality educational programs on 24x7 basis. Every day, there is new content of 4 hours which is repeated 6 times a day, allowing the students to choose the time of their convenience.
2	<b>'Kishore Manch'</b>	This channel under Swayam Prabha of MHRD run by CIET, NCERT disseminate curriculum based educational TV programs for classes IX- XII besides the programs on performing arts, crafts, physical education, teacher education, etc.

## Anexure-2

### List of Programs prepared by Vigyan Prasar and Telecasted on Doordarshan and its allied Channels

No.	Name of the Program	Description
1	<b>Khudbud Khel Vigyan Ke (Hindi)</b> 	Khudbud is a unique Television science serial with a single minded mission, that of popularizing Science and more importantly the method of Science. Targeted at children, it encourages creativity and self discovery. The Team travels to different schools, in villages and towns and plays Science with children. It encourages the children to put on their thinking caps. Here Science is not confined to Text books or definitions, but a game of reasoning, rational thinking, experimentation and think-along.
2	<b>Science Monitor (English)</b> 	<b>Weekly Science News Program</b> Vigyan Prasar has come up with a challenging task of producing weekly science news in English for depicting the recent developments in science and technology. These programs are being telecasted through RSTV. This weekly news programs covers important national and international events, discoveries and happenings in the field of science and technology.
3	<b>Gyan Vigyan (Hindi)</b> 	<b>Weekly Science News program.</b> Vigyan Prasar has come up with a challenging task of producing weekly science news in Hindi for depicting the recent developments in science and technology. These programs are being telecasted through RSTV. This weekly news programs covers important national and international events, discoveries and happenings in the field of science and technology.
4	<b>Science this week</b>	The 'Science This Week' based upon the current affairs and news related to science, technology, health and environment. The voice of eminent scientists and experts from the field of science and technology give credibility to the reports.
5	<b>Kuch Tukke...Kuch Teer</b> 	Science Video Serial "Kuch Tukke - Kuch Teer : Prayog Jinhone Duniya Badal Di" is being Telecast on Doordarshan produced by Vigyan Prasar. Each episode is devoted to a specific great experiment such as discovery of x rays, discovery of green house effect, discovery of Macromolecules, discovery of Penicillin, Morgan experiment, Griffith's experiment, developments in cognitive sciences, green revolution, discovery of Blood types, discovery of vaccination, measurement of Atmospheric pressure, discovery of Semiconductor, Measuring the cosmos etc
6	<b>Kahani Dharthi Ki</b>	The year 2008 was declared as the year of Planet Earth. During this year various agencies all over the world were involved in preparing materials and

		undertaking campaigns to sensitize the threats and challenges faced by our mother earth. This 26 part video serial is an attempt to present various facets of Planet Earth in a lucid form for Indian audience. Covering range of topics such as physical and geological aspects, ecosystems, human impact n environment, the serial presents succinctly our understanding of the world we live in as well as the various threats and challenges that besiege us.
7	<b>Jo Hai Jaisa---Kyon hai Vesa? (Story of Chemistry)</b>	This program is based on current trends in chemistry. This serial makes us understand about uses of chemistry in daily life and span development in industry era. This serial also enables to understand chemistry in various areas like nanotechnology, biochemistry, health, construction, soil and agriculture and green chemistry etc.
8	<b>Aisa hi hota hai</b> 	This program is very popular among the students this program contain many specific topic of secondary science which is explained by many simple practical by using local material .
9	<b>Earth Matter</b> 	This program is presented by Mike Pandey and telecasted on Doordarshan which provide information about nature and natural resources and their conservation like forest and animals.
10	<b>Ganit Ki Siriya (Hindi)</b> 	It attempts to present various facets of mathematics. Each episode takes an interesting concept or area of mathematics and follows it using narratives, anecdotes, historical recreations and innovative problems to bring it alive. Avoiding textbook jargon, the series is conversational and would be engaging to not only viewers who have interest in mathematics but also those who may not.

### Anexure-3

#### Useful Websites/telecast for Science Programs and Educational resources

No.	Source	Description	Remark
1	BBC Science and Nature	Science programs are categorized into: Animals, Prehistoric life, Human body and mind, and Space. You can view or download recent programs using the BBC i-player, or look at the program website page which may contain a shortened podcast version	<a href="http://www.bbc.co.uk/sn/">www.bbc.co.uk/sn/</a>
2	Teachers TV	Videos ranging from uploaded clips from television programs to new programs detailing evidence- based practice in schools.	<a href="http://www.teachers.tv/video/browser/810/1021">www.teachers.tv/video/browser/810/1021</a>

		You can browse videos by age and science-learning objectives	
3	Open University	Lots of science content and clear links to forthcoming science programs.	<a href="http://www.open2.net/home.htm">www.open2.net/home.htm</a>
4	NASA	NASA <i>Brain Bites</i> are short videos relating to NASA science topics. Look at the 'episode menu' section to select an appropriate clip.	<a href="http://brainbites.nasa.gov/">brainbites.nasa.gov/</a>
5	KidSites.com	Provides links to websites offering a variety of educational science content.	<a href="http://www.kidsites.com/sites-edu/science.htm">www.kidsites.com/sites-edu/science.htm</a>
6	National Geographic	Large variety of science programs: documentary, reports, news, and specific children's programs.	<a href="http://video.nationalgeographic.com/">video.nationalgeographic.com</a> / <a href="http://video/kids.nationalgeographic.com/">video/kids.nationalgeographic.com/</a>
7	Discovery Channel	<i>Sci-Busters</i> , <i>Invention SOS</i> and <i>Kenny the Shark</i> are all science series aimed at developing investigative skills and scientific knowledge. An online TV schedule function provides descriptions of forthcoming programs.	<a href="http://www.discoverychannel.co.uk">www.discoverychannel.co.uk</a>
8	The Vega Science Trust	Higher level content may be suitable for upper KS2.	<a href="http://vega.org.uk/video/series/15">vega.org.uk/video/series/15</a>
9	Science Friday	A quirky mix of videos based on science and technology advances.	<a href="http://www.sciencefriday.com/">www.sciencefriday.com/</a>
10	Search Engines	We can search any information which is available on internet.	<a href="http://www.google.com">www.google.com</a> , <a href="http://www.yahoo.co.in">www.yahoo.co.in</a>
11	Wikipedia	It is an encyclopedia available on internet for any content	<a href="http://www.wickeypida.org">www.wickeypida.org</a>
12	YouTube	We can search and view and download any video which is available on internet.	<a href="http://www.youtube.com">www.youtube.com</a>