ANALYSIS OF EDUCATIONAL TELECAST AND WEBCAST IN INDIA WITH SPECIAL REFERENCE TO THE CONTRIBUTION OF UGC MEDIA CENTRES

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Thesis
Submitted for the degree of

DOCTOR OF PHILOSOPHY IN EDUCATION

DEPARTMENT OF EDUCATION
UNIVERSITY OF CALICUT
2019

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Certificate

I, **Dr. A HAMEED,** do hereby certify that this thesis entitled **"ANALYSIS OF EDUCATIONAL TELECAST AND WEBCAST IN INDIA WITH SPECIAL REFERENCE TO THE CONTRIBUTION OF UGC MEDIA CENTRES"** is a record of bona fide study and research carried out by **V.S SAMITHA** under my co-guidance and that it has not been previously formed the basis for the award of any other Degree, Diploma, Title or Recognition.

The thesis is revised as per the modifications and recommendations reported by the adjudicators. It is further certified that the soft copy of the thesis submitted is the same as the printed copy submitted herewith.

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Certificate

I, **Dr. M. N. MOHAMEDUNNI ALIAS MUSTHAFA,** do hereby certify that this thesis entitled **"ANALYSIS OF EDUCATIONAL TELECAST AND WEBCAST IN INDIA WITH SPECIAL REFERENCE TO THE CONTRIBUTION OF UGC MEDIA CENTRES"** is a record of bona fide study and research carried out by **V.S. SAMITHA** under my supervision and guidance and that it has not been previously formed the basis for the award of any other Degree, Diploma, Title or Recognition.

The thesis is revised as per the modifications and recommendations reported by the adjudicators. It is further certified that the soft copy of the thesis submitted is the same as the printed copy submitted herewith.

Place: Calicut University
Date : .10.2020

Dr. M.N. MOHAMEDUNNI ALIAS MUSTHAFA
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DECLARATION

I, **V.S. SAMITHA,** do hereby declare that this thesis entitled **"ANALYSIS OF EDUCATIONAL TELECAST AND WEBCAST IN INDIA WITH SPECIAL REFERENCE TO THE CONTRIBUTION OF UGC MEDIA CENTRES"** is an original work done by me under the supervision of **Prof. (Dr). M.N. Mohamedunni Alias Musthafa,** Professor, School of Education, Central University of Kerala, for the award of Degree of Doctor of Philosophy in the faculty of Education. I also declare that this thesis or any part of it has not been submitted by me for the award of any other Degree, Diploma, Title or Recognition before.

Place: C U Campus **V.S. SAMITHA**

Date : .11.2019

Dedicated to Daddy, Amma and Sheji

Acknowledgements

This thesis became a reality with the help of many individuals. Let me record my sincere gratitude to all here...

First and foremost, I would like to remember the enduring support and guidance of my supervising teacher, Dr. M.N. Mohamedunni Alias Musthafa, Professor, Department of Education, Central University of Kerala, Kasaragod. Whenever I became sluggish burdened with difficulties in life, he has waited patiently for me to get back on track. Heartfelt thanks for all the extra efforts you made to help me face the challenges.

Earnest thanks are extended to Dr. A Hameed, Assistant Professor, Department of Education, University of Calicut who has kindly consented to be my Co-Guide, for his valuable support in the last stage of the study.

I would like to express my genuine gratitude to Prof. (Dr.) K.P. Meera, Head of the Department of Education for her kind support and personal care during my study.

I remember with heartfelt gratitude, the affection and support given to me, on a very personal level, by my teachers Dr. P K Sudheesh Kumar (Late), Dr. P Usha, Dr. C Naseema, Dr. P K Aruna, Dr. V Sumangala and Dr. P Kelu from the day I joined the department as an M Ed student. Without their guidance and scaffolding, I would not have developed the confidence to undertake this work.

I am also thankful to Dr. T. Vasumathi, Dr. K. Abdul Gafoor, Dr. Baiju K. Nath and Dr. C.M. Bindhu, for their encouragement and support. Sincere thanks are extended to Mr. Sudheer, Ms. Swapna, Ms. Beena and other staff of the department.

I owe special thanks to Dr. Syed Amjed Ahmed for his valuable suggestions and help during my research work. I would like to include a note of thanks to the former Director of CEC Dr. Rajbir Singh and present Director Dr. Jagat Bhushan Nadda for the encouragement and support given to me.

For the cooperation, support and encouragement rendered for the study, I am extremely indebted to all the Media Centre Directors, other staffs of EMRCs and CEC, especially Mr. Damodar Prasad, Dr. Pankaj Tiwari, Dr. Arulselvan, Dr. Lellis Thivagar, Dr. Iftikar Ahamed, Dr. K. Narendar, Dr. Unnati Gulati, Dr. Asmita and Dr. Disha.

Sincere thanks to my friends, Roopa, Sini, Chakravarthy, Naidu, Rohini Kumar, Tharun, Lohi, Lakshmi Ratnam, Seena - for being a steady presence in my life. With love, I remember the affection of the moms of my son's friends - Biji, Bijna, Dilsha, Fijula, Raheena, Sajitha, Sakeena and Shahana.

For the valuable help in setting up of the thesis let me thank Raman for his patience and support.

I express my love and gratitude to Dr. M A Raveendran, wife Sheela, Rakesh and Sandeep and to Haseena, Iqbal, Sahel and Shazil for being there for me as family. To Nishi too, for always offering a shoulder to lean on.

With heartfelt gratitude I remember the support and care bestowed upon me by Dileep and Adarsh during the difficult times of my life. Thanks are extended to Surekha and Reji too.

Remembering with gratitude the support provided by all dear and near ones, also the hostility shown by some, because their attitude made me stronger.

Above all, I humbly dedicate this work to Daddy, Amma and Sheji - my husband who are no longer with me physically, but always there for me in spirit, for this is their dream. To my son Appu too, whose existence is the only driving force in my life.

V S Samitha

Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Chapter I

INTRODUCTION

- *Need and Significance of the Study*
- *Statement of the Problem*
- *Definition of Key Terms*
- *Objectives of the Study*
- *Methodology*
- *Scope of the Study*
- *Delimitation of the Study*
- *Organization of the Report*

INTRODUCTION

The most relevant one among the many definitions of education is that of the expression 'the process of facilitating learning'. Be it in a formal setting or informal, education helps in acquiring knowledge and how the knowledge is disbursed to the learners was tackled by establishing educational institutions in the form of schools, colleges etc. with teachers as the suppliers of knowledge. From direct mouth to mouth instruction, the world progressed through print, radio, television, computer and cell phones in the dissemination of knowledge to the aspirants. It is the technological advancement that has brought all these in to the arena of education. The vital link between knowledge and technology is evident from the fact that whenever a new technology was introduced, education sector soon zoomed in utilizing the benefits of it for reaching out to its learners. All the effects slowly evolved, from the amelioration ensued with the teaching - learning process to better student participation, engagement and seamless knowledge acquisition.

The education sector flourished with the help of Information and Communication Technology in reaching out to its learners with newer products and services and also in coming out of the confines of the four walls of classrooms. The teachers of this era utilize numerous ICT supported materials, methods and strategies in and out of the classroom to transact knowledge effectively and elevate the total teaching - learning experience. Even in the earlier times itself, the educationists have understood the value of ICT and the prominent role it is able to play in providing flexible, innovative, sustainable and cost effective services to the education sector. The emergence of newer

technologies within no time has enabled the educators new ways of thinking about imparting education. All these culminated in a fusion between computers, telecommunications and broadcasting which changed the backdrop of educational dissemination. As pointed out by educators, these turn of events have prompted many countries around the world, both developed and developing nations, to launch ambitious information infrastructure initiatives.

Examining the changes that happened over the time, we can see that the distance education first thrived with the help of print and paper communication, and when radio became popular and accessible, radio educational broadcasts also became popular. The broadcasts varied from formal school lessons to informal general education, adult basic education, literacy programs etc. Both developed and developing countries utilized extensively the radio to connect to a larger number of people from distant places. Radio played a vital role in the dissemination of knowledge then.

When television was introduced, it soon took over the role of radio in providing entertainment as well as information. As it combined audio and visual aspects of communication, it was considered to be more effective than audio media. 'Visual media of communication are not just convenient and indifferent technologies for the transmission of knowledge, but also and perhaps mainly, different languages for gathering, packaging and conveying knowledge' (Salomon, 1980).

Television could be found in billions of households around the world irrespective of the economical status. Broadcasting via television started in 1928 and between 1950s and 2000s, television has turned in to a significant mode of

communication across the world surpassing radio and newspapers. Today online television and other broadcasting technologies have changed the face of traditional home television sets.

From the earlier times itself, along with the entertainment programmes, some programmes were developed for educational purposes also, at the time mostly for children. There were several other programmes also designed for raising social awareness, health education, literacy etc.

The importance of television as a source and tool of teaching was recognized and utilized by many countries around the world. The medium was used for formal, informal and non-formal modes of education. It supported formal education by being a part of curriculum, functioning as a supporting tool. Several school and college telecasts were examples of this. In a similar way, non-formal and informal education sector also utilized the services of television in reaching the learners. Television as a tool of teaching/ learning could achieve many objectives like enhancing quality of education, reaching the under privileged, providing flexibility of time and space in learning, providing mass education etc. Though early educational telecasts consisted of instructional programmes delivered by teachers/ presenters like a verbal lecture, the visual depictions of the theories made these programmes interesting and attention sustaining.

Coming on to the use of computers in education, the first computer based training programme was introduced in 1960, first for students at University of Illinois, which later was extended to school level. The online learning programmes started becoming interactive in 1970s. The introduction of internet in the 1990s then revolutionized the use of e-learning tools and methods of delivery of

educational resources. The increased availability of broadband connection for internet made the students take notice about the educational content available at affordable cost through the web. The World Wide Web enabled people around the world have access to a vast amount of information on almost all areas of interest. The web based learning can be considered as a continuum, with pure distance learning at one end and completely interactive learning just like face to face traditional learning at the other end. Whatever be the mode of delivery, the web could be viewed as the largest repository of knowledge. Now it is the era of virtual learning environments enabling the people access to a wealth of online information and opportunities for e-learning.

Tele - Education and E - Education: From Countrywide Classroom to MOOCs - The Indian Scenario

Along with the changes in the education sector worldwide, India also has witnessed multifaceted transformations across different periods. From the Gurukuls we are at the Virtual Universities now, steadily progressing from the roots of Nalanda - the oldest university in the world, with the developments in the technological field.

In India, television first came on 15th Sept 1959 as the National Television Network of India. The main purpose of this initiative was "educate, inform and entertain the masses". In his inaugural speech, Dr. Rajendra Prasad, the then President of India stated,

"...hope television will go a long way in broadening the popular outlook and bringing people in line with scientific thinking".

As per the 2011 census, 67 million (35.1%) households had Radio or Transistor, and Television was available to 61 million (31.6%) households in the country out of 191.9 million households (http://censusindia.gov.in). In 2012, Menon reported that cable services reach 94 million homes with 88 million analog connections and 6 million digital ones, while DTH has commanded 41 million subscribers.

As reported by a TV Media Research Organisation (TAM Annual Universe Update - 2015), India had over 167 million households (out of 234 million) with television sets, of which over 161 million have access to Cable TV or Satellite TV, including 84 million households which are DTH subscribers. The numbers have been steadily increasing and it is estimated that the number of television households will be more than 200 million by 2023 (www.statista.com).

Broadcast Audience Research Council (BARC) India is a Joint Industry Company represented by broadcasters, advertisers, and advertising & media agencies. The Council, by a 2018 survey, reported that the number of homes having a television set in the country has increased from 183 million in 2016 to 197 million (out of 298 million). They have also reported that the number of TV viewing individuals grew by 7.2 per cent to 836 million, from 780 million in 2016.

On account of the accessibility factor, in India at the beginning television was used mainly for imparting knowledge and skills on new and scientific methods of farming to the farmers through programs like Krishidarshan. Then it was extended to impart education to primary, secondary and college level students. One of the first such school projects was Secondary School Television

Project (1961) designed mainly for the secondary school students of Delhi to overcome the shortage of well-equipped laboratories, qualified teachers, space etc. The project enabled nearly 20,000 students from 150 schools in Delhi to receive the benefits of specially designed science and enrichment programmes. Another one of the earliest and systematic efforts in India with respect to an educational television channel is Satellite Instructional Television Experiment (SITE) which was launched on August 1st, 1975. This was meant for the people in the villages of six states (Rajasthan, Karnataka, Orissa, Bihar, Andhra Pradesh and Madhya Pradesh) and their primary school going children.

The institutional framework of higher education system in India consists of Universities established by an Act of Parliament (Central Universities) or of a State Legislature (State Universities), Deemed Universities (institutions which have been accorded the status of a University with authority to award their own degrees through central government notification), Institutes of National Importance (prestigious institutions awarded the said status by Parliament), Institutions established by State Legislative Act and Colleges affiliated to the Universities (both government-aided and unaided).

Before Independence, access to higher education was very limited and could be termed as elitist, with enrolment of approximately 2.1 lakh students in 500 colleges and 20 universities. After independence, the Government initiated a planned development of higher education in the country particularly with the establishment of University Grants Commission in 1953. As a result of this effort an exponential growth in higher education institutions has occurred quantitatively as represented in Table 1.

Table 1

Growth of Colleges for General Education, Professional Education and Universities from 1950 to 1980-81

Year	Colleges - General Education	Colleges - Professional Education	Universities
1950 -51	370	208	27
1955-56	466	218	31
1960-61	967	852	45
1965-66	1536	770	64
1970-71	2285	992	82
1975-76	3667	3276	101
1980-81	3721	3542	110

Source: Educational Statistics 2004-2005, MHRD 2007

It can be seen that in 30 years, the number of colleges offering General Education increased tenfold. Similarly the number of colleges offering professional education and Universities also increased. The enrolment rate as calculated by Selected Education Statistics (SES) in 1950-51 was 0.7%, which increased to 1.4% in 1960-61. In 1983, it was raised to 4.04%. Though there was a significant increase in number of higher educational institutions in the country from 1950 to 1980-81, it was not enough to meet the demands of growth in the number of students aiming for higher education. There was great disparity among the colleges located in various parts of the country in terms of infrastructure, quality teaching, dearth of equipped laboratories and libraries, manpower, other facilities etc. which resulted in imbalance in the quality of teaching between rural and urban India.

The need for utilizing the services of television for making available quality education to students irrespective of their locale and privilege arisen out of this context.

The launch of Indian National Satellite (INSAT) in 1980 and its availability for educational purposes led to INSAT project which was aimed at making the rural masses aware of the latest developments in the areas of agricultural productivity, health and hygiene. The project also led to the development of educational programmes by MHRD to be aired via Doordarshan, the national television network. The UGC-Higher Education Television Project (HETV) (1984) was launched next, by the University Grants Commission in collaboration with INSAT, which started the educational television project, popularly known as 'Countrywide Classroom' (CWCR). The IGNOU-Doordarshan telecast, designed mainly for Distance learners started in May 1991. Ministry of Human Resource Development, Information & Broadcasting, the Prasar Bharti and IGNOU launched GyanDarshan (GD) jointly on 26th January 2000 as an exclusive Educational TV Channel of India.

The entry of UGC to the world of educational television started with the telecast of programmes brought from foreign countries or developed locally by the Media Centres established for producing educational programmes. The CWCR programmes thus developed were telecast through the public television network - Doordarshan. At first, the UGC and the Media Centres adopted an open programming strategy which led to the development of several good quality documentaries. Slowly the shift to syllabus based programmes has taken place. These programmes were not aired then, but used as transportable videos in VHS tape format for viewing by students who did not have access to good lecturers.

The commercialization of Doordarshan made the CWCR programmes pushed to insignificant hours which in turn reduced their visibility and utility.

This led to the launch of a satellite higher education channel - Gyandarshan-4 (GD-4) by UGC in collaboration with MHRD called VYAS in 2004.

After one year, EduSat - the satellite built exclusively to serve the education sector - was launched to meet the demand for a satellite based interactive education and supplement to the face-to-face classroom instruction. With the help of several Satellite Interactive Terminals (SITs) (also called Virtual Classrooms) and Receive Only Terminals (RoTs) as part of EduSat, UGC carried out virtual classroom operations too.

Following the worldwide movements on exploiting ICT, e-learning and web based learning, Government of India started National Mission on Education through Information Communication Technology (NME-ICT) - a Centrally Sponsored Scheme to leverage the potential of ICT, in teaching and learning process for the benefit of all the learners in Higher Education institutions at any-time anywhere mode. Different government agencies of education have taken part in the project. Through NME-ICT project, the UGC has developed e-contents for under graduates and post graduates and made these available to students through internet and television. On the footsteps of the ambitious project, the Consortium for Educational Communication (CEC) - the nodal agency of Media Centres and the Media Centres under it have entered into the production and dissemination of Massive Open Online Courses (MOOCs) now.

A noted initiative in this area in India was the launch of pilot project of One Stop Education Portal - SAKSHAT on October 30th, 2006. The vision of the Sakshat portal was to cater to the learning needs of more than 50 crore people through the scheme NME-ICT. The scheme is to *provide connectivity to all*

institutions of higher learning to world of knowledge in the cyber space, to leverage the potential of ICT, in providing high quality knowledge modules with right e-contents, to address to the personalized needs of learners, in order to take care of their aspirations. These modules are to be delivered through Sakshat (www.mhrd.gov.in). Sakshat is now a repository of CEC e-contents, e-PG Pathsala, NPTEL Engineering Media Content, A-View Virtual classrooms, Talk to a Teacher and Spoken Tutorial.

A joint initiative of MHRD and NCERT under NME-ICT called ePathsala (executed by UGC) has been developed for showcasing and disseminating all educational e-resources including text books, audio, video, periodicals and a variety of other digital resources. These resources are in the OER (Open Educational Resources) format developed and maintained by INFLIBNET Centre.

Several such projects are available now to the students, run by Governmental agencies which utilize the services of both television and web. Some are listed below:

- SWAYAM (Study Webs of Active learning for Young Aspiring Minds): An online free e-learning digital platform portal that facilitates hosting of all the courses taught in classrooms from class 9 to PG to be accessed by anyone, anywhere at any time.
- SWAYAM Prabha : A bouquet of 32 DTH channels operationalised for telecasting educational content on 24 x 7 basis
- Saransh : Web portal launched by CBSE for schools
- E-ShodhSindhu - Provides current as well as archival access to more than 15,000 core and peer reviewed journals.

- E-Adhyayan : Repository of e-books for UG & PG courses, being derived from the e-text of e-Pathsala.
- Shodhganga: A digital repository of Indian Electronic Theses and Dissertations hosted and maintained by Inflibnet Centre.
- INFLIBNET Centre: Inter University Centre of UGC involved in connecting all university libraries in India.

Education with technology is considered as the most promising development in education. With many innovations in the technological field, the concept of learning and teaching has undergone a tremendous change. These provided a global learning environment, which allows accessing the course material anytime, anywhere.

Need and Significance of the Study

The twentieth century was the age of science. It has brought about a change in every walk of life. Television, within some years of its invention, has taken up the interest of the world by storm. In the earlier times and before the entry of internet, it was considered to be one of the most wonderful and powerful means of communication, education and entertainment.

The variety of broadcasts of educational content, easy access to television sets at majority of homes, regular transmission slots with repeat telecasts, relation to curriculum - all these made the role of television in the education sector highly useful.

The developed countries have exploited fully the advantages of television in education, but India has yet to exploit fully the potential of television for education. More than 70% of India's people live in villages where good teachers, good

libraries, well equipped laboratories and other basic requisites for schools and colleges, computers, good network coverage etc. are hard to get. Even in this era of computers and internet, outcomes of many successful projects stress the role and significance of educational television in India for achieving the aims of education for all.

When television is used for educational purposes, it is called Educational Television (ETV). ETV programme means the television programme prepared for educating a lesson/topic. It is capable of creating interest and motivation in both children and adults and has become a major instrument of education as well as significant component of distance education learning and alternative system for various categories of learners (Akhter, 2011).

In India, many educational agencies and institutes with the organizational capabilities in Government sector are trying to serve the growing educational needs of the learners. Premier institutes like IITs, IIMs, IISC etc. and authorities like MHRD, UGC, AICTE, NCERT have always been involved in providing quality education to learners in India both by traditional as well as new modes.

India's apex body for education, the University Grants Commission (UGC) realizing the potential and power of television to act as means of educational knowledge dissemination proposed to use television to strengthen education in the universities and colleges. The Government launched the Countrywide Classroom (CWCR) programme through UGC for students in colleges and universities and its ETV programmes were started telecasting from 15th August 1984. UGC aimed at imparting quality education through CWCR programmes by overcoming the problems of higher education in India viz.,

outdated curriculum, dearth of expert teachers, ill equipped laboratories, shortage of books and journals and limited resources of knowledge.

UGC established Educational Media Research Centres (EMRCs) and Audio Visual Research Centres (AVRCs) (collectively called UGC Media Centres) in Universities with state of the art infrastructure to produce educational programmes for Doordarshan. The objectives of the CWCR Project as given by the UGC are:

The broadcasts will aim to upgrade, update and enrich the quality of education while extending its reach. They will attempt to overcome the obsolescence of the syllabus and present the latest advances in all fields, including especially in the newly emerging ones. The programmes will seek to arouse the interest of the viewers, to whet their appetite, and to broaden their horizons. The aim is to stimulate and not satiate.

When more such Centres were started at various universities and institutions across India, UGC established an autonomous body called Consortium for Educational Communication popularly known as CEC in 1993 as a Nodal Agency to coordinate, guide & facilitate the activities of Media Centres. CEC has established and running an exclusive 24 x 7 CEC-UGC Higher Education Satellite Channel of MHRD called VYAS (launched on January 26th, 2004). The content for the channel is developed by the Media centres which have been renamed by UGC as Educational Multimedia Research Centres (EM^{2}RC / EMRC / EMMRC) in 2004.

Following the world footsteps in utilizing the powerful medium of internet, India Government also started relying heavily on World Wide Web to

reach learners. CEC, the Media Centres and many other public institutions have started developing e-contents as a part of initiatives like National Mission on Education through ICT (NME-ICT). These programmes are distributed free through internet as well as television. Though the television received a set back with the wide spread use of internet and computers, it is coming back with force through the DTH (Direct-to-home) revolution. All the e-contents developed so far are being telecast through the DTH channels under Swayam Prabha which is a group of 32 DTH channels devoted to telecasting of high quality educational programmes on 24 x 7 basis using the GSAT-15 satellite.

Now the CEC and 21 Media Centres under it are involved in the production of educational video programmes for television and web in the form of TV Lecture series, e-contents, DTH lectures and Massive Open Online Courses. CEC and the Media Centres have more than 1,000 trained manpower & state of the art equipment. CEC has perhaps the largest repository of Educational Video programmes produced by its Media Centres.

Indian TV today is accessible to over 85% of the population. Also, India has the technical expertise and support to expand educational television and web based activities. The important question then will be whether our media centres are geared up to meet the challenge. Some critics are of the opinion that media centres cause huge drain on the public money as the output is not contributing much to the higher education sector. They also feel that UGC has not yet recovered even 1% of its investment by marketing the programmes. These are issues to be addressed by educational researchers.

Now it's been more than three decades since the UGC started using television to strengthen education in the colleges and universities through its

country wide class room (CWCR) programme using the media centres and more than 10 years since its entry into e-learning/ e-resources segment. What is the position of the CEC & MCs now? What is the reach of the programmes? Is the CEC realizing its aims and objectives? Are the media centres using their full potential in service of the UG and PG education of India and the states which they belong? Are we exploiting the services of CEC in harnessing our college going generation? It is time for a reassessment in the management and production aspects of the CEC/ Media Centres.

The thoughts arised out of this context are stated as research questions of the present study:

- How was the evolution of telecast and webcast of educational video programmes in India?
- How do the main agencies of Government function in the field of educational telecast and webcast?
- What is the status of programme production of CEC and the Media Centres for telecast and webcast?
- What constraints/problems are faced by the CEC and the Media Centres in the production and dissemination of educational video programmes?
- How effective is the dissemination of educational video content developed by the Media Centres by the CEC?
- How much aware are the learners about the educational programmes developed by the Media Centres? Are the learners exploiting these efforts to a good extent?

- How equipped or capable are these production centres in producing quality programmes?
- How the teachers teaching outside India are finding the quality of the programmes? Are these programmes at par with international standards?

Finding answers to these questions should be a top priority in the educational research culture. This is specifically very relevant as the country is moving to the inclusive quality education and with the generation of digital natives. Coupled with the fact that television enjoys a penetration rate of more than 66% and the internet a preferred source of amassing knowledge by the younger generation, both the television and the web can be utilized by the educational agencies to a very high extent in providing authentic and quality content.

Statement of the Problem

The UGC Media Centres were established for addressing the needs of Indian Higher Education through the use of electronic and new media along with the appropriate use of emerging ICT. Media Centres together with their Nodal Agency - CEC create and disseminate multimedia content and educational videos for higher education through broadcast and non-broadcast modes. In 35 years, from the Countrywide Classroom telecasts, the Media Centres and CEC came a long way. Now the vision of the CEC is to increase the accessibility of higher education to a larger part of populace in the country across socio-economic and geographical barriers. With a knowledge repository of more than 40,000 educational video programmes, CEC maintains its stature as the largest

repository of digitized higher education content across diverse disciplinary streams. Unlike other private service providers, CEC provides its learners with an inexhaustive store of rich multimedia higher education content mapped to curriculum followed in the country through an exclusive platform for Massive Open Online Courses and e-contents ensuring quality and authentic content. Apart from this, CEC and the Media Centres are running 11 DTH higher education channels on MHRD's SWAYAM Prabha, broadcasting live lectures, e-contents etc by eminent academics. In order to understand the status and utilization of the efforts of these Governmental agencies, the investigator felt the need for studying about the topic.

This study is thus an attempt to explore, explain and understand the various aspects of educational telecast and webcast carried out by UGC Media Centres together with their apex body CEC. Hence the present study is entitled '**Analysis of Educational Telecast and Webcast in India with special reference to the contribution of UGC Media Centres**'.

Definition of Key Terms

The definition of key terms in the statement of the problem is given in the following part to have a better understanding of the study.

Analysis

Analysis is the detailed examination of the elements or structure of something (Oxford Dictionary). The term Analysis in the title of the study stands for the detailed examination of different aspects of educational telecast and webcast in India particularly with respect to the efforts of Media Centres and CEC functioning under UGC.

Educational Telecast

Broadcasting is the distribution of audio or video content to a dispersed audience via any electronic mass communications medium in a one-to-many model.

A telecast is a programme that is broadcast on television and can be defined as transmission of video programmes through television.

Educational telecast is the transmission of video programmes for educational purpose through television.

Educational Webcast

Internet broadcasting, popularly known as Webcasting, use internet for dissemination of new or original content in the form of media files both live and on demand. A new definition of Webcasting is as a media presentation distributed over the internet using streaming media technology to distribute a single content source to many simultaneous listeners or viewers. Webcasting is also known as streaming video or video-on-demand. It can be any transmission of information over the internet that makes use of streaming technology. It is either an audio or video file and is watched streaming instead of having to download it into the computer.

By Educational webcast, the investigator means broadcasting of live and recorded educational content over internet.

UGC

University Grants Commission-A statutory organization of the Government of India for the coordination, determination and maintenance of standards of teaching, examination and research in university education.

UGC Media Centres

The production centres set up by the UGC in various universities and institutions in India for producing in house quality educational programmes for electronic media.

The first 14 Media Centres, then called Educational Media Research Centres (EMRC) and Audio Visual Research Centres (AVRC) were under the direct control of a special cell of UGC until 1993. This cell was expanded and converted by the UGC to an Inter-University Centre called Consortium for Educational Communication (CEC). It is the nodal agency which coordinates, guides and facilitates educational video programme production at the national level through the Media Centres.

Now a total of 21 Centres and CEC are engaged in the production of Multimedia based video programmes. In 2004, the names of all the Educational Media Centres (EMRCs) and Audio Visual Research Centres (AVRCs) were changed to Educational Multimedia Research Centre (EM^2RC). Presently all Centres are using the abbreviation of either EMRC or EMMRC. In this study, by the term UGC Media Centres, the investigator means all the 21 Media Centres and CEC.

Contribution

Contribution is the part played by a person or thing in bringing about a result or helping something to advance. In this study, a study on the contribution of Media Centres means a detailed investigation and analysis of the functioning, facilities, performance and problems of Media Centres and CEC with respect to telecast and webcast of educational programmes.

Objectives of the Study

Specifically, this study in respect of UGC Media Centres seeks,

1. To explore the evolution of telecast and webcast of educational programmes in India
2. To evaluate the status of telecast and webcast of educational programmes in India by UGC Media Centres and the contribution of UGC Media Centres in this domain
3. To examine the problems faced by the UGC Media Centres in the production and dissemination of programmes for telecast and webcast
4. To suggest measures for the functional improvement of UGC Media Centres

Analysis of these objectives leads to the evaluation of the functioning of Media Centres of UGC-CEC and the contribution of these Centres and their apex body in the dissemination of educational content via telecast and webcast.

Methodology

Design of the Study

As the study intended to explore, explain and understand the various aspects of educational telecast and webcast carried out by the UGC Media Centres, both qualitative and quantitative paradigms are needed. Paradigm here means a view of how an inquiry should be done. So the study followed a mixed approach.

The study about Indian educational telecast and webcast with special reference to the contribution of UGC Media Centres was carried out and presented as two parts. In the first phase, evolution of Educational Telecast and Webcast in India was studied with special attention to the contribution of Media Centres of UGC-CEC. In the second phase, efforts had been made to identify specific problems faced by the media centres related to planning, production, transaction and evaluation of productions and to suggest measures for the functional improvement of UGC media centres.

Population

The study aimed to explore the different aspects of educational telecast and webcast of Media Centres in detail. At first, in 1984, UGC started the production for Countrywide Classroom program through 6 Media Centres set up at 6 Universities. Subsequently CEC was established in 1993 as a nodal agency to coordinate, guide and facilitate production of educational video programmes at the Media Centres. When the study was first undertaken, there were 18 media centres spread over 14 states, by 2016 the number has increased to 21 including the one at the Union Territory - Puducherry.

Hence the CEC and the 21 centres functioning under CEC constitute the population. From this, 10 Centres were chosen randomly as sample for the study: Centres at Jamia Milia - Delhi, Osmania University, Puducherry, Dibrugarh, Patiala, Roorkee, Calicut University, Madurai, Sagar and EFLU - Hyderabad. CEC was also included in the sampling frame. Sampling technique used was purposive sampling, which is described as a random selection of sampling units within the segment of the population with the most information on the characteristic of interest.

The investigator collected data from relevant sources and from the personnel connected with the functioning of the centres. The work force of the Media Centres of UGC and the apex body CEC form the main data source.

The group of people comprises of Governing Body Members, Director and Joint Directors of CEC, Directors of Media Centres, Research/ Junior Research Officers, Engineers and other technical personnel, Producers and Production Assistants, Students, Subject Matter Experts, Indian teachers teaching at foreign universities, Academic Coordinators and Head-DTH Project.

From this group, data were collected from 5 Directors of Media Centres, 5 Research Officers, 5 Engineers, 10 Producers, 225 Students, 20 Subject Matter Experts, 5 Indian origin teachers teaching at foreign universities and Head- DTH Project. From CEC, the information was collected from Director, Joint Director, Finance Officer, Research Officer, Broadcast Engineer, Media Tape Librarian, Producer and 4 Academic Coordinators.

Tools and Technique

For the study, the following research tools were employed for gathering data.

1. Questionnaire on the activities of Media Centres to Directors of Media Centres (Samitha & Musthafa, 2014)
2. Questionnaire on Production aspects to Producers of Media Centres (Samitha & Musthafa, 2014)
3. Questionnaire on Research aspects to Research Officers of Media Centres (Samitha & Musthafa, 2014)

4. Questionnaire on Technical aspects to Engineers of Media Centres (Samitha & Musthafa, 2014)
5. Questionnaire on awareness and utilisation of educational telecast and webcast to students (Samitha & Musthafa, 2014)
6. Questionnaire to Subject Matter Experts of Educational Programmes (Samitha & Musthafa, 2014)

Semi-structured interviews within a frame work were administered to gather information from the following persons:

a. Head - CEC
b. Member of Governing Body of CEC
c. Joint Director (Software) - CEC and the Preview team
d. Finance/ Accounts Officer - CEC
e. Media Tape Librarian - CEC
f. Research Officer - CEC
g. Broadcast Engineer - CEC
h. Academic Coordinators of CEC & Media Centres
i. Indians teaching outside India
j. Head of DTH Project

Statistical Technique Used

Percentage analysis was used wherever needed. Similar responses were pooled and explained. Odd responses were treated separately and described qualitatively.

Scope of the Study

Technology plays an important role in the education sector. From the CWCR programmes to MOOCs the UGC, CEC and the 21 Media Centres have come a long way in the dissemination of knowledge to the students of higher education. It is felt by many that these parties are yet to realize their respective objectives in the fullest extent and they are yet to make their presence known to those concerned in an effective and useful way.

The primary aim of the study was evaluation of the functioning and contributing aspects of the Media Centres of UGC. This study tried to explore the history of the efforts of India in the dissemination of knowledge utilizing the technology in order to overcome the constraints it has been facing from time to time. The study also tries to explore, explain and understand the various aspects of educational telecast and webcast by the Media Centres and CEC. Since the investigator collected data from adequate sample using valid tools adopting suitable research design to the purpose, she hopes that findings of the study will be generalisable and help all concerned in improving the functioning and production aspects of the UGC Media Centres.

Limitation of the Study

As the Centres were spread in different states of India, it was difficult both in terms of expenses and time to visit the Centres and understands the conditions there directly.

Delimitation of the Study

For the survey with respect to the students, the number of the sample was limited to 225, that too from all courses. No consideration was given to the specific subjects/ branches of the courses.

In the history part of the study, the focus was on the efforts of Governmental agencies. The contribution of private agencies was not considered in the study.

A more detailed study incorporating the psychological variables of learning, effectiveness of programmes, learner characteristics, individual performance of Centres, etc. was beyond the scope of this study.

The cases of private providers of educational resources were not taken into consideration.

Organization of the Report

The report of the study is presented in the following way.

Chapter 1

This chapter of the report contains a brief introduction, need and significance of the study, statement of the problem, definition of key terms, objectives, methodology in brief, scope of the study, limitation and delimitation of the study and organization of the report.

Chapter 2

It gives the historical development of the concept of the study and the review of related studies on educational telecast and webcast.

Chapter 3

This chapter contains the methodology of the study and covers the discussion of the documents used for the study, tools employed for the collection of data, selection of sample, procedure of data collection, scoring and consolidation of data and statistical technique used for analysis.

Chapter 4

Details of analysis along with conclusion and interpretations are presented in the chapter.

Chapter 5

The last chapter includes a brief summary and interpretations of the study, major findings, educational implications of the study and suggestions for further research.

Chapter II

REVIEW OF RELATED LITERATURE

- *Theoretical Overview of Educational Television*
- *Historical Overview of Educational Television*
- *Studies related to Educational value of Television*
- *Theoretical Overview of Educational Webcast and E-Learning*
- *Historical Overview of Educational Webcast and E-Learning*
- *Studies related to Educational Webcast and E-Learning*

REVIEW OF RELATED LITERATURE

The review of related literature is a written summary of articles, books and other documents that describes the past and current state of knowledge about a topic; organizes the literature into topics; and documents a need for a proposed study. This review serves the purpose of providing a need for a study and demonstrating that other studies have not addressed the same topic in exactly the same way (Cresswell, 2009).

The investigator has reviewed the literature from various sources about the relevant aspects of the present investigation and tried to present a brief overview of it. This study is an attempt to analyze the educational telecast and webcast in India with special reference to the contribution of UGC Media Centres. The studies reviewed are summarized and presented under the following sections.

- Theoretical Overview of Educational Television
- Historical Overview of Educational Television
- Studies related to Educational value of Television
- Theoretical Overview of Educational Webcast and E-Learning
- Historical Overview of Educational Webcast and E-Learning
- Studies related to Educational Webcast and E-Learning

Theoretical Overview of Educational Television

Not very long ago, worldwide communication of information instantaneously was not so common. Now, there is no doubt that modern communication technology has vastly increased our exposure to information and experience and as a result education and its imparting methods also have grown leap and bounds. Most media have implications for education that are only now

beginning to be fully understood and appreciated. In fact, there is now the pervasiveness of mass media. There are more magazines, newspapers and books; there are more educational programmes on radio and television, as well as on internet. The education or learning came out of the four walls of a traditional classroom and is being helped by various tools and techniques like e-resources, e-learning, on-line learning, virtual classrooms, DVDs, educational channels airing specially designed programmes, websites, software, smart classrooms, online courses, and many more. In short, modern communication technology is now part and parcel of the learning situation.

Over the last several decades, educational sector has turned to television and internet /computers and started exploiting their services extensively. The roles and effects these media, starting from television are briefly explained here.

Definition of Educational Television (ETV) and Types of Programmes

Educational/Instructional television (ETV/ITV) includes those broadcasts relayed directly to an organized programme of formal instruction and are directed at specified learners: to classrooms (schools, colleges and universities), and to individual viewers (usually adult and continuing education). Instructional Television (ITV) can also refer to any planned used of video programmes to meet specific instructional goals.

Educational television programmes are of different types. It can be teacher guided where a teacher leads viewers through learning experiences. Systematic television programmes are broadcasts related to a course of study or syllabus with well behavioural objectives and planned learning experiences. Ordered and sequential types are those broadcasts presented at regular intervals in sequence; one builds upon another. Integrated broadcasts are related to other

learning experiences such as laboratory practical, reading, discussion, writing etc. which can be supplementary to original instruction.

Considering the content and context, the programmes can also be categorized in to Instructional, Informational and Motivational. Instructional programmes present either a subject or a part of subject providing information on the same. A text is prepared by an expert and either presented by him/ her or by a professional presenter. Informational programmes also present subject or part of it, but more in an indirect way, usually in documentary form. Motivational programmes contains social problems with a dramatic structure, thus the viewers are educated via entertainment.

Use of Educational Television

Educational television programmes can be utilized in many ways. In the beginning when television was introduced to the education sector, it was widely used in a variety of ways: for direct classroom teaching, as supplementary to classroom teaching, in non-formal education sector etc. Though the importance of television is lessened in the age of internet and personal computers, in many under developed and developing countries, it is still being utilized for the purposes as detailed below.

Direct classroom teaching

Educational television programmes can be used for direct classroom teaching where the television teacher is the only teacher. Slight assistance can be given by a 'live' teacher. In the earlier days, the ETV programmes were brought in to overcome the shortage of skilled and experienced teachers and the lack of facilities in rural areas. When accompanied by teachers' hand books and

students' workbooks for follow up activities, these programmes based on the core curriculum, were very much beneficial.

Supplementary enrichment classroom teaching

The ETV programmes can also be used as a supplement to regular instruction. Enrichment means an addition to or a reinforcement of something that the teacher is already trying to do. Here television is used to reinforce the content, skills or attitudes that teachers have already transacted in the classroom. These specially chosen, relevant to content, curriculum based programmes are closely integrated by the teacher with their own teaching in the classroom to make the teaching more effective and attractive.

Instructional television, at the time when it was mostly used, was not designed to replace the teacher, rather was treated as an extra resource on which the schools can draw from. Educational television was thus seen as being primarily intended for improving the quality of the existing educational service and as a support to it. Educational television can be considered as a learning resource in that it can offer teachers and students teaching materials which would not be easily accessible to them in other ways.

Educational television provides learners with access to knowledge and information in a more direct and concrete form. Television can provide physical models, professionally designed graphics and animation, foreign languages spoken in context by native speakers, interviews with national leaders, it brings natural disasters such as earthquakes, volcanoes, etc. into the classroom.

Educational television can be used in expanding the formal school system. It has been used in some countries to enable pupils, who would otherwise have had no formal schooling beyond a certain age, to continue with their schooling.

Equalizing or Enlarging Educational Opportunities in Non-Formal Education

Another major reason for using educational television is in a non-formal educational system. In a non-formal setting, educational opportunities can be provided through part-time study for those outside the normal age range or geographical reach of the basic school system. It is more or less learner centered than teacher or subject centered. So, a learner in a non-formal educational system needs to put in more personal efforts to achieve his/her goals.

In non-formal education, instructional television can be useful in:

a. Reducing inequalities existing prior to entry to formal educational system: There is strong evidence from psychological research that the five years of life - before formal schooling begins - are crucial for the intellectual, emotional and social development of a child. The pre-school programmes specially designed for toddlers help them develop intellectually, emotionally and socially.

b. Reducing inadequacies subsequent to the formal education system: Instructional television can cater to those who left school without completing their education or school drop outs. Educational television can make these adults acquire more knowledge if they choose to do so.

c. Training or educating people to know their rights, to take direct action themselves to improve their own situation in life, and to take advantage of existing services.

d. Imparting further knowledge of trade, business and new skills to those who already are in service /jobs.

Although Educational television cannot solve all the educational problems in any given country, its use will undoubtedly enrich learning, provide more opportunities for learning at both formal and non-formal system of education and makes all round education more meaningful and realistic. Research studies indicate that the use of Educational television has fast tracked dissemination of learning materials more than ever before.

Historical Overview of Educational Television

In an experimental form, television was introduced to the world as early as 1920s. By 1950, television and the black & white broadcasting gained popularity in the western countries. Color broadcasting started by 1960, and by 2006, the digital television transmissions started replacing analog transmissions owing to better clarity in transmissions. Then high definition televisions with higher resolution and internet television started gaining more popularity with the introduction of smart television sets.

Educational purposes are rarely the main reasons for introducing a television service. However, whatever the reasons for setting up of a television service, it is not difficult to find valid justification for using television for educational purposes, since more than half of the households around the world possess a set. Television has been used for a wide variety of educational purposes, including reducing illiteracy, poverty and disease. More importantly, it is being used to educate those who otherwise would have received no education at all. Even after the World Wide Web has taken up the space of television all over the world, television is still being widely used to educate the learners.

Educational Television: The World

There had been many educational programmes on television from the beginning itself. At first those were part of other entertainment programmes like Open University programmes on BBC TV in UK, later specialty channels started functioning dedicated to fulltime educational programmes. Children's television series were always popular in all countries, ranging from formal type learning programmes to those that indirectly teach. Most of these types will be having a moral behind every episode, often explained at the end. Many studies pointed out that television can be a powerful and effective tool for children if used wisely, helping them from their early days itself discover where they fit into society, understand and develop better relations with peers and elders, and particularly understand complex aspects of communication. Be it children or adults, Edutainment programmes started gaining popularity worldwide from as early as 70s. People in the media started developing television programmes for educational purposes relying on entertainment to spread educational messages. Programmes were also made to raise social awareness.

Some of the famous old and new shows combining education and entertainment are listed below:

- Telenovela (Latin America) (1970): Designed to educate people about family planning, literacy etc.
- Sesame Street (US): Perhaps the most famous children show, Sesame Street is developed by Sesame Workshop- a non-profit organization, formerly called Children's Television Workshop. Their first episode was aired on 10 November 1969. This series combined live action, comedy, short films, animations and puppetry to sustain the attention of children.

- Captain Planet and the Planeteers (US) (1990): It is an animated environmentalist television programme.
- Modern Marvels (1995): One of the longest running TV series in the History Channel, which focused on how technologies affect and are used in modern society.
- Dora the Explorer (US) (1999): The target audience was the preschool set of 2-5 year olds. In each episode the main character teaches the viewers a new word in Spanish/English and urges them to use it to help solve problems.
- Drive thru History (2004): The series takes the viewers to holy sites across the world. The programme has been broadcast worldwide on History International and Trinity Broadcasting Network.
- How it's made (2001): It is a documentary tv series on the Discovery and Science channels. Shows how common everyday items are manufactured.
- Nat Geo shows: The National Geographic Channel featuring non-fiction documentaries involving nature, science, culture and history is very famous for its educational value.

Regarding the use of television in the higher education, one of the earlier attempts was by the University of Northern Iowa, USA when they started the first regularly scheduled Teachers College television programme, a film on safety education aired on October 5, 1950. After the World War II, there were many such attempts started all over USA. The Federal Communications Commission there set aside 242 television frequencies for non commercial purposes in 1952. The University of Houston established the first educational television station in the US in 1953 called KUHT. The station also offered the

university's first televised college credit classes. The Public Broadcasting Service, which began service in 1970, combined televised educational lectures with popular programmes like Sesame Street. Developments in the field of educational telecast occurred around the same time in Germany and elsewhere in Europe.

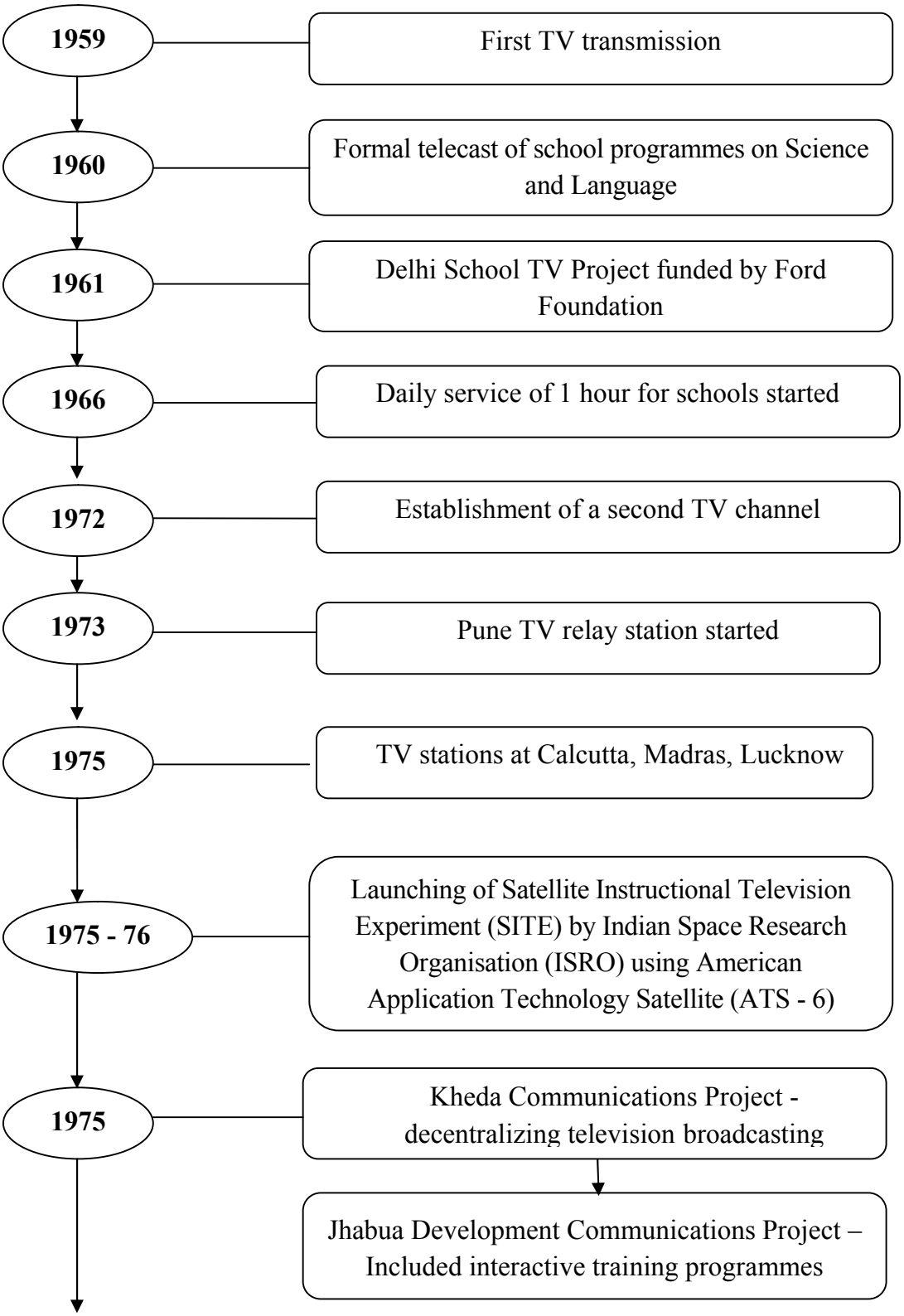
Television: The Indian Scenario

In India, television first came on Sept 15th, 1959 as the National Television Network of India. The transmission was on an experimental basis, and commercial services commenced in 1965.

According to Rani (2006), the history of Indian Television can be divided into five stages.

- First stage is the Television in post-independent India which covers the growth of the medium from 1959 to 1975. The sole service provider was Doordarshan.
- Second stage is with respect to the satellite broadcasting. The first satellite based, live TV transmission using the INSAT 1 B satellite took place with the live coverage of Independence Day celebrations on 15th August 1982.
- Third is during the emergency period when television was used as a political weapon of the government.
- The fourth stage shows the growth and development of television with the advent of cable and newer technologies &
- The fifth stage saw the revolution of satellite television in India.

A time line is given below indicating the growth of television in our country.



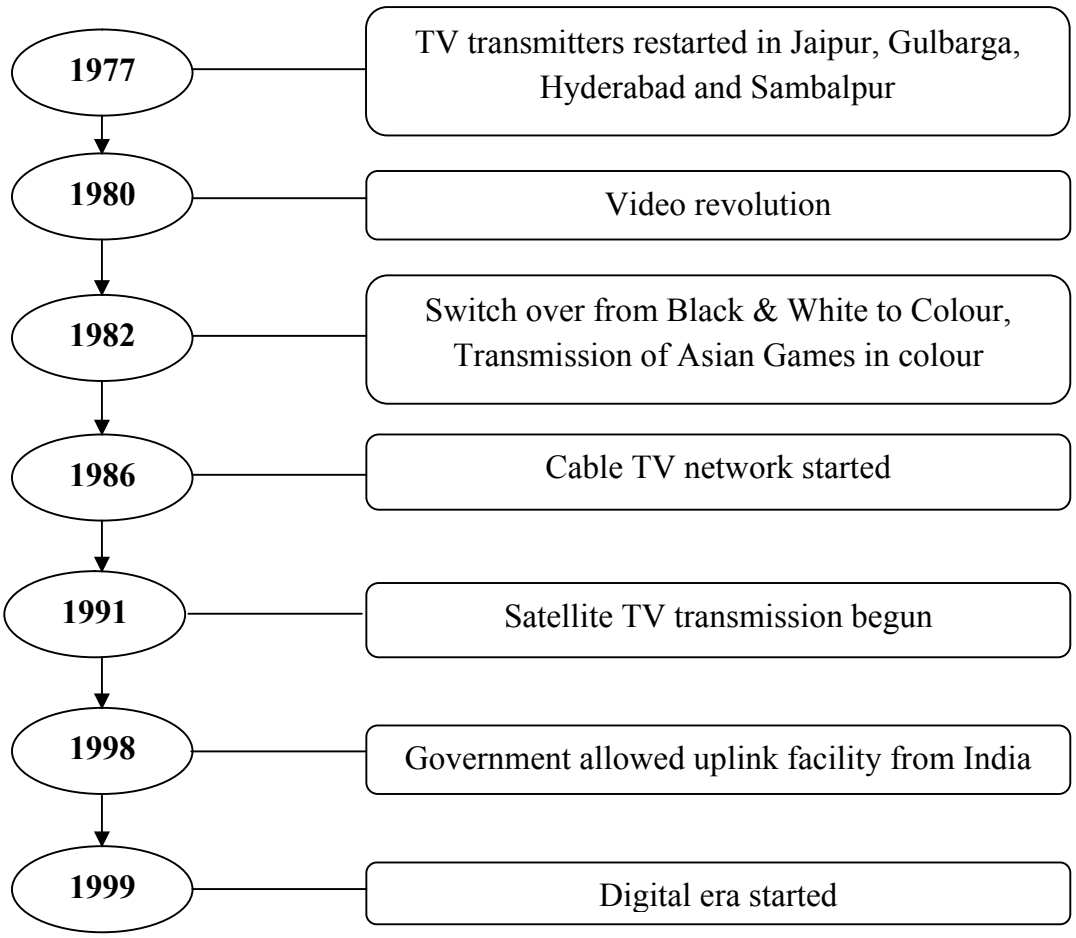


Figure 1. Time line of the growth of television in India

In the last decades, television with its numerous channels took over the households of India - be it entertainment or education. In 2010, a total of 515 channels were available and now (2018) more than 900 permitted private satellite stations are there in India apart from many other local, regional language channels. Our national network Doordarshan operates 66 Studio centres all over the country, including 17 major studio centers at State capitals and 49 other studio centers located in various cities. Over the years Doordarshan has grown into a network operating two all-India channels (DD National and DD News), an international channel (DD India), a sports channel (DD Sports), DD Bharati, DD Urdu, DD Kisan and 34 satellite channels besides providing free-to-air DTH service having 104 in its bookings. (http://prasarbharati.gov.in/DD)

So, from the beginning itself, the television was viewed as a good tool for educating the masses because of its accessibility. With its large audience it has attracted educators as being an efficient tool for imparting education to primary, secondary and university level students.

Educational Television: Growth and development in India

On 19th January 1960, the India Government formally launched telecast of school programmes on Science and Language. It was done by the All India Radio (AIR) in collaboration with the Education Department. The Ford Foundation funded 'Delhi School Television Project' was launched in 1961, by which 150 schools in Delhi received specially designed science programmes and other enrichment programmes. Recognizing the power of TV on education from the experiment, daily telecast of 1 hour duration for schools was started in 1966.

As most of the population of India resided in the villages with agriculture as their main occupation, in 1967, 'Krishi Darshan' was launched for the benefit of farmers of 80 villages in the states of Uttar Pradesh and Rajasthan. This was made possible by increasing the power of transmitter at Delhi to cover these areas and by installing community receiving sets. The programmes for Krishi Darshan were made by the Government in collaboration with Department of Atomic Energy, Indian Council for Agricultural Research (ICAR) and the State Governments of UP and Rajasthan. In the programme, a host presented success stories of farmers and answered queries (received via post) related to agriculture.

The Indian National Satellite (INSAT) became operational in 1982 and the establishment of low power transmitters facilitated greatly the expansion of television in India. Though by this time the entertainment programmes took over

most of the transmission time, the shortage of programmes with the increase in telecast hours paved the way for production of more educational programmes for national network. This led to the launch of Countrywide Classroom (CWCR) by the Government through UGC for students in colleges and universities in 1984. Along with this, in 1984 itself, NCERT started broadcasting programmes for schools.

For producing programmes for the higher education sector to be aired in the national network, UGC established Media Centres in Universities, called Educational Media Research Centres (EMRC) and Audio Visual Research Centres (AVRC). The official transmission of CWCR started on 15th August 1984. Initially 6 media centres were set up by the UGC and by 1992, the number increased to 14. On 26th May 1993, UGC established an Inter University Centre - Consortium for Educational Communication (CEC) with the objective of disseminating countrywide classroom programmes through TV and also as a nodal agency at national level to coordinate and monitor the functioning of media centres. Later 8 more Media Centres were opened. Each of these Media Centres has full-fledged studios with high quality equipment for broadcast quality programme production. The programmes developed are then sent to the CEC for dissemination through various ways.

Initially the programmes were given 1 hour morning slot and later the same were re-telecast in the afternoon slot. The programmes produced in Hindi and English began its telecast on 2nd February 1994. At the height of its popularity, the CWCR telecast enjoyed the viewership of about 20 million people and daily viewership of 4 million people (Rani, 2006).

With the establishment of Prasar Bharati Corporation of India, the free allotment of time slots for programmes came to an end. This and the heavy emphasis given to entertainment programmes hindered the progress of broadcast of programmes by the CEC. Rani (2006) pointed out many reasons for the decline in the popularity and loss of viewership for the educational programmes aired by CEC. Some of these are,

- Insignificant viewing slots
- Unannounced change in telecast timings on account of sports programmes/parliamentary sessions etc.
- Indifferent attitude of Doordarshan
- The importance given by Doordarshan (DD) to revenue generating entertainment programmes
- Unavailability of free slots
- Explosion of satellite private television channels offering a wide variety of entertainment programmes.

Vyas et al. (2002) identified some major educational television projects which have already made their impact with the Indian society and those are, Secondary School Television Project (1961), Satellite Instructional Television Experiment (SITE) (1975), Indian National Satellite project (INSAT) (1982), UGC-Higher Education Television Project (HETV) (1984), IGNOU-Doordarshan Telecast (1991), Gyan- Darshan Educational Channel (2000) etc.

Some of the main projects are described below.

Secondary School Television Project (1961)

With the shortage of well-equipped laboratories, qualified teachers, space etc., this project was designed mainly for the secondary school students of Delhi. The project enabled nearly 20,000 students from 150 schools in Delhi to receive the benefits of specially designed science programmes and enrichment programmes.

Satellite Instructional Television Experiment (SITE) (1975)

Of all the projects/experiments involving television, SITE calls for special mention. The Satellite Instructional Television Experiment, started on August 1st, 1975 was the earliest and systematic efforts in India with respect to an educational television channel. The experiment is also regarded as the largest ever conducted in human communications. The mission was carried out with the help of Application Technology Satellites of NASA. The one year experiment was meant for the people in the villages of six states (Rajasthan, Karnataka, Orissa, Bihar, Andhra Pradesh and Madhya Pradesh) to contribute to family planning, agriculture practices and national integration and also for general and adult education. That is, the two tier programme was intended for both the community in general and schools. The criteria of selecting these states for the programme were the backwardness, potential to continue the television service after the project, economic condition, availability of basic infrastructure and facilities and the size of the population between 500 to 5000 (Chander & Karnic, 1976). Production of programmes, mainly three categories - News, Instruction and Entertainment - were done at three centers: Cuttack, Delhi and Hyderabad. The SITE proved beyond doubt the tremendous use of TV for developmental

purposes and was a splendid opportunity for the scientists with the concept of broadcasting.

Kheda Communications Project and Jhabua Development Project

As a part of SITE, another project, called Kheda Communications Project was launched in 1975 to understand the nature of development of programmes for television. This project launched by Development and Educational Communication Unit (DECU) of the Space Application Center (SAC) in Ahmedabad was instrumental in decentralizing television broadcasting in India. With the low power transmitter provided by the United Nations Development Programme (UNDP), a local production studio at Pij village and a Satellite Earth Station at Ahmedabad gave the villagers the pleasure of watching television programmes in their own language. The project helped in understanding the power of audio visual communication and the nature of development programmes suitable for different communities. The Kheda project later won the UNESCO Prize for rural communication efficiency.

Another project, Jhabua Development Communication Project evolved from the Kheda project, for benefitting tribal people living in the rural hilly area of Jhabua district in India's Madhya Pradesh state. The project, also launched by DECU, was an experiment in checking the utilisation of an interactive satellite-based broadcasting network to support development and education in remote and rustic areas of India. A special feature was the availability of talkback terminals through which people ask questions, provide feedback, and report on the progress.

Indian National Satellite Project (INSAT) (1982)

The prime objective of the INSAT project was aimed at making the rural masses aware of the latest developments in the areas of agricultural productivity, health and hygiene. The breakthrough came with the launch of Indian National Satellite (INSAT) in 1980 and its availability for educational purposes. As a result the Ministry of Education in India had taken over the production of educational programmes to be aired with via Doordarshan. The programmes were mainly for the school going children.

UGC-Higher Education Television Project (HETV) (1984)

The University Grants Commission in collaboration with INSAT started an educational television project, popularly known as 'Countrywide Classroom' (CWCR) on August 15th, 1984 with the aim to update, upgrade and enrich the quality of education while extending their reach.

The Credo of the Countrywide Classroom states that it is,

'……to provide new insights, to bring in new findings and to take students on vicarious tours of places and laboratories they would never see. Inter-relatedness of various disciplines and of developmental problems would be highlighted so that the sum is greater than the total of the parts ... stress will be laid on the process of converting information into knowledge and - hopefully - knowledge into wisdom'.

At the time of inception in 1984, a 1-hour slot was allotted in the Doordarshan national network. Later it was increased to two 1-hour slots, from 1.00 to 2.00 p.m. and 4.00 to 5.00 p.m., on all the working days. While the former slot was used to telecast new programmes, the latter slot was a repeat telecast.

IGNOU - Doordarshan Telecast (1991)

The Indira Gandhi National Open University (IGNOU), established by an Act of Parliament in 1985, has continuously striven to build an inclusive knowledge society through inclusive education. It has tried to increase the Gross Enrollment Ratio (GER) by offering high-quality teaching through the Open and Distance Learning (ODL) mode.

With the launch of EduSat (a satellite dedicated to education) on 20th September, 2004, and the establishment of the Inter-University Consortium, the University has ushered in a new era of technology-enabled education in the country. The IGNOU-Doordarshan telecast programmes, designed mainly for distance learners started in May 1991.

GyanDarshan Educational Channel (2000)

Ministry of Human Resource Development, Information & Broadcasting, the Prasar Bharti and IGNOU launched GyanDarshan (GD) jointly on 26th January 2000 as the first exclusive Educational TV Channel of India. IGNOU was given the responsibility to be the nodal agency for uplinking/ transmission using INSAT - 2 B. Within one year of its launching, on 26th January 2001, it became non-stop daily 24 hours transmission channel for educational programmes. Although Gyan Darshan has made its presence felt in all Open Universities and most of the prominent conventional Universities /schools, it still has the potential to reach the door steps of learners through cable TV network.

The channel shifted from analog to digital mode after getting linked to INSAT-3C in 2002. The IGNOU then expanded GyanDarshan into a bouquet of

channels namely GD-1, GD-2, GD-3 and GD-4, being uplinked from earth station at Electronic Media Production Centre **(**EMPC). The details of the channels are as follows:

- GD 1 is 24 hour channel having the programmes produced by IGNOU and best educational programmes from other educational channels of Gyan Darshan.
- GD 2 is devoted entirely to interactive distance education, which is a unique feature of the bouquet of channel using DVB - RCS technology. This was launched in 2003. At the beginning, this channel was dedicated exclusively for languages.
- GD 3 (Eklavya Channel) is a 24 hour Channel which brings quality education to the students pursuing engineering education throughout the country. This was started on 26th January, 2003 in collaboration with Department of Technical Education of the MHRD and IITs.
- GD 4 (Vyas Channel) is a 24 hour Channel which provides quality education to the students pursuing higher education throughout the country. This was launched in 2004. VYAS was jointly coordinated by UGC and CEC.

Kisan TV Channel (2004)

This channel was launched on 21st January 2004, dedicated exclusively to Agriculture, for providing agriculture related information to farmers. This was an innovative attempt, trying out narrowcast broadcasting - which is thought to be the most appropriate way of reaching people at the grassroots. Doordarshan's low and high power transmitters (LPT and HPT) were used for the telecast.

Launch of CEC's EDUSAT Network

GSAT-3 known as EDUSAT is the satellite exclusively devoted to meet the demands of educational sector and was meant for distant classroom education from school level to higher education. It was launched on September 20th, 2004 by Indian Space Research Organization (ISRO) to meet the ever increasing demand for an interactive satellite-based distance education system for the country. It has revolutionized classroom teaching through IP (Internet Protocol) based technology. EDUSAT has five K_u (K-under) band transponders providing spot beams, one K_u beam transponder providing national beam and six extended C-band transponders providing national coverage beams.

Consortium for Educational Commission (CEC) is one among the five primary users of this educational satellite.

At present, there are over hundred Satellite Interactive Terminals (SITs) and Receive only Terminals (RoTs) under CEC EDUSAT network, installed at various colleges, Academic Staff Colleges and Universities across the country. Many more are being added with the purpose of providing quality higher education to the remote areas through satellite network. CEC EDUSAT network is empowering students through cutting edge technology and caters the needs of students across the country.

EDUSAT live transmission

CEC EDUSAT network has done exceptionally well in the past and has won many laurels since it began live transmission on 5th September 2005. CEC has established UGC-CEC nationwide network comprising of 98 Satellite Interactive Terminals (SIT). In the live transmission, CEC acts as the teaching end where Subject Experts deliver live lectures. These lectures are received by

various SITs and RoTs. These are known as Class Room End. The Teaching End can be shifted from one SIT to another. Thus, the students can benefit from experts located at various Educational Institutions across the country.

The Expert can address the queries of the students in the live mode. The students can interact and ask questions using the following three methods.

- Audio Video Conferencing
- Text Mode
- Through Telephones

North East EduSat Network

On the recommendations of the North East Council, the CEC has established another network called North East EduSat Network on 5th September 2006. As per the 2012 newsletter of CEC, there were 12 SITs installed in Universities and 70 RoTs in colleges of North East region.

Agencies of Educational Telecast in India

In India, under Ministry of Education, several organizations function for the upliftment of the educational sector from school level to post graduate and professional education. Now almost all are involved in the telecasts and webcasts of educational programmes for the divisions coming under them. Some of the agencies responsible for educational telecasts for the higher education as well as school level education are described below briefly.

University Grants Commission (UGC)

Realizing the potential and power of television to act as means of educational knowledge dissemination, UGC started the Countrywide Classroom

Programmes in the year 1984. For production of educational programmes, initially Media Centres were set up at 6 Universities. It was done with the objective of producing in-house quality educational programmes for electronic media.

Consortium for Educational Communication (CEC)

The Consortium for Educational Communication popularly known as CEC is one of the Inter University Centres set up by the University Grants Commission. It has been established with the goal of addressing the needs of Higher Education through the use of powerful medium of Television along with the appropriate use of emerging Information Communication Technology (ICT). Today 21 Media Centres now known as Educational Multimedia Research Centres (EMRCs) are working towards achieving this goal under the umbrella of CEC located at various higher education institutes in the country. These programmes are telecast on Doordarshan and Gyandarshan Channels.

The main activities of CEC are as follows:

- *Close Coordination, facilitation, overall guidance and direction towards the activities of the Media Centres set up by the UGC in various Universities throughout the country.*
- *Dissemination of Educational programmes through broadcast as well as non-broadcast modes. Production of Educational programmes (Audio/Visual and Web Based) and related support materials, and further setting up of appropriate facilities for such production.*
- *Research activities related to optimizing the effectiveness of such programmes.*

- *Providing a forum for the active involvement of academic and other scholars in the creation of appropriate educational programmes.*
- *Studying, promoting & experimenting with new technology that will increase the reach and/or effectiveness of educational communication.*

CEC and the Media Centres have more than 1000 trained manpower & state of the art equipment. CEC has perhaps the largest repository of Educational Video programmes being produced by its Media Centres, numbering more than 40,000.

Indira Gandhi National Open University (IGNOU)

IGNOU is the world's largest University providing education to those who are deprived of formal education. It was established by an Act of Parliament in 1985 and offers high quality teaching through the Open and Distance Learning (ODL) mode. As early as 1999, IGNOU has started using technology mediated education making ODL hi-tech. As of 2018, IGNOU has 21 Schools of Studies and a network of 67 Regional Centres, around 2,667 Learner Support Centres and 29 Overseas Partner Institutions. With the launch of EduSat, the University has entered in to the world of technology-enabled education, which made it easier to transact interactive digital content. This also enabled the University to add value to the traditional distance education delivery mode with modern technology education within the framework of blended learning (www.ignou.ac.in).

National Open School (National Institute of Open Schooling)

National Open Schooling is the distance education centre for school education up to pre-degree level/ plus two in India. Based on the suggestion of National Policy on Education for strengthening Open School System, the MHRD

established National Open School in 1989. In 2002, the name was changed to National Institute of Open Schooling. NIOS operates through a network of five Departments, Regional Centres and Accredited Institutions in India and abroad. One of the major activities of the NIOS is to make use of modern means of communication and educational technology in distance education. To supplement and complement the conventional modes of distance learning, the media unit of NIOS produces multimedia packages to learners and broadcast/ telecast these audio/video programmes on different channels (www.nios.ac.in).

Electronic Media Production Centre (EMPC)

The Electronic Media Production Centre (EMPC) was established by IGNOU in 1995, with the financial and technical support of Government of Japan, as a Media Centre to prepare learning materials for the distant learners. Housed in the Sanchar Kendra Complex at Maidan Garhi campus in New Delhi, it serves as a Nodal Resource Centre in production, dissemination and transmission of educational software in the country, utilising a wide range of communication media.

The major activities undertaken by the Centre are the production and dissemination of educational audio-video programmes. Curriculum-based audio-video programmes are developed to supplement the courseware of IGNOU by a trained and skilled in-house staff, using state-of-the-art facilities. Both broadcast and non-broadcast modes of delivery are adopted. The cassettes/CDs are sent to RCs/SCs and are also sold at reasonable rates through the Marketing Unit of the EMPC. The audio/video programmes produced at EMPC are broadcast/telecast over Gyan Darshan, Gyan Vani and Edusat Channels of IGNOU and the National Channels of AIR/ Doordarshan regularly.

National Council of Educational Research and Training (NCERT)

The National Council of Educational Research and Training (NCERT), is an organization set up by the Government of India, with headquarters located at Sri Aurobindo Marg in New Delhi, to assist and advise the Central and State governments on academic matters and policies for qualitative improvement related to school education. It was established in 1961. The major constituent units of NCERT are National Institute of Education (NIE), Central Institute of Educational Technology (CIET), Regional Institutes of Education at Ajmer, Bhopal, Bhubaneswar and Mysore, North - East Institute of Education at Shillong and Pandit Sundarlal Sharma Central Institute of Vocational Education at Bhopal (https://ncert.nic.in).

Central Institute of Educational Technology (CIET)

To improve the quality of school education utilizing television and other media, the Centre for Educational Technology (CET) was set up in NCERT and Education Technology (ET) Cells were established in 21 states under it. CIET was established by merging the CET and Department of Teaching Aids in 1984 to facilitate technology mediated education in schools. The major aim of CIET is to promote utilization of educational technologies like radio, TV, films, satellite communications and cyber media either separately or in combinations (https://ciet. nic.in).

State Institute of Educational Technology (SIET)

The State Institute of Educational Technology (SIET) is responsible for the planning, research, production and evaluation of educational software like

video, audio programmes and computer multimedia. SIET also aims to implement schemes to generate teaching technologies and learning process in the modern context. There are 7 SIETs in the country under Department of Education, Ministry of Human Resource Development in the states of Uttar Pradesh, Bihar, Andhra Pradesh, Maharashtra, Orissa, Gujarat and Kerala. These SIETs are responsible for making programmes for schools in regional languages.

Studies Related to Educational Value of Television

Several studies have been conducted worldwide about the educational values of television starting as early as 1960s. Many educational programmes also were prepared and aired for the benefits of school going children and toddlers, the famous one being 'Sesame Street'. It paved the way to many such programmes. Premiered in 1969, Sesame Street was a children's TV programme created in the US with the goal of '*mastering the addictive qualities of television and do something good with them*'. The programme is known for its educational content, and images communicated through the use of muppets, animation, short films, humor and cultural references.

As the technology developed over the time, the studies undertaken also dealt with new technologies. Hence the studies are presented here in the chronological order.

In Ireland, though the Irish Television service started providing programmes of educational nature from as early as 1962, after twenty years, they have terminated the service of both educational radio and television. Ireland then

became one of the few countries without a formal educational broadcasting service. Studying about this state of events, Coolahan (1984) outlined several factors which eventually led to it. One factor was the termination of financial support by the Department of Education because of which no new programmes could be developed. The reports and guidelines forwarded by different committees to rectify the situation also were neglected. Another concern pointed out by the author was the inaction and air of indifference by the administrative system on educational broadcasting.

Tiene (1997) commented that the interactive television as a distance education medium appears to have considerable potential as long as educators will strive to meet the challenges associated with teaching students at a distance.

Palmer (1999), originator of Sesame Street - the famous television programme for children, in an article recommended the following ideas for capacity building to improve educational television in developing countries:

- Expand and improve technical facilities by way of better national planning involving wide stakeholder participation.
- Develop an extensive data base on best practices, one that provides a foundation for other crucially important actions - like technical information for each genre on content planning, audience research, presentational design, and evaluation.
- Planning for global policy implementation.
- Planning for increased channel capacity: Special steps are needed to ensure that local educational programming receives adequate consideration, funding and air space.

- Get the services of experts to help plan and implement sustainable improvements in such areas as content planning, use of audience research, educational strategies, and technical and artistic production values.
- Train those who invest in or manage educational TV offerings.
- Training of TV scriptwriters and directors on how to make TV for learning more engaging, interactive, persuasive, and sensitive to the needs and interests of the learner.

Wynia (2000) studied the feelings of students about interactive television. She suggested that for higher satisfaction through education at a distance, the educators have to magnify and enhance communication through online chat rooms, virtual office hours, responsive e-mails and remote site visits.

Huston et al. (2001) conducted a longitudinal study to examine the impact of educational television. Collecting data on the naturalistic viewing patterns of children during their early childhood and after a decade when they have become adolescents, the researchers found that adolescents who had been frequent viewers of children's informative programmes, such as Sesame Street and Mister Rogers' Neighborhood, had better grades in high school than those who had been infrequent viewers of this kind of educational fare.

In her book, ‘Viewers like you? How public TV failed the people’, Ouellette (2002) narrates the story of first US Public Service Broadcaster (PBS) during the 1960s. One important issue pointed out by Ouellette is that most ETV programmes utilized a ‘print derived aesthetic’ characterized by ‘unadorned and slow moving interpretations of the written word’. This observation is relevant in these times too.

Even in a small country such as Cyprus, educational broadcast was brought into the elementary education system in the 1960s. The whole programme was later abandoned, in the early 80s. In a historical account of educational broadcast in Cyprus, Karagiorgi (2003) listed many points for the failure of the attempt:

- No major research or need assessment was carried out before implementing the programmes.
- The administrative bodies lacked consensus on aspects of innovation.
- Reluctance of the teachers to implement the programme in the classroom.
- Lack of faith of teachers in the educational value of educational broad casting.
- Quality of programmes was questionable and curriculum integration of those programmes were problematic.
- Programmes developed were not relevant and appropriate for the Cyprus curriculum.
- Goals formulated lacked clarity as the innovative practice was imported from foreign countries without any regard to local relevance and meaning.

Writing about Kheda Communications Project in India, Rani (2006) highlighted the uniqueness and significant features, which points to the nature of the programmes for TV. She pointed out that the success of communication depends on the availability and accessibility of resources to the target audience. The production of the programmes was done with the cooperation of the beneficiaries and they dictated the nature of the programmes. In reaching only those for whom the message was relevant, appropriate and important, it minimized the wastage of the message.

Roy and Chhabra (2007) proposed in their study that Tele Education is vital for both under developed and developing countries which serves as a means to provide students with learning experiences and opportunities like those available to learners in developed countries.

While studying about the effectiveness of different media of education among learners and tutors in Bangladesh Open University, Islam & Islam (2008) found out that though half of them prefer text materials and tutorial classes, more than 80% learners were interested to see the TV programme for their teaching learning activities and expected that TV programmes should be entertaining, informative and of diverse nature.

Studying about the impact of Allama Iqbal Open University (AIOU) Television on 2003 year intake students' performance in distance education through a relationship between broadcast day, time and duration, Siraj (2008) could not find any strong relationship between Learning from TV and Academic achievement in the AIOU situation. The author suggested that use of television in the AIOU situation will be more effective if transmission day, time and duration are adjusted according to the students' demand and when students' assignments are based on both textbook and TV programmes.

Gabrelian, Blumberg and Tracy (2009) conducted an exploratory study using one such educational programme 'Square One' on the impact of appeal on what children may learn from educational television programmes. The study focused on the effects of audience appeal on fourth-graders' and fifth-graders' comprehension of and selective attention to narrative and academic content in educational programme segments. Their findings indicated that most students recalled relevant narrative content even with segments rated low

in appeal. This demonstrated that children do not necessarily have to like what they see on an educational television programme to feel confident that they understand what they saw.

Misra (2010), in a paper observed that the internet has challenged the supremacy of television as an important medium to disseminate information to the students. At the same time, internet offers good opportunities for promoting educational television. Misra also proposed that the best strategy to make educational television popular and usable will be to conduct inward and outward educational television researches. The inward research means how students perceive, what they like and what impact they get from educational programmes and outward research means whether they know about, how they receive and what is the role of educational programmes in their life.

Sub-Saharan Africa region lags behind the rest of the world in terms of internet technologies and other socioeconomic factors, one factor that stands out is the continent's lack of education. With 50% of the population under 20, few numbers of universities and colleges, lack of access to books & up-to-date classroom materials, the demand for quality college-level education can be very high and significant. This led to the establishment of African Virtual University - an intergovernmental organization partnering with more than 50 institutions. Investigating the case of the AVU, Simmons et al. (2011) carried out a focused literature review of Tele Education in the African context and noted that Kenya set out to make a difference with TeleEducation and they are achieving that goal and others related to extending educational opportunities to marginalized groups. They further observed that these types of tele-education initiatives are suitable for more countries like Kenya.

Dr. A.P.J. Abdul Kalam, addressing the Pan-African Parliament in Johannesburg (2003-04) proposed to provide seamless and integrated satellite, fiber optics and wireless network for connecting all African nations. The Pan-African e-Network project was the result and has the objective to provide tele-medicine and tele-education to Africa. The data centre was at Delhi with its tele-hubs located in 5 universities and IGNOU was one among them. Nanda and Saxena (2013) carried out a thorough case study of the Pan Africa e-network project offered by the Indira Gandhi National Open University. The authors concluded that such a virtual education can tailor goods and services to meet the basic needs of the community and then move slowly and steadily toward broader wealth generation. Entrepreneurship education through tele-education would provide a mix of experiential learning, skill building and, most importantly, mindset shift, while developing attitudes, behaviours and capacities at the individual level that would not only help the individual career of learners but create a range of long-term benefits to society and the economy.

A notable effort was made by the Ethiopian Ministry of Education in utilizing educational media such as satellite TV programme for improving quality of secondary education to cope up with lack of qualified teachers, lack of good teaching models, and remote rural regions separated from educational benefits. Kim and Bogale (2014) investigated the actual practice and effectiveness of these satellite TV programmes and their findings indicated that the Ethiopian secondary school students who utilized satellite TV programme scored highly in the evaluation areas of context, input, process, and product of the programme. It was also found that *learning demand, learning content (interests, customized learning, appropriateness, supporting face-to-face class,*

understanding, usefulness) and class management (interaction with TV teacher, affirmative class environment) were factors affecting satisfaction in a satellite TV programme. The authors have recommended several educational and administrative strategies also, which included effective motivational instructional design for improving students' active participation, consideration of factors such as location (urban and rural) and gender when designing, developing, and operating satellite TV programme, development of countermeasures for raising teacher's integration of the satellite TV programme to the Class etc.

Many experts and academicians pointed out that the potential of television as a learning tool was not fully exploited by both developed and developing countries. Misra (2013) analyzed the educational television broadcasting in Germany from different perspectives joining in an effort to search for the causes of underperformance of TV and to provide suggestions for making it as a better tool. The author pointed out many challenges - low funding/ high cost for productions, decreasing interest in TV programmes, lack of uniform policies for broadcasting, legal challenges, low popularity among youth etc. He proposed that countries should come forward to learn from educational television experiences of each other. According to the author, Television as a medium is further required to accept and embrace present socio-economic and technological changes. Broadcasters are required to accept technological changes like internet and commercial competition for the promotion of educational television.

One of the first televised university courses, "Shakespeare on TV" instructed by Dr. Frank C Baxter was a huge success in the US Educational Television in the 1950s. Baxter's dynamic presentations were held up as an excellent example for how teaching and media entertainment could coexist

(Smith, 2014). Studying the success of Baxter, Smith also remarked upon the challenges faced by the teachers/presenters of educational programme on TV. He maintained that in addition to the feeling of a restricted sense of movement at the studio, the emphasis is on the temporal challenges of television teaching which requires the teacher to be precise, concise and consistent. Smith further remarked that the formidable task television teachers face is that ' they were required to offer content that was systematic and comprehensive yet concise and exciting, to design presentations that were visually stimulating without recourse to gimmicks or titillation, and to give lectures that were both scholarly and actorly'.

Instruction through interactive television (ITV) is a method of teaching content to students at a distance using interactive technology. ITV is the use of two-way video and two-way audio for instruction (videoconferencing). For Laboratory science classes offered to distance learners require a methodology that allows for the completion of tactile activities. Reddy (2014) pointed out that Interactive TV allows real-time student-teacher interaction and discussion, which is most suitable for these type of classes. However some of the drawbacks include necessity of a common meeting time and place and a substantial initial financial investment. Though ITV decreases flexibility of learning time, environment and pace of a distance learner, the real time interaction factor of ITV makes it worth the sacrifice.

Studies Related to CWCR Programmes

The studies on the Countrywide Classroom (CWCR) programmes of the media centres are presented here in the chronological order they have been conducted in order to understand the developments related to the productions.

In one of the studies about the CWCR, Agrawal and Malek (1986) remarked that the undergraduate students from various linguistic regions prefer to view these programmes in the language of their college studies. The students, but were forced to watch the programmes in English. At that time, the planners of these programmes also concentrated more on enrichment programmes rather than syllabus based programmes.

Kumari and Ali (1990) conducted a study as a part of the CWCR Project during a series of workshops organized by NIEPA for principals of rural area colleges, to see and assess the kind of institutional support provided by the rural colleges to the CWCR project. After a detailed study they found out that very little institutional back up was provided by the colleges. Moreover the general involvement of the Principals with the CWCR programmes was also extremely low.

Mishra (1990), while working in the capacity of Research Scientist with UGC-INSAT TV Project, conducted a feedback study of the target audience assessment of the CWCR programme from 9 colleges in Himachal Pradesh. At that time, the telecast was from 12.45 pm to 1.45 pm with a repeat from 4.00 pm to 5.00 pm on six days a week. Even though 84 % of the respondents view the telecast, only 9.1% were regular viewers. An important finding/suggestion came out of the study was about the inconvenient timing of the telecast, and another one was about the absolute need of giving proper publicity of the telecast schedule through newspapers and TV announcements.

In its search for new ways to improve and enhance learning with the use of educational technology available in the country, the UGC, in collaboration with the Indian Space Research Organisation (ISRO) conducted experiments called

National Talkback Experiments in 1991 and 1994. These experiments used a mode of conferencing with one-way video and two-way audio communication in a television broadcast situation that has been found to be quite effective in many advanced nations.

The first National Talk Back Experiment was called UGC - ISRO National Talk Back Experiment and was carried out to test the viability of two way interactive communication to enhance and enrich the quality of educational content for under graduate students. For one week from 25th to 30th Nov 1991, 835 students from 8 selected locations from across the country watched 12 prerecorded ETV programmes made by the Media Centres uplinked from Delhi earth station. Soon after the telecast the students interacted through two ways audio and one way video with the subject experts located at the studio created for the purpose at Delhi station. For interaction students made use of satellite based remote talkback located at two centres and conventional or temporarily dedicated STD lines at other centres. Some used FAX also. During this period the research team using elaborate and well-designed tools measured and examined technical, operational, educational, enrichment and economical aspects of the experiment. The analysis of the data indicated that the interactive mode of television should become a regular feature of the CWCR.

At a time when there were only 4 EMRCs and 10 AVRCs functioning, Goel and Sahoo (1992) conducted a study about the effectiveness of talkback programmes involving the interaction between the viewers and the subject experts during post telecast sessions. They found the ETV programmes well developed and well-presented having a positive reaction by the students. The

researchers also reported that the gain from the programmes with talk back facility is more than those without talk back.

While the national talkback experiment demonstrated the technical feasibility and the pedagogical processes involved in interactive television, the later experiment in 1994 offered an interactive telecourse on new information and communication technologies. Having noted the success of running such a package, it is planned to run special packages in interactive mode on a regular basis and make these an integral part of the Countrywide Classroom transmission. The expert committee put forward many suggestions (Reddy et al., 1995) for making interactivity more effective such as:

- increase in number of telephone lines at the teaching end to ensure fast connectivity
- provide more time for interaction between students and experts
- ensure uniformity in programme content, quality, and information overload
- provide the enrolled students with supplementary reading material before the telecourse
- open the telecourses to the general viewing audience
- improve the technical quality of both the programmes and the interaction
- use teleconferencing for educational television more frequently, in a more organized manner.

The CEC, the Media Centres under it and other independent researchers carried out many studies to know about the effectiveness and utilization of Countrywide Classroom programmes developed and disseminated by the CEC

(Peddharkar (1988), Kumar (1990), Mishra (1990), Kumari & Ali (1991), Govindaraju (1996) and Rao (1998)). They have reported the following main reasons for the underutilization of and disinterest in CWCR programmes.

- lack of proper information about the programmes,
- indifference of teachers in motivating the students and themselves in the utilization of programmes for supplementing the teaching-learning process,
- non availability of television sets at colleges and homes,
- lack of proper space or extra space for the viewing of programmes,
- lack of electricity in the colleges,
- difficulty in following the language used in foreign programmes and
- improper mode of delivery of programmes.

Various viewer-ship surveys conducted by the Media Centres in the 90s showed that these programmes were being watched by a sizable population of students and teachers besides a very high percentage of house wives, retired persons and senior citizens. The CEC arranged two viewership surveys in 1993 and 1997 (conducted by ADMAR Services (P) Ltd). As per the report, the overall viewership of UGC countrywide classroom in 1993 was 21.29 million viewers with an average daily viewership of 3.99 million. About 1.57 million were regular viewers watching UGC programmes over 4 days a week. The 1997 report pointed out that there was only a small increase in the viewership, from 21.29 million to 22 million. Considering the population of India, this was a very small percentage.

Studying about the features, structure, organization and functioning along with the difficulties and limitations of CWCR Project, Govindaraju and Banerjee (1999) pointed out the difficulties in giving a specific focus while preparing educational materials for enrichment for want of a national curriculum. Another

obstacle pointed out by the researchers is identifying and getting uniform telecast timings which are suitable for college students at large. They proposed that this should be viewed in the Indian context where there is a wide disparity in the curriculum, the infrastructure, the educational resources and the mode of teaching. Another important point forwarded by them is the need to bring together the two *different professional ideologies*- subject experts without much insight into the television production and the media technicians without much subject insight - *and practices* to achieve the goal of the Countrywide Classroom by means of professional programming. To survive in the digital era, they suggested exploring interactive packages utilizing the potential of widespread cost-effective internet services to complement the Countrywide Classroom. To overcome the limitations of transmission, the researchers advised to distribute these telecasts in videotape format in order to reach maximum number of students.

Studying about different investment-centric educational media among students of urban and rural Tamilnadu, Arulchelvan and Viswanathan (2006) reported that internet is comparatively more utilized among the different media. Some of the reasons they have attributed to the underutilization of Radio and TV are lack of awareness, lack of publicity about the content and timings of the programmes, lack of interactive nature of the programmes, non-availability of signals etc. They further reported that only a small percentage-14.61 percent respondents watch CWCR programmes while a huge population of students, 85.39 percent do not even watch the programme.

CEC Research Reports on VYAS Channel

The commercialization of Doordashan and the introduction of more and more entertainment programmes directly affected the airing of educational

programmes. The odd and irrelevant timing of the programmes reduced the viewership very much. To rectify the problem, the CEC with the support of MHRD and UGC launched Gyandarshan-4 (GD-4) called VYAS - the higher educational channel of UGC, in 2004. The channel could be received either directly by installation of a dish antenna or through the cable network. At first, the channel telecast 6 hours of fresh programmes everyday with repeat transmission 3 times on a regular basis. A variety of programmes such as a mix of syllabi based and enrichment type, in the form of documentaries, lectures, discussions and some other formats were telecast on the VYAS channel under various programme categories.

In a study conducted in 2006, Jan (2007) reported that even with such a variety of programmes, the channel remains underutilized as the programmes could not be viewed without the help of a cable network or dish antenna. Even after two years of its operation, people were not fully aware about the channel or its programmes. The researcher has recommended that enough publicity is to be given to create awareness about it among the target audience so that they are motivated to either ask cable operators in their areas to provide the channel or install a dish, to directly receive the programmes. The involvement of college teachers is also to be encouraged to make viewing part of classroom activity which can greatly enhance the scholastic achievements of students.

CEC compiled reports in 2010 on "National viewership survey on UGC-CEC Vyas Higher Education Channel telecast through cable and satellite and DD DTH" conducted by 14 media centres. The consolidated findings are as follows:

a. At the time, Vyas channel/ UGC programmes had a viewership of 13.2% of the total student population in Higher Education.

b. Though maximum TV watching is at home while internet access is at college and private places, to access the course material, computer and internet were the most preferred media while for general awareness and enrichment, radio and television are the best media.

c. 36.5% of the respondents watch the VYAS/UGC programmes and the preferred mode for accessing was Doordarshan.

d. The duration of the programmes preferred by the students was up to 30 minutes.

e. More than 50 % of the respondents found the quality of the programmes good and were of the opinion that the multimedia inputs helped in understanding the topics better.

f. Majority of students shown preference for enrichment programmes followed by syllabus based question answer programmes followed by syllabus based lecture programmes.

g. Students' suggestions included showing the topics related directly to their course of studies, general awareness programmes, current issue based programmes, etc.

h. Teachers' responses stressed the usefulness of multimedia inputs in the programmes.

i. Vigorous publicity of the channel is of dire need.

Interactivity of the programmes

Television telecasts are essentially a one way mode of teaching unlike traditional classroom teaching. Learning and assimilation of knowledge becomes more effective when there is a two - way or interactive communication between

the learners and teacher. Almost all the studies and real responses of the students made it clear that lack of interaction was a major disadvantage for UGC educational telecasts on Doordarshan. The talk back experiments mentioned above were conducted for solving the interactivity problem during such telecasts.

All the recommendations after the experiment (relevant at the time) were mostly about increasing the number of telephone lines at the teaching end, more interaction time after each class, organized teleconferencing, providing the enrolled students with supplementary reading material etc. The final report on the talkback experiments (Reddy et al., 1995) concluded that "interactive television" increases "*participatory communication that brings about motivation and commitment*" among the teacher and the participant students.

In association with ISRO, after the launch of India's first thematic satellite EduSat, many Universities across India have established Satellite Instruction Terminals (SITs). The interactivity problem with respect to the telecast of programmes was lessened with the introduction of Satellite Interactive Terminals also known as Virtual Classrooms, established at various locations in the country as part of EduSat.

Arulchelvan (2013), based on the data collected from the experts/ teachers and students of Engineering, found out that though the level of awareness and the usage of SITs are satisfactory, the frequency of usage is less. At the same time the EduSat videoconference grabbed more attention than any other media then. He recommended that adjusting the telecast timings of EduSat network with the user requirements, incorporating more video clippings covering industrial activity, live demonstrations, graphical presentations, intimating the

schedules through e-mails/ college in advance, etc. make the programmes effective and interactive among the students.

Theoretical Overview of Educational Webcast/ E-Learning

Considering the potential of reaching the masses in this technological era, the internet surpasses the role of television. Internet's fundamental and powerful capacity to share any content globally at almost no incremental cost enabled sharing of educational content online either openly or for profit (Walsh, 2012). Broadcasting any content via internet is termed as Internet Broadcasting, which is also known as Cybercasting, Net casting, Webcasting, Unicasting and Streaming Media. As well as reprocessed audio or video that is transferred from radio or TV to the Internet, Internet Broadcasting commonly includes broadcasting new or original content both 'Live' and 'Video On Demand' to the Web (Vin, 1997).

Webcasting has been defined as 'broadcast video, live or on-demand, using streaming technology across the World Wide Web… to offer the ability to deliver good quality imaging… within any chosen learning environment (Reynold & Mason, 2002). The most unique feature of webcasting is that the content can be supplied to any device that has Internet technology built into it, like personal computers, televisions equipped with set-top boxes, mobile phones, media players etc.

Webcast refers to the process of communicating simultaneously across multiple computers for parallel distribution of media via the World Wide Web using the streaming technology. Webcast is mainly of two types: Live and On-demand webcast. Live webcast is the transmission of live or prerecorded audio or video to personal computers that are connected to the internet. In On-demand webcast, prerecorded clips are delivered or streamed to users upon request.

The potential advantages of webcast are many: unlike telecast, webcasts can be accessed innumerable times, aspirants can watch it any time, irrespective of schedules. The makers can have the data on the number of people utilized the same, the feedback even in the real time, interactions - the possibilities are varied. Live programmes as well as the recorded programmes can be made available on the web which can be accessed by anyone, anytime, anywhere. The most important among them is that all the content is stored on a central protected website. Undoubtedly, it is an important tool with great potential in the world of education: for institutions and students as well.

The working of webcast is as follows: Streaming is a technique for transferring data where the data in the compressed form (audio/video) are processed as a steady and continuous stream (webopedia). Also as it is sent as a continuous stream, it can be played as it arrives. The internet streaming requires a source media - a video camera, audio interface, screen capture software, and the content is digitized using an encoder. The media publisher then delivers this by way of a content delivery network. The content need not be recorded at the originating time, but it was often done.

The various forms of learning utilizing ICT are defined by different terms such as web-based learning, computer-mediated communication, telematics environments, e-learning, virtual classrooms, online instruction, I-Campus, electronic communication, cyberspace learning environments, computer-driven interactive communication, distributed learning, borderless education etc. All forms of learning/teaching through ICT can be broadly termed as 'e-learning'.

E-Learning can be defined as learning with the help of electronic technologies which in turn helps a learner in accessing learning materials

connected to the educational curriculum outside of a traditional classroom. The major components of e-learning are computers and internet. With newer and newer technologies emerging, e-learning takes up many forms and many terms such as computer assisted learning, online learning, technology-delivered instruction, distance learning, mobile learning, virtual classrooms etc. The definitions differ in different contexts; e-learning can take up the form of a standalone method of learning : learning completely online, or it can be used as a supplementary tool to face-to-face interaction or traditional teaching. This can be termed as hybrid or blended learning.

Historical Overview of Educational Webcast/ E-learning

The growth of learning webcasts on the internet has been phenomenal. More and more institutions and business organizations provide their content via webcasts. This method provides an easy way for a potential learner to study any topic he or she wishes. As early as 2002, there were many web based learning systems developed to facilitate online learning such as Blackboard Learning System, Web Course Homepage System, Web course Tools etc.

Some of the prominent efforts include the Open Courseware projects - MIT Open Courseware of Massachusetts Institute of Technology, Open Yale Courses, webcast.berkely and India's National Programme on Technology Enhanced Learning (NPTEL). One of the earlier attempts on webcasting classroom lectures was by University of California, Berkeley using Berkeley Internet Broadcasting System (BIBS) developed by the university itself. The BIBS offered live webcast and on-demand replay of class lectures using streaming media on the internet in as early as 1995. The creation of Open Course Ware (OCW) fuelled this movement.

Germany is the pioneer in this, but the much needed momentum for this movement was provided by Massachusetts Institute of Technology (MIT), which proposed Open Course Ware in 2000. MIT OCW is a free and open publication of material from thousands of MIT courses covering the entire MIT curriculum and used by millions of learners and educators around the world (https://ocw.mit.edu).

In the area of education, the term 'Open Educational Resources' (OER) needs special mentioning. These are a mix of open and freely accessible educational materials. The last several years has witnessed a phenomenal growth of OER where many institutions have established portals for the dissemination of both free and chargeable educational contents. For providing directions to integrate OER in higher education, UNESCO and Common wealth of Learning have published "Guidelines for Open Educational Resources in Higher Education" (2011).

Globally there are many OER platforms which provide educational contents through their websites. Some of the platforms are listed below:

- Currikki (http://www.curriki.org/)
- OER Commons (http://www.oercommons.org/)
- MERLOT : Multimedia Educational Resource for Learning and Online Teaching (http://www.merlot.org/)
- Open Courseware Consortium: A collaboration of higher education institutions (http://www.ocwconsortium.org/)

The Open Course Ware Consortium (OCWC) is a collaboration of higher education institutions and associated organizations from around the world creating a broad and deep body of open educational content using a shared model (OCW

Consortium, 2011). The Consortium consists of more than 280 universities and organization worldwide that have published materials from more than 21,000 courses. USA, China, France, Latin America, Japan, Korea, Turkey, Spain, and UK are some of the countries actively participating in the efforts of the consortium.

Though sounding synonymous, there are some differences between online courses and online courseware. Open courseware resources provide effective opportunities for independent learning while online courses are designed to specifically support learning directly. These courseware resources also are useful as a reference tool by educators for designing educational programmes, courses, and materials; by learners in planning formal study at traditional universities; by working professionals in tracking field developments and completing a work related project or task; and for a host of other uses that treat the site more as a reference like Wikipedia than as courses to be taken beginning to end (Carson et al., 2012). The advent of open course wares, according to Carson, is from the question posed by MIT president that *"How will the Internet change education, and what should our university do about it?"* which ultimately led to the development of MIT Open Courseware.

After MIT, many other Universities in the US (Yale, Harvard, Stanford etc) and around the world started offering online courses, collectively called Massive Open Online Courses (MOOCs), for distance education. By the end of 2011, MOOCs gained much popularity. The courses boast of interactive platforms for the students thus making the learning more effective. Now many universities and institutions are offering MOOCs to whoever is interested. A very low number of educators can serve thousands of students through MOOCs

at no extra cost to the learners if these are provided by no-profit organizations/ government.

The following flow chart depicts the emergence of MOOCs and platforms.

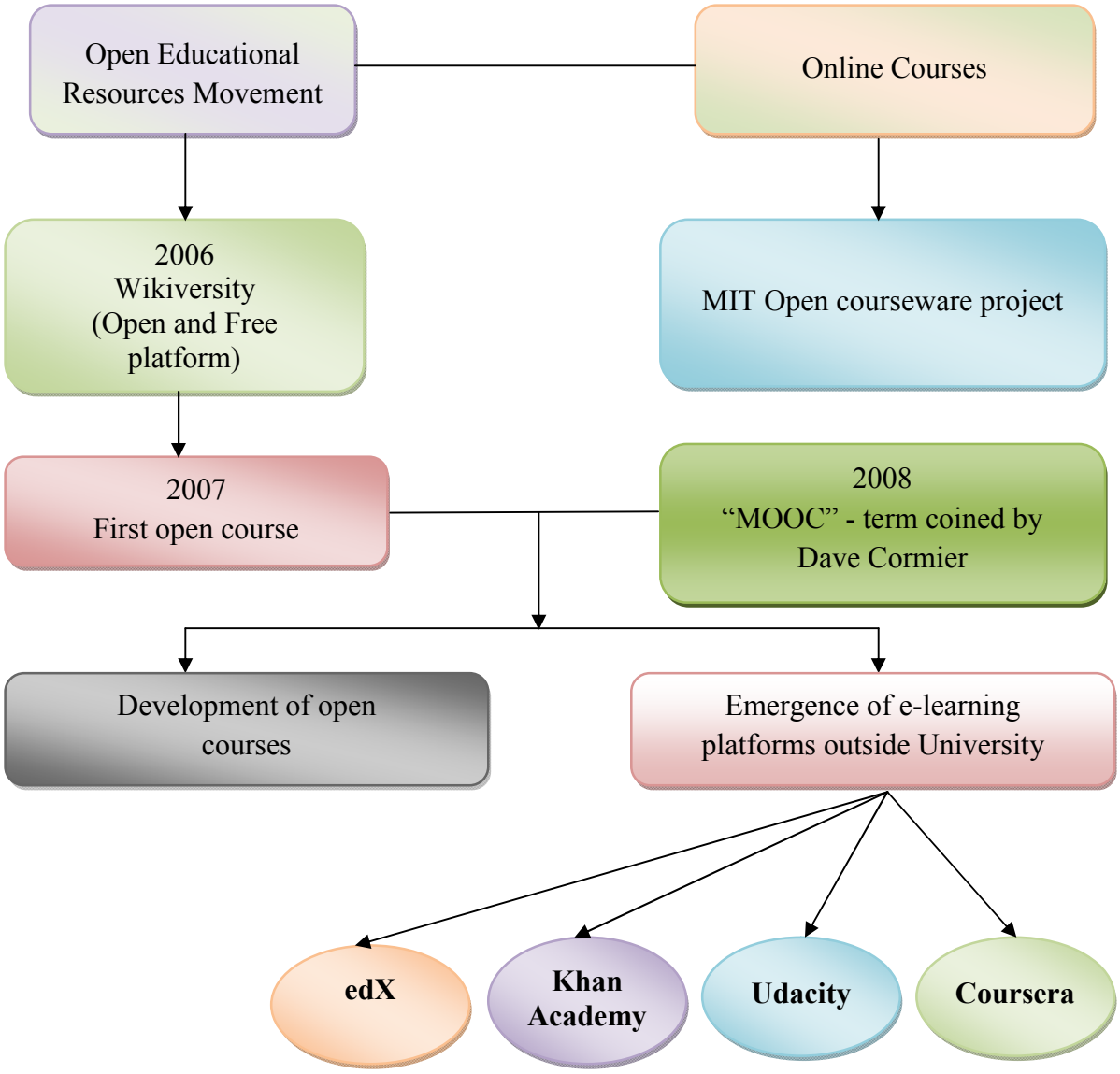


Figure 2. Emergence MOOCs

A list of some of the MOOC providers and the respective countries/ universities is given below.

Table 2

MOOC Platforms and Providers

No.	Name	Year of Launch	Launched / Run by	Country
1.	edX (formerly named MITx)	2012	Massachusetts Institute of Technology & Harvard University with 130 global partners	USA
2.	Open HPI	2012	German MOOC platform hosted by Hasso Plattner Institute (HPI)	Germany
3.	Future Learn	2013	The Open University, England, with 143 UK and international partners	UK
4.	Open Study	2013	Open Universities Australia	Australia
5.	Federica.eu		University of Naples Federico II	Italy
6.	France Université Numérique (FUN)	2013	French Ministry of Higher Education	France
7.	XuetangX	2013	Tsinghua University under the supervision of the China Ministry of Education Research (uses open edX platform)	China
8.	Open Education		National Platform of Open Education	Russia
9.	Prometheus	2014	Ukrainian universities and companies	Ukraine
10.	K-MOOC	2015	Korean Universities	Korea

Indian movement in webcast /e-learning

The literacy rate in India as per the 2001 censes was 64.8% and between 2000 and 2004, there was only a growth rate of 6.33% in the number of colleges for general education (from 7,900 colleges to 9,400). The cases of Primary, Upper Primary and Plus two level schools also were not very different. During

the same period the enrolment of students in the schools were as low as 4.24%, 4.59% and 8.93%, respectively. India then was way behind in the Gross Enrolment Ratio when compared with that at the global level.

The Department of Higher Education, MHRD conducted a detailed study as part of NME-ICT Mission and has identified many weaknesses in our education system, some are listed below:

- Lack of timely and easy availability of knowledge resources to all.
- Opportunities lost because of difficult access to information and guidance.
- Questionable quality of teaching at various places
- The growing digital divide and a very low percentage of digital literacy
- Lack of access to institutions and also of devices to digitally bypass shortcomings of Institutions and teachers
- Inefficient functioning of the knowledge delivery mechanism.

Considering the low statistics and the existing weaknesses with respect to the higher education sector, Government of India decided to utilize the potential of Information and Communication Technologies (ICT) to enhance the GER from 10 to 15% during the 11^{th} Plan period. Accordingly, the Government set aside a considerable amount of approx. Rs. 500 Crores in 2008-09 for the National Mission on Education through ICT. The Mission scaled up an existing Education helpline SAKSHAT to take care of all the needs of the learning community by extensively utilizing e-learning concepts and the ICT based methodology. The Mission also entered in to the development of high quality e-content, for loading on to 'SAKSHAT' in all disciplines and subjects, at various levels using the best available authoring tools and making fullest use of

animation and multimedia technologies. The Mission planned to ensure free availability of the e-content to all users / learners throughout the country using all possible channels such as internet, intranet, EduSat or narrow casting TV signals, Direct To Home (DTH) platform etc.

Through this ambitious project, the Government has provided high speed broadband connectivity to many universities and colleges throughout the nation for the development and dissemination of e-contents in various disciplines. Around 20,000 colleges were provided with VPN (Virtual Private Network) connectivity too. Through National Programme on Technology Enhanced Learning (NPTEL) of 7 IITs and IISc Bangalore, which was the first attempt of India in the production of OERs, over 1000 courses in Science and Engineering disciplines have already been developed.

The earlier initiatives in these areas were National Digital Repository of IGNOU, Sakshat for disseminating e-contents, Shishya for XI-XII Standards' content by CBSE and Vidya Vahini which provided interactive training and developmental communication integrating IT into the curriculum of rural schools.

Some of the other initiatives in India are listed below:

- e-contents by Consortium for Educational Communication (CEC) (http://cec.nic.in/EContent/Pages/Search.aspx)
- e-PG Pathsala (by INFLIB Centre) (http://epgp.inflibnet.ac.in/)
- e-Gyankosh (IGNOU) (http://www.egyankosh.ac.in): The learning resource repository of IGNOU - eGyanKosh was initiated in 2005 to store, index, preserve, distribute and share the digital learning resources

developed by the ODL institutions in the country (www.egyankosh.ac.in). It offers free and open access to all, facilitating self learners as well as educators. IGNOU further extended the facilities of eGyanKosh by starting a FlexiLearn Platform in 2009 which is an Open Course Portal where aspirants can register and explore courses for free (www.ignouflexi learn.ac.in). The difference between both is that while eGyanKosh is an archive of the learning resources of the University, FlexiLearn provides not only the resources, but a complete learning experience also.

- National Repository of Open Educational Resources (NROER) by NCERT & MHRD (http://nroer.in)
- Sakshat Portal by IGNOU (http://www.sakshat.ac.in)
- Virtual Labs: This initiative provides remote-access to laboratories in various disciplines of Science and Engineering catering to students at the UG, PG levels as well as to research scholars.
- A-VIEW: multi-modal, multimedia e-learning platform.
- e-Yantra: An initiative to incorporate Robotics into Engineering education.
- Project OSCAR (Open Source Courseware Animations Repository): Repository of web-based interactive animations and simulations (Learning Objects (LOs)).
- Virtual Learning Environment (VLE): An initiative of Institute of Life-Long Learning, University of Delhi providing e-resources for UG and PG level.

Open courseware and online learning changed the concept of learning and teaching along with the use of technology in education. Technological usage in

education provides global learning environment, which allows accessing the course material anytime, anywhere, connect other learners, and get access to the content without considering any geographical boundaries. The significant changes in use of the technology in online education has seen emergence of the concept of Massive Open Online Course (MOOC) (Chauhan, 2017).

In recent years, the popularity of these online courses and the enrolment of students in the same have increased way beyond the expectations of many. India Government, taking into consideration the huge demand for these types of courses started several projects for the dissemination. Currently, NPTEL, mooKIT, IITBX, and SWAYAM are the platforms used in India for offering courses. Now India, after US is dominating in enrolments globally.

Studies Related to Educational webcast/ E-Learning

For the last several years, there has been tremendous growth in the e-learning/ online education sector. More and more Universities have started offering courses via web. While preparing courses for online, the educators need to address the issue of differences between online teaching and traditional classroom teaching. Educators should have a better understanding on the use of technology, instructional designs and related e-learning fields to effectively use online courses for instruction.

Earlier studies mainly concentrated on predicting the future scenario in the utilization of web for study purposes. There were also many studies comparing the effectiveness and learning outcomes of e-learning with that of traditional institutional learning. Later the studies were done for analyzing the factors and improving the effectiveness and designs of e-learning programmes.

In this section also the studies are presented in the chronological order in order to understand the developments in the area of web based learning.

Many researchers and experts have predicted that e-learning will greatly contribute to growing flexibility in academic study patterns. This flexibility allows the students to adjust their interests, needs and learning styles to a variety of learning settings and media combinations. Another prediction was that hybrid courses combining various components of face-to-face encounters with online provision will emerge as a growing pattern in academic institutions.

In a case study about the impact of e-learning, Jones and O'shea (2004) put much emphasis on strategic planning and pointed out that with the new developments in e-learning, Universities need to re-think fundamentally their thinking and therefore their strategies in a whole range of areas including human resources, estates, pedagogy, quality assurance, funding, management and commercial and educational partnership.

In an early study Zang, Zhao, Zhou and Nunamaker (2004) pointed out the advantages of e-learning. From the perspective of the learners, they have listed the advantages as, *an increased accessibility to information, better content delivery, personalized instruction, content standardization, accountability, on-demand availability, self-pacing, interactivity, confidence, and increased convenience*. As far as faculties are concerned, e-learning reduces costs in comparison to a traditional classroom environment after initial course development, enables a consistent delivery of content, and improves tracking, among other benefits. The researchers noted that despite these benefits, e-learning has a higher drop-out rate than traditional delivered instruction.

Guri-Rosenblit (2005) in her paper has predicted many developments likely to be come up in the field of education/ distance education, such as,

- Consortia type ventures will be formed, joining a large number of universities and also as partnerships between universities and the corporate world, offering a rich variety of distance teaching programmes.
- Many of the mixed-mode institutions and consortia offering distance teaching courses will utilize the communication capabilities of the new interactive media.
- Hybrid courses, combining various components of face-to-face encounters with online provision will emerge as a growing pattern in academic institutions.
- More universities and new for-profit companies will export academic and professional programmes as a commodity to a variety of student populations.

South Korea has entered in to the world of online teaching and learning as early as 1998-2000. Studying about Korean Content Management in e-Higher Education, Lee (2006) put forth many suggestions for a favorable outcome, such as:

- Establishing a national level of overarching planning for courseware management,
- University and consortium level planning for quality content management,
- E-learning content sharing systems through methods like learning technology standardization

- Training and support systems for specialists in educational development, instruction and administration.

In the arena of higher education, with the emergence of new information and communication technologies (ICT), many have related to them as new generation of distance education, some have referred to their implementation in academia as challenging the very existence of campus based universities (Guri-Rosenblit, 2005). Guri-Rosenblit predicted that the impact of the new technologies on higher education environments will grow dramatically in the future, and will affect all domains of academic activity-research, teaching and learning, organization, finance and government policy. As she has rightly remarked, the new technologies did not endanger the existence of the campus universities, but rather enriched, supported and enhanced many of their activities.

As the e-learning gained more and more popularity during the early 2000, many agencies concerned with it were venturing in to the area of measuring and developing guidelines for e-learning quality in higher education. Alexander and Golja (2007) in their paper gave an account of two major evaluation studies at the University of Technology, Sydney (UTS), utilising a systems approach to investigate the consequences of e-learning, and inquired into the value of this particular institutional approach for deriving e-learning quality. The researchers described and analysed students' and teaching staff's experiences of an e-learning system (LMS) over a two-year period. They remarked that the experiences of the learners need to be considered in shaping e-learning developments. They also pointed out that the students recognize the value with respect to their access to education, choices about learning and constraints of e-learning. Each part or

level of an e-learning system is interrelated to others. Instead of determining the good aspects of each part, the researchers advocated taking in to consideration the learners' experiences to further improve the quality of the parts and extending the development to the whole system.

In the same period, various web based learning systems were developed to support e-learning in higher education. These technology-based pedagogical tools provide e-learning platforms that use the Internet as a delivery mechanism to allow students from all over the world to access a number of learning tools such as discussion boards, chat rooms, course content management, etc. Ngai, Poon & Chan (2007) investigated the underlying relationship between technical support, perceived usefulness, perceived ease of use, attitude and the acceptance of the web based learning system - WebCT for higher education. They have found out that technical support has a direct effect on the perceived ease of use and perceived usefulness and also has a strong indirect effect on attitude. As this underlines the importance of user support and training in influencing the perceptions of users and, eventually their use of the system, the researchers pointed out that it is essential for universities to provide effective user support and to encourage users to use the system.

When the technologies started penetrating all walks of life, some educators believed that there is an urgent necessity for educational reforms to cater to the young people who have been immersed in technology all their lives, imbuing them with sophisticated technical skills and learning preferences for which traditional education is unprepared. Studying about youngsters' relationship with technology, Bennet, Maton and Kervin (2008) observed that

while technology is embedded in their lives, young people's use and skills are not uniform. There is no evidence of widespread and universal disaffection, or of a distinctly different learning style which calls for such drastic reforms.

Studying about research and trends in the field of e-learning from 2001 to 2005, Sun et al. (2008) identified the following research topics with respect to e-learning: learners' motivation, such as their beliefs or attitudes toward e-learning, participants' information processing in an e-learning environment, different types of instructional approaches used in an e-learning environment, participants' learning experiences in an e-learning environment, the influences of prior knowledge (technology knowledge and technology experience) on participants' learning processes and outcomes, participants' metacognition status and its influences during the process of e-learning.

In a study about the success of e-learning Wagner, Hassanein and Head (2008) developed a Responsibility Matrix after analyzing the needs and concerns of stake holder groups namely *Students, Instructor, Institution, Content Provider, Technology Provider, Accreditation body and Employer*. According to them, e-leaning success in higher education is a shared responsibility between the various e-learning stakeholders and when all stakeholders fulfill their responsibilities to create effective and meaningful e-learning experiences, positive outcomes extend beyond success in specific courses and programme to facilitate lifelong learning and discovery.

Studying about E-Learning in India in the Geoscience domain, Chandra (2009) remarked that as the subject itself demands the latest technological tools, systems and techniques, and results in the most innovative technical developments,

the e-learning has to remain relevant to cutting-edge technologies for storage, access, and delivery of information instructions. The e-learning tools have the ability to revolutionize the Indian education scenario and can help in India's quest for information literacy amidst the huge data and information deluge. She has pointed out that libraries need to constantly adapt and re-invent themselves with any advances brought in by the ICTs. Chandra suggested that libraries should market and brand their services and products, particularly those libraries with institutional repository or any such ICT implementation or any new user services as the leading unit in the institution. She has also suggested the libraries to build a web-presence, either in search engines or the wikipedia.

Mayadas et al. predicted in 2009 that as a variety of information and communication technologies (ICT) have been emerging and evolving in different contexts and fields, ICT integrated education will become normal in entirely online learning environments and in blended courses over the next five to ten years.

Tripathi and Jeevan (2010) while studying about e-Learning Library and Information Science, illustrated how to design, develop and execute a functional e-learning course. They also have pointed out various issues related to e-learning, from the different perspectives of teacher, learner, and institution. They have stressed that developing and implementing an online course requires a thorough understanding and planning of various steps and procedures and requires coordination and concerted efforts of all the stakeholders - students, administrators, teachers, course designers, and developers. For improving the learning outcomes, which in turn are affected by e-learning system quality, e-

learning readiness, and e-learners' competencies, the researchers have advocated making efforts to improve the e-learners' online learning skills of self-direction, metacognition, and collaboration. The providers can arrange training sessions, user awareness and orientation programmes before the launch of e-learning courses for this.

A qualitative research study was conducted by Boling et al. (2011) to understand what constitute effective online learning experiences, from both teacher and student perspectives. One of the findings pointed out that the students who engaged in online learning are strongly affected by their social learning environments. The findings also revealed that courses and programmes that were more interactive and incorporated the use of multimedia are more helpful than the more traditional online courses. According to the findings, the factors that hinder effective learning are: programmes that emphasize text-based content and lecture, limited student interaction with others, and provided little variation in the modes of instruction used online. Also the disconnect between students and their instructors, students and other students, and online instructors and other faculty make the online learning experiences less enjoyable, less helpful, and more frustrating to some individuals when compared to those who made more personal connections and interactions through their courses. The researchers recommended the following for promoting positive, online learning experiences:

- The instructors need to carefully consider how designing specific environments can support and/or hinder both student learning and motivation
- Provide accessibility, flexibility and individualized feedback for building a strong student–instructor connection

- Creating a cohesive online community is a vital component of all online programmes
- Course content within the programme should be based not only on domain knowledge but also on heuristic tasks that reflect real-life work responsibilities
- Courses are to be sequenced in such a way that the content and skills developed in each course should build upon one other.

While surveying Open Courseware initiatives worldwide, Vladoiu (2011) studied in detail the initiatives of Massachusetts Institute of Technology (MIT) and Open Course Ware Consortium (OCWC). She has identified four major directions of action for MIT i.e., *placing OCW everywhere*, i.e., making the OCW content easy to find and distribute via ubiquitous devices, including reaching underserved populations; (2) *reaching key audiences* by customizing OCW materials to better meet the needs of people across a broad spectrum of backgrounds and cultures; (3) *creating communities of open learning*, by providing for an open learning ecosystem that enables more than access to the content, namely that boost collaborative learning; (4) *empowering educators worldwide* by providing them with the right tools they need to be able to share OCW content with their students.

Vladoiu further suggested that its members may benefit from extra advantage of using dedicated tools, from consultation with and support from Consortium's network of experts, from collaboration with peers within working groups and communities of interest, but also by increasing their international visibility and recognition, and by participating in a joint international effort that provides for a sustainable future for open sharing of educational resources.

Al-Omari and Salameh (2012), while studying about the perception of under graduate students in Jordanian universities about e-learning and traditional learning pointed out that many still values books in the teaching and research process. The students firmly believe that e-learning has a significant role to play in supporting and enhancing their university learning experience, but it is still necessary to combine face-to-face classes with online activities (discussion boards, short answer tests). They clearly felt that e-learning could sometimes be used as an alternative to face-to-face activities.

Bhuasiri et al. (2012) remarked that institutions in developing countries face unique challenges compared to developed countries and must understand what drives learners and faculty toward e-learning system. A greater appreciation of these challenges allows stakeholders to take appropriate action to ensure e-learning system success. Their study categorized e-learning success factors into seven dimensions: learners' characteristics, instructors' characteristics, e-learning environment, institution and service quality, infrastructure and system quality, course and information quality, and motivation. They have also pointed out the importance of curriculum design for learning performance. Technology awareness, motivation, and changing learners' behavior are prerequisites for successful e-learning implementations.

Greyson and Allgaier (2012) in their paper described about the efforts of Health Libraries Association of British Columbia (HLABC), Canada in taking up HLABC Webcasting-Web conferencing Pilot Project when faced with the challenge of providing Continuing Education (CE) opportunities to a geographically dispersed membership, for estimating about the feasibility and value of the

webcast and web conferencing in reducing participation barriers. The project was successful in improving access to their remote and rural members.

Two researchers, Michail N. Giannakos and Panayiotis Vlamos from Ionian University, Corfu, Greece have carried out many studies with regard to educational webcast.

Some of the most widely used theories regarding the adoption of technological tools are the Unified Theory of Acceptance and Use of Technology - UTAUT, Social Cognitive Theory - SCT and Theory of Planned Behavior - TPB. Using a hybrid frame work based on these theories, Giannakos and Vlamos (2011) conducted a survey with 176 webcast learners to clarify the effect of webcast duration into learners' intention to adopt webcasts for learning and to shed light on learning strategies to promote learning webcasts. They concluded that learners' behavioural intention to use webcast for learning is affected by the duration of webcast. The variables the researchers identified as having strong relations with the learners' intention to adopt technological tool for learning are *Social Norms and Perceived Expectancy*. Beliefs for the usefulness of webcasts and social influence also have considerable effects on using webcasts as a learning medium.

Using the same hybrid frame work, the researchers (2011) also investigated the factors that affect learners' acceptance of webcast and also tried to find out whether the webcast adoption exhibits any differentiation based on the learners' level of experience. They remarked that the introduction of e-learning tools is always complex and the learners do not adapt to the use of ICT well. Many learners are not ready to fully utilize the ICT tools in their education. Their findings

indicated that *Effort Expectancy, Performance Expectancy and Social Norm* display a high significant impact on learners' behavioural intention.

Using an empirical study, Giannakos and Vlamos (2013) analysed learners' acceptance of educational webcasts. Their findings revealed that learners with prior experience in educational webcasts are more likely to adopt this media. The results of this study verified that ease of use and usefulness are important and influential factors in determining learners' Behavioural Intention to use webcasts for learning purposes. Recommendations put forwarded by the authors are:

- Webcast developers should strive to increase participants' intrinsic motivations such as social norm, and make them feel in a home-like environment
- Instructors and higher education institutions should focus on the educational webcasts' usefulness and ease of use because their predictive effect on educational webcast acceptance is higher.
- Instructors may consider different methods to increase the experience with the webcast system.

The same researchers attempted in 2013 to study about the educational effectiveness of webcasts when used as an autonomous method by way of a group evaluation experiment comparing traditional learning and a specifically developed educational webcast. They argued that for teaching complex tasks, traditional learning/ teaching is more effective as the interactivity and cooperation to understand complex concept is more possible with traditional methods. They proposed to either use well designed or specific webcasts or use it as an information delivery or an introductory medium to be effective.

Based on an extensive research review, Bell and Federman (2013) tried to answer three key questions about the growth of e-learning in post-secondary education: *the effectiveness of e-learning compared to other delivery media, the features which influence its effectiveness and the barriers to the adoption of it in higher education*. They concluded that e-learning can be an effective means of delivering post-secondary education while maintaining the stand that any form of instruction can be effective if it is able to create the conditions necessary for students to learn specific content. They also urge researchers to examine how different aspects of these programmes influence their effectiveness and state that effectiveness is determined by the degree of fit between the design of the e-learning and the characteristics of the course for which it is used. They proposed that academics and institutions need to collaborate to address the challenges surrounding academic integrity in online environments, devise effective support systems for under prepared learners, evaluate the economic models that underlie e-learning, and understand how to deliver e-learning across geographic and cultural boundaries.

Vaccani, Javidnia and Murto (2014) compared the effectiveness of webcast to that of live lectures as a teaching tool in medical school. Though the students prefer their lectures in the traditional class room settings, they felt that the webcasts were an effective way to receive their core curriculum. The authors remarked that the webcasts were more effective as they could be viewed by the concerned more than once at their own convenience which was beneficial to learning.

In a study about supply and demand in e-learning involving perceptions and preferences of e-learning providers and e-learners, Sridharan, Deng and

Kinshuk (2014) proposed that the supply does not always follow on the heels of the demand due to the differences in perceptions and the challenges to fulfill the demand. They further suggested that major differences between the perceptions of e-learning providers and e-learners exist on two dimensions: pedagogies and management of learning resources. Their findings also indicated that the management of learning resources is considered critical by e-learners, but is not strongly perceived by e-learning providers.

In 2014, studying about the prospects and challenges of e-content development, Vijayasekhar and Muralidhar noted that having insufficient internet bandwidth and power constraints are big challenges in the Indian context. They have also pointed out that the very low percentage (14%) e-literacy against 74% of literacy rate among the country population prevents the full utilization of online contents in India.

Reviewing literature on the challenges of e-learning faced by academics in higher education, Islam, Beer & Slack (2015) categorized it into five challenges: *learning styles and culture, pedagogical e-learning, technology, technical training and time management challenges*. As these challenges are vital to understand for any institution wishing for a successful e-learning outcome, they pointed out that *(i) to achieve the best learning outcome it is desirable to have an understanding of students' learning styles, (ii) pedagogy to be considered as it is concerned with enabling the best way to achieve learning, (iii) technology should be robust and have enough capacity and capability to handle student academic communication and functions smoothly (iv) academics should be well trained for technological aspects so as to achieve the expected outcome & (v) difficulties in management of time should be taken care of as e-learning is 24x7.*

Mayes, Natividad and Spector (2015) remarked that expanding internet, ever more powerful mobile devices, and other innovations make the task of designing effective formal and informal learning challenging, especially in light of the high rate of change in these new technologies. The researchers advocated that educational technologists must expand their forward-thinking leadership and planning competencies so as to ensure effective use of new technologies.

Noesgaard and Orngreen (2015) investigated the following research questions: *How is the effectiveness of e-Learning defined? How is the effectiveness of e-Learning measured? What makes e-Learning solutions effective?* The most prominent definition they could find was learning outcome. They recommended that along with quantitative measures normally being used, both qualitative measures and self-assessment can give researchers and designers quality feedback on the effectiveness of the e-Learning solution. They have categorized the factors promoting the effectiveness of e-Learning according to the context in which the e-Learning solution was used and developed a model to guide e-Learning design. The model includes the key factors *Resources, Interaction, Practice, Support, Motivation and Experience*.

While studying about the challenges experienced by Kenyan public universities on implementation of e-learning and for possible solutions towards its successful implementation, Tarus, Gichoya and Muumbo (2015) outlined the following challenges hindering the implementation: Inadequate ICT and e-learning infrastructure, Financial constraints, Lack of affordable and adequate Internet bandwidth, Lack of operational e-learning policies, Lack of technical skills on e-learning and e-content development by the teaching staff, Lack of

interest and commitment among the teaching staff to use e-learning and Amount of time required to develop e-learning content.

They have outlined several strategies also to address these challenges, the important ones being: facilitating access to e learning, formulation of appropriate and operational e-learning policies, giving comprehensive training of lecturers on e-learning skills, collaborations and partnerships with other successful e-learning partners in a bid to acquire best practices to accelerate the implementation of e-learning as well as reduce duplication of resources etc.

Studying about various MOOC platforms in India, Chauhan (2017) maintained that the major concerns regarding the implementation of MOOCs in India are, *the lack of infrastructure, investment, diversified population, quality of courses, adoption of MOOC among learners and their acceptance by the academic institutions*. She recommended providing a better Internet access for the country's population for worldwide connectivity, encouraging public private partnership for the necessary investments, meeting the diversified needs of the learners in terms of language of courses etc. She also pointed out the need of a national quality assessment framework to assess the quality and adoption of new approaches.

Conclusion

Two of the most useful technologies adopted by the education sector are those of television and web for the dissemination of educational content, supplementing, complementing and sometimes replacing traditional classroom teaching.

Both the developed and the developing countries have extensively utilized the services of television for imparting education to the masses owing to

its accessibility and high penetration level. Studies have shown that lack of financial support from the Government, inaction and indifference by the administrative system on educational broadcasting, lack of major research or need assessment studies, lack of faith of teachers in the educational value of educational broadcasting, lack of curriculum integration of the programmes, irrelevant and non-appropriate programmes can be detrimental to its growth and use in any country.

Earlier studies have pointed out that the telecasts were just an extension of written material recited by the teachers on camera, later the inclusion of graphics and other multimedia content made the programmes better. The main problem or issue with educational telecasts as pointed out by many studies was its lack of interactivity with the learners. The researchers suggested that the educators have to magnify and enhance communication through online chat rooms, virtual office hours, responsive e-mail, remote site visits etc. which can be made possible now with the increased accessibility of internet. The telecasts could be made more useful and effective if transmission day, time and duration are adjusted according to the students' demand and when students' assignments are based on both textbook and TV programmes.

When the internet has started challenging the supremacy of television as an important medium to disseminate information to the students, the studies suggested utilizing its popularity for promoting educational television. For both telecasts and webcasts of educational materials to be effective and useful, educators need to be more concerned about developing effective motivational instructional design for improving students' active participation, about factors such as location (urban and rural) and gender, about raising teacher's integration

of the programmes when designing, developing, and operating such programmes. Broadcasters are also required to accept technological changes and commercial competition for the promotion of educational telecast/ webcasts.

Despite having thousands of Universities, colleges and stand-alone institutions in India, the Gross Enrolment Ratio in higher education was as low as about 20.8% as per the report of All India Survey on Higher Education (2011-12) by MHRD. Even before this study, India has been investing a huge amount for the adoption, establishment, implementation and maintenance of educational media for learners. Efforts also have been taken to increase the accessibility of education by several sections of youth taking in to consideration the geographical separation, digital divide etc. Whether the learners are utilizing the fruits of these labours to the fullest extent is the lingering question.

The viewership studies carried out by Media Centres, CEC and other researchers in the 90s pointed out that only a small percentage of student population watched the CWCR programme telecasts by the CEC. At that time the internet was not popular or its usage wide spread. The students were not even aware about the programmes prepared exclusively for them. Now with the low rates for connectivity, availability of computers, smart phones etc. learners are more inclined towards web than television.

Researchers and educators stress the importance of making the stakeholders aware about the services in the area and improving the technical infrastructure. The underutilization of the television programmes again points to the lack of awareness of the quality and number of programmes, lack of publicity about the content and timings of the programmes at the Governmental level,

University level and college level, lack of interactive nature of the programmes, non-availability of signals, lack of interest from the side of the service providers (Cable TVs, Government networks) in allotting better time slots for the programmes etc.

E-learning, in recent years, has become a widely accepted and popular mode of learning/ delivering educational materials in higher education by universities throughout the world. A lot of studies were undertaken by researchers about the factors contributing to e-learning success. Unlike traditional classroom learning, e-learning requires much motivation and interest from the learners' side. Though there are a lot of benefits to e-learning both from the perspectives of learners and faculty, e-learning has a higher drop-out rate than traditional delivered instruction. So it is imperative to consider learner characteristics and preferences, and also the competencies of teachers while developing e-learning materials.

Talking about the webcasts, overabundance of programmes in the web is a problem. Among those, the quality programmes developed by the Governmental agencies gets side lined. Here also lack of awareness among the students about the services of various Governmental agencies matters the most. Despite spending huge amounts for utilization of modern technology in the educational content dissemination, it is not reaching the stake holders.

The Media Centres first functioning under UGC and then under CEC have been in the field of telecasting and webcasting educational content for the last several years. Not many studies have been carried out with respect to the contribution of Media Centres. With the changes in time and technologies, the

workings and preferences of the Media Centres also have changed. In this context, the investigator was interested in analysing and exploring different facets of educational telecast and webcast in India with special reference to the contribution of UGC Media Centres.

Chapter III

METHODOLOGY

- *Design of the Study*
- *Population and Sample*
- *Tools and Techniques used for the Study*
- *Description of Tools and Techniques Employed*
- *Procedures Adopted for Data Collection*
- *Statistical Technique Used*

METHODOLOGY

Methodology is the specific procedures and/or techniques adopted for a research study used to identify, select, process and analyse information about the topic. The working and the contribution of Media Centres functioning under Consortium for Educational Communication - an Inter University Centre of UGC, in the world of educational telecast and webcast are studied here in the natural settings and the focus is on the view of the participants connected with it. Here participants mean those who are involved in the whole process as well as the stake holders. The investigator tried to observe what they do as well as how they perceive and interpret things.

Specifically this study in respect of educational telecast and webcast in India through UGC Media Centres seeks,

1. To explore the evolution of telecast and webcast of educational programmes in India
2. To evaluate the status of telecast and webcast of educational programmes in India by UGC Media Centres and the contribution of UGC Media Centres in this domain
3. To examine the problems faced by the UGC Media Centres in the production and dissemination of programmes for telecast and webcast
4. To suggest measures for the functional improvement of UGC Media Centres

The details of design of the study, tools and techniques, data collection procedure, scoring and consolidation of data used are described under different sub headings in this chapter.

Design of the Study

Research can be broadly divided into two categories- Qualitative and Quantitative. There are many designs and methods within these categories and the researcher chooses them according to the particular study.

As the present study intended to explore, explain and understand the various aspects of educational telecast and webcast carried out by UGC Media Centres, both qualitative and quantitative paradigms are needed. Paradigm here means a view of how an inquiry should be done.

With a qualitative study, a researcher is inquiring about such topics as how people are experiencing an event, a series of events, and/or a condition. The questions generally seek to uncover the perspectives of an individual, a group, or different groups.

The distinction between quantitative and qualitative research methods in organization studies is generally perceived as being that while the quantitative approach is objective and relies heavily on statistics and figures, the qualitative approach is subjective and utilizes language and description (Lee, 1992). The goal of descriptive strategy in a qualitative approach is to describe the state of affairs at the time of study. Both methods are important for an organization/s depending upon the nature of information gathered. This study thus involves a detailed investigation using multiple sources of data, the collection of which was guided by the objectives of the study. When the qualitative and quantitative approaches represent two ends on a continuum, mixed method approach lies in the middle of it as it incorporates the elements of both approaches (Gravetter & Forzano, 2003).

The data were collected mainly through questionnaires, interviews, observations and documents. Cohen et al. (2013) defined questionnaire as the instrument for collecting primary data. Primary data is data that would not otherwise exist if it were not for the research process and is collected through both questionnaires and interviews. Although there is a large range of types of questionnaire, the authors have remarked that, there is a simple rule of thumb: the larger the size of the sample, the more structured, closed and numerical the questionnaire may have to be, and the smaller the size of the sample, the less structured, more open and word-based the questionnaire may be.

An Interview is typically a face to face conversation between a researcher and a participant involving a transfer of information to the interviewer (Cresswell, 2009). The three main types of interview that can be implemented in social research are Structured, Unstructured and Semi-Structured. Structured interview is a pre-planned one where the researcher writes down the interview questions before conducting the interview. Such a format is an effective way to keep the interview tightly focused on the target topic. In unstructured interviews, as the name indicates, there will not be any specific set of pre determined questions. Though the questions will be based on a particular topic of study, it allows the interviewees the chance to give free and informal responses. The most common among the three is the Semi-structured interview. This type is a mix of the two types mentioned above, where the questions are pre-planned prior to the interview but the interviewer gives the interviewee the chance to elaborate and explain particular issues through the use of open-ended questions. This type is

appropriate to researchers who have an overview of their topic so that they can ask questions (Bryman, 2008).

Whatever is the method or approach, document analysis is an integral part of any study. A great deal of knowledge amassed over the years about organizations or any particular topic of interest is stored or recorded in documents. These documents can act as the main data source for studying about the historical aspects of a study. The analysis of documents is a systematic procedure involving review and evaluation of documents. Corbin and Strauss (2008) maintained that document analysis, like any other analytical methods in qualitative research, requires that data be examined and interpreted in order to elicit meaning, gain understanding and develop empirical knowledge.

The study about educational telecast and webcast by UGC Media Centres was carried out and presented as two parts. A mixed approach was used mainly for the first part utilizing the quantitative data amassed from many annual reports and documents. For the second part of the study, questionnaires, semi-structured interviews, document analysis and direct observations were used to explore, explain and understand the various aspects of educational telecast and webcast carried out by UGC Media Centres.

The first part of the work deals with the evolution of educational telecast and webcast through Media Centres of UGC in India. The methodology adopted for this phase was document analysis.

The following documents were analysed by the investigator:

- Websites of UGC, CEC and individual Media Centres
- Research Reports
- Annual Reports of CEC
- Books and Journals

The following aspects of the UGC, CEC and Media Centres were analysed from the above mentioned documents:

- The historical evolution of telecast and webcast of educational content in India with emphasis on the contribution of Media Centres
- The establishment and growth of UGC Media Centres in India
- Different initiatives of Government of India for the development of educational materials and dissemination of them.
- The aims and objectives of UGC and CEC with respect to the Media Centres
- The status of telecast and webcast of educational programmes developed by the Media Centres in India like the status of production, dissemination, viewership etc.
- The functional organization structure of the Media Centres
- Managerial and Financial Aspects of CEC
- Production Aspects with respect to personnel involved and educational programmes produced.

In the second part of the report, efforts had been made to identify different facets and specific problems faced by the media centres related to planning,

production, transaction/ dissemination and evaluation of productions and to suggest measures for functional improvement of media centres. Data were collected using questionnaires and interview.

Population and Sample

The population of the study undertaken is the Media Centres of UGC functioning under an apex body - Consortium for Educational Communication - an Inter University Centre of UGC on Electronic Media. As of 2018, there are 21 media centres functioning under CEC.

At first, in 1984, UGC started the Countrywide Classroom (CWCR) Programmes through 6 Media Centres set up at 6 Universities. Subsequently CEC was setup in 1993 as a nodal agency to coordinate, guide and facilitate educational programme production at the Media Centres. When the study was undertaken, there were 18 media centres spread over 14 states, by 2016 the number has increased to 21 including the one at the Union Territory - Puducherry.

The details are given in Table 3.

Table 3

Educational Multimedia Research Centres under CEC

Sl. No.	Name & Place	Functions in	State
1.	Mass Communication Research Centre, New Delhi	Anwar Jamal Kidwai - Mass Communication Research Centre, Jamia Millia Islamia	Uttar Pradesh
2.	EMRC, Hyderabad	Osmania University	Telengana
3.	EMRC, Pune	University of Pune	Maharashtra
4.	EMRC, Roorkee	IIT - Roorke	Uttarakhand
5.	EMMRC, EFLU - Hyderabad	Central Institute of English and Foreign Languages (CIEFL) (now EFL-U)	Telengana
6.	EMMRC, Ahmedabad	Gujarat University	Gujarat
7.	EMRC, Chennai	Anna University	Tamilnadu
8.	EMMRC, Jodhpur	Jai Narain Vyas University	Rajasthan
9.	EMMRC, Kolkata	St. Xavier's College (Autonomous)	Kolkata
10.	EMMRC, Srinagar	University of Kashmir	J & K
11.	EMMRC, Madurai	Madurai Kamaraj University	Tamilnadu
12.	EMMRC, Imphal	Manipur University	Manipur
13.	EMRC, Patiala	Punjabi University	Punjab
14.	EMRC, Indore	Devi Ahilya Vishawavidyalaya	Madhya Pradesh
15.	EMRC, Mysore	University of Mysore	Karnataka
16.	EMRC, Sagar	Dr. Hari Singh Gour University	Madhya Pradesh
17.	EMMRC, Calicut	University of Calicut	Kerala
18.	EMRC, Lucknow	Babasaheb Bhimrao Ambedkar University	Uttar Pradesh
19.	EMRC, Dibrugarh	Dibrugarh University	Assam
20.	EMRC, Bodh Gaya	Magadh University	Bihar
21.	EMMRC, Puducherry	Pondicherry University	Puducherry

Source: www.cec.nic.in

The following figure shows the distribution of Centres across India.

Source: www.cec.nic.in

Figure 3. CEC and Media centres

As the Centres are situated in different states in India (17 States and one Union Territory), collecting information from all is not practical in terms of time, effort and finances. The investigator made all attempts to ensure the representation of all the Centres from different states while selecting the data sources. For this, the investigator selected a representative group, wherever such a case is possible, from among the centres.

Sampling Technique

Purposive sampling technique was adopted for the study, which is described as a random selection of sampling units within the segment of the population with the most information on the characteristic of interest. Purposive

sample is a non-probability sample that is selected based on characteristics of a population and the objective of the study.

The purposive sampling technique is the deliberate choice of an informant due to the qualities the informant possesses. It is a nonrandom technique that does not need a set number of informants. The researcher decides what needs to be known and sets out to find people who can and are willing to provide the information by virtue of knowledge or experience (Bernard 2002).

Data were collected from the personnel associated with the following Centres.

- MCRC, Jamia Milia
- EMRC, Osmania University
- EMMRC, EFL-U, Hyderabad
- EMMRC, Dibrugarh
- EMMRC, University of Calicut
- EMMRC, Madurai
- EMRC, Sagar
- EMRC, Patiala
- EMRC, Roorkee
- EMMRC, Puducherry

  and

- CEC, New Delhi

Information was collected through questionnaires and interviews from the following persons associated with the Media Centres and CEC and also from those associated with educational telecast and webcast in general.

- Production/Technical/Research personnel of Media Centres
- Head/ Directors of Media Centres
- Subject Matter Experts of educational video programmes
- Learners/viewers of educational programmes
- CEC personnel
- Academic Coordinators at CEC and Media Centres
- Indian origin teachers teaching at foreign universities
- Head of DTH Project

The rationale for selecting the aforementioned data sources are as follows:

To get an understanding about the production aspects of a Centre, the investigator collected information from the key production personnel -Producers and Engineers, and for gaining insight in to the research activities, from Research Officers too, one from each category, from different Media Centres. Questionnaires were used to gather information from them.

In order to look after its affairs, each Media Centre has a Director at the helm. The Director of the Centre is the principal executive responsible for the smooth and efficient functioning of the Centre in pursuit of its objectives. To get an overall understanding about the realization of objectives envisaged for Media Centres, the working, the productions etc. the investigator approached the Directors and collected information from them through a questionnaire.

From the production of documentaries, the CEC and Media Centres ventured in to other arenas starting with syllabus based lectures. The development of courseware e-contents for National Mission on Education

through Information and Communication Technology (NME-ICT) started in 2009. After the completion of the project on the development of e-content, the Media Centres moved onto production of Massive Open Online Courses provided through SWAYAM Platform and educational lectures for Swayam Prabha DTH channels. Teachers of different Universities and other institutions from all over India contributed as Subject Experts for the e-Contents, MOOCs and DTH lectures thus developed/ developing. Their opinions and suggestions with regard to the production and dissemination of programmes were collected using a questionnaire.

Learners are the main stake holders here. Data were collected from students from 8 states of India. The students were treated as one unit, the rationale being that the reach of technology is tremendous and with the wide use of television/ mobile phones/ smart phones/ personal computers and low internet tariffs, students from formal education sector across India have somewhat similar opportunities in accessing telecasts and webcasts.

Academic Coordinators were appointed both at CEC and Media Centres to look after the activities with respect to production of MOOCs and DTH programmes. Hence the reflections on their experiences were also gathered to get an understanding about the process of development of programmes for these projects.

Universities and other institutions abroad have started utlising the services of television and internet for connecting to students. At many institutions, it is mandatory to record the class lectures and webcast the same as soon as the class is over. Those who were unable to attend the classes and those

who wanted to watch it again can access the classes anytime from anywhere. The investigator wanted to collect information from the Indian teachers who are exposed to the academic environment outside India so as to compare the products from both sides.

The different units under CEC are Administration & Finance, Software & Hardware, Media Tape Library and Maintenance. Though CEC is the nodal agency and mainly responsible for the dissemination of educational content developed by the Media Centres, it also is involved in the production of programmes. So CEC has a production team, research team and media management (programme storage/ archiving and dissemination) team along with Finance and Administration team. Information and specifics were collected through semi-structured interviews from the following CEC personnel:

- Governing Body member
- Director
- Joint Director (S/w)
- Research Officer
- Producer
- Broadcast Engineer
- Media Tape Librarian
- Finance Officer

Details of data source selected are given below in Table 4.

Table 4

Distribution of Data Sources

No.	Designation	Number
1.	Governing Body Member CEC	1
2.	Director - CEC	1
3.	Joint Director - CEC	1
4.	Directors of Media Centres	5
5.	Research/ Junior Research Officers	5
6.	Engineers	5
7.	Producers / Production Assistants	10
8.	Students	225
9.	Subject Matter Experts	20
10.	Indian teachers teaching at foreign universities	5
11.	Academic Coordinators - CEC & MC	6
12.	Head - DTH Project	1
13.	Producer - CEC	1
14.	Engineer - CEC	1
15.	Research Officer - CEC	1
16.	Finance Officer - CEC	1
17.	Media Tape Librarian - CEC	1

For studying about the production facilities and productions (total number of productions since establishment, number of studios and details of posts sanctioned/filled) the investigator selected 10 Centres randomly and collected data. The ten Centres are,

1. EMRC, Osmania University
2. EMRC, Ahmedabad
3. EMMRC, Jodhpur

4. EMRC, Chennai
5. EMRC, Madurai
6. EMRC, Srinagar
7. EMMRC, Kolkata
8. EMRC, Mysuru
9. EMMRC, Calicut
10. EMMRC, Dibrugarh

Tools and Technique used for the Study

Primary data collection is an important part of the research work. Interviews can be used as a primary data gathering method to collect information from individuals about their own practices, experiences, beliefs etc. In a structured interview, people are asked to respond to as nearly identical a set of stimuli as possible (Bernard, 2013). The stimuli are often questions. Structured interviews are mainly used to control the input that triggers people's responses so that their outputs can be reliably compared.

For this study mainly questionnaires were used for collecting information from the sample. Semi-structured Interviews were conducted face to face and via telephone. Semi-structured interviews give the respondents freedom to elaborate upon their answers.

Semi-structured interviews were administered to officials of CEC. More important is the fact that at key positions, single persons are holding the job: Director, Media Tape Librarian, Broadcast Engineer and Research Officer at CEC. There are two Joint Directors as well. Semi-structured interviews here

were used to gather focused, qualitative textual data, and had a frame work of themes to be explored. The investigator selected this mode as it can uncover rich descriptive data on the personal experiences of the participants. The objective was to obtain information on the job role of each person and his/ her experiences. The investigator hoped that this would provide an overview of the processes involved and the role of the personnel.

The following tools and techniques were used for the collection of data for the present investigation.

1. Questionnaire on the Activities of Media Centres to Directors of Media Centres (Samitha & Musthafa, 2014)
2. Questionnaire on Production Aspects to Producers of Media Centres (Samitha & Musthafa, 2014)
3. Questionnaire on Research Aspects to Research Officers of Media Centres (Samitha & Musthafa, 2014)
4. Questionnaire on Technical Aspects to Engineers of Media Centres (Samitha & Musthafa, 2014)
5. Questionnaire on Awareness and Utilisation of Educational Telecast and Webcast to Students (Samitha & Musthafa, 2014)
6. Questionnaire to Subject Matter Experts of Educational Programmes (Samitha & Musthafa, 2014)

All the questionnaires were semi-structured with both closed and open ended items.

Semi-structured interviews within a frame work were administered to gather information from the following persons:

a. Head - CEC
b. Member of Governing Body of CEC
c. Joint Director (Software) - CEC and the Preview team
d. Finance/ Accounts Officer - CEC
e. Media Tape Librarian - CEC
f. Research Officer - CEC
g. Broadcast Engineer - CEC
h. Academic Coordinators of CEC & Media Centres
i. Indians teaching outside India
j. Head of DTH Project

Description of Tools and Techniques Employed

The details of the tools and techniques employed for the study are described below:

Questionnaire on the Activities of Media Centres to Directors of Media Centres

As per the Guidelines of UGC for establishment, management and running of a Media Centre, the Head/ Director shall be the principal executive responsible for the smooth and efficient functioning of the Centre in pursuit of its objectives. The tenure of a full time Director is for a period not exceeding five years at a time or up to the age of 60 years, whichever is earlier.

The specific objectives framed for a Media Centre includes, setting up of facility for production of programmes, research related to optimizing the

effectiveness of the programmes, networking and collaboration with other educational agencies in India and abroad in the field of educational communication, training and overall human resource development in the field of educational communication and studying, promoting and experimenting with new techniques/ technologies that will increase the reach and / or effectiveness of educational communication.

The tool contains a total of 17 questions (excluding the section on general information) based on the following aspects:

- General information
- Specific objectives outlined for Media Centres by the UGC/ CEC
- Satisfaction regarding the working environment at the Centre
- Role of CEC / Funds / Budget
- Other services
- Constraints
- Relation with Host University / Institution

A total of six items were given soliciting the general information like name, date of joining / experience as Director at the Centre, no. of terms in the Centre as Director, the name of the University/ Institution the Media Centre is attached to, name of the centre and year of establishment of the Centre.

The first question contains five sub points about the extent of realization of the specific objectives envisaged for a Media Centre. The question calls for a free response.

Eleven dichotomous questions requiring yes/no response were prepared for collecting information regarding satisfaction in the working of the centre,

preparation of plan of action, receipt of funds, other services of the centre, quality of programmes, satisfaction in the rate of productions, constraints with working as a part in a University, role of CEC and workshop/ training conducted by the centre. Nine of the questions among these were given the option for expressing the reasons for the negative/ positive answer.

One question with four options is given to collect the opinion of the Director on the dissemination of programmes by CEC. Two questions, out of which one is with three options, were given to understand about the relationship of a centre with the host institution. One open ended question is included for getting suggestions regarding the changes to be made to improve functioning of the Centre, quality of productions and dissemination of productions by both CEC and individual media centres. One question is given for getting information on the way of ensuring the quality of programmes produced at the Centre, which is an open ended one.

Scoring

The frequencies of the responses of the structured items requiring yes/no were tabulated directly. In the case of open ended items the similar responses were pooled and categorised. Odd responses were described qualitatively.

Validity

The tool was constructed taking in to consideration the role and capacity of a Director at a Media Centre.

During the process of construction of the tool itself content validity and face validity were ensured. The questionnaire covers the pertinent points

associated with the role of a Director. Before the construction, the investigator talked to a former Director who had served a Media Centre for 3 consecutive terms and many other then serving Directors and framed the items based on their suggestions. Hence the investigator believes that the tool is valid enough to yield the facts and reflections of a Director on the running of a Centre. The experts also agreed that the items in the questionnaire are valid enough to check the objectives of the study.

The tool is presented as Appendix I

Questionnaire for Production/ Technical / Research Personnel

One of the objectives of the study is to examine the production aspects of the media centres with regard to the process, personnel and the educational programme. Key production personnel in a centre are Producers who are responsible for production of programmes, Junior Research Officers who are responsible for carrying out research activities of a centre for bringing about the necessary improvements and Engineers who are responsible for the technical maintenance of a Centre.

Questionnaire on Production aspects to Producers of Media Centre

The Producers at a Media Centre are primarily responsible for the programme production activities of the Centre. She/ He has to co-ordinate all production activities in the centre. Some of the duties and responsibilities of a Producer in a Media Centre include the following:

a. Produce programmes independently
b. Co-ordinate and supervise production of programmes and e-contents

c. Undertake pre-production planning, scheduling and logistical and other arrangements

d. Ensure the quality of programmes according to the suggestions and requirements of CEC

e. Make required modifications in the programmes as per the preview reports and feedback from CEC

f. Implement the directions of CEC/UGC on programme production

g. Supervisory -in -charge of production personnel on production

h. Attend production meetings to be held periodically

i. Review of the progress of production in the centre at different stages.

Taking these points in to consideration, the investigator with the help of her guide prepared a questionnaire with open ended questions also to get the relevant information from the producers of programmes.

The section soliciting general information contains six items, namely Name of the person, Date of joining/ Experience, Name of the Centre, Year of establishment of the Centre, University/ Institution the Centre is attached to, and Age.

The main section of the questionnaire contains a total of nine questions. The first question is for getting information about their target on productions to be achieved if any. In case of targets, options with type of programmes were given to specify the numbers. The next question is to know whether the time given for completion of tasks is adequate. Three options were provided to specify the reason for the negative answer and fourth option is for free response.

The third question also is a dichotomous question with Yes/No option to know whether the concerned Centre/production personnel have developed any new programme technique/template, as one of the specific objective of a Media Centre is about studying, promoting and experimenting with new techniques/ technology that will increase the reach and effectiveness of educational communication and various activities. Provision was given to the respondent to elaborate for the positive answer. Two questions with 5 options each were given for soliciting their opinion on the quality of the programmes produced by their own Centre and other Media Centres, and for finding about difficulties with respect to production of programmes.

The next three questions were given for getting their opinions on the working environment, similar templates of the programmes and workshops/ training sessions conducted. Provisions for free response were also given for all these three questions.

The last item was given for getting their suggestions to improve the quality of the products of CEC/ media centres.

Scoring

The frequencies of the responses of the structured items requiring yes/no were tabulated directly. In the case of open ended items the similar responses were pooled and categorised. Odd responses were treated separately and described qualitatively.

Validity

The tool was constructed taking in to consideration the activities of a producer at a Media Centre. The facilities arranged by both the Centre and the

apex body for improvement of personal capabilities and betterment of productions also were considered. As the front runners of productions in a Centre, the suggestions of the producers were sought for further understanding of the process.

During the process of construction of the tool itself, content validity and face validity were ensured. The questionnaire covers the pertinent points associated with the job of a producer. Hence the investigator believes that the tool is valid enough to yield the facts and reflections of a producer on the production aspects of a Centre.

For establishing face validity the investigators consulted with experts in the field of study. The experts included were former Directors, Producers, and other academicians. The experts agreed that the items in the questionnaire are valid enough to check the objectives of the study.

The tool is presented as Appendix II.

Questionnaire on Research Aspects to Research Officers of Media Centres

Each Media Centre is sanctioned with one post for either Research Officer or Junior Research Officer. The Research Officers are primarily responsible for the general research and content research works of a Centre. This calls for conducting audience research to assess the effectiveness of the educational programmes and undertaking content research for programmes of the centre (for documentaries, subject mapping in the case of syllabus based programmes etc). They are also responsible for review of the programmes,

especially the accuracy and authenticity of the contents of the programmes. In most of the Centres, they are also entrusted with production of programmes independently or in collaboration with Producer (s).

Taking these points in to consideration, the investigator with the help of her guide prepared a questionnaire with open ended questions also to get the relevant information from the Research Officers.

The section soliciting general information contains six items, namely, Name of the person, Date of joining/ Experience, Name of the Centre, Year of establishment of the Centre, University/ Institution the Centre is attached to, and Age.

The main section of the questionnaire contains 11 items. The first three questions are aimed to collect information regarding the conduct of research studies at their own centres. Two questions are for specifying any significant findings gained through research at their respective centres and for knowing whether they have implemented any changes in production aspects based on the research findings. The respondents were given the option to elaborate upon their answers. The next three questions were for understanding the relation with the CEC regarding research matters like whether they have any or easy access to the research done by other Media Centres/CEC, communication from CEC regarding CEC's own research work etc. Two questions were given to get their perceptions on the overall quality of research and the quality of programmes produced by their own centres and other centres. One question was given on the visibility and reach of the programmes of the media centres. Suggestions for improving the research aspects of Media Centres/ CEC were also solicited.

Scoring

As most of the questions were open ended, similar responses of the questions were pooled and categorised. Their opinions and suggestions are described qualitatively.

Validity

The tool was constructed taking in to consideration the duties and responsibilities of research personnel at the Media Centres.

During the process of construction of the tool itself, content validity and face validity were ensured. The questionnaire covers the pertinent points associated with the research activities. Hence the investigator believes that the tool is valid enough to yield the facts and reflections of a Research Officer of a production centre. For establishing face validity the investigators consulted with experts in the field of study. The experts agreed that the items in the questionnaire are valid enough to check the objectives of the study.

The tool is presented as Appendix III.

Questionnaire on Technical aspects to Engineers of Media Centres

The Engineer(s) are primarily responsible for testing and lineup of Studio/Production Control Room (PCR) equipment for production and the routine maintenance/servicing of Centre's audio-visual equipment, computers and stores. When there were EduSat transmissions from the Centres, they were also responsible for Edusat functions including up-linking, down-linking and maintenance of equipment. The Engineers prepare the list of equipment needed

at a Centre and foresee the purchase, installation and commissioning of equipment.

Considering the duties of an Engineer, the investigator with the help of the supervising teacher prepared a questionnaire based on the following aspects:

- The Technical Advisory Committee (TAC) List of Equipment
- Technology used at the Centre
- Purchase of equipment
- Technical quality of programmes
- Training/ workshop for technical personnel
- Constraints/ difficulties

The questionnaire contains a total of 10 items. The first question solicits the Engineers' opinion about the TAC list prepared by the CEC, and were given 5 options including a free response one. Six questions were of Yes/ No type, imploring the responses about purchase of equipment - freedom /difficulties, facilities at the centre, workshops/ training and working environment at the Centre. All the questions were given provisions for elaborating upon their positive or negative answer. Out of two questions, one was for getting their suggestions on the preparation of TAC list and the other, about the transition from analog to digital format.

The last item invites their suggestions for improving the technical quality of the products of CEC/ media centres and the smooth functioning of the production/ post production at the centre.

Scoring

Similar responses of the questions were pooled and categorised. Odd suggestions were treated separately and described qualitatively.

Validity

The tool was constructed taking in to consideration the duties and responsibilities of an Engineer at a Media Centre. The facilities arranged by both the Centre and the apex body for enhancement of technical skills, awareness of technical advances in the world and betterment of technical quality of productions also were considered.

During the process of construction of the tool itself content validity and face validity were ensured. The questionnaire covers the pertinent points associated with the job of an Engineer. Hence the investigator believes that the tool is valid enough to yield the facts and reflections of an Engineer in the smooth running of a production centre.

For establishing face validity the investigator consulted with experts in the field of study. The experts included were former Directors, Technical personnel and academicians. The experts agreed that the items in the questionnaire are valid enough to check the objectives of the study.

The tool is presented as Appendix IV.

Questionnaire on awareness and utilisation of educational telecast and webcast to students

Students are the main stake holders of telecast and webcast of educational programmes. The development, the expenses, the efforts on

dissemination - all these are for the sake of uplifting the conditions of tertiary education in the country, to overcome the many problems related to the sector, for providing equal opportunities to all for accessing quality educational resources irrespective of geographical conditions, economic status, rural/urban divide etc. With new advancements in technology, a whole new world of opportunities are open to them in the form of OERs, E-resources, Online courses, Courseware, Lecture series through DTH channels, other knowledge resources available through web etc. Now the learners are able to access any material from around the world, anytime.

As far as regular instruction or formal/non formal /informal education is concerned, selection of authentic and quality resources is very important. From the vast plethora of educational materials available as a result of IT advances, the so called judicious selection becomes difficult. Governmental agencies from the beginning of these advancements of technology are involved in the development of quality products for the learners. In this context, the investigator tried to gain some understanding about the awareness of learners with respect to the many projects and newer initiatives of the Governmental agencies, their perspectives on the utilization of these programmes etc through a questionnaire.

The section soliciting general information contains four items, namely, Name of the person, Age, Course of study and State to which they belong.

The main section of the questionnaire contains a total of 27 items. Out of these, 21 questions are of Yes/ No type. These questions were given to check whether the learners are aware of the availability of general educational programmes on television, telecast and webcast of educational programmes by

Governmental agencies: both old and newer initiatives of Government such as EduSat broadcasts, Vyas channel telecasts, e-contents, SWAYAM portal, MOOCs, SwayamPrabha channels, facilities arranged by the UGC etc. Out of these 21 questions, 9 questions have sub questions of Yes/No type and were given to elaborate their answers. For the questions about their familiarity with educational video programmes in television, a sub question is given to know the frequency of their viewing and another for listing the programmes they watch. Two questions were given for knowing their expertise in using internet and the purpose of using it, and fixed choices were provided for responses. A total of 8 questions, including sub questions, were there with fixed choice responses other than Yes/No options. The last question is an open ended one soliciting their suggestions for the improvement of programmes.

Scoring

Similar responses of the questions were pooled and categorised. Then the percentages of the responses were tabulated for each item.

Validity

A pilot survey was conducted among the students before the preparation of the actual questionnaire.

During the process of construction of the tool itself, content validity and face validity were ensured. The questionnaire covers the pertinent points associated with the different programmes available with television and web. Hence the investigator believes that the tool is valid enough to yield the facts and reflections of a student. For establishing face validity the investigators consulted

with experts in the field of study. The experts agreed that the items in the questionnaire are valid enough to check the objectives of the study.

The tool is presented as Appendix V.

Questionnaire to Subject Matter Experts of Educational Programmes

A Subject Matter Expert (SME) plays the most crucial role in the development of an educational video production. The SME is an expert in the particular subject who prepares the content for the programme and collaborating with the production team of the Centre, presents the content before the learners, be it in the form of e contents, MOOCs or DTH lectures. In the case of a documentary, an expert provides the content behind the theme and helps the Producer in finalizing the script for the programme.

The Media Centres make use of the expertise of teachers from the host University/institutions mostly for getting the scripts of the programme. Teachers from outside colleges also contribute to the development. Usually the subject experts themselves present the content, sometimes the service of other presenters also is being utilized by the Producers/ SMEs.

A Subject Matter Expert is closely associated with the Media Centre during the entire time of producing a programme. She/he is involved in writing the script, presenting the content on camera, helping the Editor during editing phase, working with Graphic Artists/ Animators for preparation of multimedia content relevant to the topic and reviewing the final outcome. She/he is also responsible for effecting the content level corrections on receipt of final review reports from CEC.

The investigator constructed the questionnaire for Subject Experts to understand their experiences with the Media Centre during the production of programmes. The investigator believes that the perceptions and suggestions will help improve the academic quality of the programmes, at the same time improving the practices of the Media Centre/ CEC also.

Taking these points in to consideration, the investigator with the help of her guide prepared a questionnaire with open ended questions too to get the relevant information from the Subject Matter Experts.

The section soliciting general information contains eight items, namely, Name of the person, Age, Designation, Experience, Name of the College/ University, Name of the Media Centre the expert is associated with and State.

The main section of the questionnaire contains a total of 14 items. The first question solicits the way by which they have come to know about the development of educational programmes at the Centre they have associated with. Four options are given including an option for free response. Six items of yes/no type were prepared for collecting information regarding their satisfaction with the development of the programme; working environment at the Centre; structure of programmes; whether they have watched similar educational video programmes of other agencies /channels; about the visibility and popularity of programmes among students and workshops/ orientation programmes/ training organised by CEC/ Media Centres. All these questions were given the option for expressing the reasons and or rating the satisfaction level for the negative/ positive answer.

One question is given for knowing the type of programme for which the expert has contributed to. Five questions were given to understand their outlook

or perspective towards the academic and technical quality of the programmes in general, any difficulties they have encountered during the development of programme at the concerned Centre and whether they have received any review reports of their own programmes or not. Another question was given to rate the responses of Media Centres/CEC for their communications in relation to apprehensions/ queries during their association with the Centre. An open ended item was given as the last one soliciting their suggestions for overall improvement of the programmes of Media Centres.

Scoring

Similar responses of the questions were pooled and categorised. Then the percentages of the responses were tabulated for each item. Odd and elaborations of the answers were treated separately and described qualitatively.

Validity

The tool was constructed taking in to consideration the role of each Subject Matter Expert in the development of a programme at any given Media Centre.

During the process of construction of the tool itself, content validity and face validity were ensured. The questionnaire covers the pertinent points associated with the experiences an SME bound to face at a Centre or during the preparation of content for the programme. Hence the investigator believes that the tool is valid enough to yield the facts and reflections of a Subject Matter Expert associated with a production centre. For establishing face validity the investigators consulted with experts in the field of study. The experts agreed that

the items in the questionnaire are valid enough to check the objectives of the study.

The tool is presented as Appendix VI.

Semi-structured Interview to:

a. Head - CEC
b. Member of Governing Body of CEC
c. Joint Director (Software) - CEC
d. Finance/ Accounts Officer
e. Media Tape Librarian
f. Research Officer
g. Broadcast Engineer
h. Indians teaching outside India
i. Academic Coordinators of CEC & Media Centres
j. Head of DTH Project

Semi-structured Interview to Head - CEC

The CEC was conceived and established as a nodal agency to coordinate and facilitates the activities of the Media Centres. The head of the CEC is designated as Director. During the period of this study, two persons have held the post. Dr. Rajbir Singh held the post from 2013 - 2017 and Dr. Jagat Bhushan Nadda, has taken up from 2017.

The semi-structured interview was carried out on a frame work of themes which are detailed below:

- Objectives framed for the Consortium: The main objective behind the establishment of CEC was close coordination, facilitation, overall guidance and direction to the activities of the media centres set up by UGC in various universities. The Director was prompted to describe the extent of realization of the various objectives.
- Role of CEC in the functioning /administration/ policies of Media Centres
- Templates formulated for the programmes, presentation aspects, quality of the programmes
- Viewership surveys, the effectiveness of such surveys, changes implemented based on the results
- Constraints faced by the CEC
- Popularisation and awareness programmes
- Current initiatives
- Plans for future

Semi-structured Interviews to Member: Governing Board of CEC

The CEC has a Governing Board which is the executive decision making body that manages, administers, directs and controls the affairs of it. The questions were based on the following points:

- Running of the CEC
- Policies formulated for CEC and Media Centres
- Constraints
- Future plans

Semi-structured Interviews to Joint Director, Finance/ Accounts Officer, Media Tape Librarian, Research Officer, Broadcast Engineer - CEC

Each one of them was asked about their respective roles, the specific function their respective departments are carrying out, the facilities, relationship with the Media Centres, constraints etc. as general questions. The Joint Director (Software) is responsible for quality checking of programmes and generation of review reports of programmes. The questions to the JD were with respect to the functions of the department.

More questions were asked to the Media Tape Librarian and the Broadcast Engineer regarding the specific functions and processes of their sections in a detailed way. The frame work adopted for Media Tape Librarian is as follows:

- Collection and archiving of content
- Constraints in archiving old and new collections, digitization, etc.
- Status of library
- Future plans
- Human resources

The Joint Director (Hardware) along with Broadcast Engineer is responsible for the preparation of TAC list of equipment required for MCs and CEC. The questions to the Broadcast Engineer were mainly based on the TAC list and the effects of fast changes in technology with respect to the purchase of equipment for the centres.

Semi-structured Interviews to Academic Coordinators

CEC is the National Coordinator for SWAYAM Prabha and SWAYAM platform for UG and PG non-technology education having overall charge for producing educational content for the channels and Massive Open Online Courses. CEC in turn has appointed Channel Coordinators and Academic Coordinators for DTH and MOOC projects to ensure the viability of the broadcast content and coordination with the EMRCs, Faculty and other agencies. The Channel Coordinators at CEC look after the channels allotted to the CEC and subject wise programming, creation of new content, managing the EMMRCs and Inflibnet Centre at BISAG etc. Those Media Centres which are allotted DTH channels also have Academic Coordinators for looking after their own channel activities. The main responsibilities of an Academic Coordinator include coordinating with different EMRCs for development and delivery of MOOCs, curriculum wise subject and content mapping for channel schedules, organizing trainings, workshops, subject committees, review committees, etc.

The themes selected for semi-structured interview are listed here.

- Relation and coordination with EMRCs
- Quality parameters adopted
- Improvements required
- Conduct of feedback studies / results' implementation
- Impact on production if any on distance/ different languages
- Difficulties
- Future plans

The interview planned for the Head of DTH Project was also a semi structured one. As the person behind the NPTEL programme and the DTH, the interview was planned with the following themes.

- Academic quality of the programmes
- Effectiveness of DTH telecasts and constraints faced in the dissemination of programmes
- Significance of telecasts
- Opinions on the e-content and MOOC projects and suggestions for improvement
- Role of Media Centres and expectations on them

Semi-structured Interviews to Indians teaching outside India

Many Indians are working outside India in different Universities where the adoption of modern technology in the education sector was done way before India. The teachers are more used to online instruction and web/TV resources. The frame work of themes/ questions for the interview were prepared on this basis, which are listed below:

- Learning at the tertiary education level
- The experience in the field of telecast and webcast of educational programme
- Suggestions for improving the structure and dissemination of programmes
- Increasing the quality, usefulness of a tv/web lecture and that of public sector broadcasts
- Strengths and weaknesses of programmes by India and foreign countries

Procedure Adopted for Data Collection

After deciding upon the data sources, the investigator visited CEC to collect data from the concerned personnel. As she is working in a Media Centre, during many meetings, she had the chances of meeting almost all the Directors of Media Centres. Detailed discussions were carried out during those occasions. Also questionnaires were sent to them via e-mail and the investigator contacted them over telephone too in order to get their responses directly. In that way, both the investigator and the respondents were able to elaborate upon their responses. The investigator was also able to conduct a face to face interview with the Head of DTH Project.

All the other questionnaires to Producers, Research personnel, Engineers, Students and Subject Matter Experts were sent via e-mail.

The preliminary data were collected during the early phases of the research study. Interviews with the former director of the CEC, Directors of different Centres, some of the CEC officials etc also were carried out during the period 2014-15. Since then lots of changes with respect to the programme production were effected in the centres as well as CEC. New equipment were purchased, studios were revamped, development of e-contents after the first lull in the production went in to full swing, after that the e-content project was wound up, development of MOOCs both repurposed and fresh were initiated, Swayam portal and SwayamPrabha DTH Channels were started - all these changes made the investigator repeat the process of data collection during the years 2017 to 2019.

Statistical Technique Used

Percentage analysis was used wherever needed. Similar responses were pooled and explained. Odd responses were treated separately and described qualitatively.

The analysis of the responses and reports collected are presented in detail in the next chapter.

Chapter IV

ANALYSIS AND INTERPRETATIONS

- *Phase I: Evolution of Educational Telecast and Webcast in India*
- *Phase II: Analysis of problems faced by the Media Centres and Measures for Functional Improvement.*

ANALYSIS AND INTERPRETATIONS

The present study is mainly intended to analyse the educational telecast and webcast in India through UGC Media Centres and the contribution of the Media Centres in the domain. This chapter deals with analysis and interpretation of the data based on the objectives framed for the study as listed in Chapter 1. The following description gives the objective wise analysis and results of the study.

Quantitative and Qualitative Analysis of the Data

The data were collected from different sources through multiple lines of approach as given below.

1. Documents pertaining to the study (Annual Reports, Books on the subject, Research Papers, Articles etc.)
2. Responses of
    - Directors of Media Centres
    - Producers of Media Centre
    - Research Officers of Media Centre
    - Engineers of Media Centre
    - Students
    - Subject Matter Experts of Educational Programmes
    - Head - CEC
    - Member of Governing Body of CEC
    - Joint Director (Software) - CEC

- Finance/ Accounts Officer - CEC
- Media Tape Librarian - CEC
- Research Officer - CEC
- Broadcast Engineer - CEC
- Academic Coordinators of CEC & Media Centres
- Indians teaching outside India
- Head of DTH Project

The analysis of the data obtained through various sources and samples was done in line with the objectives of the study and is given as four parts as detailed below:

In the first part, a historical outline of telecast and webcast of educational programmes in India was detailed with emphasis on the working of the main agencies: the UGC - CEC and the Media Centres functioning under it. Also a brief description of different projects of the Government of India is given in this part.

The second part consists of the details of responses collected from various personnel associated with the CEC and Media Centres.

In the third part, a comprehensive discussion is given on the basis of the reported data and attempt is made to identify the problems and difficulties faced by the Centres and suggest remedial measures.

A critical examination of all the results comprises of the fourth part, done by cross checking the responses of all the sampled groups.

Phase I

Two of the objectives framed for the study are about exploring the evolution of telecast and webcast of educational programmes in India and evaluating the status and contribution UGC Media Centres in telecast and webcast of educational programmes in India.

Evolution of Educational Telecast and Webcast in India

To study the historical evolution of educational telecast, webcast and the role of UGC Media Centres, the researcher analysed secondary data available in several books on the subject, websites, annual reports, research reports, etc. The data compiled from all these gave a profile of the evolution of educational television, which though still in use, gave way to computers, open courseware, online learning, and webcasts.

When the first television transmission was started at New Delhi on 15th August 1959, the primary objective was to use it for transmitting education related programmes. As nobody owned television sets privately, the Government established 180 teleclubs with television sets in and around Delhi. Since the schools in India, soon after independence, lacked good laboratory and learning resources, mainly science related programmes based on school curriculum were aired at first. That is, the entry of educational television started as an experimental project broadcasting telelessons to schools in Delhi. The important milestones with respect to educational telecast in India are given below:

- 19th January 1960: All India Radio in collaboration with Department of Education launched the first formal telecast of school programmes on Science and Languages.
- 24th October 1961: With the help of Ford Foundation, Delhi School TV Project was launched on an experimental basis to study about the role of

TV in education. Specially designed science and enrichment programmes were aired for secondary school students of Delhi. Regular telecasts (Science and Language) for secondary school students started in 1961 with about 150 schools receiving the programmes.

- 15th August 1966: Daily telecast of 1 hour was started for schools.
- 1972 - 1975: Daily school telecasts were given through the 7 TV stations (Bombay, Srinagar, Amritsar, Pune, Calcutta, Madras and Lucknow) established by the Government during this period benefiting the urban school students of these places.
- 1st August 1975 - 31st July 1976: Satellite Instructional Television Experiment (SITE) by ISRO using the American Application Technology Satellite (ATS-6) used satellite for broadcasting messages related to health, family planning, adult literacy, teacher education, science education and primary education through television programmes.
- 1977 - 1978: Following the success of SITE, Government restarted TV transmitters to meet the needs of education and development in Rajasthan, Karnataka, Andhra Pradesh and Orissa.
- 1982: Indian National Satellite (INSAT) became operational. Also Doordarshan established its National Network.

Based on the findings of the experimental project carried out in 1961, the Ministry of Education decided to support the educational function of television. As a result there had been consistent efforts to build an infrastructure for software production in different parts of the country. Recognising the importance of technology and the role it is able to play in the education sector prompted the Government to take up a scheme of educational technology and established a unit

for Educational Technology in 1971 with the assistance from United Nations Development Programme under the administration of NCERT. Under the scheme, an ET unit in the Ministry, a Centre for Educational Technology (CET) under NCERT, and ET cells in six SITE states were set up in 1974.

The launch of the Indian National Satellite (INSAT) in 1980, and its availability for educational purposes led the Ministry of Education to take over the production of educational television programmes for transmission via Doordarshan. INSAT for Education was conceived as a tripartite project, and was supported by UNDP, UNESCO, and GOI. Under its aegis, an Educational Technology Division in the Ministry of Education was set up. Central Institute of Educational Technology (CIET) was then set up merging CET and Department of Teaching Aids of NCERT. This agency was the one which was first charged with the task of undertaking educational television.

The conventional systems of education at those times had not been able to keep up with the growing needs of India and some of the factors identified by the UGC, India's apex body for higher education, were as follows:

- The colleges at the rural areas including some at main cities and urban areas were experiencing shortage of trained teachers, dearth of well-equipped laboratories and well stocked libraries.
- A great disparity with respect to quality teaching exists between rural and urban institutions.
- Television, as an effective mass medium, can be utilized to overcome the geographical barriers to impart quality education to students of rural, remote and under privileged areas of India.

- The satellite (INSAT) can be used for dissemination of educational programmes through television.
- Through television, programmes like classroom situations, seminars, tutorials, vocational and technical courses requiring visuals, in service courses/programmes for teachers etc. can be aired.
- These programmes and facilities could form the core of a university of distance education.

In the Annual Report for the year 1983-84, UGC reported that the Commission has constituted a Working Group to advise it on various matters connected with the setting up of centres of mass communication and educational technology in Indian Universities, considering the fact that on INSAT becoming operational, one hour transmission time can be ensured.

The working group had forwarded many recommendations, one of the most important being appointing a Task Force to prepare a Plan of Action. This was done in August 1982. UGC further noticed that the teachers who are to produce educational programmes for television are not familiar with the new medium, and there were limited facilities at the universities and institutions for familiarising these experts in programme production too.

Considering all these factors, the UGC set up training and production facilities with standard equipment in six selected Centres, namely,

1. Mass Communication Research Centre, Jamia Millia Islamia, New Delhi,
2. Educational Media Research Centre (EMRC) at Poona University,
3. Educational Media Research Centre at Gujarat University,
4. Educational Media Research Centre at Central Institute of English and Foreign Languages (CIEFL), Hyderabad,

5. Audio Visual Research Centre (AVRC) at Osmania University,
6. Audio Visual Research Centre at Roorkee University.

A Central Programme Committee also had been set up to coordinate and channelise suitable materials for daily telecast by Doordarshan.

As per the '83-84 report, the following decisions were made by the UGC/ Task Force:

- Production of enrichment programmes at the Under-graduate level in different disciplines so as to benefit any educated person.
- Production of special programmes for teachers in higher education to enable them to handle their class and examination work, to give them up to date knowledge and particularly to make them familiar with educational goals of their profession.
- Procurement of world class educational programmes from other Universities/ institutions in India or abroad. For determining suitability of such programmes for being televised through INSAT-IB, set up a Cell/ Unit at Jamia Milia Islamia.
- Setting up a Research Advisory Committee for studying about audience profile, entry behavior and skills, understanding of English language, needs etc.

The project was officially called UGC INSAT TV Project and it was set up for coordinating the production and transmission of high quality educational programmes and making it available to students, teachers and other viewers through the terrestrial transmission of Doordarshan using the services of INSAT Satellite.

UGC initiated the Countrywide Classroom (CWCR) Programmes in the year 1984 using satellite communication for enhancing the reach of higher

education. The first telecast of CWCR programmes was on 15th August, 1984 on Doordarshan National Network (DD1).

The objectives of all the envisaged programmes were to upgrade, update and enrich the quality of education while extending its reach.

The CREDO for the Countrywide Classroom reads:

The programmes will aim to upgrade, update and enrich the quality of education while extending its reach. They will attempt to overcome the obsolescence of the syllabus and present the latest advances in all fields. The programmes will seek to arouse the interest of the viewers, whet their appetite and broaden their intellectual horizons. The aim is to stimulate but not to satiate. The programme will not be based on or restricted to a syllabus. Instead they will seek to provide new insights, interrelatedness of various disciplines and highlight developmental problems so that the sum is greater than the whole of the parts.

UGC's decision to start production centres at different Universities of different states was to enable them to exploit the expertise of the academic community. AVRCs were smaller centres with minimum equipment and a small number of staff whereas EMRCs were relatively bigger centres with more production facilities and staff. These were later renamed in 2004 as Educational Multimedia Research Centres (EM^2RC/ EMMRC). Under the CWCR Programme, UGC produced special educational programmes in Hindi and English and these were aired on Doordarshan for the benefit of college students across the country.

In the beginning, the CWCR programmes were more of enrichment type. The Centres produced programmes like documentaries, interviews, discussions and did not much concentrate on syllabus or curriculum. The nature of programmes

then shifted to lectures based on UGC model syllabus for undergraduates. The lectures were made more appealing with the use of more than one medium-audio/video, graphics, animations and other visuals. The programmes produced by the Centres were mostly in English, and some in Hindi. Later when Doordarshan launched channels in regional language, some of the Media Centres also started telecast of programmes made in regional language in the regional channels. The first ever regional telecast of CWCR programmes was started by AVRC - Mysore, in Kannada on 19th December 1998. The Media Centres at Kolkota, Hyderabad and Pune also entered in to the telecast of programmes in regional language - namely Bengali, Telugu and Marathi.

Timings of the CWCR Programmes

The CWCR programmes, initially were aired on the Doordarshan national network - DD 1 from 12.45 p.m. to 01.35 p.m. for six days in a week up to February 1985. Repeat telecast of the programmes started from 16th February 1985 between 04.00 p.m. and 05.00 p.m. Later the timing of the telecast was shifted to morning slot - between 5.30 and 6.30 a.m. Sometimes the timings were altogether different. The timings of the programmes (telecast schedule) (in the year 1999) were decided on the following reasoning (Source: CEC):

- For morning Hindi programmes from 06:00 - 06:30: The viewers targeted were based on Vernacular, Ethnic and Regional. These programmes were given a weekly focus.
- Morning 07:15- 08:00 English: Larger audience, Breakfast time. So programmes were of softer, shorter, better quality and given a weekly focus.
- 11:00-12:00 English: Targeted serious nonstudents, longer and content oriented programmes.

- Saturday and Sunday-06:00-07:00 - English: For a more relaxed audience, Softer subjects but long duration programmes were given.
- For University video lecture courses, the viewers targeted were considered as serious students. For them, Monday to Friday, programmes were given during 00:00-00:30 and 10:00-10:30 and better lectures were used. For Saturday family viewing in metro cities, foreign programmes in English were given during 11:00 to 12:00.

Prelude to the official launching of the exclusive education TV Gyandarshan (started by IGNOU, MHRD and Prasar Bharti using INSAT- 2 B) with uplink facility at IGNOU, daily test transmission of programmes was done for 2 hours from 5.00 p.m. to 7.00 p.m. After the official launch on 26th January 2000, the duration of transmission was increased to 4 hours each day, from 5.00 p.m. to 9.00 p.m. In February the same year, the transmission was further increased to 9 hours, and then to 16 hours from June 2000. The Gyandarshan became a 24 hour channel on 1st November 2000 and transmitted programmes supplied by UGC (CEC & Media Centres), NCERT, CIET, SIETs and IGNOU. The UGC programmes had a 4 hour slot and the programmes were repeated 2-3 times a day.

The satellite based GD channel changed from Analog to Digital mode after it gets linked to INSAT - 3 C in March 2002. Later the IGNOU expanded Gyan Darshan into four separate channels dedicated to General Education, Technical Education, Higher Education and Languages. GD-1 deals with programmes for IGNOU, NIOS and NCERT along with a number of other institutions. Bhasha Mandakini initiative was launched under Sanskrit Net, for the propagation of languages including Sanskrit. GD-2 is dedicated to interactive teleconferencing for distance education academic programmes of IGNOU. GD-3 is called Eklavya, and

is for engineering education. This channel presents lectures of the courses taught at IITs (Kharagpur, Mumbai, Kanpur, Delhi, Guwahati, Roorkee and Chennai). GD-4 VYAS is a curriculum based higher education channel.

Another channel, fully devoted to agriculture related and rural development programmes also was inaugurated in January, 2004.

The details are presented in Table 5.

Table 5

Details of Gyan Darshan Channels

No.	Name of Channel		Launched on	Agency/ Programme providers	Sector
1.	Gyan Darshan - 1		Jan 2000	UGC, NCERT, CIET, SIETs and IGNOU	Education in general including secondary, higher secondary and distance education
2.	Gyan Darshan - 2	Bhasha Mandakini	Sep 2003	Central Institute of Indian Languages, Mysuru	Languages
				IGNOU	Also interactive distance education
3.	Gyan Darshan - 3	Eklavya	Jan 2003	IIT Delhi with other IITs and Dept. of Technical Education - MHRD	Technical Education
4.	Gyan Darshan - 4	Vyas	Jan 2004	UGC and CEC + EMMRCs	Higher Education

When the higher education channel of India VYAS was launched by CEC on 26th January 2004, the CWCR programmes got aired on 24x7 basis. The

programmes were also telecast for one and half hours on DD 1 and DD Bharthi (pertaining to disciplines: healthline and culture). Soon it gets diversified into multimedia e-learning production, in tune with the web based online learning initiatives of the UGC and Govt. of India.

The educational programmes for undergraduate students are meant to bridge the knowledge and information gap exists with the remote and rural places of India. To ensure and increase the reach of the programmes all over the world, the CEC started webcasting the channel soon after the launch.

In 2004 itself, the EduSat programme also was launched.

EDUSAT and its contribution

EDUSAT (GSAT-3) was India's first exclusive thematic satellite intended for educational sector, from school level to higher education. This was indigenously developed by Indian Space Research Organisation (ISRO). ISRO set up a nationwide multiuser in its EduSat national Ku Band - Satellite Interactive Terminal. Launched on 20th September 2004, the EduSat programme was meant to provide distance education service using advanced space technology and ground technology of media convergence and was aimed to bridge the gap in teaching infrastructure between rural and urban students.

There were six selected user networks operating independently with their user terminals anywhere in India. Those are,

1. UGC/CEC
2. IGNOU
3. CIET/ NCERT

4. NITTTR (National Institute of Technical Teachers Training and Research)
5. Vigyan Prasar
6. ISRO

The network has one main teaching end along with Satellite Interactive Terminals (SITs) and Receive only Terminals (ROTs).

The EduSat network is a narrow casting one, having two way video and two way audio facility. The satellite uses Internet Protocol based technologies to transfer multimedia contents across the country. It is capable of transferring data from teaching end (studio linked with uplink earth station) to the receiving end (colleges).

A Studio acts as a Teaching end, where the subject experts and teachers conduct classes. All the Satellite Interactive Terminals are known as class ends. Since it is a two way communication system, the experts at the teaching end can see and interact with those who sit at each SITs and vice versa. Transmission like this is called multicast.

As stated by ISRO, the EduSat had manifold objectives: through several Receive only Terminals and Satellite Interactive Terminals, it aimed to supplement the curriculum based teaching, imparting effective teacher training, providing access to quality resource persons and new technologies, and thereby taking education to every nook and corner of India. The programme was implemented in three phases: Pilot, Semi-operational and Operational. Details are given as follows:

- Pilot Phase: Pilot projects were taken up in Karnataka, Madhya Pradesh and Maharashtra using INSAT-3B ahead of formal launch of EduSat with 300 terminals.
- Semi-operational Phase: Almost all the states and national agencies were covered during this phase.
- Operational Phase: Networks were further expanded utilizing funds of individual States and User agencies.

In September 2010 the EduSat satellite was decommissioned. The traffic of tele-education networks were then migrated to other ISRO satellites. By 2012, there were a total of 83 networks which connected above 56,000 schools and colleges with the help of 4,943 SITs and 51,221 ROTs (www.isro.gov.in).

ISRO, after withdrawing the support given to EduSat transmissions, provided the band width to the bouquet of 32 DTH channels (SwayamPrabha) and some channels for Gujrat using VSAT 15.

National Mission on Education through Information and Communication Technology (NME-ICT)

In the Eleventh Plan period of India, the Ministry of Human Resources (MHRD) established National Mission on Education through Information and Communication Technology (NME-ICT) for strengthening ICT infrastructure in the higher educational institutions and for development of courseware e-Contents for tertiary education sector. This was launched on 2nd February 2009.

There were more than 50 projects on e-content under the mission which are developed or being developed in various subject disciplines through various

Governmental agencies like Indian Institutes of Technology/Science, Universities, Colleges etc. The CEC was entrusted with the development of e-contents for undergraduate courses.

Production of courseware E-content for undergraduate subjects

The Consortium for Educational Communication (CEC) - the apex body of Media Centres, partnered the Mission by taking up the development of Courseware e-Content for Undergraduates (UGC model curriculum for 3 years UG course) in 2009 itself. After accepting the project, CEC along with the Media Centres went on to develop the widely accepted e-Content template in four quadrant following instructional design methodology.

In the Pilot phase, the CEC and the Media Centres developed 65 modules. In the next phase, when the development of e-Contents in eight subjects: Botany, History, Anthropology, English Language (General), Mathematics, Photography (Vocational), Hindi Language (General), Environmental Science was completed, these were dedicated to the nation on 28th January, 2014 and were made available on webportals www.cec-ugc.nic.in and www.sakshat.ac.in. In the next two phases, the CEC and the Media Centres under it went on to develop e-Content in 87 subjects based on Undergraduate syllabus. Details are presented elsewhere.

Production of courseware E-content for postgraduate subjects

e-PG Pathsala is another centrally sponsored scheme to leverage the potential of ICT, in teaching and learning process under the NME-lCT for the benefit of all the learners at higher education institutions anytime anywhere mode. UGC was selected by NME-ICT-MHRD in the year 2011 as the Nodal Agency/National Coordinator for the project “Production of Courseware

e-Content for Post Graduate Subjects" for development of e-content at Non-Technology PG level in 77 subjects. The project though launched in 2012, picked up momentum in 2014. Under this project, UGC developed curriculum-based and interactive content in different subjects across disciplines of Social Sciences, Arts, Fine Arts and Humanities, Natural & Mathematical Sciences, Linguistics and Languages. The Learning Management System for e-PG Pathshala (http://epgp.inflibnet.ac.in/) became available in open access since March 2014 and hosted on INFLIBNET server. Total cost of project received by the UGC from MHRD is Rs. 84 crore. In 2014, 70 subjects were identified for programme production and 1,500 modules were uploaded in the portal. The details of e-Content development as on 30.09.2017 (as given in the Annual Report of UGC 2017-18) are presented below:

Table 6

Details of e-Content Development in PG subjects as on 30.09.2017

No.	Particulars	Number of e-contents
1.	No. of PG subjects	77
2.	No. of Papers (courses) for which content is developed	968
3.	No. of Static Content uploaded on server	23,834
4.	No. of Video / Self-learning uploaded	22,038

INFLIBNET (Information and Library Network) is an Inter University Centre which connects all University libraries and information centres thereby promoting scholarly communication among academicians and researchers. Vidya-mitra is a project assigned to the INFLIBNET Centre in May 2014 and is an online learning portal for all the e-content projects developed under the NME-ICT, MHRD. Vidya-mitra hosts 62,000+ Video (Self-learning / e-Tutorial) and 45,000+ eText.

SWAYAM and Massive Open Online Courses (MOOCs)

For supporting the concept of open education, the Government of India started many initiatives which help in providing open resources in terms of repositories, libraries, educational media files, e-books, etc. Some of the efforts being that of IGNOU with its National Digital Repository, the Sakshat portal (at the time providing e-contents), Shishya by CBSE Board for providing e-resources for plus two students, Vidya Vahini - school computerization programme etc.

From the success of these types of resources, the idea of online courses came into play and India started to work for this following the footsteps of the world. MOOCs are the online courses designed to support unlimited participation (hence the term Massive) open to anyone interested and are offered through a platform. It has gained lot of popularity since the time of its development. As per the reports from the year 2016, India after US, is dominating the global growth in enrolment of students for these online courses of different providers like Udacity, Coursera, edX etc.

Top institutes like IITs, IIMs, IISc entered into this sector first in India: like that of NPTEL (National Programme on Technology Enhanced Learning - project initiated in 2003) developed by seven IITs along with IISC, mooKIT by IIT - Kanpur, IITBX of IIT Bombay etc. While IIT Kanpur and Common Wealth of Learning started on the work on MOOCs from 2012, NPTEL began offering MOOCs from 2014. NPTEL used the open-source technology for offering courses which are powered by Google's open-source platform *Course Builder.*

The Government of India has also launched SWAYAM (Study Webs of Active learning by Young Aspiring Minds) portal, the indigenous platform of

MHRD that provides an integrated platform for online courses, using information and communication technology (ICT).The portal was launched to supplement the formal education system in the country from high school to higher education. Online courses are uploaded by different agencies on to the portal and any student can join virtual courses offered by the best teachers in the country, interact with the teacher, take tests, earn academic credits and transfer them on their academic record. MOOCs for SWAYAM are developed as per the pedagogy of a particular subject following the four quadrant approach as followed in the case of e-content.

National Coordinators (NC) are assigned with a specific sector to cater to MOOCs such as high school, engineering/ non-engineering diploma/ degree/ post-graduation. The MHRD again selected UGC as National Coordinator for developing MOOCs in Non-Technology PG programmes and CEC for the development and delivery of MOOCs for Non-Technology Under Graduate degree level courses. There are 9 National Coordinators for different sectors of education as follows:

A. School Education:
    1. NCERT (National Council for Educational Research and Training)
    2. NIOS (National Institute for Open Schooling)
B. Out- of -School Education
    3. NITTTR (National Institute for Technical Teachers Training and Research) for development of Teacher Training programme
    4. IGNOU (Indira Gandhi National Open University)

C. Under-Graduate Education

5. NPTEL (National Programme on Technology Enhanced Learning) for Engineering
6. AICTE (All India Council for Technical Education) for self-paced and international courses
7. CEC for Non-Technology Under Graduate degree level courses
8. IIMB (Indian Institute of Management, Bangalore) for Management Studies

D. Post-Graduate Education

9. UGC for Non-technical PG Education

MOOCs are developed in two ways: by repurposing the already developed e-Contents and by developing fresh ones.

SwayamPrabha - Free DTH Channel for Education

SwayamPrabha is a group of 32 DTH (Direct To Home) Channels devoted to telecasting high quality educational programmes on 24 x 7 basis using the GSAT- 15 satellite. The channels are uplinked from BISAG (Bhaskaracharya Institute for Space Applications and Geo-informatics), Gujarat. The 4 hour transmission of fresh content is repeated 5 more times in a day. All the aforementioned agencies provide the content for transmission and the web portal is maintained by the INFLIBNET Centre.

The details of channels are presented in table 7.

Table 7

List of SwayamPrabha DTH Channels

No.	Name of Channel	Subjects	Run by
Channel 01 to 10 managed by CEC/UGC			
1.	Vageesh	Humanities-1, Language & Literature	EMRC - EFLU
2.	Sanskriti	Humanities-2, Art, History, Philosophy & related subjects	CEC
3.	Prabodh	Social Science-1, Sociology, Political Science & related subjects	EMRC, Jodhpur
4.	Saaraswat	Social Science-2, Psychology, Education, Home Science & related subjects	CEC
5.	Prabandhan	Social Science-3, Management, Library Science, Information Science & related subjects	MCRC, Jamia Milia
6.	Vidhik	Social Science-4, Law, Legal Studies, Human Rights & related subjects	EMRC, Patiala
7.	Kautilya	Economics, Commerce and Finance	EMRC, Ahmedabad
8.	Aryabhatt	Physical Sciences, Mathematics, Physics, Chemistry & related subjects	EMMRC, Calicut
9.	Spandan	Life Sciences, Botany, Zoology, Bioscience & related subjects	EMRC, Srinagar
10.	Daksh	Applied Sciences, Allied Physical and Chemical Sciences & related subjects	EMRC, Chennai
Channel 11 to 18 managed by NPTEL			
11.	Channel- 11	Chemical Engineering, Chemistry & related subjects	IIT, Kharagpur
12.	Channel- 12	Civil Engineering & related subjects	IIT, Delhi
13.	Channel- 13	Computer Science & Engineering	IIT, Kharagpur
14.	Channel- 14	Electrical Engineering, Electronics and Communication Engineering & related subjects	IIT, Delhi
15.	Channel- 15	Engineering subjects and General Subjects for Engineering	IIT, Madras

No.	Name of Channel	Subjects	Run by
16.	Channel- 16	Humanities, Social Sciences and Management	IIT, Kanpur
17.	Channel- 17	Mechanical Engineering & related subjects	
18.	Channel- 18	Mathematics, Physics, Metallurgy & related subjects	IIT Tirupati / IIT Madras
Channel 19 to 22 for High School Students managed by IIT Delhi, is called IIT PAL			
19.	IIT PAL 1	Biology	IIT, Delhi
20.	IIT PAL 2	Chemistry	
21.	IIT PAL 3	Mathematics	
22.	IIT PAL 4	Physics	
Channel 23 & 24 managed by IGNOU			
23.	Channel- 23	Liberal Arts & Humanities	IGNOU
24.	Channel- 24	Agriculture, Vocational and Allied Sciences	
25.	NIOS:D.El. Ed	Regional Language	NIOS
26.	Channel- 26	State Open Universities' Programme	IGNOU
27.	Channel- 27	Secondary School Education	NIOS
28.	Channel- 28	Higher Secondary School Education	
29.	UGC-INFLIBNET	PG Subjects & Yoga	UGC-INFLIBNET
30.	Gyanamrit	School Education	NIOS
31.	Channel- 31	School and Teacher Education	NCERT
32.	Channel- 32	Teacher Education	IGNOU & NIOS

VYAS Higher Education Channel is UGC/CEC Channel - 33, and the programmes telecast are in the following area:

- Band I : Art/Culture/Literature/Language
- Band II : Social Science
- Band III : Management and Other Professional Courses
- Band IV : Natural and Applied Science

The UGC - CEC Media Centres

Initially 6 Media Centres were started by the UGC. The 6 Centres established first were, Media Communication Research Centre (MCRC) at Jamia Milia Islamia, EMRCs at Poona University, Gujarat University, Central Institute of English and Foreign Languages (CIEFL), Hyderabad, two Audio Visual Research Centres (AVRC) at Osmania University and Roorkee University. The other 15 Centres were established one by one after these: EMRCs at St. Xavier's College, Kolkata, Jodhpur, Madurai, and AVRCs at Indore, Sagar, Chennai, Imphal, Patiala, Srinagar, Calicut and Mysore. During 2011-12, six new Media Centres were shortlisted by UGC, out of which four Centres were opened thereafter.

Now a total of 21 Media Centres are functioning at various universities and institutions in the country. Table 8 gives the list of these Media Centres.

Table 8

UGC Media Centres Across India

No.	Year of Establishment	Named as	University/ Institution	State
1.	1982 - 83	Mass Communication Research Centre (MCRC)	Jamia Milia Islamia, New Delhi	Uttar Pradesh
2.	1983	Audio Visual Research Centre (AVRC)	Osmania University, Hyderabad	Telengana
3.	1983	Educational Media Research Centre (EMRC)	University of Pune, Pune	Maharashtra
4.	1983	Audio Visual Research Centre (AVRC)	University of Roorkee (IIT Campus, Roorkee)	Uttarakhand

No.	Year of Establishment	Named as	University/ Institution	State
5.	1983	Educational Media Research Centre (EMRC)	CIEFL (EFLU), Hyderabad	Telengana
6.	1983	Educational Media Research Centre (EMRC)	Gujarat University, Ahmedabad	Gujarat
7.	1985	Audio Visual Research Centre (AVRC)	Anna University, Chennai	Tamil Nadu
8.	1985	Educational Media Research Centre (EMRC)	Jai Narain Vyas University, Jodhpur	Rajasthan
9.	1986	Educational Media Research Centre (EMRC)	St. Xavier's College, Kolkota	West Bengal
10.	1986	Audio Visual Research Centre (AVRC)	University of Kashmir, Srinagar	J&K
11.	1986	Educational Media Research Centre (EMRC)	Madurai Kamaraj University, Madurai	Tamil Nadu
12.	1989	Audio Visual Research Centre (AVRC)	Manipur University, Imphal	Manipur
13.	1989	Audio Visual Research Centre (AVRC)	Punjabi University, Patiala	Punjab
14.	1990	Audio Visual Research Centre (AVRC)	Devi Ahilya Viswavidyalaya, Indore	Madhya Pradesh
15.	1994	Audio Visual Research Centre (AVRC)	Dr. Hari Singh Gour Central University, Sagar	Madhya Pradesh
16.	1996	Audio Visual Research Centre (AVRC)	University of Calicut, Malappuram	Kerala

No.	Year of Establishment	Named as	University/ Institution	State
17.	1996	Audio Visual Research Centre (AVRC)	University of Mysore, Mysuru	Karnataka
18.	2012	Educational Multimedia Research Centre (EMMRC)	Babasaheb Bhimrao Ambedkar University, Lucknow	Uttar Pradesh
19.	2012	Educational Multimedia Research Centre (EMRC)	Dibrugarh University, Dibrugarh	Assam
20.	2012 - 13	Educational Multimedia Research Centre (EMRC)	Magadh University Bodh Gaya	Bihar
21.	2012	Educational Multimedia Research Centre (EMRC)	Pondicherry University, Puducherry	UT of Puducherry

(Year of establishment Source: CEC)

Though sanctioned in 1982-83, most of the pioneer Centres were established at their respective Universities/ institutions in ’84.

The location of EMRC, Jamia is at AJK (Anwar Jamal Kidwai) Mass Communication Research Centre - a premier media institution in India - Jamia Milia Islamia University, Delhi. It was established in collaboration with York University, Toronto and the Canadian International Development Aid Agency. The CIDA provided the Centre with sophisticated production equipment while the York University sent their teachers for transacting media education. This Centre was the first and one of the six centres opened by UGC in 1984 and was the host institution for UGC - INSAT TV Project/CEC-UGC, from 1984 to 1991.

One among the oldest centres, the AVRC, Roorkee was established in the University of Roorkee, which was later turned in to IIT. It is the only Media Centre situated in an Indian Institute of Technology (IIT) campus. It was established in the year 1983, based on the recommendations of the Task Force on Mass Communication and Educational Technology.The Centre was taken over by CEC in 2005.

Opened on 7th October 1984, the EMRC, Ahmedabad at Gujrat University is one among the pioneer centres. Another two centres among the first six are EMRC established at CIEFL (now called EFL-U), Hyderabad and EMRC, Osmania University, also at Hyderabad, Andhra Pradesh (now Telengana). The location of EMRC, Pune is at Savitribai Phule Pune University, Pune. One of the oldest Centre, it has the largest floor space studio designed by British Architects who designed BBC Studios in U.K.

The Audio Visual Research Centre in the Jai Narain Vyas University, Jodhpur was sanctioned by the UGC in the year 1986 and was upgraded to EMRC in 1991.

Established as AVRC in 1991, EMRC, Patiala Centre covers the states of Punjab, Haryana, Himachal Pradesh and Union Territory of Chandigarh. The Centre functions at Punjabi University, Patiala. The Indore Centre though established in 1989, became operational only in 1992. Formerly AVRC, the EMRC Indore functions at Devi Ahilya Vishwavidyalaya, Indore.

The EMRC in the state Madhya Pradesh is located at Dr. Hari Singh Gaur Central University, Sagar. Established in 1986, EMRC Srinagar functions at University of Kashmir. The EMRC Lucknow functioning at

Babasaheb Bhimrao Ambedkar University, is UP's first EMRC established in a University Campus.

Audio Visual Research Centre (AVRC) at Karnataka state was established in 1996 at the University of Mysore. Two other Centres in South India are the Calicut and Chennai established as AVRCs in the year 1998 and 1985 respectively. AVRC, Calicut is functioning at University of Calicut, Kerala and EMRC, Chennai Centre is at Anna University, Chennai, Tamil Nadu. Another Centre at Tamil Nadu is the Educational Multimedia Research Centre, Madurai Kamaraj University, also was established as an Audio Visual Research Centre (AVRC) in 1986 and was upgraded to Educational Media Research Centre (EMRC) in 1991.

EMMRC at St. Xavier's College (Autonomous), Kolkata, is the only Media Centre of UGC hosted by an undergraduate college. The EMMRC at Imphal established in 1989 was the only Media Centre in the North-East India, until Dibrugarh Centre joined the list in 2012. The Manipur Centre is another Centre which produces programmes for the local viewers in regional language (Manipuri). EMRC Dibrugarh was approved by the UGC in July, 2012 and functions at Dibrugarh University.

Centre for Electronic Media (CEM) was established in 2008 in Pondicherry University, Puducherry with the objective of producing educational films in broadcasting format for students of Higher Education. Following the approval by the UGC in the year 2012 the Centre has become an Educational Multimedia Research Centre (EMRC) under CEC.

The Centres were renamed Educational Multimedia Research Centre in 2004 by the then UGC Chairman Dr. Arun Nigvekar. The spread of Media Centres across the country is given in figure 4.

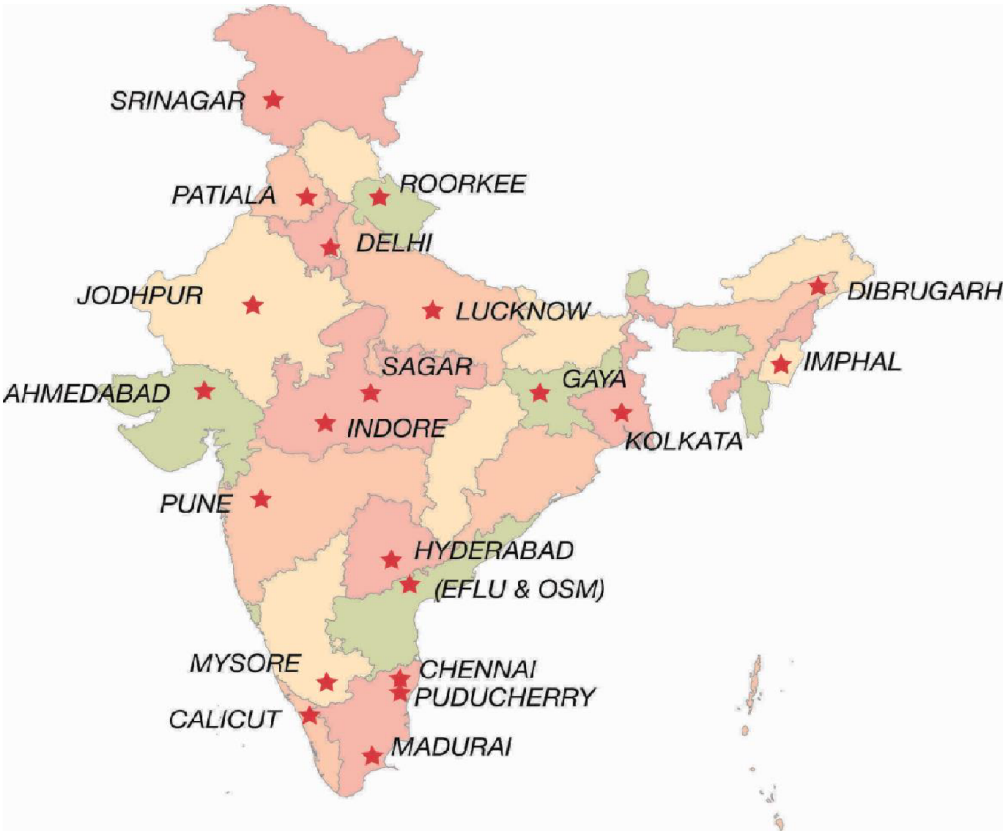


Figure 4. Distribution of Media Centres in India

There were three kinds of Centres envisaged: AVRC, EMRC-I and EMRC - II and this categorization was based on the number of staffs sanctioned as well as targeted programme production per year. The targets assigned for these three kinds were 50, 100 and 125 per year respectively. The Staffing Pattern is detailed in the following table 9 (Guidelines - Feb, 1996).

Table 9

Staffing Pattern at Media Centres

No.	Designation	AVRC	EMRC-I	EMRC-II
1.	Director	1	1	1
Production Staff				
2.	Joint Director	-	-	1
3.	Producer II	-	1	1
4.	Producer -I	3	5	6
5.	Production Assistant	3	3	4
6.	Cameraperson	2	2	4
7.	Graphic Artist	1	1	1
8.	Computer Animator	-	1	1
9.	Unit Assistant	-	1	1
10.	Carpenter (Set Fabricator)	-	1	1
11.	Unit Peon	1	2	3
Engineering Staff				
12.	Engineer Grade I	1	1	1
13.	Technical Assistant	1	2	3
14.	Technician	3	4	5
Research Staff				
15.	Research Officer	-	-	1
16.	Junior Research Officer	1	1	1
Media Library Staff				
17.	Assistant Librarian	-	1	1
18.	Professional Assistant	1	1	1
Transport				
19.	Driver-cum-Helper	1	1	2
Administrative & Financial Staff				
20.	Section Officer (Admn)	1	1	1
21.	Section Officer (Accounts)	-	-	1
22.	Accounts Assistant	1	1	1
23.	Clerk (LDC)	1	2	2
24.	Personal Assistant	1	1	1
25.	Stenographer	1	2	3
26.	Peon	1	2	3
	Total	25	38	51

(Source: Guidelines for the Establishment of Media Centres, UGC)

The sanctioned posts at the Centres - Ahmedabad, EFLU-Hyderabad, Jodhpur, Kolkota, Madurai and Pune are 38 in three categories - Administration, Technical and Production. The rest of the centres were sanctioned with 25 posts each. None of the Centres were given the EMRC-II status.

These Centres were first set up on project mode, on plan to plan basis, with UGC assistance on 100% basis both for recurring and non-recurring activities. Funds are granted for the purchase of equipment, vehicle for production travels, modification/construction of studio and other technical area including AC, acoustical etc. The Centres were made to change in to Non-Plan mode since 2001. To meet the demand of producing quality educational video programmes and generate e-content material in a variety of fields with the help of academic personnel of the university system, the Media / Affiliated Centres work as self-sufficient autonomous production centres.

As per the Guidelines for establishment of Media Centres, published by UGC, the Media / Affiliated Centres will have to adhere to the following specific objectives:

- *Understand the significance of education in general, and higher education in particular, in the global and Indian contexts.*
- *To set up proper facility for producing educational programmes and generating e-content material.*
- *Research related to optimizing the effectiveness of the programmes.*
- *Networking and collaboration with other educational agencies in India and abroad in the field of educational communication.*

- *Training and overall human resource development in the field of educational communication.*
- *Studying, promoting and experimenting with new techniques/ technologies that will increase the reach and/ or effectiveness of educational communication.*

The University / Institution in which the Centres are established will have to provide adequate and suitable building for housing the Media / Affiliated Centre. Affiliated Centres are Universities or institutions receiving assistance from Central / State Government. These can become Affiliated Member of the CEC, for a collaborative programme. The Affiliated Centre will not be provided Non-Recurring Grants from the UGC for running the Centre.

Governance of Media Centres

On the recommendations of CEC, the Media / Affiliated Centre will receive requisite funds from UGC. However, CEC will be coordinating the production and related functioning of the Media / Affiliated Centres. A standard Tripartite MoU (Memorandum of Understanding) will be signed by the Chairman - UGC, Director - CEC and the Vice-Chancellor where the Media /Affiliated Centre is being set up. The Board of Management / Executive Committee of the Centre (as per MoU) will be responsible for all academic, administrative and financial affairs of the Centre and will overview its activities and provide directions for functioning of the Media Centre and also recommend policy issues to CEC-UGC (*Extracted from Guidelines*).

A Board of Management of a Media Centre comprises of the following members:

- Chairman : Head of the Institution
- Seven members :
    - One eminent educationist/ Expert (from outside) from related subjects nominated by the Head of the Institution
    - One academic member of the Executive Council/ Governing Body/ Syndicate of the University to be nominated by the Chairperson from the said body
    - One nominee of the CEC
    - One nominee of the UGC who is an expert in the field of media
    - Two members co-opted by BoM
    - Member Secretary - Director, EMMRC

Consortium for Educational Communication (CEC)

The University Grants Commission has established various Inter University Centres (IUCs) since 1984 under Clause 12 (ccc) of the UGC Act, 1956. The Inter University Centres are autonomous bodies within the University system with a view to providing centrally the state-of-the-art equipment and facilities, which are not generally available at many Universities due to cost factor, for the benefit of researchers working in different Universities.

When the UGC has started the transmission of CWCR programmes, a special cell, UGC INSAT Television Project, was established to coordinate the production and transmission of these educational television programmes. At the same time six programme production centres (four Educational Media Research Centres and two Audio Visual Research Centres) were also established at different educational institutions of the country. By 1992, there were 14 Media Centres

under UGC to cater the CWCR programme. For better co-ordination among the media centres and monitoring and to harness the potential of communication technology for educational purpose, UGC developed the special cell it has started first and turned it into an autonomous Inter University Centre - Consortium for Educational Communication on May 26, 1993 (CEC) as a nodal agency to coordinate, guide & facilitate such educational production at the National level. Located inside the IUAC (NSC) Campus, New Delhi, CEC was envisaged as an apex body which oversees and coordinates the activities of all the media centres.

One among the 7 such Inter University Centres under UGC, the role of CEC at the time of its establishment was to,

- Provide directions for the CWCR programmes
- Coordinate, guide and facilitate production of programmes for the CWCR by the Media Centres under it
- Ensure the quality of programmes received from the Media Centres by previews and technical checks
- Designing transmission/programme schedules for telecast at the national network
- Organization of qualitative and quantitative research on various aspects of production, transmission, effectiveness, need assessment, utilization etc
- Arrangement of workshops and skill development programmes for the production staff of the Media Centres.

Over the years with the tremendous growth in the utilization of ICT in education sector, the role of CEC also changed accordingly. Now the Inter

University Centre has the goal of addressing the needs of higher education through the use of powerful medium of Television along with the appropriate use of Information Communication Technology (ICT). CEC's mandate is to address higher education needs by developing educational multimedia content and its dissemination through various modes such as TV, radio, web portals, CEC Gurukul live lectures and various offline media.

The current objectives as reported by the CEC are,

- *Coordination, facilitation, overall guidance and direction to the activities of the Media Centres set up by UGC in various universities/ institutions*
- *Production of educational programmes (especially video and audio) and related supplementary material and the setting up of appropriate facilities*
- *Dissemination of educational programmes, through both broadcast and non-broadcast modes*
- *Research to optimize the effectiveness of the educational programmes*
- *To provide a forum for active involvement of academicians and scholars in creation of educational programmes*
- *Studying, promoting and experimenting with new techniques/ technology that will increase the reach and effectiveness of educational communication and various activities for promotion of higher education by using electronic media and ICT tools.*
- *Digital learning environment building by organizing various Trainings, Workshops, Seminars and Conferences on use of ICT in education. CEC*

also conducts various types of media research including production and audience.

In pursuance to these objectives, CEC coordinates the development of Media Centres, takes steps to ensure the quality of software, coordinates telecasting of the programmes and motivates, inspires and encourages innovations (CEC Annual Report).

The organization chart of CEC is presented as Figure 5.

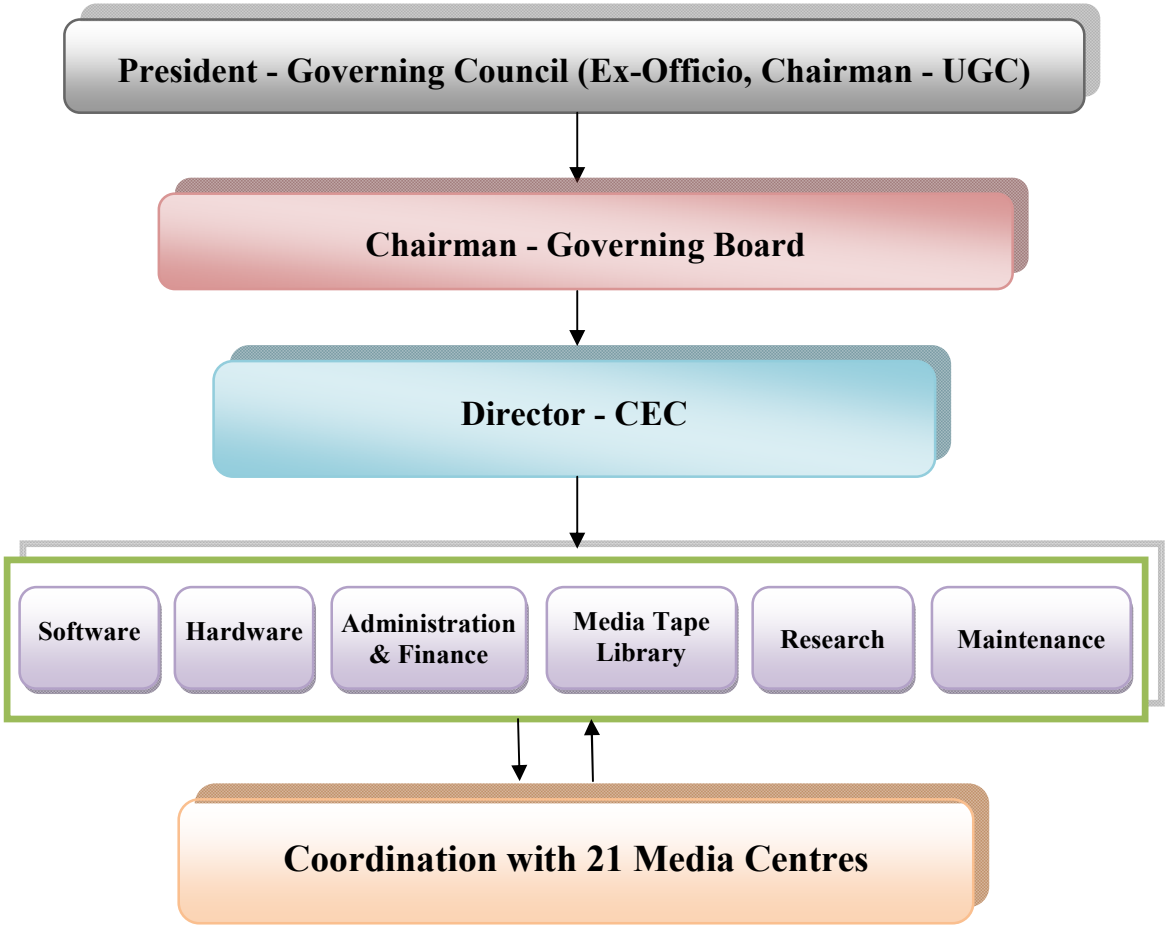


Figure 5. The organization chart of CEC

The decisions regarding policy matters and the developmental issues are taken by the Governing Council - the apex body of CEC. It is headed by the Chairman - UGC.

The Governing Board is the executive decision making body that manages, administers, directs and controls the affairs of the CEC and the Chairman is nominated by the President of the Governing Council. Director - CEC is the Member Secretary of the Board. The members of the Board are:

- Chairman
- Ex-officio Members
  - Vice-Chairman, UGC
  - Secretary, UGC
  - Vice-Chancellor, IGNOU
  - Director, CEC
- Nominated Members
  - One of the Directors of Media Centres
  - Four Media Experts
  - Three Vice-Chancellors of Universities having Media Centres
  - One Engineering Expert in the Broadcasting / IT field
  - One eminent Media Expert to be nominated by Govt. of India

The different units under CEC are Administration & Finance, Software & Hardware, Media Tape Library and Maintenance. Finance decisions are taken by the Finance Committee.

The structure of the Finance Committee is as follows:

- Chairman : Chairman of Governing Board of CEC
- Ex-officio Members
  - Secretary, UGC
  - Financial Advisor, UGC
  - Director, CEC

- Bureau Head of the Plan Budget Section, UGC
- Chief Administrative Officer, CEC

- Nominated Members
  - One member of Governing Board
  - One Joint Director
  - An external member - Expert in Finance

The Technical Advisory Committee (TAC) handles the Software and Hardware aspects. Director, CEC is the Chairman of the Committee. Other members are,

- Joint Secretary, UGC
- Director Engineer, CPC, Doordarshan
- Three Directors of Media Centres
- Technical Expert, EMPC, IGNOU
- Technical Expert, DECU (ISRO)
- Technical Expert, CIET
- Account Officer, CEC
- Joint Director (H/W), CEC

Media Tape Library at CEC is a central repository of all the programmes. It stores the collection of Masters (Original) of all the educational video programmes in various formats (beta cam cassettes and professional disks) produced on different subjects and topics by all the Media Centres under CEC. The library is growing day by day and in the year 2015-16, the total number of enrichment programmes, syllabus oriented programmes, video lectures produced as a part of NME-ICT mission, LoRs (Learning Object Repositories), e-Content

modules etc. was 28,997. The Library has its own customised computer software called VILCIX (Video Library Computerized Information System) for management of the data available on the video programmes received in the library from the Multimedia Centres.

The Library has the following functions: The Library database caters to the in-house needs which includes providing information for planning, scheduling of programmes for disseminating via both broadcast and non-broadcast modes, for marketing purposes and also for preparation of online catalogues. The online catalogues provide information on programmes subject wise and multimedia materials. The Library also has taken steps to archive Reusable Learning Objects (RLOs) taken from its existing media collections.

The rise in the number of programmes at the library is presented and depicted in table 10 and figure 6.

Table 10

Details of Collection of Programmes at Media Tape Library

No.	Year	Total No. of programmes received	No. of programmes received in the year	No. of LoRs received in the year	Total No. of e-contents received
1.	2011 - 12	17,642	1,963	217	1,917
2.	2012 - 13	20,060	2,409	138	2,259
3.	2013 - 14	23,062	3,002	300	7,151
4.	2014 - 15	28,877	2,797	1,200	9,798
5.	2015 - 16	31,977	3,100	4,272	12,671
6.	2016 - 17	37,048	5,071	3,025	18,332
7.	2017 - 18	39,272	5,140	10,510	23,373

(Source : Annual Reports of CEC)

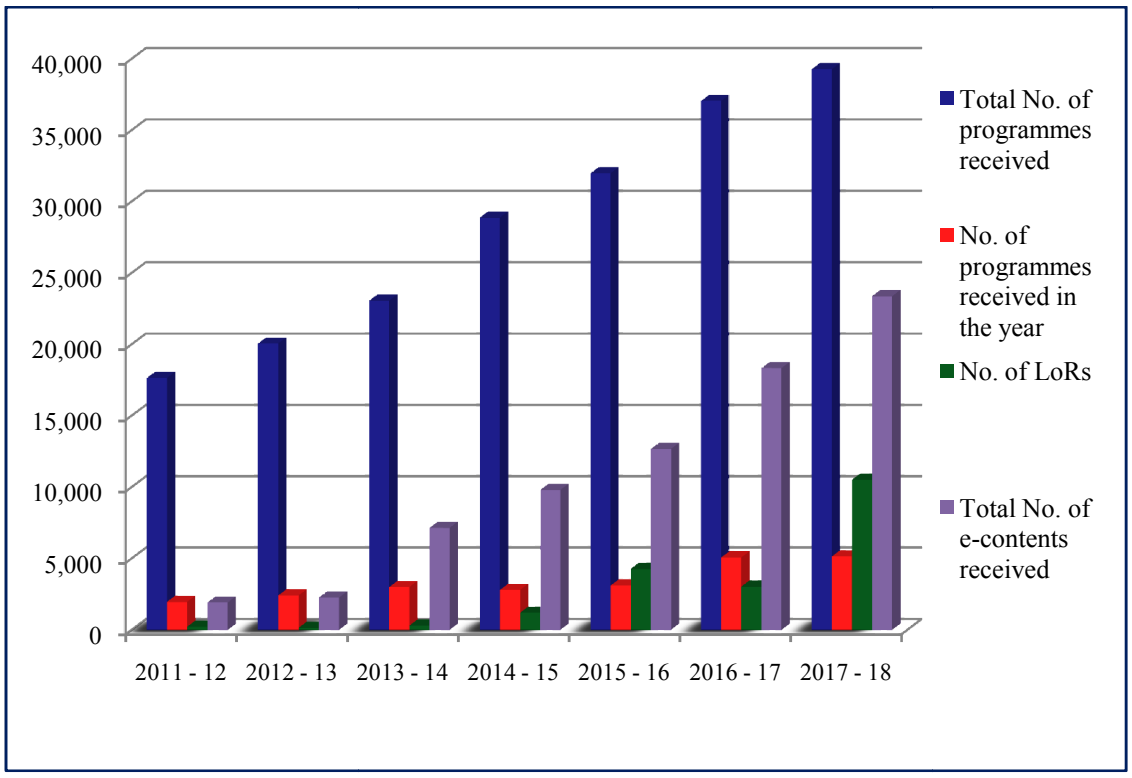


Figure 6. Number of programmes in the Central Media Tape Library at CEC

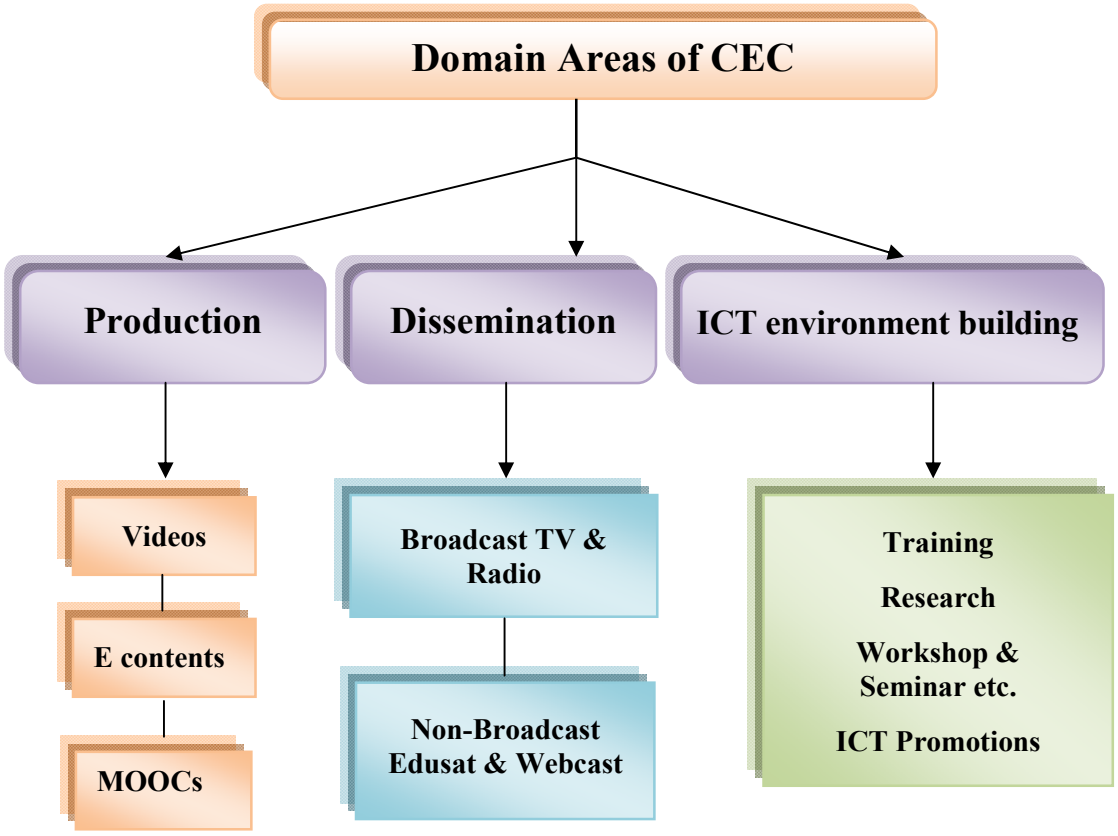
Initially the programmes were stored in the betacam format. About half of the programmes are in betacam format and for preserving and archiving the programmes, the CEC is involved in converting the old Analog format programmes to Digital format. The converted programmes are then stored in Digital Diskettes. The library is also a repository of more than 50,000 e-material, again in different formats. In order to manage these, the CEC adopted 'Web based Media Library Management System' which was developed by National Informatics Centre (NIC). The data can be accessed through intra-portal (between CEC and its Media Centres) link of CEC website. The portal facilitates many services like connectivity between CEC and Centres, information sharing/ accessing in real time, video conferencing, uploading programmes and details associated with programmes, etc.

Financial Assistance

The CEC receives full financial assistance from UGC for carrying out the activities. During the financial year 2015-16, UGC released Rs. 566.87 Lakhs under Plan and Rs. 545.65 Lakhs under Non-Plan to the CEC. During the financial year 2016-17, it was Rs. 356.91 Lakhs and Rs. 561 Lakhs respectively. The same year CEC was allotted a further amount of Rs. 1865. 40 Lakhs for TAC (Equipment) purchase. For the FY 2017-18, Rs. 435.41 Lakhs was released by UGC under Plan and Rs. 710.66 Lakhs under Non-Plan.

Activities of CEC and the Media Centres

The domain areas of CEC are depicted in figure 7:



(Source: Annual Report - CEC-2015-16)

Figure 7. The domain areas of CEC

CEC and the Media Centres are involved in the production of Educational Videos, E-Contents, Short Learning Objects (SLO) and Massive Open Online Courses. The dissemination of these products is done by the CEC through both broadcast and non-broadcast modes: TV and Radio as well as through EduSat and Webcast. For building up an ICT environment, CEC conducts training sessions, workshops, seminars, ICT promotion programs, research activities etc.

Educational Video Programmes

Educational Video Programmes fall under two categories: Enrichment based (documentaries) and Curriculum based (Subject videos for higher education sector). Both categories of programmes cover different subjects across four bands/streams:

1. Language/ Literature/Art and Culture
2. Social Sciences
3. Management and other professional subjects
4. Sciences/ Technology

In the beginning, when the media Centres were concentrating on the development of enrichment programmes/ documentaries mostly, the number of productions for a 10 year period was very promising. The details are given in table 11.

Table 11

Production of Educational Videos (Total) for the period 1990 - 2004 by Media Centres and CEC

Media Centre	Upto 1990	No. of programmes produced during														Total
		'91	'92	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	
EMRC																
Ahm	333	81	51	42	27	20	17	18	14	2	10	1	11	4	0	631
Cal	116	36	42	75	72	62	50	103	96	79	49	50	52	50	12	944
Del	302	53	44	63	71	81	74	56	37	0	0	33	0	44	0	858
CIEFL	337	85	75	92	71	54	62	45	23	30	10	38	43	27	7	999
Jod	74	35	71	80	65	71	71	55	35	28	40	47	41	38	7	758
Madurai	79	40	26	29	28	36	40	23	3	21	11	2	9	7	17	371
Pune	449	75	60	73	103	108	75	66	57	75	21	34	44	55	15	1310
AVRC																
Calicut	-	-	-	-	-	-	-	1	1	6	9	9	14	10	3	53
Osm	60	32	17	41	41	29	37	23	13	39	40	66	50	49	1	538
Indore	-	0	8	17	28	50	67	63	56	43	49	50	45	40	11	527
Madras	54	30	34	30	45	33	32	12	22	9	27	24	17	18	0	387
Manipur	2	2	2	5	8	1	1	10	11	15	19	12	10	5	1	104
Mysore	-	-	-	-	-	-	1	2	13	23	17	7	13	28	5	109
Patiala	0	0	0	4	4	5	20	16	10	0	0	7	9	14	0	98
Roorkee	45	20	27	23	6	10	21	13	34	33	28	43	49	35	6	393
Sagar	-	-	-	-	-	0	0	0	3	5	22	23	13	12	1	79
Srinagar	0	0	1	8	7	3	6	5	10	12	16	15	14	10	6	113
CEC & Joint	20	0	0	0	0	0	0	0	0	5	0	0	0	0	0	25
Grand Total	1871	489	458	582	576	563	574	511	447	425	368	461	434	446	92	8297

(Source: CEC Annual Report 2004)

From the figures it can be seen that all the EMRCs have done well during the period, as well as AVRCs within their limits. Some of the Centres like Pune, CIEFL and Delhi have done exceptionally well, and from the AVRC side, Osmania

and Indore produced more number of programmes. Number wise, some Centres' performances seem to be low, but those Centres have won many awards for their programmes like Calicut Centre concentrating more on quality, than on numbers. All the EMRCs were started during 1983 - 86, and they have had more experience in production by the time the other Centres have started.

The annual rate from the beginning to 2013 was 602 and then the Centres picked up a faster pace in the production owing to the increased production of Lecture based programmes. The year wise production of programmes is given in table 12.

Table 12

Annual Production of Educational Videos (Total) by Media Centres and CEC

No.	Year	No. of Educational Videos
1.	Till 2013	602
2.	2013-14	3002
3.	2014-15	3022
4.	2015-16	3100
5.	2016-17	5071
6.	2017-18	5140

The rise in the production across 5 years is graphically represented in the figure 8.

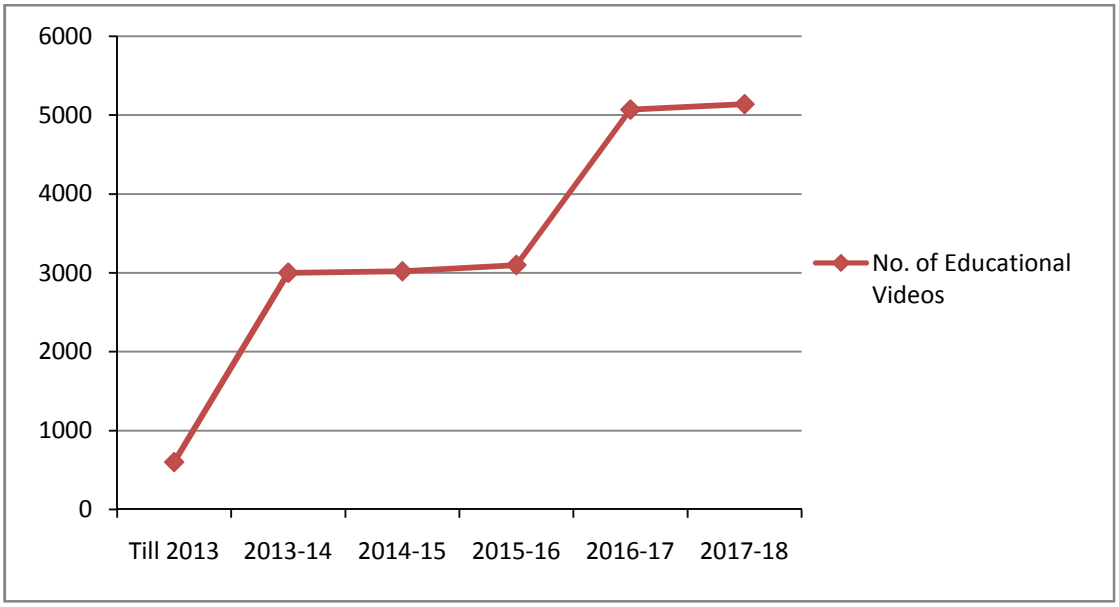


Figure 8. Production of Educational Videos (Total) by Media Centres and CEC

The annual reports of CEC state that from the beginning till the year 2012-13, the annual production was only a meagre 602 videos. With a substantial increase of 3,002 videos in the very next year, the Media Centres maintained a steady trend for the next two years too. There again was a considerable increase in the number of videos produced for the years 2016-17 and 2017-18, above 5,000 videos. The CEC Media Library boasted of a knowledge repository of approx. 30,000 educational video programmes on different topics and subjects in the year 2015-16.

The Media Centres are the main providers of programmes to the CEC. The latest Centres at Dibrugarh, Assam, Bodh Gaya and Puducherry are yet to start the production of programmes as on the end of FY 2017-18. Though established in 2012, Lucknow Centre started productions only after some time. The production figures of individual Media Centres for 5 consecutive financial years are presented in Table 13.

Table 13

Production of Educational Videos - Media Centres' wise

No.	Name of the Centre	No. of Educational Videos				
		2013-14	2014-15	2015-16	2016-17	2017-18
1.	EMMRC Ahmedabad	88	175	111	286	80
2.	EMMRC Calicut	240	466	182	312	73
3.	EMRC Chennai	322	230	415	742	420
4.	EMRC Delhi	155	154	98	228	323
5.	EMMRC Hyderabad (EFLU)	308	212	252	319	214
6.	EMRC Hyderabad (Osm)	82	30	48	169	66
7.	EMRC Indore	164	130	155	139	12
8.	EMMRC Jodhpur	241	109	61	144	532
9.	EMMRC Kolkata	126	200	144	206	285
10.	EMRC Lucknow	-	-	-	-	70
11.	EMMRC Madurai	326	40	36	304	708
12.	EMMRC Manipur	93	144	117	244	722
13.	EMRC Mysuru	125	411	393	608	237
14.	EMRC Patiala	146	146	108	408	40
15.	EMRC Pune	92	59	208	23	487
16.	EMMRC Roorkee	121	164	231	118	0
17.	EMRC Sagar	141	162	200	403	672
18.	EMMRC Srinagar	232	190	341	418	199

The production of individual Media Centres across 5 years is graphically represented in the figure 9:

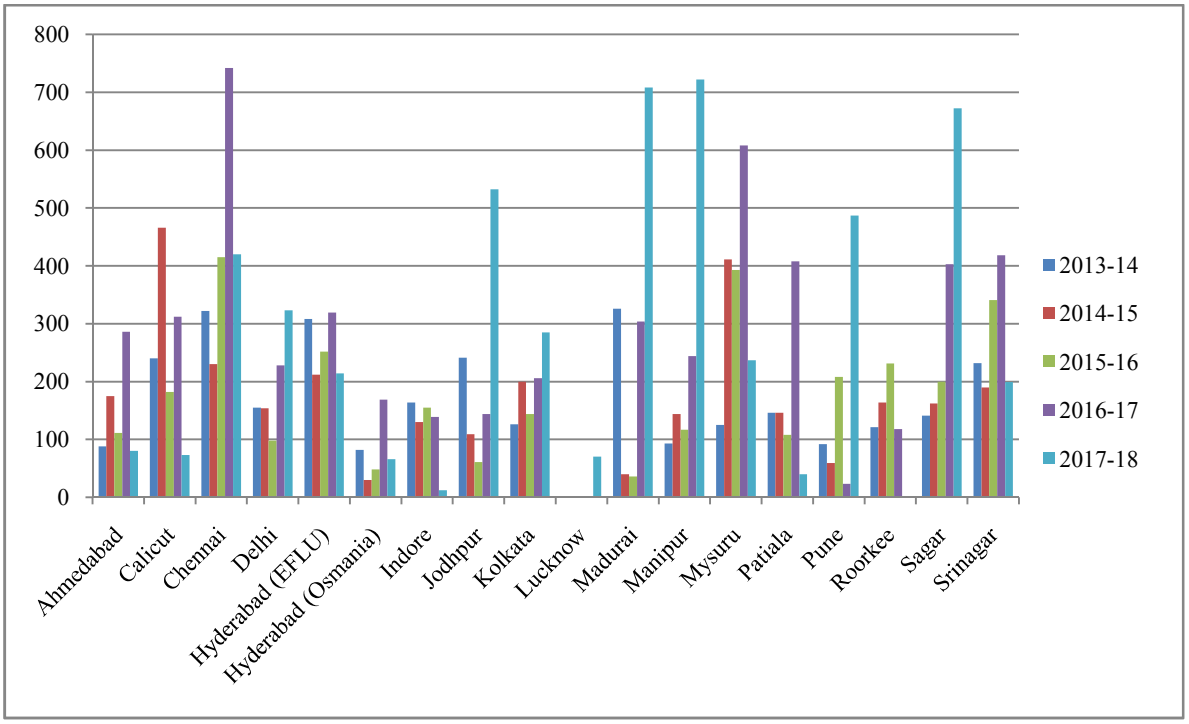


Figure 9. Production of individual Media Centres across 5 years

E-Contents

E-contents are complete courseware which includes video on a particular topic, its complete transcript, questions, quiz, assignments and references in downloadable format. CEC and its Media Centres started the development of e-contents under the NME-ICT Project of MHRD in 2009 and also the dissemination of all courseware on net and web which could be viewed anytime from anywhere. CEC and the Media Centres developed e-Contents in 29 subjects in Phase - I and 58 subjects in Phase - II. Together they have successfully completed the project of e-content development in 87 undergraduate (UG) subjects with a total no. of 23,373 e-courseware modules. The whole project was carried out in three stages: Pilot Phase which started soon after the project was launched in 2009, Phase - I which followed and Phase - II, sanctioned in May 2014.

As stated in the Annual Report of CEC for the year 2015 -16, the annual production rate of the NME-ICT e-Content up to 2013 was given as 564.75 modules per year since the beginning of the project in 2009. During Phase I, all the Media Centres together dealt with only 29 subjects and after the completion of the phase, they were again allotted more subjects. The increase in the rate of production can be seen from the table.

The production figures of E-contents received at the CEC from the media centres are presented in table 14.

Table 14

E-contents Received by CEC from Media Centres (April 2013 - March 2018)

No.	Year	No. of E-contents
1.	2013-14	2613
2.	2014-15	2620
3.	2015-16	2700
4.	2016-17	5470
5.	2017-18	5778

The Media Centres were allotted different subjects for developing e-Contents. The production figures of individual Media Centres for 5 consecutive years are given in Table 15.

Table 15

Annual Production of E contents of Media Centres (April 2013 - March 2018)

No.	Name of the Centre	No. of e-Contents				
		2013-14	2014-15	2015-16	2016-17	2017-18
1.	EMMRC Ahmedabad	94	173	117	291	172
2.	EMMRC Calicut	206	208	120	231	166
3.	EMRC Chennai		160	330	583	791
4.	EMRC Delhi	261	226	67	424	148
5.	EMRC Hyderabad (EFLU)	81	174	186	96	1290
6.	EMRC Hyderabad (Osmania)	87	75	56	164	67
7.	EMRC Indore	176	125	149	139	8
8.	EMMRC Jodhpur	239	86	262	187	143
9.	EMMRC Kolkata	104	266	101	395	357
10.	EMRC Lucknow	-	-	-	14	70
11.	EMRC Madurai	302	3	12	346	728
12.	EMMRC Manipur	62	143	105	266	496
13.	EMRC Mysuru	104	234	164	554	666
14.	EMRC Patiala	134	141	102	392	58
15.	EMRC Pune	65	189	202	347	171
16.	EMMRC Roorkee	98	125	266	312	25
17.	EMRC Sagar	71	157	133	299	301
18.	EMRC Srinagar	137	135	328	430	121

The performances of individual media centres are graphically represented in the figure 10.

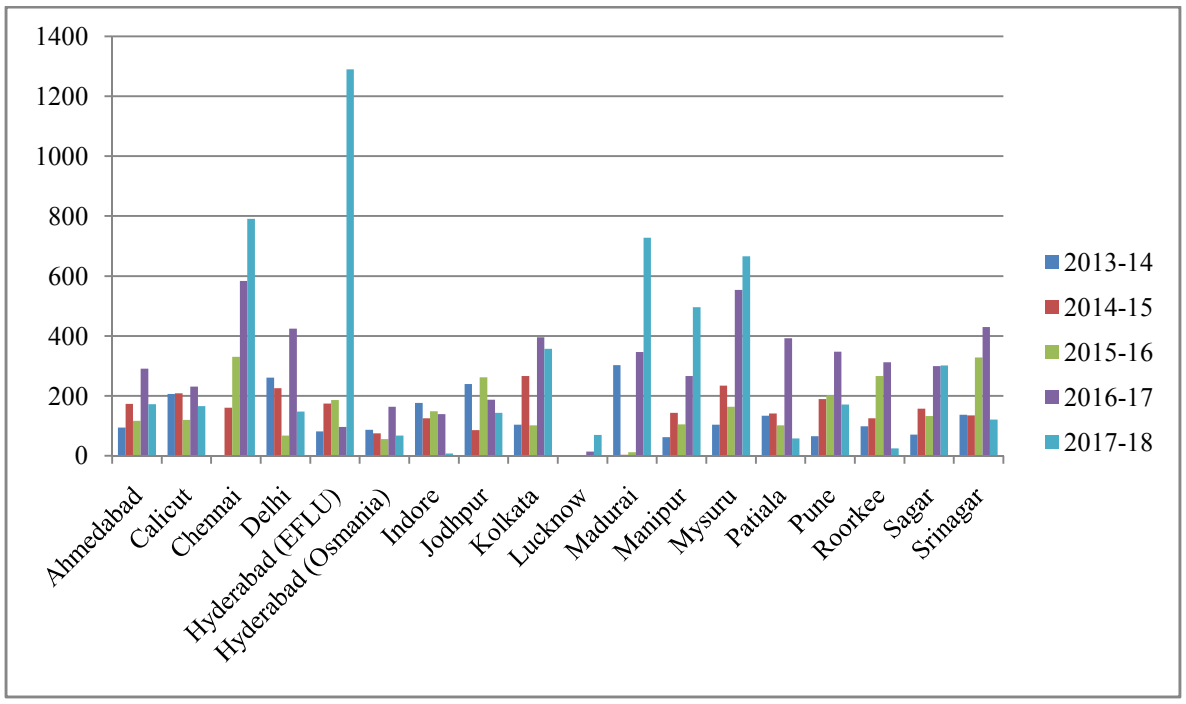


Figure 10. Annual production of E contents of media centres

Short Learning Objects (SLO) / Learning Object Repository

Short Learning Objects (SLO) are short duration videos on frequently asked questions on random topics across different subjects. Each one will be embedded with both text and multimedia content and is explained to provide a rich learning experience. SLOs can be treated as capsules of quick learning videos that supplement course based exhaustive learning. In the year 2015 -16 there were 4,272 SLOs available in the library of CEC. During 2016-17, 3,025 videos were added to the repository and during 2017-18, the number of SLOs drastically increased to 10,510. As per the last published Annual Report of CEC (as on March 2018), nearly 19000 SLOs are available in the CEC Media Library which are also uploaded in CEC's website.

Selecting 10 Media Centres at random, the researcher was able to collect some pertinent data regarding the facilities and production aspects. These are presented in table 16.

Table 16

Number of Studios, Productions and Posts of 10 Media Centres

No.	Name	Year of Est.	No. of studio & Post Production Suites		No. of programmes produced (as on Sep 2018)				Posts	
					Enrichment Videos/ lectures	E Contents		LoR	Sanctioned	Filled
						No. of Subjects	No. of modules			
1.	EMRC, Osmania University	1983	1	2	835	21	695	50	25	21
2.	EMRC, Ahmedabad	1984	1	3	989	3	749	181	38	22
3.	EMMRC, Jodhpur	1985	1	4	2901	6	1478	1613	38	21
4.	EMRC, Chennai	1985	2	2	3602	15	2570	895	25	14
5.	EMRC, Madurai	1986	1	2	2156	5	1569	7450	38	18
6.	EMRC, Srinagar	1986	1	7	2347		1506	1210	26	23
7.	EMMRC, Kolkata	1986	2	6	1015	6	1563	805	38	22
8.	EMRC, Mysuru	1996	1	3	2722 298 (Regional)	15	2032	600	25	19
9.	EMMRC, Calicut	1996	1	3	384	11	1417	405	25	16
10.	EMRC, Dibrugarh	2012	1 (yet to develop)		0	1	19	nil	25	0

Massive Open Online Courses

CEC was appointed as National Coordinator in March 2016 for the development of Non-Technology Undergraduate Degree level programmes. CEC and the Media Centres started the project by repurposing the already developed

e-Contents into 31 UG and 72 PG MOOCs and offered the courses (Phase I) on SWAYAM. Fresh MOOCs are being prepared by the Media Centres on various subjects and the UGC has allowed Credit Mobility to the students registered at any University, on taking up MOOCs.

Dissemination

CEC coordinates the dissemination of educational content produced by Media Centres though some Centres have started webcasting of programmes on their own. Today, CEC is the largest Digital Educational Content Repository in India with a wide range of educational content/ programmes. CEC uses various learning platforms for the benefit of learners worldwide.

- EduSat: CEC has started two way audio-video communications through EduSat network from 5th September 2005. It has one main teaching end along with remote Satellite Interactive Terminals (SIT) and Receive Only Terminals (ROT). This network had more than 58 SITs located at all EMRCs under CEC, Academic Staff Colleges and in many Indian Universities. CEC has put up LORs, Video on Demand and e-Content modules on to the network. On September 5th 2006, for the North East sector of India, CEC established another network, called North-East EduSat Network. CEC reported in 2017 that due to some technical problems at CIET Hub through which the CEC is having the EduSat delivery, the transmissions are made available through web only. The live lectures are also made available on popular video networking site - YouTube and on Vyas channel.

The activities of CEC with regard to EduSat transmissions are depicted in the flow chart below:

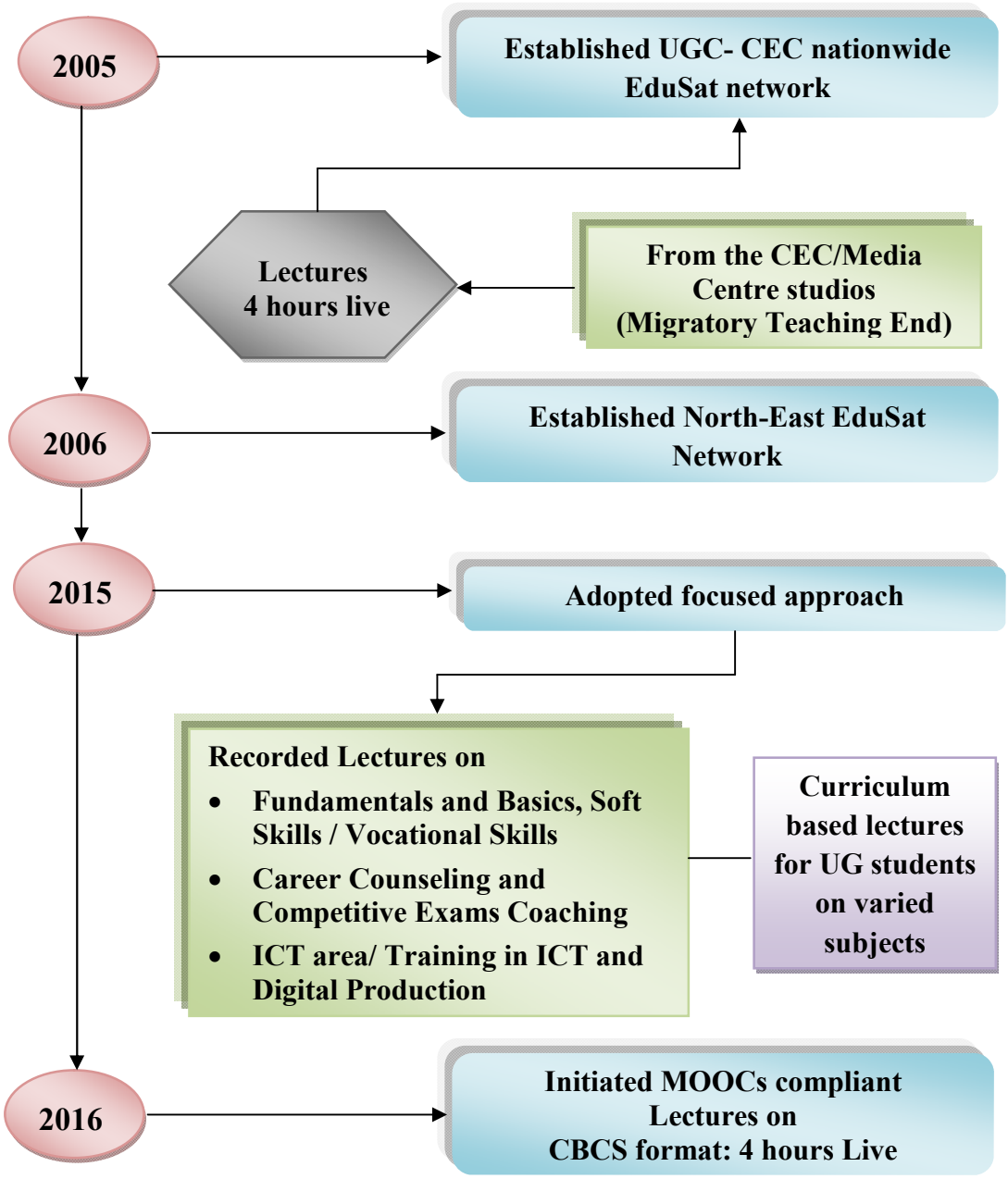


Figure 11. EduSat transmissions - Activities of CEC

- SWAYAM Prabha DTH Channels: CEC coordinates the running of 10 DTH channels (Channel Nos. 01 to 10) for Non-Technology UG and PG programmes and another (Channel No.33) for VYAS Higher Education. CEC Gurukul live lectures are live fed on the channel and also webcast on CEC portal. VYAS 24 x 7 channel is available on DD Direct Plus (DTH Platform of Doordarshan) and on Dish TV (Private DTH Operator).

- Online/Web
    a. CEC Live Lectures: 4-hours live and interacting lectures every day (web-streaming and Vyas DTH Channel).
    b. CEC YouTube Channel
    c. Web Portals : CEC, INFLIBNET, MHRD and Govt. of India portal

B. Community Radio Stations: Some of the Media Centres run Community Radios for broadcasting educational programmes. EMMRC Chennai, Anna University was first in the country to introduce community radio. EMMRC Ahmedabad, Srinagar, Mysore and MCRC Jamia also run Community Radios.

Viewership

In the beginning, when there were not much entertainment programmes, educational programmes aired on television attracted many learners and general public. Rani (2006) mentioned that at the height of its popularity, CWCR telecast enjoyed the viewership of about 20 million people and daily viewership of 4 million people. When the revenue generating entertainment programmes gained popularity both with the Doordarshan and the public coupled with frequent change in the telecast timings, the visibility became low and the UGC/CEC and the Media Centres lost the viewership considerably. By 1991, with the entry of private satellite channels, the education broadcasts again took a backseat. This situation changed drastically when the availability of transponders in Indian National Satellite made the Government dedicate an entire satellite along with exclusive channels to education. The UGC/CEC regained its viewers with the entry of different types of channels for different sectors. CEC has even a YouTube channel which was started in 2012. Since its inception till 31 March

2018, CEC's videos on YouTube have recorded a watch-time of 514,652 hours (CEC Annual Report 2017-18).

Other Services

CEC and Media Centre organizes yearly several seminars, conventions, workshops, training programmes, awareness programmes etc for ICT environment building for education purposes. CEC also organises training workshops for the benefit of its administrative, technical and production personnel and for educators and media professionals working in various colleges, institutions and media centres in ICT applications in education. Hands on training / internship programmes for media students in the areas of media production and broadcast are being conducted regularly by both CEC and Media Centres. CEC undertakes Teacher training in production of e-learning material and its adoption in pedagogy.

Conclusion of Profile Analysis

Educational communication was given its due importance worldwide considering the fact that it is through education only, a nation attains development. Though the Indian higher education system is said to be one of the largest in the world, India was far behind in the Gross Enrollment Ratio, 15% while that at the global level is 23%. Several institutions were set up by the India Government so as to bring the ratio nearer to the global average. Considering the facts that the demand for education will always surpasses the supply of institutions and that there exists a wide knowledge gap between the rural and urban population, the UGC had launched CWCR programme to facilitate the dissemination of education on a wider level. Since then the Government has set up many institutions for providing the content for the programme such as Educational Multimedia Research Centres (EMRCs) for production of

educational programmes and Consortium for Educational Communication for coordinating the whole activity.

Analysing the profile of educational telecast and webcast in India, it can be seen that India has steadily progressed in the field of telecasting and webcasting educational content, be it primary, secondary, higher secondary or higher education. Now India has exclusive satellite, many channels, web portals etc. for disseminating educational content to the needy irrespective of time or place. With the change in time and technology, the Government has also tried to update and upgrade what it had to match the changing requirements of the society. The authorities introduced many schemes to leverage the potential of ICT, entering in to the arena of World Wide Web. Due importance was given to e-education along with educational television.

The study concentrated mainly on two of the governmental agencies, the CEC and the Media Centres under it for the role they have in developing educational video content for both telecast and webcast. It can be seen from the many figures that both the CEC and the Centres have come leaps ahead in developing quality programmes for the education sector in a variety of subjects. Starting with educational documentaries, the CEC and the Media Centres progressed to lecture series on various topics, syllabus based lectures, e-contents, DTH lectures and MOOCs. The syllabus based programmes of all types of courses supplements the formal classroom lectures, at the same time a big aid to the distance and non-formal education sector too.

Out of the 21 Media Centres under CEC, all the Centres except those at Puduchery, Dibrugarh and Gaya, are into the production of programmes in full swing.

Out of the several lakhs programmes available in the internet now a days, the educational programmes developed and disseminated by these governmental agencies stand apart with their authenticity. Introduction of MOOCs, the indigenous new platform SWAYAM, UGC's new step of awarding Credit Mobility - all shows that India is at par with any of the other countries which offer high standards in education.

Phase II

Two of the total four objectives of the study are to examine the problems faced by the Media Centres in the production of programmes for telecast and webcast and to suggest measures for the functional improvement of Media Centres. On analysing the profile of the Media Centres and CEC, it is understood that from the time of establishment, all the 21 Centres and CEC steadily progressed in the field of educational video production and dissemination. A massive number of programmes were already developed and archived by all the Centres and CEC and all are keep on producing more programmes under various projects and schemes, simultaneously disseminating them to the learner community through both broadcast and non-broadcast modes. In this context, a second phase was undertaken to analyse the conditions and status of CEC and Media Centres with respect to production and dissemination of educational programmes from the responses of the personnel associated with the day to day working of the Centres and CEC.

The human resources at a Media Centre consist of Director, Research Officer or Junior Research Officer, Engineer, Producers, Production Assistants,

Camerapersons, Graphic Artist, Technical Assistant, Technicians, Unit Helper, Driver and Administration personnel.

Production of a video programme is a team operation which requires the skills and abilities of a variety of experts and specialists. It is the sum total of the coordinated efforts of skilled individuals who make up the production team. The team can be roughly divided into two groups viz. production staff members and production crew members. The production staffs including the producer/director and production assistants are concerned primarily with the creative side of the production while the production crew consists of technical personnel who are primarily concerned with equipment operation and maintenance.

From the team, the investigator sought responses of Producers, Engineers and Research Officers for understanding the conditions of programme production at a media centre.

In the case of a documentary, the producer is responsible for the entire production and is the in-charge of all production aspects from the planning and writing of the script to the final production and editing. With respect to the syllabus based programmes, a Producer is not involved in the preparation of a script, which is done entirely by the subject matter expert. Generally the responsibility of finding a suitable subject matter expert to deliver the lecture in the concerned subject falls on a producer. The Producer thus supervises all pre-production planning, rehearsals, the actual production and post-production activities of documentaries, DTH lectures, e-contents and MOOCs.

The Engineer of a Centre with the help of other technical team members - Technical Assistant, Technicians and Cameraperson set up the studio floor and the control room for the programme prior to the actual shooting/ video recording. Engineer is also responsible for preparing the list of equipment to be purchased, and upon their purchase, installation and commission and the routine maintenance/ servicing of the equipment.

The Research Officers/ Junior Research Officers are responsible for carrying out the research activities of the Centres. The Junior Research Officers are primarily responsible for the content research works at the Centre. They are required to carry out research work according to the directions of CEC from time to time. Another main work is to conduct audience research to assess the effectiveness of the educational programmes at the Centre level. Some of the other duties include:

- Undertake content research for programmes of the centre.
- Content collection for programmes.
- Review of the programmes, especially the accuracy and authenticity of the content of the programme.
- Preparation of documents related to projects and proposals.
- Preparation of monthly reports, annual reports and performance reports.

The following section gives a detailed report on the responses of the aforementioned production team under three headings: Responses of Producers of Media Centres, Responses of Technical personnel of Media Centres / CEC and Responses of Research personnel of Media Centres.

Responses of Producers of Media Centres

The producers are the key persons responsible for the production of programmes. Right from finding Subject Experts to sending the programmes to CEC, they are the back bone of each programme. Research Officers support them in the pre-production stage and during the production and post-production stages; the other team members comprising of Engineer, Technicians, Camerapersons, Graphic Artists, Editors etc. support them in carrying out the work to completion successfully.

There are Producers and Production Assistants in a Centre. Though the duty of a Production Assistant is mainly assisting the Producer(s) in the production process like collection of properties, identification of subjects, location, making all arrangements for shooting/video recording, undertaking pre-production planning, scheduling etc. (formulated during the documentary production stage of media centres) most of them enter right in to independent programme production from the beginning. So, the Production Assistants are also treated as Producers here.

The investigator contacted 10 producers from 10 Media Centres. All are in the age range of 40 - 50 having experience in working as Producer for more than 10 years. A Structured questionnaire with both closed and open ended questions was administered to the Producers and the investigator talked directly to them over phone. Though choices were given for questions, most of the respondents gave detailed replies outlining their points in each scenario. Their responses are consolidated and presented here.

For the question regarding target for productions, all producers elaborated upon the present scenario in the same way. During earlier period when the

Centres were involved in the production of only documentaries, individual targets were assigned to the Producers. When the Centres started developing syllabus based programmes, the Centres were given target instead of to the personnel. The total number of modules /lectures for a particular subject for a particular year will be computed and the responsibility of producing a feasible number of programmes in a year is divided between the producers of the Centre. The number of productions of producers varies depending upon the particular subject, duration of the course and the total number of modules envisaged for that subject. In the case of MOOC productions also, the workload and target are decided based on the number of MOOCs approved and allotted to a Centre. Senior producers produce more number of programmes than junior producers and production assistants. Again, at most of the Centres, other members like Camerapersons, Graphic Artists, Engineers and Research Officers also take up individual programme production. When work load becomes more, almost all Centres hire/d freelance producers to complete the project in time.

For the question about whether the producers are getting adequate time for achieving the target, all gave detailed replies elaborating the conditions before and at present. Present here means, after the Centres have shifted their focus to syllabus oriented programmes. Though the producers are from different Media Centres, their responses were similar in almost all matters. When the Centres were doing only documentaries, with targets like one documentary in one or two months, the workload was not much of a burden. They all had adequate time to research upon the subject, conduct shooting, devote time for editing with the editors and fine tune all the other aspects before wrapping up the documentary and other programmes like fillers. They used to get amble opportunities at that time for

expressing their creativity in the productions as the documentaries are essentially a Producer's effort mostly. Now, they have pointed out that the scenario has changed completely. When the Centres started producing lectures also, there was a comfortable time period for completing the work as the number of such programmes was not much. They could spent sufficient time on supervising various aspects in the post production stage like development of graphics, selection of pictures, sitting with the subject experts and editors for final fine tuning etc.

With the e-content project, each of the Centres was given different subjects and deadlines to complete development of modules in a number of subjects, if not all. A U.G curriculum for three years' contains several papers, and each paper contains many sections. Together each paper calls for the development of 100 - 400 individual titles. This condition pressurised all the producers as time was not enough to complete all the modules in a satisfactory way. Since the Subject Matter Experts are taking care of the scripts/ content for the video lesson, the producers were not involved in the process. Also the producers may not be knowledgeable enough in a particular subject to get involved in the process of developing the script. All producers participated in the study opined that they could not get involved in the presentation aspect also because of this reason. They could only ensure that the scripts are received, get it reviewed by other experts and arrange the shooting. Some of the producers (25%) were involved in collecting the pictures, development of graphics, etc. All but one unanimously agreed that in the race to finish the work, many factors like too much work, not enough time for post-production work, non-availability/ scarcity of experts for reviewing the academic script and finished programme, scarcity of subject experts willing/ capable of providing quality content, etc.

made the time allotted inadequate to meet the targets. One producer remarked that there is no difficulty in getting quality experts and expert reviewers at the campus in which their Centre is functioning, but the pressure of finishing the work in time affected the overall work. Then the additional responsibilities of running the MOOCs, checking the matters with SMEs, administration matters, scheduling of time for shooting (as all the Centres have only 1-3 studios) - all these made the problem of time constraint more serious.

For the question regarding development of any new programme technique/ template by their Centre, all producers replied that they are following the prescribed template mostly, but the presentation style varies with each presenter. All further replied that they have communicated to CEC their own ideas about templates and presentation aspects through their Directors whenever there are meetings or workshops convened. One producer elaborated that as there should be some uniformity for the academic lessons, a prescribed and same template is better, at the same time it also means that there are no variations in the presentation. They could have taken the lessons outdoor, or to the classrooms to make it more interesting and real like. Two of them further suggested that a template or same style is not needed for the introduction video of the MOOCs giving course highlights and could have space for creativity on its development. One producer remarked that their Centre has started following a new presentation style using a glass board with chalk pen, which is economical when compared to Smart panels. Their Centre is planning to introduce the method to other centres as well. This use of glass board does not require additional lighting. Whatever changes or suggestions the people from Centres are having, all are of the opinion that there is no proper communication from the CEC about the matters they have forwarded.

Regarding the quality of their own productions and that of other Centres, all remarked that the programmes are good, but is mainly depended on the subject experts and presenters. The presentation may be dull despite an excellent script or vice versa. One pointed out that as it is a structured academic programme, and is presented by an expert, not much scope for creativity or innovative style is there unless it is undertaken by the presenter herself/ himself. Another producer remarked that the accent of the experts/ presenters sometimes affects the overall quality. The accents of presenters from different parts of India are different and some times more pronounced. Those who are excellent orators or having good language skills uplift the quality of the programme. Two producers stressed the need to apply good instructional designs and follow educational taxonomies for better presentation of the lessons. The Media Centre production team lacks formal training in these aspects of teaching, be it instructional designs, taxonomies, educational objectives etc. If such a formal training is imparted before they undertake the production of these types of purely academic, syllabus oriented programmes they could also have a good understanding about the way a topic should be presented.

Though all the producers agreed that the working environment at the Centres are satisfactory, the over workload, time constraints, inability to exploit their creativity with the same type of structured programmes etc. have taken a toll on their satisfaction level. They have also pointed out that lack of opportunities to have a professional growth, lack of clear understanding in policies about promotion and other rules etc also affect satisfaction levels adversely.

About the difficulties they are facing, 90% of the respondents replied that they are having difficulties in getting quality experts, getting scripts and other relevant materials from them in time and completing productions within the time

frame they have anticipated. Convincing expert teachers to come to the Centres to contribute to the development is always difficult. Again, all but one agreed that they are satisfied with the pace and work of post-production. One producer added that an improvement in the infrastructure facilities and good equipment are needed at their Centre.

For syllabus based e-contents/ MOOCs, Media Centres are using the templates provided by the CEC. When asked about their opinions about this, all replied that it needs improvement. One pointed out that creative teaching is important and the role of a producer in this scenario is minimum. The templates were developed in the year 2011-12 and are not very contemporary. The template of MOOC is just an extension of e-contents, which is to be improved. The points for improvement forwarded by the respondents are:

- Incorporate links to useful places like dictionary, supplementary reading/ learning materials, other related programmes etc.
- Make the programmes more user friendly, interactive and engaging
- Introducing Flip learning programme (watching the programme before attending a regular instruction on the same topic) / blended learning/ new learning strategies
- Improvement in the design (spacing of logo, screen space etc)
- Flash based technology to be turned back to HTML
- Making it more adapted to mobile phones

Regarding workshops/ training sessions, only 40% of the respondents replied that CEC is conducting workshops regularly, and others maintained that not many workshops or training sessions are conducted. Though the individual Centres are

conducting workshops for subject experts regularly or before taking up the production for a particular subject, for production team members they also are not conducting any. One producer replied that their Centre along with another Centre had conducted one for their entire team and it was very useful as it evoked more confidence and gave the opportunity to update their knowledge. All suggested that skill enhancement trainings, workshops on new production techniques, technologies, presentation aspects - such programmes can make a very big difference.

As for suggestions for overall improvement of the programmes, they have forwarded the following comments:

- Good quality equipment, good budget, expert teachers are the main factors that reflect on the quality of the work.
- Financial and technical support for more creative and experimenting programmes.
- Programmes should be made more learner-centric, interactive and engaging. It should not be bookish, rather be based on creative writing.
- For the youth, different strategies to be incorporated matching their aspirations. The whole package should be attractive to catch the attention of the learners. Same type of programmes cannot sustain the attention. More research is to be conducted among the learners to make the programmes better.
- Clear instructions from CEC are needed to plan and execute the work. No immediate deadlines should be given. Ample time given for productions improve quality of the programmes.
- Templates should be in line with the nature of the subject.

Discussion

The development of educational video programmes for telecast and webcast is the most important factor in the functioning of any Media Centre. So the opinions and perspective of the production team matters the most in improving the overall performance of the Centres. The producers at the Centre are concerned that they are not much involved in the actual development of a video as the script and presentation are done by the Subject Matter Expert (presentation either by themselves or by another presenter) and they do not get any opportunity to utilise or foster their creativity. They are also of the opinion that since in most of the cases they are not familiar with the subject, they are unable to contribute to the subject side of a programme. All unanimously pointed out the need to be kept abreast of the recent developments and for training and skill enhancement workshops. A common difficulty faced by many is the scarcity of expert teachers who are capable of delivering a good quality lecture. An educational video with quality content, clear presentation accompanied by well thought out and sequenced graphics and other multimedia parts make it attractive and useful to the student community.

It is also to be noted that none of the Centres seems to have availed the service of instructional designers in the development of individual modules or courses. Most of the Centres take the help of some faculty from their universities to decide upon the number and titles of modules required for a particular paper in a particular subject. Sometimes the subject experts suggest the titles they would like to take up. No special committee or an academic body is constituted usually to select the expert teachers, divide the curriculum/ syllabus into convenient

modules, the sequencing of titles etc. The producers themselves are finding teachers from the universities or affiliated colleges, sometimes teachers come forward on their own expressing an interest in developing an e-content or course.

All these factors point out the need of a full-fledged pre-planning phase with academic bodies of the Universities, academicians of particular subjects, heads of institutions, teachers and producers before embarking upon the development of e-contents.

Responses of Technical personnel of Media Centres/CEC

The responses of technical personnel (Engineers and Technical Assistants) on TAC list, purchase of equipment, availability, working conditions and facilities at their respective centres were collected and analysed.

The list of equipment a Centre needs and to be purchased is prepared by the Technical Advisory Committee (TAC) of CEC. About the TAC list of equipment forwarded by CEC, two respondents stated that their Centres are not satisfied with the present list. They are of the opinion that most of the equipment included in the last list and the present list work under old technology and that new and advanced economical equipment need to be included in the list. The Engineers further said that they have intimated this to the CEC outlining their specific requirements, including advance technology equipment and forwarded their own lists. Another respondent elaborated that the TAC is considering only the basic requirements rather than advance technology equipment. Two others are of the opinion that about 75% of the listed equipment is okay and satisfactory and are based on the requirement of a Centre. The list gives a broad category of equipment out of which each Centre can select and purchase according to their

requirement. This means that based on what they already have at their studios, they can choose the additional equipment that are required for further expansion or support, from the list. All suggested that the CEC should consider advance technology and future scenario while framing the list and be ready for the changes that will be coming in the broadcasting field. All remarked that they have the freedom to choose and purchase from the TAC list but not for purchasing outside the list other than small, low cost equipment.

Asking about their suggestions on the preparation of TAC list, all of them mentioned about the need of a meeting of all concerned technical personnel responsible for maintaining equipment of a Centre with the CEC before finalising the list. If such a preliminary meeting is conducted, they can voice their specific requirements, apprehensions, and at the same time can have an understanding about the viability of the list being prepared. Lack of interaction with CEC before the release of TAC list is another issue with them.

Regarding purchase of equipment for the Centre, all the Engineers stated that they are facing many problems. Almost all Centres except two are functioning in state Universities and the Centres are required to follow the rules of the University and that of the state. The time gap between the release of list, getting the approval of first CEC and then that of the University, rules and regulations in the University/ state system, tender process for expensive equipment - all are hurdles in the process of purchasing the necessary equipment.

For the question about the transition period from Analog to Digital format, all have given rather detailed answers. The transition was smooth for all the Centres and the change in the production format was completed by 2011,

though while considering other channels in India who have changed to digital by 2008, the transition can said to be late. Again the respondents agreed that the format level and technical quality of the programmes are on par with other channels in India. The production of MOOCs for SWAYAM is already in the High Definition format, though the DTH productions are in the standard definition format.

All of them pointed out that there are not many workshops or training sessions conducted for technical personnel. There are limitations in self-learning and suggested that if CEC takes an initiative in conducting a meeting/ workshop for all Engineers and other technical personnel including Camerapersons from all the Media Centres and CEC, it will be hugely beneficial. Two of the Engineers also have suggested that if they were given opportunities to attend international workshops or training sessions or trade fairs, it will give more insight into the developments and innovations in the field.

There weren't any complaints about the working environment at the Centre as far as the technical personnel are concerned, except about the lack of parity among the centres regarding service matters.

The suggestions to improve the technical quality of the products of CEC/ media centres and the smooth functioning of the production/ post production given by the respondents are listed here.

- Production workflow should be improved, as an automated workflow can reduce the actual production time considerably. In such a practice, capturing, recording, online mixing, editing etc. are carried out simultaneously.

- File transfer (programmes) can be made direct which can cut down the use of optical disks, which will be more economical. Optical Fibre technology can be used more.
- Low cost, advance technology equipment are to be included in the TAC list.

The investigator has interviewed some members belonging to the technical team of CEC including the Broadcast Engineer cross checking the points outlined by the technical personnel of media centres. They have clarified that they do solicit suggestions and remarks from the Media Centres and consider those before the preparation of a TAC list. They have maintained that the technical quality of the programmes produced by all concerned is on par with that of international standards. At CEC level, for the dissemination of programmes (telecast and webcast), they have adopted several new methods/ strategies utilising low cost equipment like SSDR recorders. The Engineer further explained that they are very much aware of the advancement of technology in broadcast equipment and accordingly are updating the TAC list taking in to consideration cost effectiveness also. The technical team of CEC have directly supervised setting up of studios at the new centres.

The main difficulty pointed out by the CEC team also is regarding the time taken to get a TAC list approved by the UGC. Though the list is prepared at CEC by the T A Committee in which a UGC representative - generally Joint Secretary - is a member, the committee forward it for the approval of UGC. The details of responses of the Broadcast Engineer at CEC are given at a later section.

Discussion

The technical and technology era is a fast changing one. Some engineers at the media centres have pointed out that the authorities who sanctioned the purchase of equipment for the Centres are not considering advance technology equipments, rather concerned only with the basic requirements. Some are not even satisfied with the list prepared by the Technical Advisory Committee and most of the Centres have forwarded their own lists. The CEC, at the same time pointing out that they, along with several other media centres, are procuring broadcast grade cameras and other high quality recording equipment, video-audio mixtures and other PCR equipment to maintain high level of technical quality.

Again another important factor pointed out by many is the time gap between allocation of funds, release of TAC lists, the procedures to be completed by the Centres, getting sanction from the individual Universities / Institutions under which they are working etc. Normally, the Plan/ TAC funds are released once or twice during a Plan period depending upon the requirement/ proposal of the individual centres and considering the requirements for a broadcast studio in general. The Committee provides a list containing equipments belonging to a broad category, out of which the individual centres decide the particular equipments they require for their studios.

From the responses of the technical personnel of the Media Centres, it can be understood that the format level prescribed for recording and sending the programmes is on par with the other broadcast channels elsewhere. Though the technology adopted is adequate now, with increased automation and the use of

advanced digital equipments, both the Media Centres and the CEC could improve their production workflow. The present systems can be turned in to completely automated ones, making use of Automation Servers, Online Editing etc. which help in reducing production time. The cost of broadcast hardware is diminishing nowadays significantly with the new types of digital equipments. These low cost digital equipments do not require much space also without compromising on the technical quality of the programmes. Recording, archiving, sending and receiving programmes can be achieved without much of a hassle.

The changes have been started at the CEC level itself with hard disk based video recorders and professional quality PTZ cameras. These changes have been spread already to the new centres like those at Dibrugarh and Puducherry. The other centres also will be procuring the new technology equipments soon.

The technological world is moving more or less at lightning speed. There is a great need to equip the technical personnel of the production centres to meet the challenges head on. The lack of training sessions is a concern among the personnel concerned as understood from their responses. As of now, there is no or minimum interaction among the personnel from different media centres and also with the CEC. Regular workshops, training sessions, meetings with all the technical personnel from all the media centres and the CEC will be hugely beneficial in running a studio effectively and effortlessly. A preliminary meeting with all the concerned technical personnel involved in the studio operations, prior to the TAC meeting to finalise the list of equipments also will be beneficial in understanding new developments in the sector which in turn help them make aware of the requirements at their own studios.

Responses of Research Personnel of Media Centres

Out of the 21 Media Centres, the Centres at Chennai, Jodhpur, Madurai, Jamia Milia, Pune, Lucknow, EFLU - Hyderabad and Roorkee have no Research Officers at present. The Centres at Dibrugarh, Bodh Gaya and Puduchery are yet to start production and the appointments are not being made until now (as on 2018). The investigator contacted the RO/JROs from 5 Centres and collected information about the research work carried out by their respective centres. Their responses are consolidated and presented here.

The officer from Patiala Centre remarked that their Centre has taken part in National viewership survey conducted in 2010 studying about viewership at Punjab, Haryana, Himachal Pradesh and UT of Chandigarh. Another respondent stated that their Centre along with CEC are in the process of evolving specific research about the reach and reception of DTH platform SwayamPrabha and MOOC platform SWAYAM with students and teachers. Other than that the research activities of the centre comprise of production planning, strategising, dissemination and accessing the response to the productions of the centre. In 2005, the Ahmedabad Centre has participated in the National Feedback study on Vyas Channel and DD1 programmes. The research personnel of the Centre have conducted several other surveys too.

About the significant findings gained through research by their Centres, Calicut Research Officer pointed out that serious actions are to be taken up to ensure more visibility of the programmes to the college student community in Kerala. The officer further remarked that based on the feedbacks on the studies, they are providing extensive training to the college faculties in the production of MOOC and DTH Programmes. Patiala officer elaborated upon what they have

been doing to improve upon the Centre level productions. On collecting the suggestions and opinions after showing many programmes to the students, they have incorporated several changes in the presentation styles which helped in improving overall production process.

Two officers mentioned that it is only through newsletters and annual reports, they come to know about research studies of CEC if and when they conduct such studies. Their individual Centres communicate about their own activities through the regular monthly reports forwarded to the CEC. Two others stressed the point that with the workload, all are involved in the production at every centre. They do not have much time for any research related activities.

The suggestions put forwarded by the officers from Media Centres for the overall improvement in the research activities are:

- Since the levels of students are different in different states, research studies should be piloted by the CEC. All Centres should get involved in the studies which should pan India completely. Then the CEC can compile the data and take appropriate action.
- More serious nationwide surveys have to be carried out in assessing the reach and efficiency of online education programmes. This has to be done by a higher level of big data analysis using computational methods.
- The research officers should be made to do their specific job, ie. Research work. Now they also are into producing programmes so as to achieve targets in the stipulated time. This adversely affects the research activities at the Centre level.

Discussion

From the responses of the officers, it is clear that they are more involved in the production of the programmes, rather than with research activities. Some of the Centres are making the efforts to reach out to the students, collecting their feedback and based on the findings bringing about improvements in their programmes. As all these small efforts are taking place at the Centre level, all are of the opinion that a wider study panning whole of India is to be carried out to improve the quality of programmes.

Responses of Directors of Media Centres

Directors are responsible for all the activities of a Media Centre, coordinating the efforts of all the concerned teams in the development of educational programmes. The investigator contacted 5 Directors from different Centres and the semi-structured interview was based on the main themes: Specific objectives outlined for Media Centres, satisfaction regarding the working environment at the Centre, role of CEC / funds / budget and other services, constraints and relationship with the host university / institution.

For the question about the extent of realization of five major objectives, one Director explained that they have established basic and essential infrastructural requirements well. However it has to be updated with the new requirements and arising out of new kinds of productions. Three Directors mentioned that the set up of facilities for programme production is good, though not excellent. Another was from a fairly new Centre, and he explained that they have completed the process of purchase of equipment, and setting up of studio. Two Directors pointed out that not much research activities related to optimizing

the effectiveness of the programmes are being carried out at Centres now, at one Centre they have yet to start such activities. One director remarked that the Centres should take considerable interest in analysing the reachability of the programme and the feedback thereof. More structured and focussed research has to be conducted for this. Their Centre, from the last several years has been involved in conducting awareness programmes at various colleges for teachers and students. Another pointed out that the activities by their Centre are very good, and elaborated that their Centre is conducting several evaluation sessions with students after showing them the programmes.

About the networking and collaboration with other educational agencies, one Director listed several agencies with which they have associations in the field of educational communications. Another remarked that as part of the DTH channel allotted to their Centre, they have taken initiatives in linking institutions in the areas related/ assigned to the channel, apart from associating with the Academic Staff College at the University. He has further pointed out that in the case of networking with institutions abroad, the CEC is evolving certain strategic plans. Two Directors stated that the efforts are just average, and another remarked that as a unit of CEC, they have been associating with other EMRCs in the country. Also that, their University has signed an MOU with a foreign University on many aspects of media education. The Director is hopeful that this might be helpful in improving the quality of production at their Centre.

Concerning the training and overall human resource development, one Director stressed the need of extending more focussed training to the staff in the new media technologies. Another Director has mentioned that the individuals at

the Centre are getting trained from time to time. One Director explained that existing staff of the Centre who have been working on contract are attending the capacity building programmes offered by the CEC. They have also conducted a couple of workshops last year. Two others stated that the training given to the staff is very good and good respectively.

About studying, promoting and experimenting with technologies/ techniques to increase the reach and effectiveness of the programmes, one Director explained that their Centre has taken important leads in developing web and mobile based solutions for disseminating the content developed by the Centre. The Director from the young Centre remarked that their team is always interested in improving the production process and he is confident that they are capable of winning a few national awards, due to this kind of interest. The updates in this field are provided by the experts, and are good - remarked one Director. The other two Directors mentioned that the very good efforts are being taken up at their Centres.

All Directors are satisfied with the working of the Centre with respect to production and technical team. One Centre is yet to get the administration team, and one Director feels that facilities for production need to be improved. At one Centre, they are waiting for procuring more equipment and the University is in the process of renovating old building and construction of new one. One specifically stated that though satisfied on many points, as such there is no benchmark for satisfaction, “the more you aspire, the more you raise the bar for satisfaction levels”.

All agreed that they have the freedom to frame a Plan of Action regarding the target for productions. One Director further elaborated that the target is

prefixed by the apex body, however accomplishing the tasks is determined by the Centre. One pointed out that they were able to complete the development of 1400 e-contents in the stipulated time.

On the topic of funds and grants received for functioning of the Centres, all but one are somewhat satisfied though all pointed out the issue of late disbursal. One Director mentioned that the funding is inadequate and arrears are never getting distributed in time, and one Director is waiting for the annual grants too. One specifically mentioned that communications with CEC regarding the matters is really bad as they never seem to give proper answers. Apropos the grants for other projects, one Director explained that except for the initial delay in getting the grants for the e-content project, all other releases were prompt and enough. The same is the case with MOOC project, but for the DTH project, the instalments are not at all timely. This is affecting the production of programmes, particularly when the Centre is entrusted with the responsibility of running a channel. All others are satisfied with the funding for other projects, though they do not run a DTH channel.

Three Directors agreed that the CEC is taking into consideration the budget suggestions and requirements offered by the Centre. One further explained that they are satisfied only partially as the CEC is not very communicative regarding the revision matters. One Director clearly stated that he is not satisfied, but did not give any reason.

About the other activities, three Centres have started assisting National Resource Centres in the production of MOOCs. One Centre is working on documentaries and functions for the State and has signed a MoU with the state

for the service. One Centre is yet to start any such initiatives. Another Director remarked that though they have sent several proposals regarding the same, they have yet to get any reply from the CEC. At present they are assisting the University also in the production of MOOCs, apart from those allotted by the CEC. None of the Centres are producing programmes in the regional language.

All Directors expressed satisfaction with respect to the rate of production at their respective Centres, though one Director pointed out that the productions for DTH are not going smoothly as there are inadequate funds. He has also pointed out the insufficient staff strength and infrastructural limitations with regard to the overall production of programmes.

All the Centres resort to the review reports generated by the CEC also for quality checking. Technical Quality of the programmes is ensured by the technical team of each Centre. All the scripts are reviewed by Content Editors before actual shooting, and for MOOCs, internal committees are also convened at the Centres. So none of the centres are solely depended on CEC for quality checking, as they all are having their own mechanisms.

Only one Centre is involved in webcasting of the programmes and telecasting of programmes also is being done by a governmental agency educational channel in their state. One Director elaborated that they do not have enough fund for this type of activities, but only for projects. Also the formalities with respect to auditing hinder their efforts.

Four Directors remarked that the dissemination of programmes by CEC is good, and one replied that it is excellent.

All the Directors except one remarked that they are satisfied with the role of CEC as a nodal agency. One Director stated that he is not satisfied and gave an elaborate reply on the same. He stated that,

CEC needs to make the Media Centres more relevant to the local needs of the University/ State in which it is located. It still struggles with the legacy of 1980s, when earlier media centres were started, particularly when there were no private TVs and Internet in India. The situation has changed a lot, but CEC is yet to come out from the age old principles with which it was started. A thorough overhauling of the system in CEC is needed.

About the relationship with the host university and the constraints, only one Director agreed that it is excellent and there are no constraints. One elaborated that, though the relationship is cordial and good, the University has no clear cut role in the functioning of the Centre. New Vice- Chancellors come, and the in-charge Directors also change regularly as per the interests of the University - all these affect the flow in the functioning of a Centre. Another Director stated that,

One constraint is that the University system operates on the principles of an academic teaching department. EMMRC is a production oriented department and has to be treated differently.

Yet another Director stated that,

The relationship is not good, but no choice is also there. The Media Centres cannot function independently. Universities in India also are not equipped to run an independent media centre today. Hence, nothing could be changed in the media centre today. It has to go like this with all the shortcomings.

About the quality of their own programmes, and that of other Centres, all Directors replied that the quality of their programmes is good. One Director remarked that quality of programmes varies from centre to centre and another commented that the quality depends upon the Subject Expert and the script. No one else commented on the quality of other centres' productions.

About the changes to be made to improve with respect to functioning of the Centres, quality of productions, dissemination of productions etc., only three Directors gave detailed responses. Their responses are given below.

Changes to be made at Media Centres:

For bringing up improvements in the functioning of Media Centres, one Director suggested that a Production Calendar for the year may be prepared keeping in mind the targets to be achieved. The second one pointed out that *after the introduction of NME ICT, the face of Media Centres has changed dramatically. It's another project of UGC and the media centres have become a full-fledged government run media house*. Another Director proposed that the Centres are to be made autonomous and there should be a network connecting all with inter-operational and inter-transferable process under the CEC.

For improving quality of productions at the Centre level, the suggestions forwarded were as follows:

- Adopt new popular production equipment like drone, gimble, good lenses etc. Have a well trained crew and creative environment.
- Media centres should compare the privately run MOOCs and e-learning companies and try to understand recent developments and technologies/ strategies etc and improve own productions.

- Arrange workshops and training sessions for the technical team of Centres as well as for teachers for consistent improvement and updation, on use of the medium, technology advancements and ways of improving presentation/ delivery of the content on camera.

To improve the dissemination aspects of the programmes at the Centre level, the Directors suggested that,

- Regional platforms for dissemination of programmes are to be developed.
- Media Centres have to innovate and evolve new models and methods.
- Networking with other state educational institutions and the State Government. Wide use of social media for reaching out to students and teachers.

Changes to be made at CEC:

For improving the functioning of CEC, one Director stated that,

...there is a need to have functional autonomy. Running a media centre with the command of two bosses (one is the host University, and the other is CEC) is difficult to sustain. Restructure the CEC and make the media centres accountable to any one authority.

On a similar note, another Director suggested establishing CEC as a separate institution directly under MHRD with a deemed to be status as University or a Statutory Higher Education institution like NCERT.

For improving quality of productions, at CEC level, the statements forwarded by three Directors are,

- *Provide latest equipment and regular training to production staff at par with other industry/ production houses.*
- *Media Centres are no more television production companies. This need to be understood and the CEC should rise up to the needs and demands of the society.*
- *The CEC should carry out regular and prompt analysis of productions of each Media Centre, and the reports are to be shared online. Frequent training should be arranged for staff and experts involved in the productions. Enhancing the remuneration for previewing the programmes also will be beneficial.*

For improving dissemination of productions at the CEC level, one Director pointed out that the CEC should discover new avenues and arrange chain of festivals and programmes on a monthly basis for publicity. Also require massive advertisement campaigns from their side.

Another Director stated that,

CEC absolutely failed in this (dissemination of programmes). 33 DTH channels would no way helpful to reach the real audience.

The third Director pointed out that international networking with Universities and institutions can be taken up by the CEC to improve the dissemination of programmes. Also they can arrange National Seminars, Conclaves, Symposiums, Workshops etc. at different universities across the nation.

Another point forwarded by a Director is that, more autonomy in productions should be given to the Centres. On a general level, one of the Directors remarked that the CEC and the Media Centres should improve popularisation strategies to reach every student in the country. There are problems with the conduct of examinations and people are unclear about the Credit Mobility factor of MOOCs. The matters about transferring credits at the last moment and for the last semester need to be ironed out. The matters regarding obscurity in the service rules concerning the staff of the centre, indifferent attitude of the authorities, the late implementation of pay revisions also were pointed out by the Directors.

Discussion

From the responses of the Directors, it is clear that they are very much aware of the problems prevailing at their Centres and working hard to remedy those issues. Though centre level efforts are being carried out within their capacities, most are not satisfied with the responses / lack of communication from the part of CEC.

The directors also desire for more autonomy in the functioning of both the CEC and their Centres. Though there are no problems or dissatisfaction with the amounts released as grants, most pointed out the issue of late disbursal and are concerned as it will in turn affect the smooth functioning of the Centres. Lack of efforts from the side of CEC regarding the popularisation of programmes also was pointed out.

Responses of Students / Learners

The investigator tried on a small scale to gauge the reactions of the learners regarding the educational programmes available through both television and web. The data were collected from under graduate students from various disciplines across India, from the states - Kerala, Rajasthan, Jharkhand, Odisha, Uttar Pradesh, Karnataka, Tamil Nadu, West Bengal, Andhra Pradesh and Telengana.

The learners were not categorised, and the data from 225 numbers of under graduate students were pooled to get a clear picture on their perceptions. The responses are summarised in table.

The results are presented in table 17

Table 17

Percentage of the Total Score of Responses of Students on Awareness and Popularity of Educational Telecast and Webcast

No.	Aspects	Percentage of responses			
1.	Familiarity with educational telecast and webcast		Yes		No
			73.4		26.6
	Whether watched any programmes		28.6		71.4
	Habit of watching programmes	Regularly	Sometimes	Rarely	Never
		4.2	39.4	38	18.4
2.	Aware of educational telecast/ webcast by Govt. of India		Yes		No
			27.8		72.2
	If yes, watched any programmes		14.9		85.1
3.	Heard of VYAS telecast		Yes		No
			7.9		92.1
	If yes, watched any programmes		2.6		97.4

No.	Aspects	Percentage of responses			
4.	Heard of EduSat telecast / programmes	Yes			No
		65.4			34.6
	If yes, watched any programmes	26.3			73.7
5.	Heard of Consortium for Educational Communication (CEC)	Yes			No
		13			87
6.	Heard of Educational Multimedia Research Centre (EMRC)?	Yes			No
		24.4			75.6
7.	If yes, seen any CEC/EMRC telecast / webcast	3.9			96.1
8.	Whether college publish the programme schedule of CEC/EMRC?	Yes		No	Do not know
		5.1		23.8	71.1
9.	Confidence in using Internet	Excellent	Good	Fair	Poor
		18.2	54.5	26	1.3
10.	Purpose of using internet	Entertainment		Study	Both
		55		9.1	35.9
11.	Using internet for extracting study materials for supplementing classroom learning	Yes		No	
		97.5		2.5	
12.	If yes, how often?	Regularly		Some times	
		53.2		46.8	
13.	Do you think the materials you extract from web are authentic?	Yes	No	May be/Not sure	
		38.3	4	57.7	
14.	Ascertaining the authenticity of the materials collected from web	Syllabus prescribed site	Teacher opinion	Well known Publisher	Other
		35.5	14.5	42.1	7.9
15.	Preference for educational material provider sites	Indian		Foreign	
		50.6		49.4	

No.	Aspects	Percentage of responses		
16.	Of educational programmes, which are more authentic?	Public sector		Private sector
		74		26
17.	Are you aware that, GoI through CEC/EMMRC has uploaded e contents on many subjects on to the web?	Yes		No
		15.4		84.6
18.	Heard of / seen telecast of educational programmes via DTH	32.9		67.1
19.	Heard of SWAYAM portal of GoI	33.8		66.2
20.	Heard of Massive Open Online Courses (MOOCs)	50.6		49.4
	If yes, seen MOOCs of any foreign universities?	19.5		80.5
	Would you like to enrol for any MOOCs?	Yes	No	Do not know
		52.6	14.1	33.3
21.	Heard / aware of Credit Transfer for MOOCs enrolled?	Yes		No
		7.8		92.2
22.	Whether teachers advise to use e-contents / DTH telecasts/ webcasts / MOOCs?	Yes		No
		30.3		69.7

It can be seen from the figures that though a good number of students (73.4%) are aware about telecast and webcast of educational programmes, only a low percentage (28.6) of students watch such programmes. Also, those who watched the programmes, do so sometimes or rarely mostly. Regular views are very low.

Majority of the students are not aware of educational telecast / webcast by the Govt. of India agencies. While 72.2% students are not aware of such initiatives, 85.1% of students who are aware do not watch these programmes. Again a high percentage of students (92.1) have not heard about VYAS telecast, for which the Government has had an exclusive channel for many years.

Though about 65% of the students have heard about EduSat telecast, majority admitted that they have not watched any of the programmes. Similarly a large percentage of students have not heard about CEC or EMMRC, and have not watched any telecast or webcast of the Centres.

Though the EMRCs are regularly intimating and sending schedules of programmes aired in TV/web to most of the colleges under the University they are functioning, and also to other colleges in the respective States, it can be seen from the figures that many students (71.1%) are not aware of these telecast/ webcast unless it was pointed out to them specifically by their teachers.

54.5% students think that they have good knowledge about the internet. It implies that they are more than just capable of using net: not just for surfing and sending mails. 18.2% of students think that they have excellent capacity to use net. Only a few students admitted that they are fairly ignorant about using internet. A high percentage of students use internet for entertainment only, 9.1% use net for study purpose and about 35% use net for both.

As high as 97.5% of students remarked that they use internet for extracting study materials for supplementing classroom learning. 35.5% of students sampled do not experiment with many sites, they resort to only the sites prescribed in their syllabus for collecting study materials. 42.1% students go for well-known publishers while 14.5% follow the directions of their teachers.

About equal number of students prefer Indian and foreign sites for educational materials. 74% of the students are of the opinion that the educational programmes prepared by the public sector agencies are more authentic than those prepared by private agencies.

Government of India, through NME-ICT project, prepared and uploaded e-contents in many subjects for different levels of study on to the web. As CEC/EMRCs deal with UG subjects, students were asked about these. Majority (84.6%) replied that they are not even aware about this initiative of the Government. Similar is the status of DTH transmissions too. 67.1% have not heard of / seen telecast of educational programmes via DTH.

The Government has recently launched SWAYAM portal for hosting online courses for various levels - from Class 9 to PG level - and the UGC has announced Credit Transfer too for the courses taken up in this portal. Still only about 33% students have heard about this facility and majority (92.2%) have not even aware of the opportunity of Credit Transfer for these online courses to students registered in any Indian University.

Even with the popularity of online courses around the world, only about 50% of the students have heard about MOOCs. Several well known foreign universities have uploaded many of their courses as MOOCs too, but majority of the students have not seen these popular MOOCs ever.

As many as 69.7% remarked that their teachers do not advise them to use e-contents / DTH telecasts/ webcasts /MOOCs for supplementing the education they receive at their respective institutions.

Discussion

It is alarming to notice that despite the efforts of the Government and the amount spent, a large percentage of students are not aware of the television lectures, e-contents, Massive Open Online Courses and lectures aired via DTH prepared by Government agencies. Though many are familiar with educational

telecast and webcast, students are not watching or utilising the programmes made exclusively for them to its full extent.

Vyas -the 24 hr exclusive channel for higher education - was launched in 2004. Since then it has been airing thousands of educational programmes, both on TV and web. Though many articles and studies point out that the students from rural areas are mostly the beneficiaries of these programmes, majority of the sampled students remarked that they have not even heard about VYAS telecast and webcast, much less about watching the programmes. The position about Vyas telecast may be attributed to the fact that the sampled students are from undergraduate courses from the last 2 - 3 years, and VYAS has stopped telecasting due to some technical issues. Now it is being webcast through the CEC web site. When the students are not even aware of the existence of CEC or Media Centres, they won't be looking for these webcasts either.

In this era of digital revolution, it is surprising to note the low number of students who are aware of the availability of e-contents, produced as a part of National Mission on Education through ICT, on the web.

Considering these facts, it can also be deduced that the students might have seen the programmes in TV/web, but are not aware of the name or existence of the Centres which produces these programmes and also did not take any effort to further search for the availability of such educational programmes.

The prestigious SWAYAM portal was designed to achieve the three cardinal principles of education: access, equity and quality. It was initiated specifically to take the best teaching learning resources, prepared by eminent academicians and subject experts catering mostly to formal education from various universities and institutions, to all learners including the most

disadvantaged, free of cost. It also seeks to bridge the digital divide for students. Now, majority students have the habit of using internet for extracting study materials for supplementing classroom learning. Also MOOCs are gaining popularity all over the world. Still more than half of the students sampled have not even heard about the portal even though a good number of students claimed that they are good with internet. It can be deduced that the learners are not utilising the authentic curriculum based study materials available with the portal.

Except a small number of distance education students, the entire sample belongs to the formal education sector. Naturally the expectation is that students should be aware of the facilities and services offered by Universities, other agencies etc. but it can be seen that, that is not the case. Majority have not even heard about the important movement of UGC in allowing Credit Transfer for the MOOCs undertaken by the students from the SWAYAM portal. This shows that the agencies of education are not successful in popularising these types of initiatives which can be most beneficial to the student community.

The internet is over loaded with a huge amount of information and a judicial selection of study materials is of paramount importance. Many students are of the opinion that they are not sure about the authenticity of the learning materials collected from web, but admit that they think programmes produced by Government/ public sector agencies are more authentic. Even with this realisation, the low number of students who are aware of these facilities and services offered by Governmental agencies of education points to the fact that the efforts for popularising these services are to be carried out more effectively.

In the formal education sector, teachers are the facilitators of learning. More than half of the students pointed out that their teachers never indicated the

availability of such telecasts and webcasts. Familiarising the teachers with the services offered by governmental agencies is also to be taken up for the effective utilisation of the products.

Responses of Subject Matter Experts

The role of a Subject Matter Expert is most important in the development of an educational video programme. As all concerned have pointed out, the quality of a programme depends on the expertise and communication skill of a teacher presenting it.

The investigator contacted 20 experts who have contributed to the development of e-contents, MOOCs, DTH lectures or any programme made by Media Centres/CEC. Majority were teachers with more than 10 years of teaching experience at a University/ College. Four teachers were retired from service.

The questionnaire administered contained 16 items. This was sent by e-mail and the investigator talked to each of the respondents over telephone too. In that way they could elaborate upon the answers they have already given in the questionnaires. All teachers, except one, were associated with the Media Centre at their respective States for the development of the programmes. One expert directly applied to the CEC for the development of a MOOC and prepared the same at the University where they have a virtual studio and editor. The expert remarked that though the CEC assigned a Media Centre for assisting him in the process, they have not shown any further interest or contacted him.

Only two experts approached CEC/UGC directly offering their expertise in the development of lecture programmes when they came to know about it in the earlier times. Others were approached by the production personnel soliciting

their service in the development of the programmes, and once they were explained about the project, they went on to join the respective Centres for the same. All of them, at a later stage attended one or two of the workshops arranged by the centres. Many subject experts, outside the sample frame, coming to know about such initiatives and efforts of the Centre from their colleagues and friends who were already associated with the Centres, have attended the workshops conducted by Centres and later joined for the development of programmes. As the investigator is working in such a Centre, she has had a direct knowledge about such experts associated with her Centre. Though a large number of SMEs are associated with her Centre, the data were collected mostly from the SMEs associated with other Centres.

The results are consolidated and presented in table 18.

Table 18

Responses of Subject Matter Experts

1.	Source of the knowledge about the projects		
	a. Workshops conducted by EMRCs		-
	b. When approached by Producers/ Staff of Media Centres		90%
	c. From Newspapers/Web/ Official sites of UGC/other agencies (Specify)		10%
	d. Other		-
2.	The type of programme for which contributed:		
	a. Documentary		5%
	b. E contents		15%
	c. E contents & MOOCs		60%
	d. E contents, DTH Lectures & MOOCs		20%
3.	Satisfaction with the development of the programme?	Yes	No
		95%	5%

4.	Are you satisfied with the working environment at the Centre?	Yes	No
		100%	-
5.	Academic quality of the programmes		
	a. Excellent		-
	b. Good		90%
	c. Average		10%
	d. Poor		-
6.	a. Technical quality of the programmes of Media Centres		
	b. Excellent		5%
	c. Good		95%
	d. Average		-
	e. Poor		-
7.	Improvement in structure of programmes	Yes	No
		95%	5%
	If yes, on which of the area the improvement is needed?		
	a. Template	100%	
	b. Presentation technique	All aspects needs improvement	
	c. Any other aspect		
8.	Difficulties during the development of programme, in getting -		
	a. Convenient dates for shooting	No difficulties encountered	
	b. Necessary support during post production stage		
	c. Payment in time	5%	
	d. Any other	-	
9.	Watched similar educational video programmes of other agencies / channels	Yes	No
		90%	10%
10.	Time to receive review reports of own programmes		
	a. Within 1 month of completion of programme	-	
	b. Within 6 months of completion of programme	10%	
	c. Takes much longer	10%	
	d. Never received any	80%	

11. Educational video productions of the Media Centres - visibility and popularity among students	Very low	
12. Have you attended any sort of workshops/ orientation programmes/ training organised by CEC/ Media Centres?	Yes 100%	No -
13. Response of Media Centres / CEC in relation to apprehensions/ queries etc.	CEC	EMRC
• Very prompt	100%	
• Not very responsive		
• Never given any responses		

Out of the 20 experts, only one was involved in the development of a documentary made by a Centre. Three teachers were involved in the development of lectures, e-contents and then MOOCs and the others were involved with the development of e-contents and MOOCs only. Four of the experts were involved in the production of repurposed (made from already developed e-contents) MOOCs as well as fresh MOOCs.

All are satisfied with the development of the programme they have contributed to and with the working environment of the Centre. Only one expert replied that though satisfied, the programme could have been made in a better way. The experts who have contributed to only e-contents felt that the earlier e-contents lacked finesse. As the Centres started developing more and more modules, there were a lot of improvements in the presentation style, back ground, editing, inclusion of graphic plates, illustrations etc. The teachers also became more comfortable delivering lectures to a camera. The conditions at the studios also became better - in terms of supporting materials like teleprompter, pen tablets, smart panels etc. which made their presentation better. When the Centres started developing MOOCs, the experts who have done e-contents earlier felt more confident. They remarked that the production personnel also became more learned and resourceful after developing these many e-contents.

Also they all are of the opinion that the academic and technical qualities of the programmes are good. One teacher specifically mentioned that the technical quality is on par with the international standards and is very good.

All but one agreed that the structure of the programmes need improvement, be it E-content, DTH lectures or MOOCs. One teacher expressed her concern that as the programme development is a time bound process, maintaining quality and innovativeness is difficult. There is not much time for presenting it in a better way. To finish the work in the stipulated time, two experts remarked that they had to rush through all the recordings. Another expert pointed out that both the template and the presentation techniques call for much improvement. He further clarified that it should move further in line with the programmes developed by many other external agencies in visual qualities and presentation techniques. Another has pointed out that the teachers are rigid in front of the camera and they need to loosen up to make the programme more appealing. Quality levels of the programmes are low when compared to international programmes. A teacher remarked that he has improved himself after a number of presentations and became more comfortable in front of the camera. All suggested that the programmes can be made more interactive, which in turn can sustain the attention of the viewers better. All but two commented that they have seen other programmes of this genre. Regarding the quality, not all were better than the MC programmes and some were much inferior in all aspects. Comparing a MOOC offered by her and the some other programme on the same subject, a teacher observed that shorter duration programmes are more interesting and better than the 30 minute long modules, but then the course duration will become longer too. The attention of the students may not last longer for such type of courses.

Those who are associated with the Centres were satisfied in getting convenient dates for shooting and the support during production and post production stages. Only one teacher pointed out the non-receipt of payment for the course developed.

About the review reports, majority of the teachers are unaware of such reports. The teachers whose programmes required conceptual corrections only were intimated and given the reports. Other types of corrections (spelling mistakes, more illustrations etc.) if any, usually are done by the producers or editors at the Centre. Those who have received the reports commented that it takes sometimes within, and usually longer than 6 months to receive the reports.

All but one expressed the feeling that the educational telecasts and webcasts are not having enough visibility and popularity among the students. Only one teacher felt that the course he has developed and uploaded attracted a high viewership from both within India and abroad. To the question about workshops/ seminars, all the experts replied that they have attended at least one during their association with the Centres, and felt that those were good, if not very informative.

Narrating the experiences on a MOOC delivered, a teacher suggested that preparing different types of questions for each module is a taxing work. She observed that the number of students was coming down as the course progressed and the responses from the students also were very less even after she had tried to keep the lessons simple and interesting. Moreover for a 1,500 enrolment, only one student was regular. For assignments and questions, no one responded. She felt that the whole process was a waste of money and effort.

A similar apprehension was shared by another teacher who has given a course on Sanskrit literature. He stated that,

Students see these MOOCs as an additional support for the classroom teaching. These e-contents and MOOCs cannot replace traditional classroom teaching. Though 1,800 learners enrolled for my course, I think that majority will not be attempting the examination.

The teacher pointed out that the examination fee is very high, higher than that of University fees and students may not be willing to spend such a high amount for getting some credits. He recommended that a need among the students is to be created to encourage them to take up more courses. If the quality is good, then the students will definitely utilise the courses.

Another teacher who has developed both e-contents and MOOCs said that,

We learned together, the producer and I, many aspects about the styles and ways of presenting a topic on camera, because at the beginning I think the producers also did not have much idea about how a programme should be presented. They did not allow much freedom, and I delivered the lesson more or less mechanically. Looking back I feel ashamed. I became more confident and comfortable when I started the MOOC.

The experts put forth many suggestions for the betterment of the performances of Media Centres/ development of educational video programmes.

For increasing the popularity and visibility,

- Increase advertisement through mass media as the youngsters are more adept at social media and the notice reaches them faster through it.

- Academic incentives for those who are completing the courses successfully: Now majority of the students enrolled are not writing the examinations conducted as part of each MOOC. Though the UGC has announced Credit Transfer and stipulated that at least 20% of a course be made into online courses, students are not much interested in gaining only few credits. If more incentives are given in the initial stages of the project, more students will be attracted to the courses.
- Create more awareness among students / colleges: The awareness about the availability of these courses/ e-contents/ telecasts is very low among the students. Most of them feel that the teachers are not making much effort in creating awareness among students for various reasons like insecurity about their jobs/ expertise, unwillingness to let their students learn from other teachers' classes etc. The colleges also need to take initiative in making the students notice the availability of such programmes and urge them to utilise these for their benefits.
- Design and give awareness programmes from school level itself which will inculcate in the students a habit to look for and utilise the supporting resources for their own advantage.
- Lower the examination fee: The students are reluctant to take the examinations of MOOCs (just a part of a whole paper) as the fee is comparatively higher than that of University fees for a whole semester/ year.
- Make the programmes more interesting and interactive.
- Experts are to be trained in presentation aspects of the programmes.
- Adopt aggressive marketing strategies.

For the overall improvement of the programmes of Media Centres,

- observe the developments happening in this area continuously and update the procedures timely.
- provide skill training to all people (including academic and technical) associating with production according to the changes happening in this area.

Some of the general suggestions were about the improvement to be made in the portal. The SWAYAM portal where the courses are uploaded should be made more user friendly, and proper studies or trials should be conducted before implementing any changes or examinations. The participation of the students in the courses as well as in the examinations should be ensured. Without examination results, the outcome of the courses cannot be measured.

Discussion

From the figures, it can be seen that in most cases, it is the producers/ other staff of the Centres who are bringing in subject experts for the development of the programme. Only very low numbers of interested experts are approaching these agencies directly. Experienced teachers, like professors from premium institutes owing to their heavy workload and not needing further career points are not interested in participating in these types of out of the campus initiatives. A thorough study and planning is required before embarking upon any new projects. Both the e-content development and MOOCs suffered many short comings because of lack of planning and study which are clear from the difficulties narrated by the experts. The Government had spent and is spending huge amounts for the development of e-resources, but these are not reaching the stakeholders.

Responses of CEC Personnel

The investigator collected responses from the key personnel of CEC namely, Governing Body Member, Director, Joint Director (Software), Finance/Accounts Officer, Producer, Media Tape Librarian, Research Officer, Broadcast Engineer and Academic Coordinators. Their responses collected through semi-structured interviews are detailed below.

Responses of Director - CEC

The Director was asked about the objectives framed for the Consortium and was prompted to describe the extent of realization of the various objectives. The other themes were about the role of CEC in the functioning /administration/ policies of Media Centres, templates formulated for the programmes, presentation aspects, quality of the programmes, viewership surveys, constraints faced by the CEC, popularisation and awareness programmes, current initiatives and plans for future.

About the coordination, facilitation, overall guidance and direction to the activities of the Media Centres, the Director explained that the MCs are working at the respective Universities or institutions vide a tripartite agreement with the UGC, CEC and University. The Vice-Chancellor or the Head of the institution is the Chairman of the Board of Management of the Centres and the Director - CEC is just a member of the Board. This means that the Consortium does not have much control over the MCs under it and as such there is no flow in the structure. The agreement should have been between UGC, CEC and the Media Centre which in turn can ensure some sort of autonomy in the functioning of CEC. The Director further stated that the CEC is taking all efforts to coordinate and facilitate the activities of Media Centres. It is liaising with the UGC to solve or deal with the general matters of the Centres like fund dispersal, purchase of

equipment etc., but not always these endeavours become successful. Sometimes the release of funds to the Centres gets delayed and the Centres may not be able to deliver the products the CEC asked for in the stipulated time for want of funds. CEC is expected to deliver, but owing to these kinds of matters where the CEC has no control, they sometimes are not able to do so.

The Director pointed out that as there are no transfers or changes in positions, there exists a feeling of stagnation among the staff of the Centres and CEC. There are different rules for administration, purchase, finances, service, age for pension etc. at different Centres functioning at different states/ universities. Many Centres do not have permanent Directors, most of the time the post is filled with in-charge Directors who change every now and then. This breaks a flow in the functioning of the Centres. The Director is of the opinion that a structural change is needed, where all the Media Centres should come under the umbrella of CEC in all matters as mentioned above. There should be a new MoU, with same rules applicable to all the Centres.

The investigator pointed out most of the other respondents' opinion regarding the template of the programme. For this the Director explained that the educational programmes are for academic purpose, not advertisements. So it is better to have a uniform template for similar type of programmes. It is like a classroom teaching but with the added advantage of having multimedia content. With experts having good communication skills, any Centre can have good quality programmes. The subject experts are free to choose and improve their presentation strategies.

About the viewership of the programmes, the Director remarked that all type of programmes enjoy a huge viewership from overseas. The YouTube

channel attracts many views and in rural areas the programmes have very good viewership. The live lectures uploaded in the YouTube are popular and have a wide viewership. The Director brought attention of the investigator to the statistics with respect to the viewership figures (presented in the annual report for the year): Lectures in 2017- 18 witnessed a footfall of more than 75,000 regular subscribers with 61 lakhs views added in 2018, reaching out to more than 78,000 subscribers. The Director further elaborated that making the programmes more popular among the learners is a gradual process. The popularity of the programmes should trickle down to the masses. The open mindedness of both the teachers and the learners to accept technology is an important factor.

With the launch of local chapters, digital lounges, Swayam portal, development of MOOCs, DTH lectures, workshops for capacity building, training sessions etc. the CEC is moving ahead in the field of educational communication.

Responses of Producer - CEC

The investigator conducted a semi-structured interview with the Producer at CEC soliciting information about the video production there. The producer and the team have outlined the path they have taken during the last several years with regard to the production of programmes taken up by the CEC. The production team at CEC comprises of a Producer, Cameraman, Engineer, Technical Assistants, Technicians and other general staff. The CEC productions started with live EduSat programmes when the CEC acted as the Teaching End. During 2005-06, the interactions of Director-CEC with experts of general subjects were shown live along with subject based lecture programmes. All these programmes were shown live as well as recorded repeats. CEC then launched e-courses on Scripting, Editing and Marketing. With these e-courses, learners were given the opportunity to have

two way communication over phone to clear their doubts on the subject taught. The CEC has tried outdoor shooting also for lectures.

The general programmes later changed to those belonging to 4 bands, namely Art/Culture/Literature/Language, Social Science, Management & Other Professional Courses and Natural & Applied Science of 1 hour duration. The studio at CEC was revamped and in November 2018, they have started virtual transmission also.

Every day, the team try to add at least two programmes to the repository. Now all the programmes are telecast via different channels and streamed live through website of CEC and You Tube also.

Talking about the conditions at CEC, the team pointed out many issues: less man power, difficulty in getting experts, inadequate infra structure facilities, time constraints etc. The producer has remarked that getting a quality or expert teacher for the programme is of paramount importance. The teachers either come or call directly to the CEC communicating their willingness for participating in the development of programmes or the production team go to different colleges in search of experts. Either way, they point out that they do not have much choice in the selection of an expert, the willingness from the part of the expert is the deciding factor. Like the opinions of the other producers from media centres, here also they are of the opinion that the quality of a programme rests on the communication skill of the expert/ presenter. For an academic programme, getting the concepts or the subject matter clearly across the minds of the learner is important and unless and otherwise an expert can communicate whatever he/she intents to teach clearly, the programme becomes worthless. Again, as the programmes are of purely academic in nature, using the service of a professional anchor/ presenter for teaching is not

followed. Even if the service of presenters is employed, usually teachers from the same field are called in for the same. Another pertinent problem or issue remarked upon was the slang and accent of the teachers. Heavily accented language affects the on-screen teaching adversely, but the producers are helpless in this regard. The expert teachers may not always be having good accents and vice versa.

The producer also pointed out the importance of pre-production meeting for any type of productions. She stressed that the pre-production meeting should include all the concerned parties - the production personnel from Media Centres and CEC, subject matter experts, technical personnel etc in order to have a clear understanding on what is expected out of a production. It should be planned well in advance. Once every concerned one is communicated with the particulars, production of programmes at all levels will be smoother. Another suggestion forwarded by the producer is that there should be a separate team for every aspect - now the producers are responsible for bringing in the experts, arranging the shooting, handling the related administrative matters etc apart from the actual production and post production works and advocated a proper division of labour among the staff.

Responses of Media Tape Librarian

The investigator had a face to face semi-structured interview with the Media Tape Librarian of the CEC. The frame work thought out for the librarian consisted of matters regarding collection and archiving of content, constraints facing in archiving old and new collections, digitization, etc., status of library, human resources and future plans.

The Librarian has outlined in detail the working of the library and the interactions with different Media Centres in receiving and storing programmes. The main responsibility of the media tape library at the CEC is securing,

preserving and archiving the educational programmes received from the MCs and CEC. All the collections are organised centre-wise, subject-wise and are given unique names so that retrieval and dissemination become hassle free. Every month the library team prepares a list of programmes received and programme schedule and hand over the lists to Academic Programme Officers (APOs) who arranges preview sessions of the programmes. The flow chart below illustrates the working of the library.

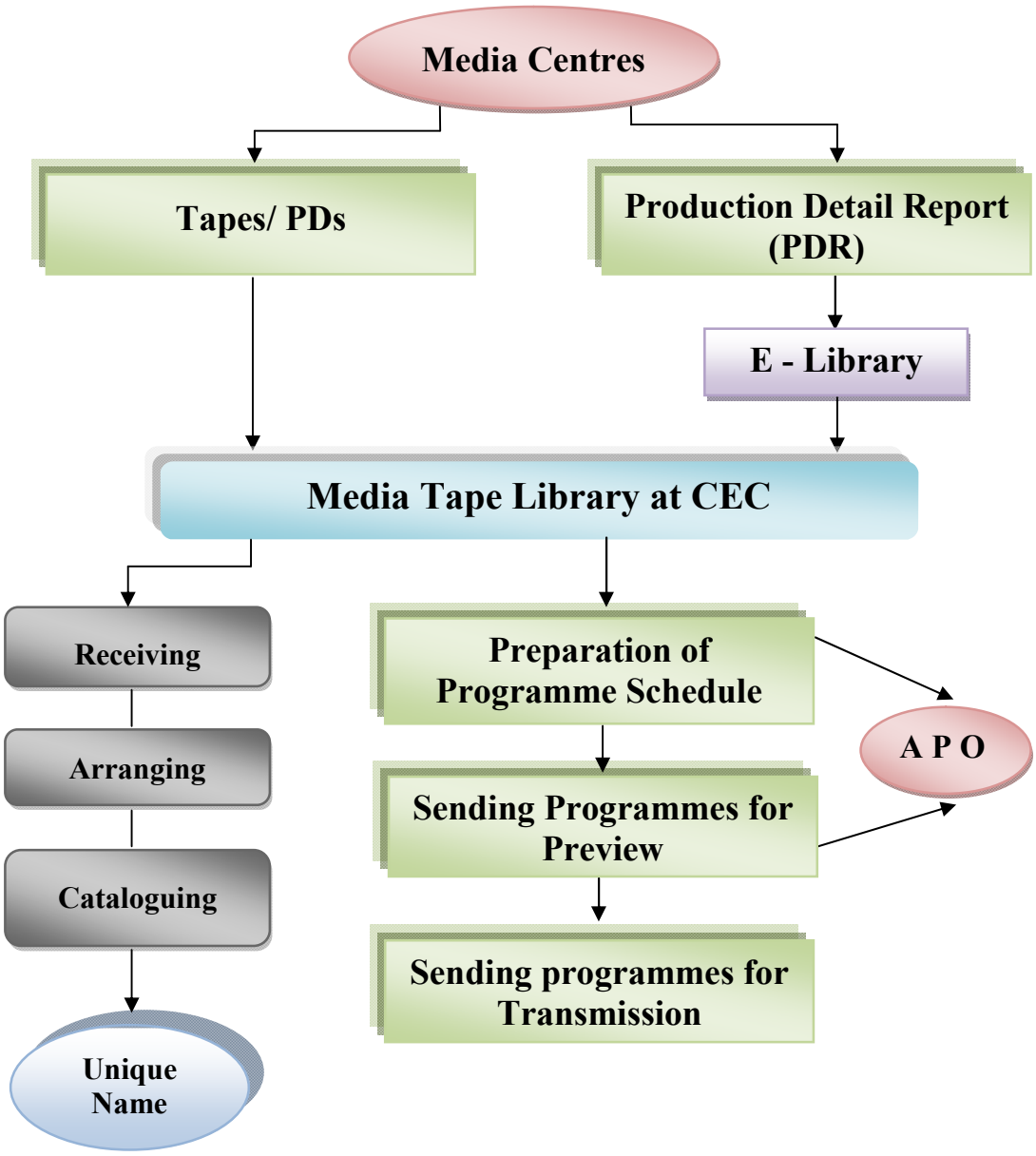


Figure 12. Working of the Media Tape Library at CEC

For the better management of programmes received, they are using E-Library Software developed by NIC, from 2016. The Media Centres, on sending programmes, are required to enter the details (Production Detail Report - PDR) of each programme in the "E-Library" application which is a Web Based system. With the help of this, Media Centres can send the details of the programmes online. The Librarian pointed out that the Centres do not always comply with this and at the CEC they have to do it for the Centres.

As per the Annual Report of CEC (2017-18), the Media Library in its endeavour and goal to secure, preserve and archive the educational material, is in the process of converting all video programmes of betacam to the digital format (Professional Disks/ XDCAM Diskettes). The total number of programmes on betacam is around 12,388 received from the 21 Media Centres. Out of these, CEC has converted around 9,054 programmes to digital format (Figures as on March 2018).

Discussing about the matter, the Librarian remarked that it is a difficult task to convert the old programmes which are in the VHS and Umatics format to digital, though the conversion from beta to PD is easier. The programmes they have already converted lack quality and now they are repeating the process. If they have checked the quality of the programmes during the conversion time, this would have been avoided. As for the programmes in the VHS and Umatics format, they fear that the retrieval will be very difficult or nearly impossible. This also could have been avoided if they have undertaken the conversions before itself or embraced the technological advances in the field at the appropriate time.

The team listed several issues they are facing at the CEC. First and foremost is the requirement of a server, what they have now is obsolete. They have not

adopted advance technology to manage a digital library. Now that the e-content project has been wound up, the library receives low number of programmes. The focus of the Centres is with the development of MOOCs, the previews of which are being done at the individual Media Centres and are uploaded straight onto the MOOC platform. So the role of a Media Tape Library is diminishing. Also the space constraints are a serious problem for a storage library. There are no reading rooms and no facilities for viewing or checking the programmes.

As for the future plans, the Librarian elaborated that they need to popularize the efforts of the Centre and market the products aggressively. Adoption of new technologies like cloud computing, conversions of programmes to better formats at the right time (whenever there is a major change in the technology), creating digital libraries, better maintenance of the Media Tape Library 24 x 7 are the main future plans outlined by the Library team.

Responses of Joint Director (Software) and Preview Team

The software aspects are handled by the Joint Director (S/W) and under the JD, the Preview team functions. After the receipt of both the PDRs and the tapes, the Media Tape Library categorises the tapes subject wise and centre wise. The list of programmes prepared is then sent to the Preview Team.

Two levels of reviews are conducted for the programmes (e-contents & videos) developed under NME-ICT for authentication and technical quality: Peer review at the Centre level and then at the CEC level. At both the places Conceptual, Content and Structural analysis of content are done. Technical parameters are monitored for optimum video and audio quality.

Academic preview and Technical Preview - the former is handled by the Academic Programme Officers and the latter, by the Technical Team. It is the

responsibility of the APOs to arrange the panel of subject experts (usually 2-3 experts) for previewing the programmes. In the presence of the APO, the panel reviews the programmes and records the strengths and weaknesses of the programmes as well as the corrections to be made. Corrections can be of factual or conceptual - minor ones are corrected at the CEC itself, and for major corrections, the tapes are sent back to the Media Centres along with Preview Reports of all the programmes received from that Centre.

The APO supplied that in the year 2015 - 16, they have carried out preview of 3,114 programmes, in the year 2016-17, the number was 2,840 and in the year 2017-18, 1,801 programmes.

The team pointed out the space constraints as the major issue. There is not enough space to conduct the reviewing process. The delay in getting back the programmes from the Centres after effecting the corrections is another problem faced by them. While the e-content project was running, previewing all the programmes was a huge task. They are still involved in previewing the programmes received.

The software unit already has developed an LMS (learning management system) for delivery of content and their future plans include the development of a mobile app which will be launched soon. The programmes which are in the Flash format (not supported by many browsers now) also are to be converted to HTML. Actually at the start of the NME-ICT project, the e-contents were made in the HTML format, but as it required IT background, they have adopted Flash which didn't require programming skills. Now that most of the browsers stopped the support to the Flash format, learners are unable to watch e-contents from the providers like Sakshat, CEC etc. The dissemination of e-contents presently is handled by the MHRD.

Responses of Finance/ Accounts Officer, Research Officer and Broadcast Engineer- CEC

The responses of Accounts Officer regarding fund receipts, Research Officer regarding the research activities and Broadcast Engineer about the TAC list and the status of equipment function/purchase are consolidated and presented here.

The Account Section has a Finance Officer and Accounts Assistant. The FO pointed out that the CEC receives Maintenance Grant and Plan Grant (Equipment/ TAC Grant) from UGC directly. The funds for running different projects (MOOC, DTH, NME-ICT, NME-ICT-North East) are released by the MHRD. The funds for the projects are then disbursed by the CEC to the individual Media Centres. The Finance Officer maintained that the allocation and release of funds are satisfactory, and if there is any excess expenditure incurred, it will be reimbursed by the concerned agency on submission of utilization details. In the case of TAC grant, the approval of TAC list by the UGC is always delayed which in turn delays all the other processes like release of grants, tendering, purchasing etc. This delay made CEC and the Media Centres return the balance amount of Grant in the last Financial Year as a part of streamlining the funds by the UGC. The FO added that the CEC is not generating any other type of income by selling its products.

The Research Unit of the CEC is headed by a Research Officer. During the period of investigation, three incumbents one after the other held the position, and it is from the second and third, the investigator collected information regarding the research activities of the CEC.

CEC used to conduct National level surveys before and not many such big scale surveys are conducted in the recent years. Now the research team is focussed

more on popularising their efforts and rigorous publicity campaigns are conducted for this. The team is carrying out popularisation programmes through three channels: utilising social media, by mass outreach and through traditional methods like conducting seminars, workshops, events such as quizzes, other competitions, film festivals, paid activities, advertisements, publicity programmes, inter channel promotions in DTH channels etc. As part of these aggressive popularisation efforts, the CEC has appointed an officer for maintaining the social media activities. The Research Officer is confident that the efforts will bring forth results.

They have started a pilot project with some selected colleges from Delhi for checking the effectiveness and reach of the programmes. The Research Officer pointed out that they are competing with offerings of private firms with global presence and giant search engines like Google and YouTube. Even with the backup of the Government, they are always a step behind in reaching out to the masses.

The R.O. maintained that the VYAS channel is still working but under the bouquet of 32 channels run by the MHRD. A total of 11 channels are handled by CEC and Media Centres. The Channel No. 33 is airing the Gurukul lectures of CEC. R.O remarked that no monitoring of TRP rates is currently being done by the CEC, but only monitoring the activities by "Google Analytics". For bringing up the changes, they are involved more in approaching colleges, teachers and learners directly. Checking the viewership and viewing habit analytics, the R.O remarked that maximum viewership is from Delhi with south states having low viewership rates.

The Technical team is headed by Joint Director (Hardware) and this team is responsible for preparation of TAC list and maintenance of broadcast studio at

CEC. The investigator talked to the technical team members and had an interview with Broadcast Engineer.

The investigator brought attention to the remarks of Engineers from different MCs about the lack of communication of CEC with them regarding the TAC list and further purchase matters. The Broadcast Engineer- CEC maintained that they do solicit the suggestions from MCs before the finalisation of the list. All types of assistance if requested are provided to the MCs by the CEC. The Engineer has pointed out that he personally supervised and carried out setting up the studio at Dibrugarh Centre.

Keeping up with the changes in technology, they also are moving ahead implementing the changes in time. They have started using SSDR Recorders for recordings which is a cheaper alternative to costly Camcorders. All the equipments are of advance technology and for archiving also, they are utilising XDCAM technology. The time taken to get approval of the TAC list is the biggest hurdle they are facing. The lack of infra structure facilities, human resources, outdated server (placed at NIC) were also pointed out by the team. A centralised server for better media asset management is their foremost priority now.

Responses of Governing Body Member

The member was asked about the responsibilities associated with the post. The member remarked that they convene the meetings whenever some decisions are to be taken and fairly regularly. Policy level decisions are discussed in detail and the recommendations of the Governing Body are sent to UGC. The member further remarked that decision regarding the implementation of 7th Pay Revision

at the Media Centres was communicated to all recently. The future plans of CEC include bringing a uniform promotion policy to the staff of all media centres and CEC, and discussions and studies are being carried out about the matter. The member is confident that the functioning of the CEC and the Media Centres will be smoother in the coming days.

Responses of Coordinators

CEC is the National Coordinator for SWAYAM Prabha and SWAYAM platform for UG-PG Nontechnology education having overall charge for producing educational content for the channels and massive open online courses. CEC in turn has appointed Channel Coordinators and Academic Coordinators for DTH and MOOC projects to ensure the viability of the broadcast content and coordination with the EMRCs, Faculty and other agencies. The Channel Coordinators at CEC look after the channels allotted to the CEC and carry out the subject wise programming, creation of new content, managing the EMRCs and Inflibnet Centre at BISAG etc. Those Media Centres which are allotted DTH channels also have Academic Coordinators for looking after their own channel activities.

The main responsibility of a Coordinator is coordination activities for development and delivery of MOOCs for SWAYAM portal and DTH programmes for the Swayam Prabha channel. The Coordinators at the CEC coordinates with different Media Centres and ensures smooth running of the programmes. The MOOC Coordinators also handles the activities of Subject Expert Groups who vet the proposals of teachers. The final approval for a MOOC is granted by the Academic Advisory Council on the basis of the recommendations of the SEGs.

The Coordinators from CEC were asked about the working conditions, their responsibilities, relation and coordination with MCs they are dealing with,

constraints they are facing, quality parameters adopted, conduct of feedback studies / results' implementation etc.

All are of the opinion that though the work load is of heavy and multi directional, they are managing it at the CEC level with many levels of stakeholders for timely and quality completion of tasks. They also are satisfied dealing with the Centres they have been entrusted with, keeping a cordial relationship with them. The Coordinators are also responsible for arranging the Subject Expert Groups comprising of 3 experts for vetting the proposals of MOOCs received at the CEC. Arranging 35-40 such groups is a heavy task, but all are of the opinion that they manage it satisfactorily. The reports of the SEGs are then submitted to the Academic Advisory Council which gives the final approval. The lists of approved courses are sent to the MCs and the Principal Investigators by the Coordinators.

They explained that the main review of the programmes (MOOCs now) are conducted by the respective media centres and random checking of 5-10 modules is done by the CEC preview team. After that the courses are uploaded onto the portal.

The remarks offered by the team are as follows:

- Gap areas in subjects: The CEC has received hundreds of proposals for MOOCs from teachers all over India, but the Coordinators are maintaining that there are still many more subjects for which MOOCs are to be made in to. In order to fill up the gaps, more and more teachers of those subjects need to come forward.

- Change in the curriculum: The programme development takes some considerable time both from the experts' side and from the media centre level. If any change in the curriculum is implemented, then it will adversely affect the credits and sequencing of the already developed courses but this has to be overcome by reviewing the content time to time and adding fresh information and weeding out and archiving the redundant.
- Old programmes: Unlike books, the video programmes needs up gradation periodically with each change in the curriculum, developments in technology etc. This requires new shooting/ recording which is time consuming particularly so when the production team is involved in daily work - this can be addressed by taking information from the faculty who are aware and can anticipate the changing needs of the student.
- Disbursal of funds: MHRD releases the project funds to CEC and the CEC then distribute it to the media Centres as per the number of papers/ modules in the case of e-contents, and credit and number of the courses in the case of MOOCs. The difficulty in disbursing the funds lies with the communication part between CEC and Centres. The timely submission of Utilisation and completion certificates by the centres ensures proper and timely disbursement of funds by the CEC. The CEC Coordinators try best by developing documents and guidelines that can give parity on the process and updating information sent by the Centres.
- Popularisation and viewership surveys: The Coordinator for DTH forwarded the details of viewership for a period of 6 months: from Jan - June 2019 as recorded by the BISAG Centre which is handling the DTH telecasts.

Table 19

Viewership of DTH Channels Allotted to CEC (Jan-June 2019)

Channel Number	Subject Coverage	Name of Channels	Viewership (6 months)
01	Language and Literature	Vageesh	23,92,454
02	History, Culture & Philosophy	Sanskriti	27,32,662
03	Social & Behavioral Sciences	Prabodh	4,08,651
04	Education and Home Science	Saaraswat	9,81,295
05	Information, Communication and Management Studies	Prabandhan	11,02,386
06	Law and Legal Studies	Vidhik	2,93,670
07	Economics and Commerce	Kautilya	4,69,432
08	Physical and Earth Sciences	Aryabhatt	7,67,092
09	Life Sciences	Spandan	9,15,543
10	Applied Sciences	Daksh	2,78,677

The DTH Coordinators suggested that inter channel advertisements can promote viewership. Watching the advertisements about programmes from other subject bands at channels other than the learners are viewing currently can increase awareness among learners. Not much effort is there for conducting any viewership surveys.

The investigator has contacted some Academic Coordinators from Media Centres also. They are of the opinion that it is always difficult to get quality experts for DTH lectures in their prescribed subject band/ area. Arranging the schedules for shooting in between the recordings for MOOCs with only 1-2 studios is another difficulty pointed out by them. Timely release of funds by the funding agency so as to meet the expenses in time is very important as far as they are concerned.

Responses of Head of DTH project

The interview planned for the Head of DTH was with the following themes - academic quality of the programmes, effectiveness of DTH telecasts and constraints faced in the dissemination of programmes, significance of telecasts, opinions on the e-content and MOOC projects, suggestions for improvement and role of Media Centres and expectations on them.

The Coordinator, also a renowned Professor of Chemistry at IIT Madras, opined that heterogeneity in educational quality is the fundamental constraint to the hosts of any telecasts or webcasts. The content quality, provided by various subject experts is not uniform. He also is of the opinion that the programmes are for learners, not for popular television, and so a video centric development is not a part of it. As for presentation aspect of a teacher, for them power point can be a limitation. Teachers tend to read mechanically and they fail to elaborate upon the points, thus making the video classes mechanical and dragging.

As far as the Professor is concerned, technology or changes in technology in particular is not a limitation as all providers use fairly good high end equipment and as such output of video quality is of no issue.

The Coordinator has pointed out many limitations in the model developed for E-contents. In the programmes, the teachers were made to sit in front of the camera. Most of them delivered the lectures in a monotonous way. The lectures instead of being discussions, becoming just deliveries. He suggested that 'Board rooms' should be there with multiple camera units so that in a recording, the plus points of a class room could be incorporated. There is no need to follow a set pattern, and the teachers should be allowed to move around freely. The

e - contents should be teacher guided student discussions bringing in the way students learn in a classroom setting. He remarked that DTH channels are trying to adopt different approaches for presenting content, not following a set template.

Regarding the problems with e-content development, the Coordinator observed that it had a different operating model. The EMRCs did not have a collaborative partnership with institutions, instead approached individuals directly. If such a partnership was there, the institutions could have been named/ selected expert teachers for the programme development. Another problem was regarding the content and curriculum which was limited to UGC old syllabus. Before undertaking such a huge project, the syllabus should have been revamped. Citing the example of NPTEL project, the Coordinator explained that at first the NPTEL team also developed many lectures with the old syllabus, but now they are reframing the curriculum based on the already recorded lectures.

Some of the persisting problems indicated by the Coordinator are,

- Students are not aware of the availability of these programmes. The teachers are not motivating and not advising them to utilise the resources.
- Poor advertising from the side of the agencies and poor planning of all the activities with respect to popularisation.
- The main limitation was the inability to reach out to a large number of learners in a short time.

For rectifying the issue of awareness among students, the Coordinator recommended many remedies: The Doordarshan is to be made to allot programme time, because television is still being watched by many, particularly people outside town area. Those who do not have a network, television is most

useful. Social media can be utilised to a good extent. Video repositories in YouTube and internet can be very beneficial for the learners. Every college needs to reach out to its students. There should be a faculty unit in colleges with a faculty single point of contact to deal with the dissemination of programmes. Educational institutions/ colleges also can have small scale advertisements.

Regarding the significance of telecasts, he has stated that as part of DTH, NPTEL and various other projects, the Governmental agencies are producing high quality videos for the learner community. It may not be very popular among the urban population, but are very well received at regions where the access to other networks is less. DTH project has school transmissions in regional languages and these also are very well received in rural areas. The Coordinator opined that inculcation of viewing habits has to be done in the beginning. It is better to assign one hour in schools for watching educational programmes designed for them.

On asking about the expectations from Media Centres, the Coordinator proposed that the Centres should produce best quality media and ensure that the content quality is equally important as the production quality. Academic review of the scripts should be done thoroughly before recording the lectures by at least two peer persons. If possible, it is better to form institutional collaborations. Also production of content of one subject should not be the responsibility of one Media Centre only, instead it should be that of an Academic Committee formed for that subject. This committee can name the experts from all over India and send them to Media Centres convenient to them for the development of the programme.

Considering the developmental aspects of MOOCs, the coordinator brought to attention many points. For MOOCs to be successful, the content

quality should be there. A network of faculty should be created first (SEG: Subject Expert Groups) and they should be the ones determining what should be done for each course. Then the Centres should help in developing those courses. Now it is the other way around. Also instead of inviting whoever is interested, the SEGs should identify expert teachers who are capable of delivering a course.

Responses of Indian teachers teaching at foreign universities/institutions

The investigator contacted 5 Indian teachers teaching at various Universities and institutions outside India. The questions given were based on the general themes: Learning at the tertiary education level, the experience in the field of telecast and webcast of educational programme, suggestions for improving the structure and dissemination of programmes, a comparison of programmes developed by India and foreign countries.

Out of the 5 teachers, one was associated with a Media Centre in the development of two DTH lectures. All the others have not involved in any of the activities of the Centres or watched any of the programmes telecast or webcast by the Centres either. The investigator requested them to watch some of the programmes and make a comparison with that of the programmes currently being webcast in the countries they are teaching.

The teacher from UK who have taught in two Universities mentioned that most of the teachers there record their lectures during class time/ content related to the same class and webcast or podcast (podcasts were more popular in UK) it after class in the weekends. This gives those who missed the classes another opportunity to watch the classes and have a better understanding. This becomes

more useful when teachers giving lectures to a large number of students could add more models/ illustrations during webcasting that otherwise could not have been presented in the actual class room situations. He further elaborated that as there are no set templates or uniformity and the presentations are actual recordings of the classroom situations, he did not feel any artificiality in those. On comparing the programmes with that of the Media Centres, he pointed out that the style of many teachers are boring and not very attention sustaining. He stated that,

"The teachers are reading text, may be with the help of a teleprompter. I could not watch these programmes for more than ten minutes. It should be like an elaboration of the points, just like teachers do in a classroom. If they do not read a text in the classroom, why are they doing so in a video class which is supposed to be a classroom like lecture?"

Some teachers with their communication skills elevate the level of programmes and he feels that the communication skills, presentation techniques, good language, good graphics and visuals - all these determine the quality of similar type of programmes like that of the Media Centres' productions. With regards to the MOOCs, this teacher felt that the foreign MOOCs, particularly American ones, are definitely better than the Indian ones in aspects like presentation, sequencing, academic quality, technical quality, provision of assignments, tests etc.

Another teacher feels that marketing is an issue with Government telecasts and webcasts. According to him, telecasts and webcasts cannot be throughout and often cannot be given at the convenience of the aspirant. Learners

should select the better options, but judiciously. For that type of selection, these governmental agencies should create more awareness among the students.

The teacher from Malaysia, compared webcasting of classes to placing products in a supermarket shelf. He said that,

"The web is like a big super market. You will get many types of a single product aiming a target group of customers. The one attracting the largest group becomes a winner in the race so to speak. Why blame Google? If your products are good, learners will definitely select them".

In his opinion, learning happens very minimally in a classroom. Most learning for tertiary education occurs outside classroom and during the preparation of examination. At these times, webcasts and telecasts can be the most useful modes for learning. This teacher recommended preparing the modules with illustrations and other multimedia. This would also enhance STEM type education (STEM is a curriculum based on the idea of educating students in four specific disciplines - science, technology, engineering and mathematics - in an interdisciplinary and applied approach).

Another teacher from Chicago concluded that the technical / academic quality of the programme, the techniques used, presentation styles, packaging and most importantly marketing and advertising are the determinants for a successful programme. She pointed out that as the USA has entered in to arena of e-resources and courses years before, they are far ahead and experienced in such productions. The standards also would be superior because of this.

One teacher has just started teaching in the Gulf countries after having taught in UK. He opined that the University system of education is very rigid

there, and a teacher is required to teach many courses in one academic year. If they are to produce online courses or supporting e-learning materials to their students, the work load and time constraints will affect the quality naturally. He feels that a teacher should be given amble time to prepare a course.

For popularising and improving such programmes, the teachers suggested the following:

- Develop applications which allow the students access the classes in their mobiles. These should be accessible to anyone even without computers.
- Maintain a dedicated team for managing and monitoring the quality of programmes.
- Two types of programmes can be made: For online distance education and as supplementary to the classroom lectures for better understanding. Need not be in the Governmental level, but can be developed by individual colleges or institutions for increasing effectiveness of regular/ distance education.
- Make the programmes more engaging by adapting better instructional designs. A better design and good presentation strategies make the programme more attracting and attention sustaining.
- Training should be given to teachers for better presentation. In most of the Indian programmes, teachers seem to be mechanically presenting a class. They must be made camera friendly and trained in different styles of presentation.
- Give more time for creating a course, screen the experts/ presenters and retain the better ones.
- Aggressive marketing strategies to be adopted by the Governmental agencies making the learners more aware about the authenticity of the programmes.

Conclusion of Phase II

Though the entry of Indian Government into the world of telecasts and webcast was late, the country has made significant growth in the sector. There are many initiatives and well run projects of tele and online education for the learners right from school to college levels.

The investigator has collected information from the people associated with one of the main such agencies in India, namely the UGC-CEC. From the Countrywide Class Room programmes produced with the help of just 6 Media Centres, the UGC-CEC has come a long way in the last 30 or so years and now with developments in ICT, became a strong presence in the world of educational communication.

Prevailing conditions were understood from the responses of the incumbents working at various centres. Information from developers and stake holders were collected to understand the different aspects of the situation and to suggest remedial measures to resolve problems, if any, of the sector.

The main constraints/ difficulties pointed out by the production team (mainly comprised of producers, research officers and engineers) include time constraints for the development of programmes & research activities, lack of infra structure facilities, lack of skill enhancement trainings etc. Producers pointed out that scarcity of teachers with good knowledge in the subject and with good communication skills, along with the pressure to complete targets in limited time make their work difficult. Engineers stressed the importance of updating equipment with advancements in technology and the importance of attending training sessions, trade fairs and workshops to keep themselves with the rapid changes in the field. Research Officers are concerned that with the heavy load on

production of programmes, research activities gets sidelined and not much research is being done both at the centres and at the apex body.

The concerns of the personnel from CEC are of a slightly different nature. Lack of infrastructure facilities is their main problem coupled with inadequate human resources to carry out the huge responsibility of the nodal agency for 21 Media Centres across India. Even after 26 years of establishment, the CEC is still functioning in the premises of another Inter University Centre, and does not even possess a proper building.

Despite the efforts of both CEC and the Media Centres, it can be understood from the responses of the stake holders and other experts connected to the field that the results of their labour are not reaching the needy in an effective way. Effective dissemination modes coupled with increased number of awareness programmes are the needs of the hour.

The Media Centres are functioning at different states under different universities/ institutions. The difference in the designations, the salary structure, the stagnation in positions on account of not having a proper promotion policy, the difference in the retirement age/pension conditions at different states due to difference in state service rules-all these are affecting the mental satisfaction of the staff. There are still no vacancies for some essential work: like sound recording, video editing, animation etc., and with restrictions in permanent appointments, no new recruitment is being made. The staffing pattern at the Media Centres is still the same as before - when the Centres were envisaged for the production of enrichment programmes. Times changed, technology changed but there are no moves to take up new positions like animators, IT professionals, etc.

Planning, production, transaction, evaluation - all are equally important to make parts whole. A thorough study and planning is required before embarking

upon any new projects. The roles of each agency, each position, each aspect - all need to be thoroughly studied and planned before implementing a programme. Both the e-content development and MOOCs suffered many short comings because of lack of planning and study. Production aspects also need to be carefully outlined - who will be doing what. If the Media Centres are supposed to be providing help in producing the programme (technical), they should not be burdened with the additional responsibility of finding the experts who will be providing content. The workforce there is not academical, but technical. A purely academic body should be there to provide them with experts. The only responsibility such a production facility should be entrusted with is helping the experts turn their scripts in to well made video programmes.

Transaction is another important factor. If the products are not reaching the intented, then spending huge amounts and efforts will be a waste. The lack of visibility and popularity is one the most important factors pointed out by all concerned. Right from the CWCR programmes, the same matter has been discussed the most, still the circumstances remain the same.

For any project to be successful, it is imperative that the shortcomings, the defects, the gaps etc. are to be identified and rectified. Presently, the concerned parties are not at all carrying out any research activities.

It can be concluded that, for improving the learning outcomes envisaged for the learners with respect to the educational telecast and webcast in India by the Governmental agencies, all the following points are to be considered and implemented:

- Learning system quality
- Readiness of the learners in accepting and utilising the resources

- The competencies, self direction, collaboration of learners in effectively utilising services offered
- Creation of better instructional designs and learning environments ensuring better interactivity
- Improving accessibility, flexibility and individualized feedback for a strong student - instructor connection
- Empower educators for better teaching and create experts' bank
- Smooth functioning of all networks of providers.

Chapter V

SUMMARY FINDINGS AND SUGGESTIONS

- *Study in Retrospect*
- *Summary of the Findings*
- *Suggestions for Improvement*
- *Educational Implications of the Study*
- *Suggestions for Further Research*

SUMMARY, FINDINGS AND SUGGESTIONS

This chapter gives an overview of the study, summary of procedures adopted, major findings of the study, analytical derivatives of the study, interpretations, educational implications of the study and suggestions for further research in this area.

Study in Retrospect

The present study was titled as **Analysis of Educational Telecast and Webcast in India with special reference to the contribution of UGC Media Centres.**

In both underdeveloped and developing countries, tele-learning and e-learning raises the level of education, literacy, and economic development. The Government of India, through its several agencies of education, is implementing and running several projects to uplift the education sector.

In the field of educational communication, the Consortium for Educational Communication (CEC) and the 21 Media Centres functioning under it are major forces to be reckoned with, in spite of the presence of many global providers. The study was undertaken to explore, explain and understand the various aspects of educational telecast and webcast carried out by UGC Media Centres. A detailed investigation and analysis of the functioning, facilities, performance and problems of Media Centres also were attempted for this study.

Objectives of the Study

Specifically, this study in respect of UGC Media Centres seeks,

1. To explore the evolution of telecast and webcast of educational programmes in India
2. To evaluate the status of telecast and webcast of educational programmes in India by UGC Media Centres and the contribution of UGC Media Centres in this domain
3. To examine the problems faced by the Media Centres in the production and dissemination of programmes for telecast and webcast
4. To suggest measures for the functional improvement of Media Centres

Analysis of these objectives was expected to lead to the evaluation of the functioning of Media Centres of UGC - CEC and the contribution of these Centres and their apex body in the dissemination of educational content via telecast and webcast. It was also expected to gain some insight into the problems and constraints faced by the Centres in the development educational content and dissemination of it to the learners so as to find out measures for the overall improvement of the system.

Methodology

A mixed approach involving both qualitative and quantitative paradigms / modes was adopted for the study as it was intended to explore, explain and understand the various aspects of educational telecast and webcast carried out by the UGC Media Centres.

The study was carried out in two phases. In the first phase, the historical evolution of telecast and webcast of educational content in India with emphasis on the contribution of Media Centres was explored in detail keeping in mind the first objective envisaged for the study. Several documents, annual reports of various organisations connected with the topic, books on the subjects, research papers, articles etc were perused to get a clear picture on the historical aspect of the study. This phase also describes and presents the status of telecast and webcast of educational programmes developed by the Media Centres in India like the status of production, dissemination, viewership etc. The annual reports of CEC and the Media Centres, websites, research reports and books were perused for the purpose.

The following aspects were compiled and analysed utilizing the aforementioned sources:

- The historical evolution of telecast and webcast of educational content in India with emphasis on the contribution of Media Centres
- The establishment and growth of UGC Media Centres in India
- Different initiatives of Government of India for the development of educational materials and dissemination of them
- The aims and objectives of UGC and CEC with respect to the Media Centres
- The status of telecast and webcast of educational programmes developed by the Media Centres in India, like the status of production, dissemination, viewership etc.

- The functional organization structure of the Media Centres and CEC
- Managerial and Financial Aspects of CEC
- Production aspects with respect to personnel involved and educational programmes produced.

In the following phase of the study, different facets of production of educational programmes, the dissemination, the working of the centres, effectiveness of the programmes etc were analysed from the responses of Directors, Research Officers, Producers, Engineers, Subject Experts, Students, Coordinators, Academicians, etc. collected through questionnaires and interviews.

Population

The population of the study undertaken is the Media Centres of UGC functioning under an apex body - Consortium for Educational Communication - an Inter University Centre of UGC on Electronic Media. From the establishment of 6 Media Centres set up at 6 Universities by the UGC for developing and running the Countrywide Classroom Programmes in 1984, the number of Media Centres steadily increased. When the study was undertaken, there were 18 media centres spread over 14 states, by 2016 the number was increased to 21 including the one at the Union Territory - Puducherry.

The details of the Centres are given below

Sl. No.	Name & Place	Functions in	State
1.	MCRC, New Delhi	Anwar Jamal Kidwai - Mass Communication Research Centre, Jamia Millia Islamia	Uttar Pradesh
2.	EMRC, Hyderabad	Osmania University	Telengana
3.	EMRC, Pune	University of Pune	Maharashtra
4.	EMRC, Roorkee	IIT - Roorkee	Uttarakhand
5.	EMMRC, EFLU - Hyderabad	Central Institute of English and Foreign Languages (CIEFL) (now EFL-U)	Telengana
6.	EMMRC, Ahmedabad	Gujarat University	Gujarat
7.	EMRC, Chennai	Anna University	Tamilnadu
8.	EMMRC, Jodhpur	Jai Narain Vyas University	Rajasthan
9.	EMMRC, Kolkata	St. Xavier's College (Autonomous)	Kolkata
10.	EMMRC, Srinagar	University of Kashmir	J & K
11.	EMMRC, Madurai	Madurai Kamraj University	Tamilnadu
12.	EMMRC, Imphal	Manipur University	Manipur
13.	EMRC, Patiala	Punjabi University	Punjab
14.	EMRC, Indore	Devi Ahilya Vishawavidyalaya	Madhya Pradesh
15.	EMRC, Mysore	University of Mysore	Karnataka
16.	EMRC, Sagar	Dr. Hari Singh Gour University	Madhya Pradesh
17.	EMMRC, Calicut	University of Calicut	Kerala
18.	EMRC, Lucknow	Babasaheb Bhimrao Ambedkar University	Uttar Pradesh
19.	EMRC, Dibrugarh	Dibrugarh University	Assam
20.	EMRC, Bodh Gaya	Magadh University	Bihar
21.	EMMRC, Puducherry	Pondicherry University	Puducherry

Sample and Date Sources

The 21 Centres and the apex body - CEC are functioning at 17 states of India. As it was difficult to go directly to all the Centres to collect information, the investigator selected a representative group, wherever such a case is possible, from among the centres. Purposive sampling technique was adopted for the study.

For the purpose of the study, data were collected from the personnel associated with the sample selected for the study: Centres at Jamia Milia - Delhi, Osmania University, Puducherry, Dibrugarh, Patiala, Roorkee, Calicut University, Madurai, Sagar and EFLU - Hyderabad. Data were collected from the personnel at CEC also as it is the apex body under which all the MCs are functioning.

The subject matter experts associated with the Centres in the production of programmes and students who are the beneficiaries of the efforts of these centres were also considered to gain an insight in to the various aspects of the situation. Suggestions and recommendations also were collected from those who are experienced in the field of educational communication.

The data sources and the rationale for selecting them are given below:

- From the Media Centre: All the staffs at a Media Centre are working towards the development of educational programmes for the learning community. Though each position is important, data were mainly collected from the following work force:
  - Production Team of a Media Centre: The key personnel involved in the development of a programme at any Media Centre are, the Producers who are the in-charge of the production from collecting scripts to the sending of the programme, the Research Officer who is responsible for the research activities of a Centre including content research and the Engineer who is responsible for the maintenance of both the studio and equipment of a Centre.

- Director-Media Centre who controls all the activities of a Media Centre.

- Subject Matter Experts: Be it a documentary or an e-content or a MOOC, subject experts are the back bone of any educational video programme. Their academic expertise acts as the scaffolding for the entire programme.

- Students/Learners: It is for the benefit of the learner community that these programmes are being developed. Being the main stake holders, their opinions and perceptions can mould and improve the programmes.

- The team - CEC: As the nodal agency for the 21 centres, each position at CEC has its immense responsibilities. For a better understanding of the process of development and dissemination of the educational programmes and issues/ constraints prevailing there, the responses of the following personnel were collected:
  - Director - CEC
  - Joint Director and the Preview team under the JD
  - Research Officer
  - Finance Officer
  - Media Tape Librarian
  - Producer
  - Engineer
  - Academic Coordinators
  - Governing Body Member of CEC was approached to get an understanding about the governance of CEC.

- Indian origin teachers teaching at foreign universities: As they are teaching at foreign countries which have adopted technology earlier than India and made better progress, the teachers teaching there can compare the programmes with that of their resident countries and offer recommendations for improvement.

- Head of DTH Project: As an expert in the subject field as well as one of the people behind the prestigious NPTEL project, the opinions of the Head of the DTH project are very valuable.

For studying about the production facilities and productions (total number of productions since establishment, number of studios and details of posts sanctioned/filled) the investigator selected 10 Centres randomly and collected data. The ten Centres are,

1. EMRC, Osmania University
2. EMRC, Ahmedabad
3. EMMRC, Jodhpur
4. EMRC, Chennai
5. EMRC, Madurai
6. EMRC, Srinagar
7. EMMRC, Kolkata
8. EMRC, Mysuru
9. EMMRC, Calicut
10. EMMRC, Dibrugarh

Tools and Technique used for the Study

For this study the following questionnaires were used for collecting data.

1. Questionnaire on the activities of Media Centres to Directors of Media Centres (Samitha & Musthafa, 2014)
2. Questionnaire on Production aspects to Producers of Media Centres (Samitha & Musthafa, 2014)
3. Questionnaire on Research aspects to Research Officers of Media Centres (Samitha & Musthafa, 2014)
4. Questionnaire on Technical aspects to Engineers of Media Centres (Samitha & Musthafa, 2014)

5. Questionnaire on awareness and utilisation of educational telecast and webcast to students (Samitha & Musthafa, 2014)
6. Questionnaire to Subject Matter Experts of Educational Programmes (Samitha & Musthafa, 2014)

Semi-structured interviews within a frame work were administered to gather information from the following persons:

a. Head - CEC
b. Member of Governing Body of CEC
c. Joint Director (Software) - CEC and the Preview team
d. Finance/ Accounts Officer - CEC
e. Media Tape Librarian - CEC
f. Research Officer - CEC
g. Broadcast Engineer - CEC
h. Academic Coordinators of CEC & Media Centres
i. Indians teaching outside India
j. Head of DTH Project

Statistical Technique Used

Percentage analysis was used wherever needed. Similar responses were pooled and explained. Odd responses were treated separately and described qualitatively.

Summary of the Findings

The findings of the first phase of the study with respect to the first two main objectives - the evolution of telecast and webcast of educational programmes in India and evaluation of status of telecast and webcast of educational programmes in India by UGC Media Centres - are summarised and presented below.

Educational Television in India - The evolution

When the first television transmission was started at New Delhi on 15th August 1959, the primary objective was to use it for transmitting education related programmes. In the beginning, as no one owned private television sets, the Government established 180 teleclubs with television sets in and around Delhi facilitating viewing of programmes. As the schools in India after independence lacked good laboratories, quality teachers, classroom facilities, well stocked libraries etc. the earlier transmissions were comprised of science related programmes based on school curriculum. These broadcasts of tele-lessons to schools in Delhi as part of an experimental project paved the way to the start of various other initiatives with respect to educational telecasts in India.

The important milestones with respect to the educational telecast in India are,

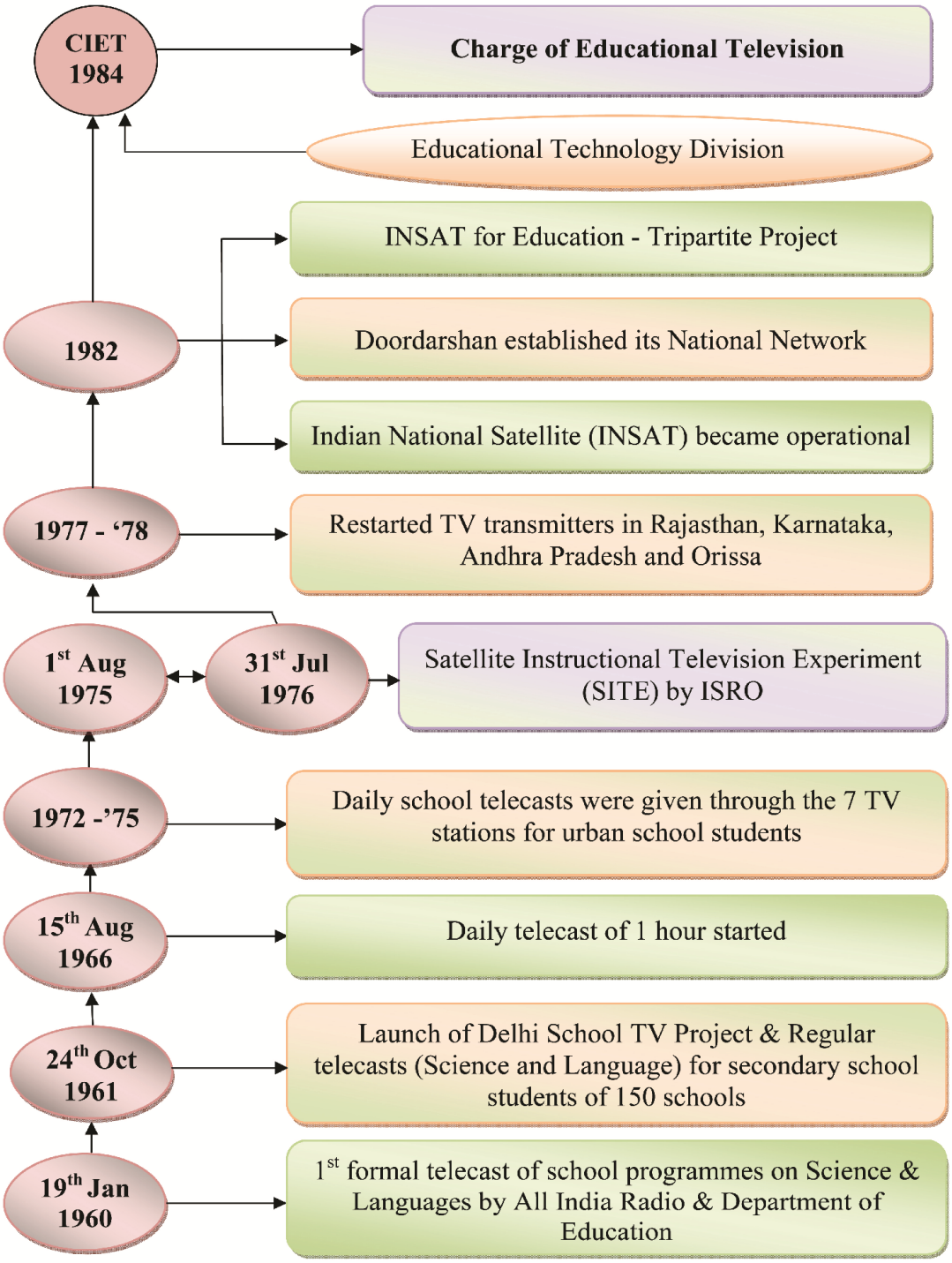
- 19th January 1960: All India Radio in collaboration with Department of Education launched the first formal telecast of school programmes on Science and Languages.
- 24th October 1961: With the help of Ford Foundation, Delhi School TV Project was launched on an experimental basis to study about the role of TV in education. Specially designed science and enrichment programmes were aired for secondary school students of Delhi. Regular telecasts (Science and Language) for secondary school students started in 1961 with about 150 schools receiving the programmes.
- 15th August 1966 : Daily telecast of 1 hour was started for schools
- In between the Government to took up a scheme of Educational Technology and established a unit for Educational Technology in 1971

with the assistance from United Nations Development Programme under the administration of NCERT following the success of the project carried out in 1961. Under the scheme, an ET unit in the Ministry, a Centre for Educational Technology (CET) under NCERT, and ET cells in six SITE states were set up in 1974.

- 1972 - 1975: Daily school telecasts were given through the 7 TV stations (Bombay, Srinagar, Amritsar, Pune, Calcutta, Madras and Lucknow) established by the Government during this period benefitting the urban school students of these places.
- 1st August 1975 - 31st July 1976: Satellite Instructional Television Experiment (SITE) by ISRO using the American Application Technology Satellite (ATS-6) used satellite for broadcasting messages related to health, family planning, adult literacy, teacher education, science education and primary education through television programmes.
- 1977 - 1978: Following the success of SITE, Government restarted TV transmitters to meet the needs of education and development in Rajasthan, Karnataka, Andhra Pradesh and Orissa.
- 1982: Indian National Satellite (INSAT) became operational. Also Doordarshan established its National Network. INSAT for Education was conceived as a tripartite project, and was supported by UNDP, UNESCO, and GOI. Under its aegis, an Educational Technology Division in the Ministry of Education was set up.
- Central Institute of Educational Technology (CIET) was then set up merging Centre for Educational Technology (CET) and Department of

Teaching Aids (DTA) of NCERT in the year 1984. This agency was the one which was first charged with the task of undertaking educational television.

The development is depicted in the following flow chart:



Recognising the factors hindering the growth of conventional education in India, UGC - India's apex body for higher education constituted a Working Group to advise it on various matters connected with the setting up of centres of mass communication and educational technology in Indian Universities. A Task Force to prepare a Plan of Action was appointed in August 1982 based on the recommendations of the Working Group.

Considering the unfamiliarity of the teachers who are to produce educational programmes for television with the new medium and limited facilities at the universities and institutions, and for familiarising these experts in programme production, UGC set up training and production facilities - 4 Educational Media Research Centres (EMRCs) and 2 Audio-Visual Research Centres (AVRCs) with standard equipment-at six selected Centres (Jamia Milia Islamia at New Delhi, Poona University, Gujarat University, CIEFL & Osmania University at Hyderabad and Roorkee University).

Further developments with the UGC INSAT TV Project were as follows:

- Establishment of a Central Programme Committee to coordinate and channelize suitable material for daily telecast to Doordarshan
- Setting up of a Cell/ Unit at Jamia Milia Islamia for procuring world class educational programmes from other Universities/ institutions in India or abroad and for determining suitability of such programmes for telecast.
- Setting up a Research Advisory Committee for research

UGC initiated the Countrywide Classroom (CWCR) Programmes in the year 1984 and the first telecast started on 15th August, 1984 on Doordarshan National Network (DD1).

The progress with the telecast of CWCR is given below:

- Up to February 1985 : between 12.45 p.m. to 01.35 p.m. for six days in a week
- From 16 February 1985: Repeat telecast of the programmes started, later changed to morning slot - between 5.30 and 6.30 a.m.
- 1993 : CEC was established.
- Daily test transmission of programmes was done for 2 hours from 5.00 p.m. to 7.00 p.m.
- 26th January 2000 : official launching of the exclusive education TV Gyan Darshan, the duration of transmission increased to 4 hours each day, from 5.00 p.m. to 9.00 p.m
- 1st November 2000: Gyan Darshan became a 24 hour channel, UGC programmes had a 4 hour slot and the programmes were repeated 2-3 times a day.
- March 2002: GD channel changed from Analog to Digital mode. Later the IGNOU expanded Gyan Darshan into four separate channels.
- 26 th January 2004: First ever higher education channel of India VYAS was launched, the CWCR programmes were aired on a 24x7 basis. Also telecast for one and half hours on DD 1 and DD Bharthi.
- 20th September 2004: Launched EduSat programme. UGC/CEC was one among the 6 user networks. Through several Receive only Terminals (ROT) and Satellite Interactive Terminals (SIT), it aimed to supplement the curriculum based teaching.
- ISRO, after withdrawing the support given to EduSat transmissions, provided the band width to a bouquet of 32 DTH channels (SwayamPrabha DTH Project).

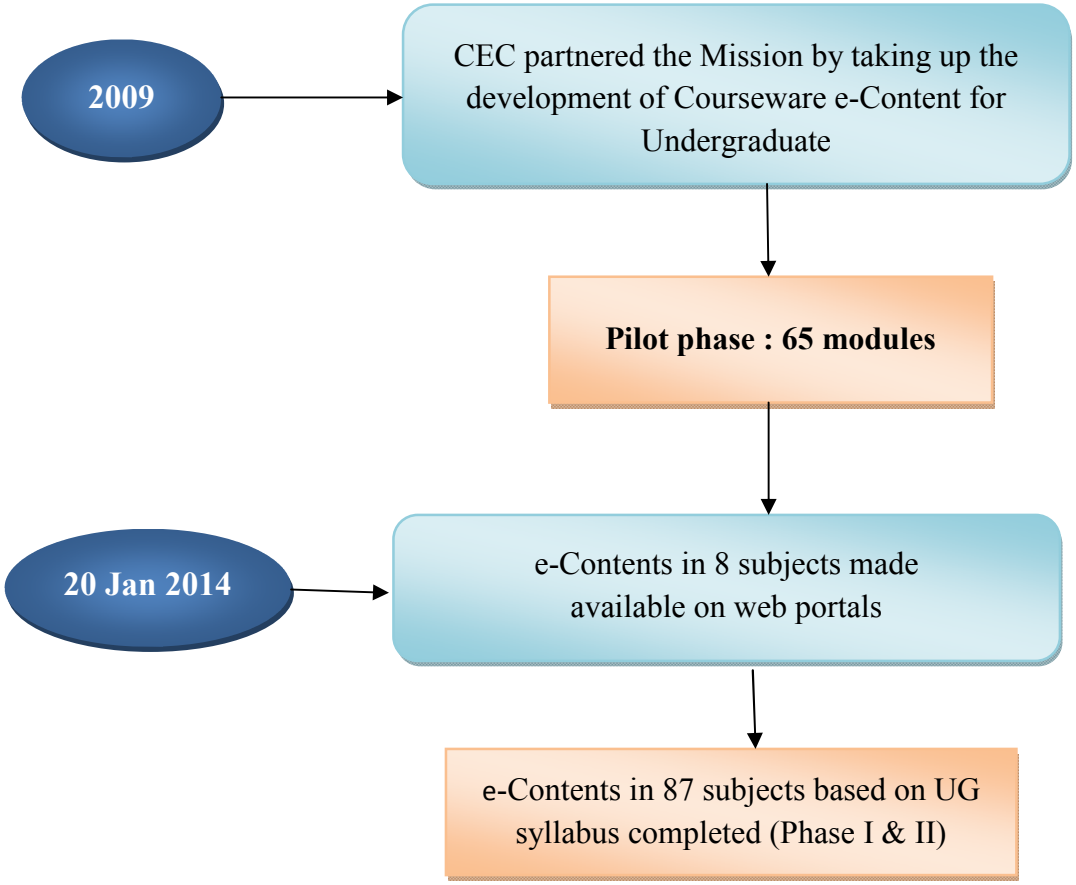
Development of e-resources and Dissemination

On 2nd February 2009, National Mission on Education through Information and Communication Technology (NME-ICT) was launched by MHRD for strengthening ICT infrastructure in the higher educational institutions and for development of courseware e-Contents for tertiary education sector.

Another main project launched was e-PG Pathsala (for development of e-content at Non-Technology PG level in 77subjects).

Production of courseware E-content by CEC for undergraduate subjects

The development of e-contents by the CEC and the Media Centres as part of NME-ICT project is illustrated as below:

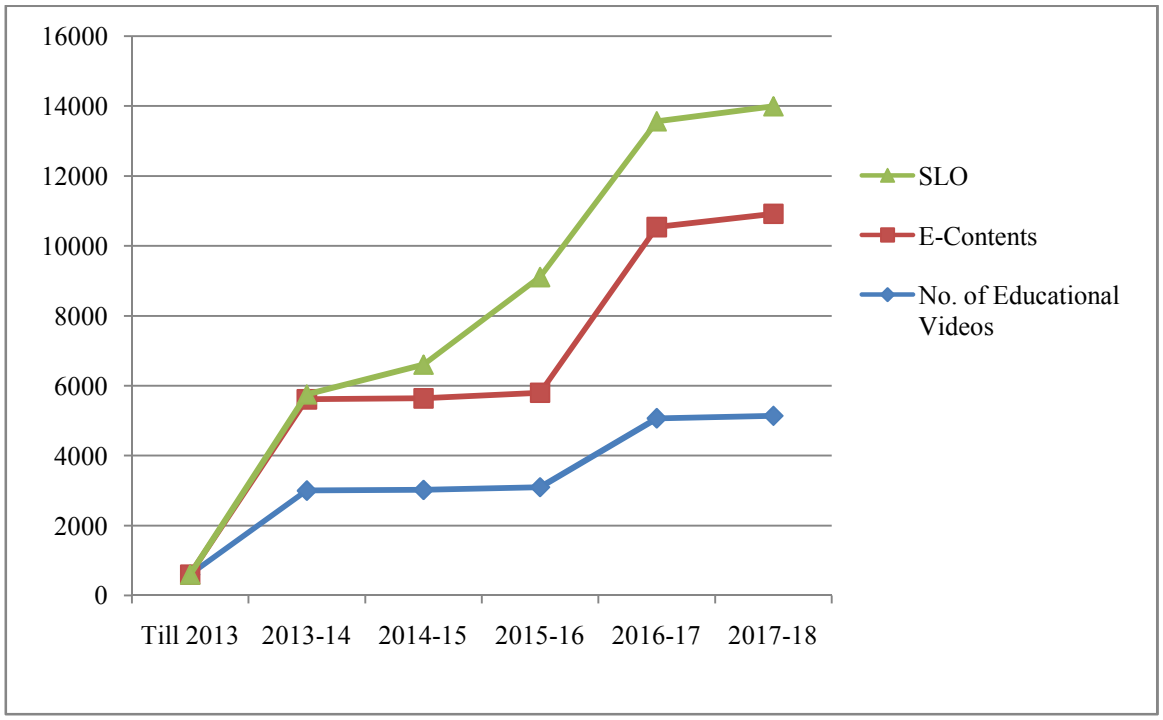


Production rates of educational programmes by CEC and Media Centres for undergraduate subjects

The rates of production of ETV programmes, e-contents, Short Learning Objects (SLO)/ Learning Objects for the consecutive 5 years by the CEC and the Media Centres are given below:

No.	Year	No. of Educational Videos /year	E-Contents/year	SLO
1.	Till 2013	602	-	-
2.	2013-14	3002	2613	138
3.	2014-15	3022	2620	962
4.	2015-16	3100	2700	3,310
5.	2016-17	5071	5470	3,025
6.	2017-18	5140	5778	3,075

The rise in the production is illustrated in the graph:



After the successful development of e-contents, the CEC and the Media Centres entered into the production of DTH Lectures for a total of 11 channels entrusted to them and Massive Open Online Courses (MOOCs).

For the dissemination of the programmes developed, CEC and Media Centres adopt both Broadcast and Non-Broadcast modes.

The programmes are available through,

- Swayam Prabha DTH Channels: 11 including Vyas
- CEC YouTube channel: Started in 2012 and live lectures are uploaded.
- Webcast: at CEC site (cec.nic.in) (Also available on www.swayam.gov.in, www.sakshat.ac.in and www.webcast.gov.in web portals of Government of India)
- MOOCs : At the SWAYAM portal

Analytical Derivatives of the Study

The other two objectives of the study are to examine the problems faced by the Media Centres in the production of programmes for telecast and webcast and to suggest measures for the functional improvement of Media Centres/CEC. For analysing these, all the responses from the participants of the study were pooled and studied. The study revealed the issues and constraints faced by the CEC and the Media Centres.

It can be understood from the previous section that the Government has spared no efforts in developing various projects for the upliftment of education at all levels in the country starting from ETV programmes to MOOCs. India is not behind, but moving with ease with the objective of Education for All.

There are 21 Media Centres in India at different parts of the country as on 2017 and with CEC as their Nodal Agency, all are involved in the production of educational programmes for the educational sector disseminated vide both broadcast and non-broadcast modes. 16 states and one UT can now boast of the presence of Media Centres.

The responses from the participants of the study can be divided into those from the media Centres, from the CEC, from the content providers: i.e. teachers, from the main beneficiaries: i.e. students and from the educationists.

For a production centre, the main activity is the production of programmes which are disseminated by their apex body and in a smaller scale, by themselves. From the Media Centres, the responses of production, research and technical personnel were collected. Almost all are satisfied with the working conditions at a Centre except for the uncertainty in the service matters like promotion policy, retirement etc. The main constraints and changes required pointed out by the production team were as summarised below.

The producers at the Centre are concerned that they are not much involved in the actual development of a video as the script and presentation is done by the Subject Matter Expert and they do not get any opportunity to utilise or foster their creativity as in the creation of a documentary.

A need to be kept abreast of the recent developments in the field is strongly felt by all of them. They do not get time or opportunities to go for any trainings or skill enhancement workshops due to the race to reach the targets. Another common difficulty pointed out by them was about the scarcity and difficulty of finding expert

teachers with good communication skills who are capable of delivering a good quality lecture. In a nutshell, everyone agreed that an educational video with quality content, clear presentation accompanied by well thought out and sequenced graphics and other multimedia parts makes it attractive and useful to the student community.

The technical and technology era is a fast changing one. The Engineers are of the opinion that instead of concentrating on the basic requirement of a studio facility, the focus of the Technical Advisory Committee should be more on the advance technology and economical equipment, now that all the studios are already equipped well. Any studio, to maintain a high level of technical quality for programmes, should have high quality recording equipment, video-audio mixtures and other PCR equipment. Almost all pointed out a need for better participation with CEC before and during the preparation of the TAC list by the CEC. Regarding the purchase of equipment and arrangement of studios accordingly, the issue lies with the time gap between allocation of funds, release of TAC lists, the procedures to be completed by the Centres, getting sanction from the individual Universities / Institutions under which they are working etc.

From the responses of the technical personnel of the Media Centres, it can be understood that the format level prescribed and followed for recording and sending the programmes is on par with other broadcast channels elsewhere. For keeping abreast of the changes happening around the world in broadcasting, both the Media Centres and the CEC should be improving their production workflow. On the personal side, all the technical team members pointed out the necessity to be aware and knowledgeable of the advancements in the technology and skills in running a studio effectively and effortlessly.

As for the research activities, from the responses of the concerned team, it is clear that not many such activities are taken up and carried out by the Centres. With only a low number of producers coupled with heavy work load, the research officers are also getting involved in independent production work. Now, many Centres on a small scale have started spreading awareness among the students by conducting workshops, seminars etc for familiarising them with the availability and use of such resources produced.

For any work to be successful and effective, research is a must. Without viewership surveys or content research or research related to the requirements of the stake holders, the programmes become more like factory made without any improvements. The Centres need to change the formats, strategies, modes of dissemination etc based on the changing needs of the education sector, otherwise their products on which huge amounts have been spent will become stale. The officers have stressed the importance of research studies panning India since the levels of students are different in different states. All Centres should get involved in the studies and then the CEC can compile the data and do big data analysis using computational methods to take appropriate actions.

As the persons controlling all the activities of a Centre, the Media Centre Directors are satisfied with the working conditions, the human resources, production figures, quality of the productions etc. at their centres. The relationship with the host university, getting funds in time, obscurity in the service rules concerning the staff of the centre, indifferent attitude of the authorities etc. are some of the issues concerning the running of a centre. Some suggested that the absence of permanent directors and frequent changes in the position may affect the functioning of the centre. All are of the opinion that the CEC and the Media Centres should be given more autonomy in their functioning.

Responses of students and subject matter experts

Students are the main beneficiaries of all these efforts of the Centres. It is alarming to notice that despite the efforts of the Government and the amount spent, a large percentage of students are not aware of the television lectures, e-contents, Massive Open Online Courses and DTH lectures developed and disseminated by Government agencies. When the students are not even aware of the existence of CEC or Media Centres, they won't be looking for the services of the agencies available free of cost.

In the present scenario, majority of the students have the habit of using internet for extracting study materials for supplementing classroom learning relying heavily on the all encompassing Google, not ascertaining first whether those are authentic or not. They are not taking full advantage of the authentic and if not better resources available free, prepared by quality teachers from formal educational sector. This shows that the agencies of education are not successful in popularising these types of initiatives which can be most beneficial to the student community. In a formal education sector, teachers are the facilitators of learning. They can make a huge difference in the study habits of a student. If they themselves are not motivating the students to adopt new ways of studying and learning, any initiative is doomed to failure.

The teachers who provide the content for the programme are the backbone of any programme developed for the learner community. Almost all pointed out that a quality teacher skilled in effective communication uplifts the level of any programme however badly it is made. Being an integral part of the development of a programme, and already contributed to the development of some associating with the media centres, the teachers participated in the study shared their apprehensions and suggestions regarding the whole process.

All are of the opinion that the educational telecasts and webcasts are not having enough visibility and popularity among the students. As the programme development is a time bound process, maintaining quality and innovativeness is difficult with changing times and requirements. They feel that enough studies and trials should have been conducted by the agencies before embarking upon initiatives with such massive effects. The inadequate preparations and studies of the authorities are reflected in the earlier productions. The experts proposed that creating more awareness among students / colleges for utilising the programmes should be the foremost priority.

Responses of CEC personnel

Responses of the personnel from the CEC were collected to understand the role and activities of CEC as a Nodal Agency to the 21 Media Centres across India and for having a clear idea about the constraints they are facing.

At present all the Media Centres under the CEC are working as per a tri-partite agreement between UGC, CEC and University. The Director is of the opinion that the agreement should be between UGC, CEC and the Media Centre which ensures some sort of autonomy in the functioning of CEC, at the same time ensuring a flow in the structure too. Also CEC should be given full responsibility of running the Centres, which can ease the burden on the part of the Media Centres regarding the hassles and other issues with UGC and the Universities with respect to fund disbursal, purchasing of equipments, policy matters, service rules etc. which in turn ensures a parity among all the Centres, which is not the case now. The Director ensured that with initiatives like digital lounges, MOOC productions, DTH channels, workshops, trainings, webcasts, awareness programmes etc. the CEC is moving ahead in full steam.

The Governing Body member is hopeful that the new strategies being developed, new policies formulated, aggressive popularization programmes being implemented, etc. will improve the functioning of CEC.

Most of the other personnel from other sections of the CEC expressed their main concern as the poor infrastructure facilities there. They do not have enough and adequate space for anything. Even after more than 25 years, the CEC does not have a building of its own, but functions in the premises of Inter University Acceleratory Centre (IUAC) Campus at New Delhi where the major part of the land is occupied by them. On visiting the CEC, the investigator could see that none of the different departments has enough working space.

The producers stressed the following points which are the most important determinants regarding the quality of the programmes.

- Expertise and communication skills of subject matter experts: Expertly presented content attracts the attention of every one, the effect will be more if it is from an academically brilliant person. Heavily accented language affects the on-screen teaching adversely, but the producers are helpless in this regard. The expert teachers may not always be having good accents and vice versa.
- Scarcity of expert teachers: Most of the senior professors from Universities are not coming forward on their own owing to their heavy workload at their place of work.
- Pre-production planning: The production team pointed out the importance of pre-production meetings for any type of productions. They maintained that the pre-production meeting should include all the concerned parties - the production personnel from Media Centres and CEC, subject matter

experts, technical personnel etc. in order to have a clear understanding on what is expected out of a production.

The Media Tape Library which is the repository of all the programmes produced so far by the Centres, also lacks space for development. There are no reading rooms and not much facilities for viewing/checking the programmes. Though they have succeeded in digitizing bulk of the programmes which were in the old formats, the conversion of very old programmes is yet to be completed. A large number of programmes in the old format converted already to digital format lacked the requisite quality and those are to be converted again to newer formats. The server they are using has to be replaced. Adoption of new technologies like cloud computing, conversions of programmes to the better formats at the right time (whenever there is a major change in the technology), creating digital libraries, better maintenance of the Media Tape Library 24 x 7 are the main future plans outlined by the Library team.

The software division team pointed out the delay in getting back the programmes from the Centres after effecting the corrections is a problem faced by them. The software unit already has developed an LMS (Learning Management System) for delivery of content and their future plans include the development of a mobile app which will be launched soon. The programmes which are in the Flash format (not supported by many browsers) also are to be converted to HTML. Lack of human resources particularly persons proficient in the IT field is another main issue with them.

The finance aspects of the Centre are satisfactory as reported by the Finance Officer. The only problem lies with the delay in getting the TAC Grant (for equipment) which in turn delays all the other process like tendering, purchasing etc.

The Academic Coordinators of CEC and that of MCs handling matters of independent channels maintained that despite the heavy work involved in coordinating the activities concerning MOOCs and DTH lectures, they are managing well. Aggressive marketing strategies, filling the gap areas in subjects, conducting popularization & viewership surveys etc are some of the suggestions put forth by them. The Head of DTH project offered many important and valid recommendations which can be followed by the CEC and Media Centres for the improvement and betterment of the system. Some of the suggestions and recommendations include forming core groups of expert teachers for each subject at national level, the selection of which can be made by an expert committee, forming collaborations with institutions, adopting different approaches for presentation of content on camera and revamping existing curriculum.

The Indian teachers teaching at various foreign universities also recommended several actions to be undertaken by the production centres. Adopting better instructional designs, training given to teachers before they do the presentation of programmes on camera, increasing awareness among students, maintaining a dedicated team for ensuring quality of programmes etc. were their suggestions.

On a common note, the working conditions and the mental satisfaction of the staff have direct relationship with the productivity of any organization. Majority of the Centres are working under State universities: the difference in the designations, the salary structure, the stagnation in positions on account of not having a proper promotion policy, the difference in the retirement age/pension conditions at different States due to difference in State Service Rules - all issues are affecting the mental satisfaction of the staff. Also because of these conditions, the Media Centres fail to attract talented people, who prefer mainstream production centres and broadcast channels. There are still no positions/ posts for some essential work: like sound

recording, video editing, IT related work etc. The Centres resort to hiring freelance staff or letting whoever is producing the programme do the additional works too within their capacity.

As majority of the Centres are functioning in Universities, the Directors are almost always chosen from the professor community who may not be having much exposure to the media. Also many Centres are functioning under in-charge Directors who gets changed every now and then. This affects the continuity of the working of a Centre.

With the increase in the different modes of dissemination and transmission hours, the demand for productions increased exponentially, at the same time the number of staffs remained the same. The heavy workload of the Centre coupled with many vacant positions (on account of restrictions imposed on new appointments/ staffing rules of UGC) made them assign production work to other staff like Camerapersons, Research Officers, Engineers and Technical Assistants which in turn affected their own duties. The best example is that of the research activities of the Centres: nowhere much research is being carried out as the Research Officers are heavily involved in the production of programmes. When the Centres get to produce a large number of programmes without an appropriate workforce, the quality of the programmes gets affected.

Suggestions for Improvement

From the 1920's when the first video transmission happened in USA, and from the 1950's when it was introduced to India to educate masses, television and its utilization in education have come a long way. When internet took over the world by storm, television was sidelined. Now with more than a decade of extensive teaching/ learning on the Internet, as a supplementary tool or extending

learning, we can say that the use of internet for dissemination of educational resources to the learners also has come a long way. With DTH network and many exclusive channels for education, television is trying for a comeback while internet for education is still moving ahead with momentum.

The main Governmental agencies also are incorporating the timely changes in their strategies and productions. Based on the facts and responses collected, the important suggestions put together with respect to the production and dissemination of the programmes and organizational aspects are listed below.

Production of programmes

1. Demand and supply aspects should be studied well in advance for any project. The remarkable growth and lightning changes in the technological world coupled with the pervasiveness of media demand an ever vigilant approach by the agencies of higher education. Education system and the authorities need to adapt to this scenario.
2. The agencies responsible for the development of educational programmes must have a solid plan of action and implementation of the programmes or projects should be based on need assessment studies coupled with proper planning. No project should be launched in haste.
3. It is not easy catering to the needs of the youth belonging to the fast changing world of this century. There are changes in every sector: be it newer subjects and branches of subjects, the teaching styles of teachers, the supporting materials available, use of technology like smart panels etc. in the class rooms, requisites of newer skills in the job sector - all these matters are to be considered seriously for the development of any programme for the learner community.

4. Each programme made for the learners should be based on prevalent practices, use of media adopted/ preferred by the stake holders, preferences, attitude and habits of learners etc. These factors are to be considered and well studied for any educational project.
5. The learning environment created should be compatible with today's world, at the same time with tomorrow's changes too. The experience of the learners, their readiness to accept the television/ web based learning systems, the competencies of the learners in using the services, their awareness on the availability of the resources - all these are to be considered for the success and effectiveness of the programmes and projects. Along with the concept of transacting knowledge, the programmes envisaged for the learners should focus on developing creative thinking, flexibility, communication and soft skills.
6. In the lectures and most of the e-contents developed earlier, the teachers used to teach in rigid, formal and stereo-typed ways. It was more like reading text using a power point application rather than discussing the matter on camera. This style makes a video programme monotonous and boring. There should not be a set pattern or template, instead Subject experts are to be encouraged to follow different approaches and their own styles for presenting educational content on camera which can sustain the attention of learners utilising appropriate support materials like graphics, animations, videos, demonstrations etc.
7. The teachers developing and presenting the programmes should be aware of instructional designs and must be able to choose the best one for their particular branch of study. Frequent training sessions and support systems can be of much help in the matter.

8. Lack of interaction was pointed out as the biggest drawback of telecasts before. With the establishment of virtual class room set ups, the problem was lessened, but the providers are not giving much emphasis on the aspect of interactivity both in the case of telecasts and webcasts. For the newly launched MOOCs, discussion forums, facility to contact teachers through e mails, etc. are there, still research and trials on other methods may be carried out to better the circumstances.

9. The technical quality of the programmes should also to be considered along with the academic quality. A poorly made programme, however good may be the content, will not attract attention of the concerned. A better packaging always guarantees attention.

Dissemination of Programmes

1. With its presence at majority of households and high penetration power, the role of television as a teaching aid and as a supplementary service to academic curricula for formal education sector as well as continuing and distance education sectors must be strengthened with proper and aggressive planning, popularisation strategies and awareness programmes targeting both learners and teachers.

2. Though it is said that the role of television got diminished with the arrival of internet, in a country like India where the majority of the people living outside urban area, television still has a valuable presence. The policy makers and authorities should ensure the allotment of slots in the national network and other channels as well, for educational programmes. The Government has arranged several exclusive channels for the learner

community but their reach continues to be at a minimum level. This point to the need for more popularisation and awareness activities.

3. Drawing from the experiences and lessons from the earlier attempts of study on telecasts, todays' educational telecasts should be revamped as per the needs of the present times. Majority of the studies pointed out the issues related to telecast timings, presentation aspects, learner satisfaction, learner preferences, interactivity, popularisation, awareness programmes etc. - all these issues and difficulties need to be studied and remedied before going ahead with more educational telecasts if it is to be successful with the learner community.
4. Though internet and the global providers of internet related services have penetrated and strengthened its presence with the young population, the importance of exploiting the educational telecasts and webcasts by the Governmental agencies for quality and authentic content must be highlighted at all circles.
5. The studies from as early as 2005 have pointed out the usefulness of adopting several new methods for better reach of programmes such as flipped learning, blended learning with strategies like online discussion in class room and out of class room (off classroom) settings, on line chat rooms, discussion forums etc. So use of newer pedagogical techniques and technologies within tele-learning /web-learning systems may be explored further and incorporated for better results.
6. Be it telecast or webcast or podcast or any other new mode of delivery of educational resources, the authorities need to ensure flexibility and ease of use of products among the stake holders, without which the efforts will not be effective.

7. Unlike books, video programmes require updating in almost all area of its development. The matter of how best this can be done should be planned well in advance to prevent it from redundancy. There is no point in stocking up several thousands of programmes if those are not relevant in the present and future context.

Organizational Aspects

As the Media Centres are functioning at different states in the country, this decentralized mode requires enormous coordination. With respect to the running and development of programmes by the MCs and CEC, it is suggested that all media centres should come under the umbrella of the apex body as it was envisaged at the time of its establishment, in all respects. This ensures parity and mental satisfaction about service matters among the staff and same rules must be made applicable to all. A continuity or flow in the structure can also be ensured by this. New staffing pattern must be designed and carried out as per the changes in requirements - both technology wise and demand wise.

Technical quality of the programmes seems to be satisfactory while the academic quality of the programmes requires improvements. Homogeneity in academic content quality is to be taken care of by the planners. To ensure this, the Governmental Agencies responsible for the development of the programmes should plan the whole process well in advance. After the completion of the mammoth task of developing e contents for both PG and UG curriculum, the UGC now is in to the development of MOOCs. Many e-contents were ill conceived and were presented badly. The teachers were not selected based on their expertise or communication skills, but in majority of the cases, based on the availability and convenience of them. Not learning from the mistakes, now for

development of MOOCs also, UGC is doing the same and have invited Expressions of Interest from whoever is interested.

Instead of considering and accepting the propositions of development of such educational video programmes from anyone who is interested, it is better to form a committee - Academic Advisory Committee comprising of academicians from different subject areas - first. The committee can perform the following tasks :

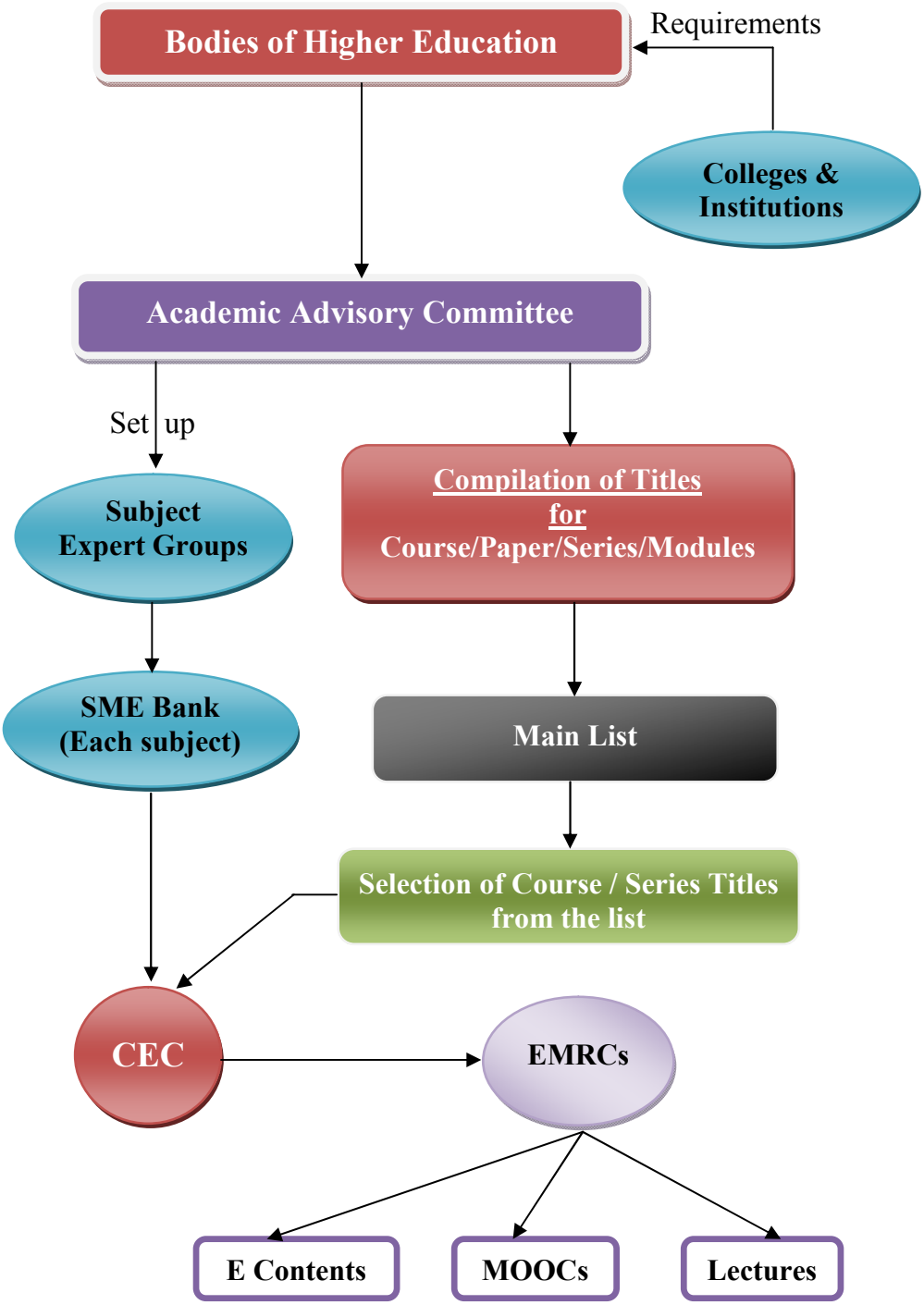
1. Invite course titles from different subjects from educational institutions from all over the country.
2. After compiling all the requirements, a main list of courses for each subject can be prepared by the committee.
3. Meanwhile, Subject Expert Groups for each subject can be put together after careful selection and stringent screening.

The list of experts of each subject area should then be forwarded to the CEC, and the CEC can direct the teachers to their most convenient and near EMRCs for the development of an e-content or a MOOC or a Lecture series.

Presently, for development of MOOCs, there are SEGs for screening and selecting topics at CEC on whose recommendations Academic Advisory Committee grants approval, but such a group is not there for selecting the teachers who are to present the course. The selection is presently being done on the proposals submitted by whoever is interested, not by checking the academic expertise or communication skills of the teacher. On getting the best teachers who can present content at its best, the Media Centres can facilitate in developing the video programmes. For the development of e-contents (not particularly for a course only, like MOOC) also, the same approach can be followed, which can ensure proper sequencing of titles from a particular paper

belonging to a particular subject. The DTH lectures also, if are developed as part of a series on a particular area, will be more beneficial for the learners pursuing a course of study.

The recommendation is illustrated in the flowchart below:



Since the whole system utilizes technology resources (like computers, software, network based communication systems, equipment etc.) and technology based practices (telecommunications, network based transmissions, remote access to instrumentation etc.), apart from the aforementioned arrangement, it will be beneficial to have a team of Educational Technologists also for the smooth functioning of the system.

The Educational Technology team comprising of educational technologists should have the additional responsibility of working as instructional designers too and must possess knowledge and skills in the management of the educational communications' projects.

The CEC is disseminating the content produced through various modes: telecasts on exclusive educational channels, webcasts, live sessions through EduSat, repositories in web channels, online courses through web portals, community radio etc. This dissemination should be more flexible and effective with a strong interactive mechanism backing all these modes of dissemination.

In the beginning, termed as the most powerful tool for educating the masses, television was for education first, information and entertainment had a second seat only. Now it is the other way around. With exclusive channels for education, television is trying to regain its lost glory, but the success of it depends mostly on how best it reaches learners.

The investigator feels that more research and studies should be carried out in the utilisation of television and internet for imparting quality education to the growing student population of India.

Educational Implications of the Study

The prime objective of the study undertaken was to suggest measures for the functional improvement of Media Centres. The evolution of the educational telecast and webcast was checked in detail in the first phase to explore and analyse the contribution of Governmental agencies in the sector. All these efforts of the providers in the field provided the momentum for further initiatives of the Government. With the new facilities and technologies, a new era in educational communication evolved and accordingly the offerings to the education sector also changed.

Looking at the status of the productions and from the responses gathered from the stake holders, it can be deduced that the communication and dissemination part of the whole process are not as effective as it should be. There are many gap areas in the subject domain. Uniformity in the academic quality is to be ensured. The natural progression of these conclusions should then be explored and new steps be implemented to improve the situation.

The implications of the past and present studies with respect to the broad areas of theory and practice have already been discussed under the heading 'suggestions for further improvement'. Even then it is worthful to re examine the same correlating with the objectives of the study and the findings derived.

The implications of the study derived thus are listed below.

- The study revealed that despite spending huge amounts on development of educational video programmes and dissemination through various broadcast and non-broadcast modes, the fruits of the labour are not

reaching the stakeholders. Aggressive popularisation, awareness and marketing programmes are the needs of the hour.

- For effective utilisation, the programmes envisaged should be developed based on the learning habits, styles, attitude, prevalent practices etc. of the youth. The curriculum should be revamped to develop new perspectives and skills needed in learners for surviving in a skill based technology driven industrial future.
- The success of any educational initiative is based on the assessment and evaluation of the learners participated in that. The examination structure should be perfected and run for better understanding about the effectiveness of online courses.
- Collaborations between Media Centres and educational institutions can be formed for building up expert Subject Teachers' banks for each subject. Better still, the academic bodies constituted by the Government for creating a bank of expert teachers can advocate the Media Centres on the academic side of the production: proposing the experts, subject area etc. This step can free the Media Centres from the hassles of finding experts for developing the matter and give freedom to the centres to concentrate fully on the actual making/ technical side of the video production.
- Teachers should be given ample training in effective communication and presentation required for broadcasts. Better instructional designs results in better programmes. If a committee can be formed comprising of curriculum specialists, classroom teachers and subject experts at the

centre level also, it can serve as a guideline to both the expert in preparing script and the producer in framing the programme.

- The technical and production staff and crew of Media Centres should also be given regular training and workshops to keep in pace with the developments and innovations in the field.
- The readiness to accept the new systems both that of learners and teachers, the competencies of learners and teachers in utilising the services, training and support systems for providers/ developers, different strategies of dissemination of content, flexibility and ease of use of the resources - all these factors are to be given due importance and consideration while taking up any educational project.

Suggestions for Further Research

1. A study can be conducted on the comparison of educational telecast and webcast in India and other countries.
2. Research can be conducted on the effectiveness of e-contents and online courses in both formal and non-formal education structure.
3. The prospects and challenges of telecasts and webcasts of educational content can be studied in detail.
4. Comparisons can be made between the educational content developed by the governmental agencies and private organizations.
5. Study can be conducted to check the role of interactive mechanism with the e-resources.
6. Studies can be carried out about effectiveness of e- learning/ digital learning resources in different subject domains.

7. The barriers of utilizing educational technology in higher education with respect to the perspectives of both teachers and learners could be investigated.
8. Impact of technology interventions in education at different fields may be taken up.
9. Factors affecting e-learning readiness of both teachers and students can be explored.
10. The constraints in the development and dissemination of MOOCs can be studied.

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APPENDICES

Appendix I

DEPARTMENT OF EDUCATION
UNIVERSITY OF CALICUT

Questionnaire on the Activities of Media Centres to Directors of Media Centres

V.S. Samitha
Research Scholar,
Dept. of Education,
University of Calicut

Dr. M.N.Mohamedunni Alias Musthafa
Professor
Dept. of Education,
Central University of Kerala, Kasaragod

Instructions: The purpose of this questionnaire is to collect information regarding the activities of the Media Centre. Please put a '✓' mark against the appropriate options and elaborate upon your answers wherever applicable. Your responses will be kept confidential and used only for research purpose.

Name	
Date of Joining / Experience at the Centre	
No. of terms in the Centre as Director	
Name of EMMRC	
University/ Institution attached to	
Year of establishment of the Centre	

1.	What is the extent of realisation of the following objectives outlined for your Centre? Please elaborate.	
	a.	Setting up of facility for production of programmes
	b.	Research related to optimizing the effectiveness of the programmes
	c.	Networking and collaboration with other educational agencies in India and abroad in the field of educational communication

	d.	Training and overall human resource development in the field of educational communication
	e.	Studying, promoting and experimenting with new techniques / technologies that will increase the reach and / or effectiveness of educational communication

2.	Are you satisfied with the working of your Centre in terms of the following? If not, cite reasons			
		Yes	No	If not, why
	• Production Team			
	• Technical Team			
	• Administration			
	• Facilities for production			
	• Equipment			
	• Infrastructure			

3.	Do you have freedom to frame a Plan of Action regarding the target for productions at your Centre?	Yes	No
4.	Are you satisfied with the fund/grant received for the functioning of the Centre? (Maintenance & Equipment Grant)	Yes	No
	If not, why? Tick whichever is applicable		
	• Inadequate		
	• Not considering the requirements of the Centre		
	• Allocation not based on actual expenditure		
	• Late releasing of funds		
	• Other		

5.	Are you satisfied with the fund/grant received for other projects?	Yes	No
	• E Content development		
	• MOOCs		
	• DTH		
	If not, give reasons.		
	• Inadequate		
	• Not considering the requirements of the Centre		
	• Allocation not based on actual expenditure		
	• Late releasing of funds		
	• Other		
6.	Are the UGC and CEC taking into consideration the budget suggestions/ requirements offered by the Centre?	Yes	No
7.	Apart from the programme production for CEC/UGC, is your Centre involved in any other activities like consultation and production of programmes for other agencies?	Yes	No
	• If yes, please provide details.		
8.	Are you satisfied with the rate of programme production at your Centre?	Yes	No
	If not, please list the constraints you are facing.		
9.	How do you ensure the quality of the programmes produced at your Centre?		
10.	Is there any internal committee for quality checking of the programmes?	Yes	No
	• Technical Quality		
	• Academic Quality		

11.	Does your Centre telecast / webcast own productions in regional channels / web?	Yes	No
	If yes, when was this started?		
12.	In your opinion, how effective is the dissemination of educational programmes produced at the Centres by the CEC?		
	• Excellent		
	• Good		
	• Poor		
	• Needs improvement		
13.	Are you satisfied with the role of CEC as a Nodal Agency?	Yes	No
	• If not, give reasons.		
14.	What is your relationship with the host University / Institution?		
	• Excellent		
	• Good		
	• Satisfactory		
	• Poor		
15.	Are there any constraints with working as a part in a University/ institution?	Yes	No
	• If yes, give details.		
16.	What is your opinion on the quality of the programmes produced by the Media Centres?	Your Centre	Other Centres in general
	• Excellent		
	• Good		
	• Average		
	• Poor		
	• Good but need improvement		

17.	Please give your suggestions and recommendations for improving the below mentioned aspects at both CEC and individual media centres.		
		CEC	MC
	• Functioning of the Centre		
	• Quality of productions		
	• Dissemination of productions		
	• Other		

Appendix II

DEPARTMENT OF EDUCATION
UNIVERSITY OF CALICUT

Questionnaire on Production Aspects to Producers of Media Centres

V.S. Samitha
Research Scholar,
Dept. of Education,
University of Calicut

Dr. M.N.Mohamedunni Alias Musthafa
Professor
Dept. of Education,
Central University of Kerala, Kasaragod

Instructions: The purpose of this questionnaire is to collect information regarding the production activities of the Media Centre. Please put a '✓' mark against the appropriate options and elaborate upon your answers wherever applicable. Your responses will be kept confidential and used only for research purpose.

Name	
Age	
Date of Joining / Experience at the Centre	
Name of EMMRC	
University/ Institution attached to	
Year of establishment of the Centre	

1.	Do you have a target for the number of productions (documentaries/ e contents/ MOOCs/ DTH lectures) to be completed per month or per year? If yes, give specifics.	Yes	No
	• Documentaries		
	• e Contents		
	• MOOCs		
	• DTH lectures		
	• Other		

2.	Is the time adequate for achieving the target or for the work assigned to you? If no, state your reason.	Yes	No
	• Too much work		
	• Not enough time for post production work		
	• Non availability of experts in reviewing programmess		
	• Other		
3.	Have you or the production team of your Centre developed any new programme technique/ template?	Yes	No
	If yes, give details.		
4.	What is your opinion on the quality of the programmes produced by your Centre and other Media Centres?		
		Your Centre	Other Centres in general
	• Excellent		
	• Good		
	• Average		
	• Poor		
	• Good but need improvement		
5.	Are you satisfied with the working environment at your Centre?	Yes	No
	If not, give reasons.		

6.	Do you encounter any difficulties in,	Yes	No
	• Availability of Subject Experts?		
	• Getting scripts and other materials in time?		
	• Completing productions within time?		
	• Getting the work completed by Editors, Graphics' team, etc.?		
	• Other		

7.	For syllabus based e-contents/ MOOCs, Media Centres are using the templates provided by the CEC.		
	Do you think the use of same template is good?	Yes	No
	If not, why?		
	Do you think it needs improvement? If yes, give your points.		

8.	Does your Centre / CEC conducts workshop or training,	CEC		EMRC	
		Yes	No	Yes	No
	• for skill enhancement ?				
	• on new production techniques and technologies?				
	• Other (please specify)				
	If yes, how often?				
	• Regularly				
	• Once in a year				
	• Occasionally				
	• Never				
	If yes to the above, are you satisfied with the workshops/training sessions?	Yes		No	
	If not satisfied, please specify reasons.				

9.	Please give suggestions to improve the quality of the products of CEC/ media centres.

Appendix III

DEPARTMENT OF EDUCATION
UNIVERSITY OF CALICUT

Questionnaire on Research Aspects to Research Officers of Media Centres

V.S. Samitha
Research Scholar,
Dept. of Education,
University of Calicut

Dr. M.N.Mohamedunni Alias Musthafa
Professor
Dept. of Education,
Central University of Kerala, Kasaragod

Instructions: The purpose of this questionnaire is to collect information regarding the work of a Research Officer. Please put a '✓' mark against the appropriate options and elaborate upon your answers wherever applicable. Your responses will be kept confidential and used only for research purpose.

Name	
Age	
Date of Joining / Experience at the Centre	
Name of EMMRC	
University/ Institution attached to	
Year of establishment of the Centre	

1.	How many research studies have your Centre conducted so far?		
2.	Has your Centre ever conducted any viewership surveys in your state?	Yes	No
	If yes, how many?		
3.	Please specify the significant findings, if any, gained through research by your Centre.		

4.	Has your Centre implemented any changes in the production aspects based on the research findings?	Yes	No
	If yes, please elaborate.		
5.	Do you have any or easy access to the research done by other Media Centres / CEC?	Yes	No
6.	Does the CEC communicate their research findings to your Centre?		
7.	Does your Centre forward research findings to CEC?		
8.	What is your opinion on the overall quality of research conducted by your Centre and CEC? Please elaborate.	CEC	Centre
9.	What is your opinion on the quality of the programmes produced by your Centre and other Media Centres?	Your Centre	Other Centres
	• Excellent		
	• Good		
	• Average		
	• Poor		
	• Good but need improvement		
10.	Do you think that the programmes of Media Centres get enough visibility among students?	Yes	No
	If not, what measures can be adopted to improve the reach of the programmes?	CEC level	Centre level

11.	Please write your suggestions for improving the research aspects of Media Centres/ CEC

Appendix IV

DEPARTMENT OF EDUCATION
UNIVERSITY OF CALICUT

Questionnaire on Technical Aspects to Engineers of Media Centres

V.S. Samitha
Research Scholar,
Dept. of Education,
University of Calicut

Dr. M.N.Mohamedunni Alias Musthafa
Professor
Dept. of Education,
Central University of Kerala, Kasaragod

Instructions: The purpose of this questionnaire is to collect the information regarding the work of an Engineer at a Media Centre. Please put a '✓' mark against the appropriate options and elaborate upon your answers wherever applicable. Your responses will be kept confidential and used only for research purpose.

Name	
Age	
Date of Joining / Experience at the Centre	
Name of EMMRC	
University/ Institution attached to	
Year of establishment of the Centre	

1.	What is your view on the TAC list of equipment forwarded by CEC?		
	• Up to date with new advances of technology		
	• Need to consider new technology		
	• Satisfactory		
	• Poorly made		
	• Other		
2.	Does your Centre have freedom to choose and purchase the equipment required?	Yes	No
	If yes, please elaborate.		

3.	What are your suggestions on the preparation of TAC list?		
4.	Do you encounter any difficulties in the purchase of equipment for your Centre? If yes, please list those.		
5.	Were you in service during the transition period from Analog to Digital format? If yes, how much time was taken by your Centre for the complete transition? Please elaborate on the time period and difficulties encountered.		
6.	What is your judgement on the technical quality of the programmes produced by your Centre and other Media Centres?	Your Centre	Other Centres
	• Excellent		
	• Good		
	• Average		
	• Poor		
	• Good but need improvement		
7.	Do you think that the facilities at your Centre are on par with that of other private / professional broadcast studios in your State/ India?	Yes	No
	If not, cite your reasons.		

<table>
<tr><td rowspan="10">8.</td><td rowspan="3">Does your Centre / CEC conduct workshop or training for skill enhancement and for the technical team on new equipment and technologies?</td><td colspan="2">CEC</td><td colspan="2">EMRC</td></tr>
<tr><td>Yes</td><td>No</td><td>Yes</td><td>No</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="5">If yes, how often?</td></tr>
<tr><td colspan="3">• Regularly</td><td colspan="2"></td></tr>
<tr><td colspan="3">• Once in a year</td><td colspan="2"></td></tr>
<tr><td colspan="3">• Occasionally</td><td colspan="2"></td></tr>
<tr><td colspan="3">• Never</td><td colspan="2"></td></tr>
<tr><td rowspan="2" colspan="3">If yes to the above, are you satisfied with the workshops or training sessions?</td><td colspan="2">Yes</td><td>No</td></tr>
<tr><td colspan="2"></td><td></td></tr>
<tr><td colspan="5">If not, cite your reasons</td></tr>
<tr><td rowspan="3">9.</td><td rowspan="2" colspan="3">Are you satisfied with the working environment at your Centre?</td><td colspan="2">Yes</td><td>No</td></tr>
<tr><td colspan="2"></td><td></td></tr>
<tr><td colspan="5">If not, give reasons</td></tr>
<tr><td>10.</td><td colspan="5">Please give suggestions to improve the technical quality of the products of CEC/ media centres and for the smooth functioning of the production/ post production.</td></tr>
</table>

Appendix V

DEPARTMENT OF EDUCATION
UNIVERSITY OF CALICUT

Questionnaire on Awareness and Utilisation of Educational Telecast and Webcast to Students

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Research Scholar,
Dept. of Education,
University of Calicut

Dr. M.N.Mohamedunni Alias Musthafa
Professor
Dept. of Education,
Central University of Kerala, Kasaragod

Instructions: The purpose of this questionnaire is to seek information regarding your awareness and utilisation of educational telecast and webcast. Please put a '✓' mark against the appropriate options or fill in the column with information relevant to you. Your responses will be kept confidential and used only for research purpose.

Name	
Age	
Course of study	
State	

1.	Are you familiar with educational video programmes in Television?	Yes		No	
	If yes, how often do you watch programmes	Regularly	Sometimes	Rarely	Never
2.	Are you aware that Government of India is telecasting and webcasting programmes for college students?	Yes		No	
	If yes, have you watched any programmes?	Yes		No	
3.	Have you heard of VYAS telecast?	Yes		No	

4.	Have you ever watched any VYAS telecast?	Yes		No	
5.	Have you heard of EduSat telecast / programmes?	Yes		No	
	If yes, have you ever watched any EduSat telecast / programmes?	Yes		No	
6.	Have you ever watched **any other** educational telecasts ?	Yes		No	
	If yes, Specify the programmes you have watched.	Programme		Channel	
7.	Have you heard of CEC (Consortium for Educational Communication)?	Yes		No	
8.	Have you heard of EMRCs (Educational Multimedia Research Centre)?	Yes		No	
9.	Is there any EMRC at your place?	Yes		No	
10.	Have you seen any CEC / EMRC telecast or webcast?	Yes		No	
11.	Does your college publish the Programme Schedule of CEC/ EMRC?	Yes		No	
	If yes, do you check for programmes pertaining to your area of study?	Yes		No	
12.	How net savvy are you?	Excellent	Good	Ok	Poor

13.	For what purpose do you usually use internet?	Entertainment	Study	Both
14.	Do you use internet for extracting study materials to supplement your education?	Yes		No
	If yes, how often?	Regularly		Sometimes
15.	Do you think the materials you extract from the web are authentic?	Yes		No
16.	How do you assess / ascertain the authenticity of the materials collected?	• Advice of teachers		
		• Syllabus prescribed sites		
		• Checking the publisher		
		• Other (Specify)		
17.	What is your preference for educational material provider sites?	Indian		Foreign
18.	Of educational programmes, which broadcasts do you think are more authentic? (TV & Web)	Television		Internet
		Govt. Sector	Private Sector	Govt. Sector	Private Sector
19.	Are you aware that Government, through CEC/EMMRC, has uploaded e-contents on many subjects in the web?	Yes		No
	If yes, have you seen any?	Yes		No
	Were you able to find any e-content pertaining to your area of study?	Yes		No

20.	Have you heard of / seen educational programmes telecast via DTH?	Yes	No
21.	Have you heard about SWAYAM portal?	Yes	No
22.	Have you heard about MOOCs? (Massive Open Online Courses)	Yes	No
	If yes, have you ever checked whether any part of your syllabus is available via MOOCs?	Yes	No
23.	Have you seen MOOCs of any foreign Universities?	Yes	No
	If yes, which MOOC do you think is better quality wise?	Indian	Foreign
24.	Would you like to enrol for any MOOCs?	Yes	No
25.	Have you heard / are you aware of Credit Transfer for MOOCs?	Yes	No
26.	Does your teacher advise you to use e-contents/ DTH telecasts/ webcasts/ MOOCs?	Yes	No
27.	If you are familiar with any of the programmes, what are your suggestions for improvement?		
	Telecast (VYAS, DTH etc)		
	E-Contents		
	MOOCs		

Appendix VI

DEPARTMENT OF EDUCATION
UNIVERSITY OF CALICUT

Questionnaire to Subject Matter Experts of Educational Programmes

V.S. Samitha
Research Scholar,
Dept. of Education,
University of Calicut

Dr. M.N.Mohamedunni Alias Musthafa
Professor
Dept. of Education,
Central University of Kerala, Kasaragod

Instructions: The purpose of this questionnaire is to collect information regarding your experience as a Subject Matter Expert. Please put a '✓' mark against the appropriate options and elaborate upon your answers wherever applicable. Your responses will be kept confidential and used only for research purpose.

Name	
Age	
Designation	
Experience	
Name of College	
University/ Institution attached to	
Name of the Media Centre to which your have contributed	
State	

1.	How did you know about the development of educational video production at the Centre you have done the work?		
	a.	Workshops conducted by EMRCs	
	b.	When approached by Producers of Media Centres	
	c.	From Newspapers/Web/ Official sites of UGC/other agencies (Specify)	
	d.	Other	

2.	The type of programme for which you have contributed:			
	a.	Documentary		
	b.	E content		
	c.	DTH Lectures		
	d.	MOOC		
3.	Are you satisfied with the development of the programme?		Yes	No
	If not, specify reason			
4.	Are you satisfied with the working environment at the Centre?		Yes	No
	If not, specify reason			
5.	What is your outlook on the academic quality of the programmes of Media Centres?			
	a.	Excellent		
	b.	Good		
	c.	Average		
	d.	Poor		
6.	a.	What is your outlook on the technical quality of the programmes of Media Centres?		
	b.	Excellent		
	c.	Good		
	d.	Average		
	e.	Poor		
7.	Do you think the structure of programmes require improvement?		Yes	No
	If yes, on which area the improvement is needed?			
	a.	Template		
	b.	Presentation technique		
	c.	Any other aspect		

8.	Did you encounter any difficulty during the development of programme in getting any of the following?			
	a.	Convenient dates for shooting		
	b.	Necessary support during post production stage		
	c.	Payment in time		
	d.	Any other		
9.	Have you watched similar educational video programmes of other agencies / channels?		Yes	No
	If yes, how do you rate the quality of those programmes?			
	a.	Better		
	b.	Inferior		
	c.	On par with the Media Centre programmes		
	d.	Any other		
10.	How long it will take to receive review reports of your programmes?			
	a.	Within 1 month of completion of programme		
	b.	Within 6 months of completion of programme		
	c.	Takes much longer		
	d.	Never received any		
11.	Do you think that the educational video productions of the Media Centres are having enough visibility and popularity among students?		Yes	No
	If not, please suggest the strategies to be adopted for increasing the reach of the programmes			

12.	Have you attended any sort of workshops/ orientation programmes/ training organised by CEC/ Media Centres?	Yes	No
	If yes, please record the rate of satisfaction	CEC	EMRC
	• Very informative and thorough		
	• Good		
	• Average		
	• Poor		
13.	How do you rate the response of Media Centres / CEC for your communications in relation to your apprehensions/ queries etc.	CEC	EMRC
	• Very prompt		
	• Not very responsive		
	• Never given any responses		
14.	Please list your suggestions for overall improvement of the programmes of Media Centres		