



Augmenting Distance Learning on the Broadcast Networks With Synchronously Delivered Print Documents[♦]

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HPL-2006-105
July 26, 2006*

broadcast
networks, distance
learning, media

* Internal Accession Date Only

[♦] Digital Learning Asia 2006, 26-28 April 2006, Bangkok, Thailand

¹ Social Research Edusat Utilisation DECU – ISRO, Ahmedabad, India

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Approved for External Publication

Paper Reference Number: DL06/ABS/179

Title: Augmenting Distance Learning on the Broadcast Networks With Synchronously Delivered Print Documents

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- **Rama Vennelakanti** is a Senior User Researcher and Strategist with the HP Labs India, Bangalore India. At HP Labs, as a user researcher her primary areas of focus are how users interact with technologies developed in the labs and understanding what their experience with these technologies is. Working on the PrinTV project since she joined the Labs in 2004, she leads the Public PrinTV efforts and the field trials. With a masters degree in Social Anthropology she has over 12 years experience in user research, having worked at both ends of the spectrum, research providers and research users. Her areas of interest and specialisation include consumer behaviour and user experience. She has been with the HP Labs for over a year now. Prior to joining HP Labs she worked with BPL Mobile, a mobile service provider as a research manager and with PQR the qualitative research wing of IMRB international, India's largest market research agency.



- **Hansa Joshi** is presently working as co-ordinator, Social Research Group and Project Manager, Social Research, Edusat Utilisation in Development and Educational Communication Unit (DECU), Indian Space Research Organisation (ISRO), Ahmedabad. She has Masters Degree in Social Work (MSW) from Gujarat Vidyapeeth (a University following Gandhian philosophy). Her area of specialisation includes communication research, specifically in area of women and children and is involved in various media research studies. She has worked extensively in several satellite based communication project including Kheda Communications Project (KCP), Jhabua Development Communications Project (JDCP) of DECU/ISRO and the present on going Edusat project of DECU – SAC / ISRO. Under the Edusat project she is mainly responsible identifying the needs and requirements of the potential users and helps in configuring the network for the niche users. She is also responsible for carrying out several research studies for making the Edusat utilisation an effective one.

1. Introduction

1.1. PrinTV:

PrinTV is a technology developed by HP Labs India that can augment and enhance the TV viewing experience by delivering to the viewer an artifact that can be extracted at the viewer end and to be printed, stored, retrieved and referred to at convenience. PrinTV uses the existing broadcast network and delivers documents in sync with the audio-visual content.

It is hypothesized that PrinTV will enhance the instructional/informational value of using TV viewing for distance education. By augmenting the TV viewing experience with a print artifact that can be printed, stored, retrieved and referred to when required broadens the experience. PrinTV provides the viewer and the broadcaster a newer medium for information transfer and exchange.

- It enables the viewer to receive additional or supplementary information, of interest related to the audio-video content telecast on TV that can be printed, stored and retrieved.
- It enables the broadcaster to pass on information to the end user through a new medium with the complementary qualities of hard copy.

PrinTV attempts to

- Enhance user experience of television by providing associated content on print media.
- Leverage and increase the utility of the bandwidth of existing broadcast networks by adding simultaneous data transmission.

1.2. Television in Distance Education

Television has been widely used in education in India. It has the unique feature of combining audio and visual technology, and thus considered to be more effective than audio media. It serves multiple purposes of entertainment, information and education. Besides performing motivational function it helps in providing discovery learning and cognitive development of its viewers. Because of its better accessibility, it can bring learning materials to the masses in more direct, effective and personal way than other educational media (Vyas, Sharma & Kumar) A significant land mark in the history of television in India was the one year Satellite Instructional Television Experiment (SITE) launched on August 1, 1975 involving 2330 villages..... (SS Chaudhary). Since then television has been widely used to impart formal and non formal education to a variety of audience from primary school children, teachers, extension workers and Panchayat Raj Members. Satellite communications technology offers unique capability of being able to simultaneously reach out to very large numbers spread over large distances even in the most remote corners of the country. Today TDCC is used exclusively for distance education and Interactive Training Programmes (ITPs)(Shymal Mehta). Currently there are over 2400 receiving terminals in the country. (Sampreshan 2004)

1.3. Audio Visual + Print A New Medium For Broadcast

Empowering instructional presentation, interaction among individuals and, student's engagement with a class and flexibility in time and space are some of the abilities attributed to the significant changes in instruction technologies brought about by the integration of various instructional media. (Eunjoo Oh).

Television is often attributed with the facility to grab attention, while print is often associated with being more persistent. We believe that the ability to provide audio-visual along with Print in a synchronous manner will not only make it possible for these media to complement each other but will also greatly impact the use of these broadcast media for distance education. This ability to synchronously deliver audio visual and print will not only impact the effectiveness and the reach of these distance education programmes, but will also impact how content is created and developed for this new medium.

2. The PrinTV Field Trials

2.1. The Experimental Setup

In order to understand the user experience and the impact of this new method of delivering content to the viewers the PrinTV System was integrated into an ongoing training programme. PrinTV was integrated into the SatCom based Gram Panchayat Member training programme conducted by the, State Institute of Rural Development.

Abdul Nazir Sab-State Institute of Rural Development (ANS-SIRD), Mysore, Karnataka, India has been the SatCom centre and nodal agency for Karnataka TDCC (Training and Development Communication Channel) network for over five years. The TDCC network is set up by the Development and Educational Communication Unit (DECU), ISRO (Indian Space Research Organisation) to promote the use of space technology for developmental purposes. The Primary objective of this Institute is to organize Training Programs for Elected Members of Panchayat Raj Institutions, Officers of various Development Departments, Representatives of voluntary organizations and Bank Officials. Conducting training research activities, evaluation and assessment of impact of various Rural Development Programs are also undertaken. The many users of the TDCC network at ANSSIRD include the Ministries of Panchayat Raj, Education, Health, Watershed, Rural Development, Women and Child Development, Agriculture and Horticulture.

One of the major training programmes conducted by ANSSIRD is for the elected representatives of the Panchayat Raj Institution (PR) of Karnataka. Karnataka has approximately 90,000 elected Gram Panchayat members. One of the major responsibilities of the Rural Development and Panchayat Raj Department is in the realm of implementing the provisions of the Karnataka Panchayat Raj Act, 1993 to achieve democratic decentralization in the governance of the State's rural areas. The 3-tier structure of Panchayat Raj Institutions of Karnataka consists of

- 27 Zilla Panchayats
- 175 Taluk Panchayats
- 5659 Gram Panchayats

The Satellite Based Interactive Communication System is an integral system of providing training and communication support for the developmental activities. Interactive Training Programmes (ITPs) are conducted by user departments to train their rural extension workers. Presently, the TDCC network provides one way video and two way audio conferencing systems. Live or recorded lectures are transmitted in video mode from the teaching end using studio and satellite facilities. The programmes are received at receiving ends at Direct Reception (DRS) sets. The receiving ends interact with the teaching end through STD (Sampreshan 2005).

Data broadcasting as a facility is not available in present mode of TDCC network. The PrinTV technology was an added facility used on trial basis for data broadcasting.

The trials were aimed at testing the effectiveness of the PrinTV through Training and Development and Communication Channel (TDCC) network of ANSSIRD, Karnataka. The trial also attempts to validate the end user experience, and to understand how the presence of a new medium impacts the teaching and information and dissemination through the TV medium. We also attempted to understand the impact of the new mediums ability to deliver Audio, Video and Print in sync on the effectiveness of the training programme.

2.2. Trial Location

A comparative study between experimental locations (with PrinTV) and control locations (without PrinTV) was carried out to measure the extent of utilization and effectiveness of PrinTV. The experimental locations for field trial of PrinTV technology are located in the taluks of Tumkur district. The control sites are in Mandya district.

Tumkur district comprises 10 taluks and 321 Gram Panchayats. PrinTV was installed at 7 of the 10 taluks. Mandya district comprised 7 taluks and 232 Gram Panchayats. 4 of these taluks were designated control sites for the study.



Fig 1: Karnataka, India

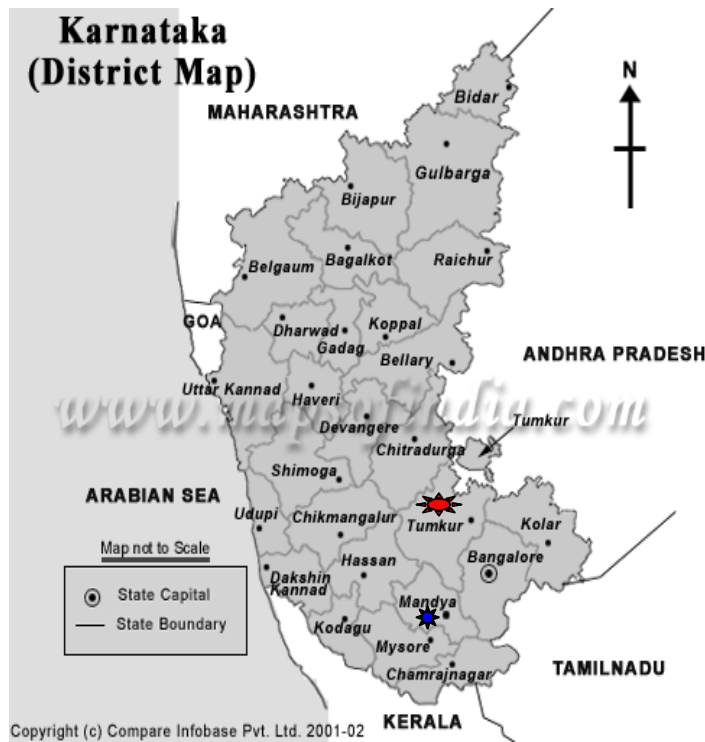


Fig 2 Tumkur & Mandya Districts of Karnataka

2.3. End Users Groups as Identified

The main end user groups identified as being touched by the PrinTV experience:

- Faculty: The ANSSIRD Faculty at the teaching end. The role of the faculty is to impart training on the Panchayat Raj System to the elected representatives of the Panchayat Raj Institution. They were users of the PrinTV system and had the main role of deciding as to what the content of the program would be. This included AV and Print content.
- Facilitators / Resource Persons: ANSSIRD Facilitators / Resource Persons at the receive ends. The resource persons or facilitators have the role of facilitating the learning and absorbing the training that is imparted. They stand in for the faculty, and help the faculty communicate with the recipients of information and help the recipients understand, absorb and retain the information given to them. They ensure and facilitate interaction within the team and with the faculty.
- Recipients: The recipients in this case are the elected representatives of Panchayat Raj Institution. The training program aims at educating and informing the PR representatives at knowing their rights, responsibilities and duties as an elected representative. The SatCom training module attempts at enabling learning through face-face interaction with the faculty and the other participants.

2.4. User Dynamics

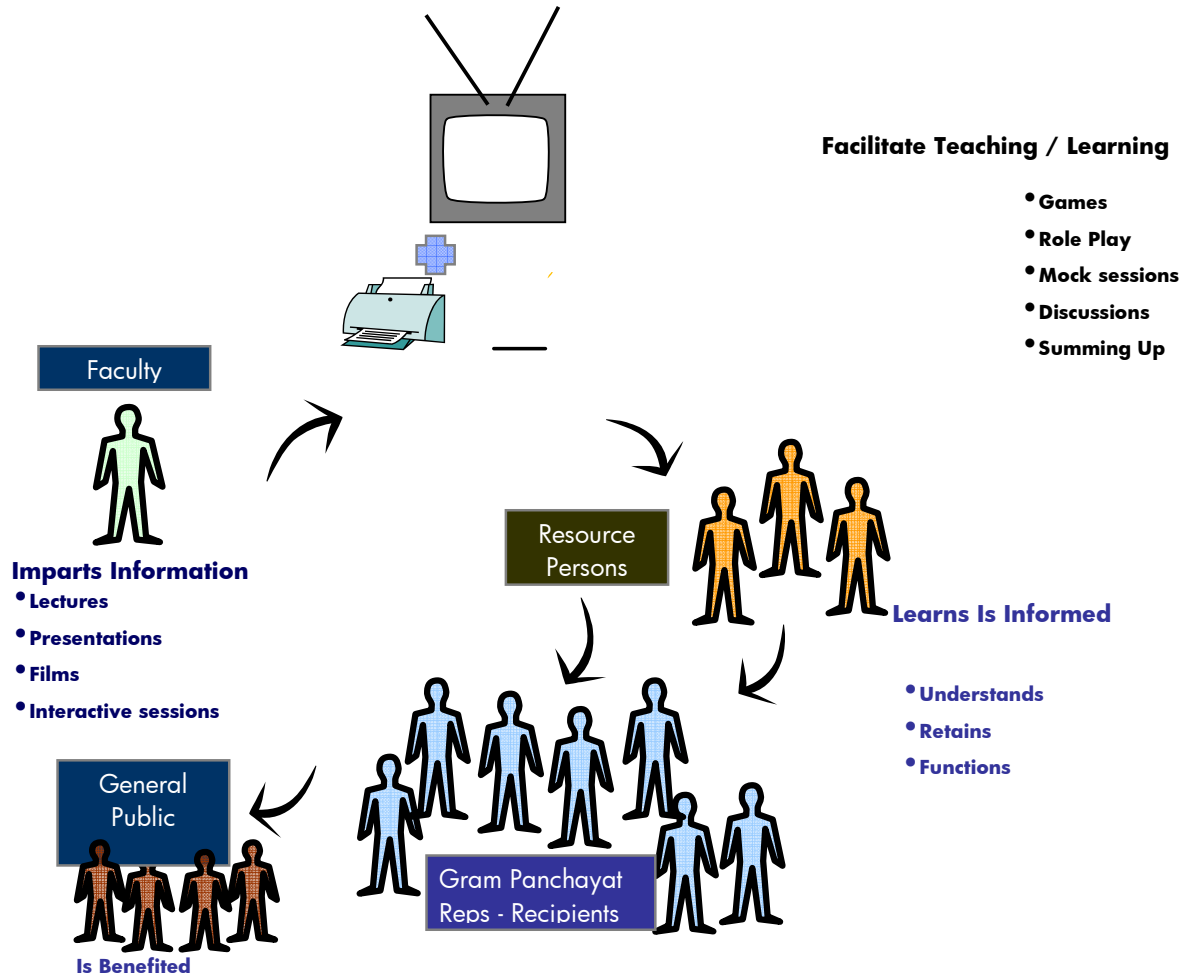


Fig 3 Depicts the Dynamics between the User Groups

2.5. Program Content:

The training program aims at educating and informing the PR representatives at knowing their rights, responsibilities and duties as an elected representative. This specific module of the training program aimed at educating and enabling the Gram Panchayat Members to carry out a detailed planning process towards generating a five year plan for their gram panchayats, resource mobilization to meet the plan expenditure and also to tackle issues like the pending electricity bills issue. A mix of localized group activities, films, play acts, presentations, lectures and live interaction sessions are employed during the training. Some printed material is prepared and circulated to the audience at the beginning of the training module.

The PrinTV system was used to send documents relevant to the specific AV being transmit. Most print documents send through the PrinTV system pertained to government orders, gazette notifications and circulars pertaining to the course content. For example the module on Resource mobilization was accompanied by a Government notification as to what are the resources that belonged to the Gram Panchayat.

2.6. Trial duration

The trials were conducted for a period of 3 months during which over 2000 gram Panchayat member trainees experienced the benefits of PrinTV. The trials were conducted during January to March 2006.

3. Trial Objectives

One of the major aims of the study is to understand the impact of this new media, AV+P on the training programme. Hence we attempted to understand the following:

- Does the PrinTV experience generate **Excitement**?
- Do they perceive the learning experience as **Richer** and more **Complete**?
- Does learning become more **Interactive** –hence more enjoyable?
- Does **Sharing** information become easier and more informative?
- Do they perceive that they are able to **Retain** more of the information they have received?

4. Indicative Observations

Since the study has just concluded and data analysis is in process, it is possible to only share indicative qualitative trends based on extensive and intensive observations conducting using a variety of ethnographic methodology including participant and non participant methods.

4.1. Does the PrinTV experience generate Excitement?

It was evident from the response and enthusiasm of the various participant groups that the PrinTV system generated a lot of excitement. This was evident in the pride with which the various participants interacted with the system and made full use of its availability. There was increased presence and attendance at the training programme and more interest evinced in the proceedings as these were backed by timely and relevant documents. The resource persons handling the sessions perceived that the attendance to the sessions had improved.

The simulcast print documents increased the involvement of the participants as they are keen to receive the print documents. Most participants encouraged their neighbours to attend the training programme as they would get

documents that were otherwise inaccessible. The PrinTV documents created a lot of discussion and scrutiny.

4.2. Do they perceive the learning experience as *Richer* and more *Complete*?

The different user groups did perceive that the training was indeed more complete as they were able to substantiate the lecture sessions with documents which could empower the GP members and initiate concrete action.

The faculty was of the opinion that they were able to not only appraise the trainees on the various topics but was also able to send them relevant documents that substantiated the information. The ability to send these documents along with the broadcast AV content enabled them to concretize the information shared.

The resource persons perceived that their role and efforts were further authenticated due the delivery of relevant documents along with the AV that they used as a background to initiate learning and discussion.

To the trainees themselves the ability to receive printed documents along with the AV content was a major incentive. They were able to take away with them some documentary evidence of information that empowered them to act in the interest of their community. These documents became tools and weapons of information that strengthened their efforts at grappling with the systems of governance.

Overall it was seen that the PrinTV experience gave the various users a sense of confidence and being more in control.

4.3. Does learning become more *Interactive* –hence more enjoyable?

The delivery of printable documents in sync with the audio video perceivably brought about a lot more active interaction within the training group. They were able to discuss the relevance of the information provided in the back drop of their experience on site and in real life. They were able to measure, compare and contrast what the legislation stated with what the ground reality and their experience was. This was a definite change as they no longer had to depend on their memory or what was told to them regarding the legislation.

The printed document that arrived with the AV was a point for discussion that gave them more insight into the information provided on TV. The level of interactivity within the group was also observed to increase.

4.4. Does *Sharing* information become easier and more informative?

Sharing information between the trainees and with the resource person becomes much better facilitated as they are able to find an anchor in the physical paper while the AV is transient.

The participants said that they would make a file of the prints and share it with their colleagues. They would carry these prints during the gram Panchayat meetings (Joshi & Hashmi)

It is also interesting to note that while the system is installed at only 7 of Karnataka's 175 taluks, the documents delivered through PrinTV have traveled across the state. Gram Panchayat members and Resource persons from across the state have called their counterparts in Tumkur to request copies of documents.

4.5. Do they perceive that they are able to Retain more of the information?

Most of the trainees opined that these documents sent via the new medium PrinTV would act as trigger to the information provided to them during the training programme.

Those with no or little literacy looked to this method of synchronous delivery as a means by which they could take these documents away to be read to them by a literate family member and thus understand what was required of them. Their memory of what they saw on TV would enable an understanding of what was being read to them at a removed point in time and space.

5. Other Application Spaces for PrinTV

Some of the applications for this technology are in the developmental space. The possible application spaces identified during our interactions with thought leaders are:

- Developmental Applications

A priority role for PrinTV is envisaged in the Behaviour Change Communication of the Government and NGOs engaged in working on developmental issues, like education, health etc. This is more so given the focus of efforts and technology to increase information flow toward the poorest and the marginalized. The low penetration of PC and internet in these semi-urban and rural markets also provides the need for an integrated technology that provides for interactive or discerning use or request for information.

Some of the applications envisage in the developmental space are:

- Education
 - TV based Educational programs - Augmenting lecturer's broadcast with printable lecture notes, reference materials & tests
- Public Information Dissemination
 - Epidemic prevention – Printable practical guidelines on preventing AIDS etc
 - Benefit schemes - Forms/procedure for applying for them

- Community information
- Edutainment
- Agriculture - Information about farming techniques, how to and how much to use pesticides, technology support.
- Epidemics – Information on symptoms, measures and precautions on avian flue
- Travel – Tourist information, travel tips, history of places.
- Health programs - Advisories
- Spiritual programs - Sermons

6. Issues For Future Discussion

The following issues need to be addressed over time to come as they have an impact on how the new medium of simulcasting data along with audio –visual communication will impact choice of media, content creation and affordance of the media over time.

6.1. Content For Mixed Media:

Traditionally content creation is created for a specific medium and the affordances on one medium rarely carry on to another. Simulcast with PrinTV opens up the arena for messaging that is complementary and completed by each other and can be delivered synchronously instead of individually.

6.2. Impact Of Mixed Media:

The impact of this form of mixed complementary media needs to be studied to understand the full significance of having the message being added to and supported through different media that complement each other and deliver synchronously, some thing not possible till now.

6.3. Affordance Of Mixed Media:

The affordance of such mixed media needs to be further explored. How do audio-visual and print media when delivered synchronously change the affordance of the various media? Do the affordances of these media get extended and flow into one another.

6.4. Impact Of Behavior Change Communication augmented by PrinTV:

Also of interest is the long-term impact of the PrinTV experience on the community served by these representatives. It is essential to understand how the community benefits from the PrinTV medium.

7. Acknowledgements:

We acknowledge with thanks and appreciation the co-operation inputs, participation and help we received from the management, faculty and staff of ANSSIRD, the

Tumkur District and Taluk officials and Resource Persons at the receive centers. Our special thanks to the GP members for their enthusiastic response

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