

Research in Educational Technology

A TREND REPORT

S. SHUKLA

INTRODUCTORY REMARKS

It was envisaged in the Sixth Plan itself that modern technology should be used extensively to extend education to all sections of society as well as to improve the quality of education in a shorter frame of time than would have been necessary with approaches known and adopted in the past. Scientific discoveries and technological advancements have changed the pattern of life of nearly all human beings; only the extent of change differs from one society to another or for classes of people in a society. Education is also forced to take note of technology. With communication technology resounding in the environment, the sounds made by the teachers are no longer insulated communications. Nor is information and education the monopoly of those who can read and write or have the means and leisure to attend institutions at specified places during specified hours. The commitment of the country to use the technology is thus expressed in the National Policy on education, 1986:

Modern communication technologies have the potential to bypass several stages and sequences in the process of development encountered in earlier decades. Both the constraints of time and distance at once become manageable. In order to avoid structural dualism, modern educational technology must reach out to the most distant areas and the most deprived sections of beneficiaries simultaneously with the areas of comparative affluence and ready availability.

Academics take a broader view of 'educational technology' (ET) than technology in the use of educa-

tion. Thus in this section all research related to approaches addressed to felt educational problems has been summarized. The number of researches reported in media communications, distance education and application of principles of learning are larger than in certain other areas.

Although there are a variety of modes now being used for education from a distance—whether formal, non-formal or informal, in this review, education through correspondence and audio-visual media, specially broadcasting, have been dealt with separately. The reason is very simple. All correspondence education is addressed to formal degree/certificate-earning, which would be considered equivalent to formal academic qualifications in job placements, etc. Most media communications are addressed to informal education, most often many times more relevant than formal education. Broadcasting media are being used for support and enrichment of formal education both contact and correspondence; but it has not as yet seriously replaced any part of contact or correspondence by even a small bit.

One would have expected and liked to see more research in this area. Technology has helped improve the quality and pace of activity as well as production in most aspects of human endeavour. Education still needs to take full advantage of modern technologies. Modern formal education became a reality for the common man with the adoption of the most important of all technologies, namely, print, but it has been slow to adopt other technologies. The current virtually proprietary control of the textbook teacher has been resistant to this change. But education cannot ignore changes in the

environment, it cannot but respond to them, albeit slowly.

Since education involves a very large number of human beings and directs the lives of all, it is necessary that new approaches are adopted with full understanding and care. Research, thus, needs to be an integral part of all programmes of ET. Adoption of some technologies, such as satellite communication and computers, is also very costly. Their utilization and gains need to be studied. Technology, by itself, cannot solve the problems of extension and needed improvement in education. Human variables are extremely important, both in the use of technology and as affected by its use. A continued watch is needed. Evaluation is an important component of educational technology in its broader meaning. It is expected that future research surveys would have a great deal more to report in this area.

MASS MEDIA

Radio and television have been with us for long, radio since 1927 and television for nearly three decades now. These have been used for informal education all along and also in formal education to some extent. As the broadcasting media in informal education have large, scattered groups, even where target audiences are specified, research in reception and learning from messages communicated would be very difficult to conduct. However, the two areas where research was initiated, monitored and utilized to a large extent in modifying the messages and policies, have been agriculture and family planning. Both of these areas were supported by strong infrastructure at all levels, including the grass-roots level.

Communication in school education had all the advantages, including better defined and found-in-one place audiences; still it did not attract researchers either from the media or from education. This could be due to lack of clarity of goals and the invisibility of achievements in education.

The first serious evaluative study was conducted by Paul Neurath when TV was used, in 1959-64, for teaching science in the newly started higher secondary schools. There was a gap of nearly ten years before it gained momentum in 1974. The policy of the government to use modern technology to extend quality education, and its powerful expression in using a satellite during 1975-76, really set the ball rolling. Satellite communications technology, especially with the help of

Direct Receiving Sets seemed costly and some proof of its achievements had to be available to extend its use. The required infrastructure was created by setting up a Centre for Educational Technology (now known as The Central Institute for Educational Technology within the NCERT) at the Centre, and ET cells in the State Councils of Educational Research Organization provided the lead in undertaking, sponsoring, promoting and coordinating research in satellite communications. The CET, SCERTs and ET cells cooperated with the Space Applications Centre and with each other and initiated some work on their own. As programmes for schools were being broadcast from 60 radio stations at that time, the above-mentioned institutions also took up research in educational radio broadcasting.

The trend is clearly visible in the quantum jump from the three studies mentioned in the area of mass media in the *Third Survey of Research in Education* to 21 in the Fourth Survey. It may be mentioned that most of the research conducted with respect to the use of ATS-6 in 1975-76 has been summarized by Binod C Agarwal of the Space Applications Centre, Ahmedabad. There are many more studies at the level of primary education than that of secondary education in this area, television taking the larger chunk. A much larger number of studies by institutions than by individual scholars, for earning a degree, have been reported.

As of 1986, Akashvani (All India Radio—AIR) had educational programme production units at 44 stations. It put out broadcasts for primary and secondary schools from 74 stations. Programmes for teachers were being broadcast once a week from almost all stations. Several stations also broadcast programmes in support of correspondence courses offered by the universities. Adult education programmes were being put out by 14 stations.

In addition, the Central Institute of English and Foreign Languages, Hyderabad, has for long been producing and broadcasting lessons for teaching English language. Regional institutes for teaching English and the State Institute of Education, Gujarat, have also been producing and broadcasting lessons in English. The Central Institute of Indian Languages, Mysore, has been producing programmes for teacher training for teaching Hindi to adults coming from non-Hindi-speaking areas. The Kendriya Hindi Sansthan, Agra, has developed audio-tapes for teaching Hindi to non-Hindi-speaking adults.

The Children's Media Laboratory (CML) of the Department of Pre-School and Elementary Education of the NCERT has produced several audio-tapes for pre-

primary children. The Central Institute of Educational Technology (CIET) of the NCERT produces prototypes of radio programmes. It has also produced several hundred audio-tapes for a variety of topics and objectives. Some of these packages have also been broadcast through some AIR stations.

While several agencies are engaged in producing audio-tapes, all transmission facilities are with Akashvani. Most of the production centres, other than Akashvani stations, produce programmes for use as audio-tapes; some others work out special arrangements and produce tapes for the special purpose of broadcasting.

For its educational broadcasts, AIR has set up a consultative panel of educationists for each of its production centres and seeks their advice regularly. For school broadcasts, it liaises with departments of education and sends information regarding broadcast timetables to all schools registered with it. School teachers also work on its panel of script writers and as audio-teachers.

Informal discussions regarding the working of these consultative processes have revealed that there have not been many conscious attempts at exploiting the potential of the broadcasting medium. Time allocation has been more or less democratic over classes and subjects. This probably has been the viewpoint as well.

In their study on 'School Broadcast Programmes' for secondary schools, Mohanty *et al.* (1976) found that the available time was not evenly distributed over classes VIII to XI and the school subjects, though programmes were within the framework of the school curriculum. In another study conducted with the help of a mailed questionnaire, Mohanty *et al.* (1984) report that the majority of the students were not exposed to the broadcasts. Sood *et al.* (1982) studied the organization and reception of radio broadcasts in Haryana. Conclusions are drawn from a 20 per cent return of the mailed questionnaire. The organizational aspect from the AIR side was found to be fairly well planned from the point of view of timing, choice of subjects, advance planning and information to schools. Although 93 per cent of the schools had received sets and 78 per cent were aware of the broadcasts, only 37 per cent listened to the programmes; fewer made suitable arrangements like putting someone in charge. Very few teachers (ten per cent) carried out post-broadcast activities. Although 64 per cent of the teachers were aware of the weekly programmes for them, only 25 per cent of the total group listened to it.

A survey of reception of the school broadcasts in Cuttack and Bhubaneswar conducted by the SCERT, Oris-

sa (1982) showed that 72 per cent of the high schools and 13 per cent of the middle schools possessed radio sets but none of the primary schools had this facility. Although most of the sets in high schools—62 per cent—were in working condition, only 15 per cent of the high schools had made provision for listening to the broadcasts in their timetable, a still smaller percentage (ten per cent) carried out pre- and post-broadcast activities. Lack of proper space, non-availability of timetable of broadcasts, inadequacy of radio sets and lack of funds were pointed out as major difficulties faced by teachers in organizing listening to the broadcasts by the students.

In a similar study regarding utilization of radio teaching in Bangalore district, Nagaraju *et al.* (1983) reported that only 27 out of 57 schools had radio sets in working condition. Out of these, only 16 schools had listening facilities, either through intercom or loudspeakers. Less than 20 per cent of the schools made provision for listening to the broadcasts.

Mohanty *et al.* (1976) reported that the radio programmes emphasized the knowledge aspect more than any other. Teachers, in general, expressed their satisfaction with production quality; they also reported learning from the programmes. They recommended extension of time and made some concrete suggestions regarding the improvement of the broadcasts. In a similar study conducted in 1984, Mohanty and others found the teachers relatively more discriminating regarding the medium, as expressed in their approval of the language used, but complained against the quality of voice and the speed of delivery. They could not be considered fully educated about the medium as they could not comment on the 'sound effects', 'format', etc. Most teachers were not aware of the need or role of pre-broadcast or follow-up activities.

In a study conducted with respect to the impact of 'Teach English, Learn English' (TELE), Gill (1984) reported higher gains in English language for both students and teachers who listened to these programmes. The listening teachers had higher scores on tests of vocabulary, grammar, pronunciation and listening comprehension. The listening pupils, including those in rural areas, also showed higher gains. TELE improved the natural and appropriate use of English, gave useful ideas for teaching/learning English and kept teachers informed about recent trends in teaching the language.

From the late seventies onwards, the use of TV in informal and formal education had continuously improved. Major Doordarshan Kendras produce and telecast programmes for school children, from two to 16 a

week. Programmes can be for general enrichment, addressed to a wide age range, comprising primary school children, or they may be specific to a class-group and subject. At some places, script writers and user-teachers are oriented; support material is provided from some centres, but it does not always reach schools in time. Synchronization with the school timetable is attempted.

In addition, INSAT is used for extending educational television to rural primary schools in some districts of Orissa, Bihar, Uttar Pradesh, Gujarat, Maharashtra and Andhra Pradesh. Nearly 50 per cent of these programmes are produced by the NCERT in Delhi and the original Hindi version is dubbed in other languages. The rest of the programmes are produced by Doordarshan and the states mentioned above and dubbed in other languages. Reception is mostly from low-power transmitters and very rarely through Direct Receiving Sets (DRSs). State Institutes of Educational Technology see to all aspects related to the reception of these programmes.

The University Grants Commission also utilizes two hours of satellite time to telecast an hour-long programme twice daily for college students. Students in approximately 5,000 colleges are expected to be viewing these programmes. The UGC has set up five Educational Media Centres which produce programmes for this purpose. There are, in addition, seven audio-visual research centres that coordinate, support and evaluate the programmes from time to time. However, as of the present, a large number of foreign programmes are being used. The telecast is in English.

Studies are being continuously undertaken by agencies like the NCERT and SCERT to provide the necessary feedback to producers and administrators. An attempt was made to draw an audience profile for the background of young children in the eastern districts of Uttar Pradesh by Singh (1985). While giving a picture of the environment and the society in general, it did not attempt to gather important information regarding the children's vocabulary, their interests or the games they play.

Several surveys have been conducted regarding conditions and appropriate utilization of the programmes for primary school children. In a survey conducted in Orissa (through questionnaires), Singh *et al.* (1986) found at any one time only 50 per cent to 70 per cent of the TV sets functioned properly. The programmes were viewed regularly only in 33 per cent of the schools. Reception of picture or sound was poor in nearly 15 per

cent of the schools. Though the programmes were distinctly meant for two populations, classes I to III and IV & V, all children of the primary classes viewed them together. Population size varied from 90 to 190, with an average around 120, thus rendering viewing quite meaningless for a large number of children. Television sets being out of order and failure of electricity were the main reasons for not receiving programmes.

In a similar study conducted in Maharashtra in 1986, Singh (1986) reported that the percentage of TV sets functioning varied between 63 and 93 per cent. Most DRSs (80 per cent) did not function at any one point of time. On the spot checking suggested a still more dismal picture of utilization (varying between 25 and 75 per cent). Reasons reported for poor utilization were inadequate facility for maintenance, large size of schools, non-availability of a room for TV viewing, lack of motivation on the part of teachers/custodians, non-receipt of the programme schedule, breakdown of electricity and lack of a linkage between the programmes and the syllabi.

In both the states in which these surveys were conducted, schools were required to submit reports regularly which could have resulted in the removal of some of the difficulties, but the schools did not send reports as the money for postage was not provided.

Only two studies evaluated the impact of TV programmes on primary school children. Sinha (1982) commented that the 22.5 minute morning transmission meant for school children could not yield much beyond their learning to make paper dolls and picking up a few new Hindi words. Although reported negatively by the researcher, even these can be considered positive findings. Children learnt. Sinha further reported that the programmes in which visual identification was higher than concept learning were comprehended better. (It may be remembered that the target audience in this case was the age group 5 to 11 years.)

Studying the impact of ETV programmes, with and without teacher intervention, on primary school children in Delhi, Seth (1983) reported that children exposed to ETV gave evidence of better language development, higher organization of information and better scholastic achievement compared with the group that did not watch ETV. The group that received the programmes with support from teachers, in the form of introduction of the programme and follow-up work after the telecast, achieved still higher on all the three variables mentioned above. She recommended involvement of teachers, prior information and guidance notes for

them. On the basis of these findings, she concluded that syllabus-oriented programmes could improve achievement for school subjects.

There are no studies reported either on the utilization or evaluation of ETV programmes in secondary schools. The programmes are confined to five or six major cities and are produced and transmitted by local Doordarshan Kendras. High schools, if they want to see the programmes, do not face the problems of maintenance or space as these are generally available. Their needs and motivation to receive the programmes are some of the areas that need investigation.

The major programme for formal education at the higher level is the one-hour telecast through satellite. As the UGC foresaw the need for using foreign programmes for quite some time, it sponsored a study for testing reception and comprehension of foreign programmes, with or without the comments of facilitators, and some Indian productions. Six centres tried out these programmes with the Development and Educational Communication Unit of the Indian Space Research Organization as the planning and coordination centre. In all, six programmes were tested. Summarizing the findings, Agarwal *et al.* reported that 68.5 per cent of college students were exposed to TV with 42.5 per cent having a TV set at home. (These statistics are changing very fast.) Nearly 90 per cent of the students believed that TV could be used for learning. Out of this, 68 per cent said that it should be used for general information while 27 per cent favoured syllabus-based programmes. The majority said that they would prefer to watch these programmes in college rather than at home. Findings regarding the medium of the programme were not conclusive. Preferences were divided between English and regional languages. This could be reflective of our attitude towards the medium of instruction in general. Also, the English language spoken by foreigners was commented upon for its limited comprehension by Indian students. About 20-22 minutes were considered as the ideal length for a programme. It was also found that an introduction or summary in the beginning of the programme enhanced its comprehension. As the number of viewers was invariably large, more close-ups were recommended by the respondents. It was further said that dubbing in two languages, maintaining the speed and the volume, should be avoided; commentary should preferably be in one language only. Programmes related to current issues such as the energy crisis were appreciated more than others. Good music and colour pictures helped hold attention.

In another study conducted on postgraduate (M. Phil) students of the Madurai Kamraj University, it was found that most students watched TV daily for periods varying from 30 minutes to two hours, averaging around one hour a day. Those who had sets at home watched more than those who watched in hostels or other places. Only 48 per cent reported watching ETV. Students preferred programmes of a general nature and in science more than in humanities. More science students watched ETV programmes. Though quite a few students found Indian programmes as good as the foreign ones, several others complained that these were not attractive and did not carry sufficient content (Pillay 1987).

Chakravarty (1982) surveyed five villages in the Chattisgarh area which were covered under SITE and found that less than 25 of the households or the heads of households viewed programmes regularly. He further pointed out that the lack of a local touch and unfamiliarity with the language could be among the reasons for lack of involvement of these people.

Referring to the role of mass media in rural development Sinha (1982) studied the process and barriers in communications within a village community and the socio-cultural implications of a technological innovation like television. The data were collected during SITE and twice after SITE, in 1977 and 1980. He reported that free access to as well as the location of TV sets helped in breaking communication barriers related to development. Television played a positive role in rural development, not so much independently but through the developmental agencies in that area. This was more true in the areas where infrastructural support was needed. Where infrastructural support was not needed, messages of the 'do it yourself' type helped. He also reported that people belonging to different socio-economic groups within the rural community perceived the messages differently.

As the educational film is now being completely replaced by the video tape, there is just one study reported regarding the effectiveness of films in teaching biological sciences (Muddu, 1978). Use of films with an experimental group of 60 students of class VIII resulted in more learning in lesser time. Students exposed to films showed better retention as well as more interest in the subject than that were not exposed to them.

A few studies were conducted covering both broadcasting media. The reception, efficacy of communication, and acceptance of messages prepared centrally by groups, varying from small ones to an all-India group,

have been studied. These are mostly in the area of informal education. Studying the role efficacy of communication, Samant, (1983) found that media programmes were only moderately comprehended but were retained well; duration of exposure did not seem to be important. Mohanty *et al.* (1976) studied the Multi-Media Package prepared for the in-service training of rural primary teachers in the teaching of science. Their findings regarding video programmes were positive for message communication, but dubbing of programmes was not appreciated. Radio broadcasts were generally appreciated. The study does not comment on either the intermix of the media or the preferences between them of the population concerned.

The emphasis on mass media in the last five years is noticeable. It seems to have already been accepted that the educational film is no longer in the run. Similarly audio/video tapes, though having high promise, still seem to be outside the reach of the majority. Broadcasting is well established with 110 radio stations and 230 transmitters in the country.

A great deal more work needs to be done with radio because of its low cost of production, reception and availability of decentralization. The glamour of TV had taken the attention of educationists away from radio. Though a large number of stations broadcast programmes for schools, there is not enough research regarding the system, its success/failure and the causes thereof. Research is also needed to identify such areas and objectives of the curriculum which are more amenable to the potential of the sound medium. Secondary school *per se* should not have any problems related to organization, but their lack of motivation in receiving the programmes needs to be studied intensively. What are the needs of the system, and can these be met by radio broadcasts, are among the questions that need attention. While school broadcasts have been in existence for more than four decades, it needs to be understood whether teacher education programmes have kept pace with the change.

Secondary education is subject-oriented. Subjects have their structures, in which only carefully designed broadcasting systems can be of interest. The essential elements of such a system need to be understood.

As radio can contribute most easily in primary education, problems related to the management of a broadcasting system in a large number of primary schools need to be studied. Supportive studies regarding vocabulary, knowledge, and the comprehension level of students, are essential. Well-prepared communication

should arouse a desire for more learning. What types of facilities would be needed in the primary schools to meet the needs of the young learners?

School broadcasts, having involved many teachers as script writers and narrators, are very similar in form and content to face-to-face teaching. A critical evaluation of broadcasts from the point of view of content and communication needs to be undertaken. Availability of educational audio-tape library facilities may be surveyed.

As mentioned earlier, except in a few large cities, TV communication is highly centralized. Several studies have pointed out the shortcomings in its appeal and the language comprehension of various groups. More work needs to be done on the identification of such areas as would be effective with the minimum of language. Studies comparing this one-way communication with the classroom, especially at the college level, need to be undertaken. Audio-cum-silent video tapes—something on the lines of tape-slide should be experimented with.

A relevant area of research is media taxonomy. Print has been with us for so long that the significance and potential of the electronic media, which are now becoming as easily available as print, have not been fully comprehended as yet. Related to this are also studies regarding the efficacy of the two broadcasting media, especially related to the content and maturity/education of the receiving groups. While audio-visual material may be more useful to the young, its utility and cost-effectiveness for students in higher education should be studied intensively.

Use of the media in non-formal education has not attracted the attention of researchers. The poorer the inputs in the system, the more the support and attention it needs from the mass media. The non-formal system is the poorest in facilities of time, space and trained manpower; it may benefit from media communication much more than the others. The area needs to be investigated.

AUDIO-VISUAL AIDS

The conventional audio-visual aids seem to attract very limited attention from researchers. Except for blackboards, maps and some charts, aids have not been easily available to a large number of teachers. They have been encouraged and trained to prepare their own aids but this has its limitations in facilities, funds and time available to the teachers. Projected aids needed financial

and, more than that, maintenance support. Moreover, availability of software did not keep pace with the movement. The area seems to have lost the interest of educationists/researchers.

Only four studies in this field have been reported. A very limited survey conducted in eight schools in a single district brought out a dismal picture regarding availability of equipment and materials. Teachers, when questioned, reported 'heavy load of work, lack of time, money and space' as reasons for not using teaching aids (Rao, 1984). Though it would be difficult to generalize from this limited survey, it is in line with work carried out earlier.

As there has been a debate in the late seventies and early eighties regarding the use of modern electronic media to support school education, its feasibility and cost, a very timely study has been carried out by Singh (1984) in 'A Comparative Cost-Effectiveness Study of "Low-Cost" Audio-Visual Teaching Aids and "High Cost" audio-visual Teaching Aids'. On comparing cost and feasibility of using low-cost aids such as charts, pictures, etc. with that of films, video and satellite television, he reported that the 'low-cost' media, when used in all schools, would cost four times as much as video-teaching and seven times as much as satellite television when latter two are used in all the schools. 'Films' are the most expensive and difficult to manage, the distribution system is also quite expensive in this case. Film, in any case, is losing ground to video/television. The researcher recommends a nation-wide coverage by educational television.

Comparing teaching through radio-television, modular and conventional approaches of three different subjects, namely geography, civics and history. Dhamija (1985) found that different approaches produced different results in various subjects. Radiovision seems to be best suited for teaching geography, students gained most from a modular approach in civics and conventional teaching produced best results in history. The involvement of the students was reported to be maximum when radiovision was used; self-confidence was highest when the modular approach was used.

From a largely developmental project, Vincent (1982) reported that nearly 55 per cent of schools of Greater Bombay could not mention even five aids which were commonly used in teaching mathematics in classes ranging from I to X, 17 per cent could not recall even one. He presented a dismal picture of lack of awareness of audio-visual aids on the part of teachers.

Ravishankar (1982) reported that audio-visual aids were frequently not used as part of training programme of teachers. Teachers' apathy to the use of audio-visual aids needs more serious investigation than their expressed views on 'lack of time or funds'. As audio/video tapes are fast coming into the picture, their distribution, availability and use by the students and teachers should also be studied.

MULTI-MEDIA PACKAGES

Education has always acknowledged versatility and efficiency of multi-media communications. Mixing face-to-face teaching, self-learning, use of audio-visual aids and do-it-yourself activities has been part of this understanding. The NCERT included media like television and radio in a well-knit package for training of primary teachers in teaching science and extended it to a large number of teachers in 1975-76. Video communication was found useful in explaining and demonstrating the process part of teaching.

One may say that the movement of educational technology is today multi-media based. The work reported in this survey is comparatively little because of lack of facilities for individual students and also, till lately, in most of the institutions also, for production of their own learning materials. More research is likely to be undertaken when multi-media packages are available.

Vardhini (1983) developed and tried out 'A Multi-media Instructional Strategy for Teaching Science at Secondary Level'. As indicated in the title of the study, there was more variety in approaches than in media. She also used a single group, rendering findings difficult to interpret. One noteworthy finding of her study was that visual projections with teacher explanation and those with taped commentary were equally effective in terms of achievement. On the basis of her efforts and experience, she concluded that, for achievement of different instructional objectives, systematically validated multi-media strategy can be implemented at school level without having to spend too much money or time.

Krishnan (1983) developed a 'Multi-media Package for Teaching a course on Audio-Visual Education', including programmed slides, programmed print material, non-projected visual aids, self-instructional material with manuals for practical exercises, self-evaluating unit tests, feedback, etc. and found it quite effective. As Krishnan also used a single-group approach, its efficacy vis-a-vis any other teaching strategy cannot be commented upon.

Menon (1984) used a multi-media approach for post-graduate students and found it satisfactory. One only wonders whether this type of work needs to be undertaken—except a developmental work.

CORRESPONDENCE EDUCATION

Even before correspondence education came into existence, Boards of Secondary Education (or equivalent institutions) and universities had provisions permitting external students to take examinations for certificates or degrees, provided they had the required qualifications and, sometimes, fulfilled specific conditions. Syllabi for the external students were the same as for regular students and they were completely on their own so far as guidance in their studies was concerned. In the absence of instruction or guidance, external students depended on sub-standard study-guides and tutorial institutions. Examining bodies were accused of using the system as an extra source of income.

The Expert Committee on Correspondence Courses and Evening Colleges set up by the Conference of Boards of Secondary Education in 1961 recommended that 'Correspondence Courses expand and equalise educational opportunity'. It felt that 'the correspondence method admits of greater flexibility than classroom education particularly in the combination of subjects'.

Correspondence education programmes also started mainly with the objective of providing an opportunity for higher education to that segment of population which could not afford full-time attendance in formal institutions for various reasons; for example girls, employed youth, population in rural areas, poorer sections of the society. Inadequate provision for higher education, quality and self time-management were additional factors. Much later, flexibility and soundness of multi-media education through a distance mode strengthened the convictions of several educationists concerning the efficacy of this kind of education.

The first certificate of any importance is earned on the completion of secondary education and correspondence starts at that point. At present, five states (Union territory of Delhi, Rajasthan, Madhya Pradesh, Uttar Pradesh and Orissa) offer correspondence education to students even for the school-leaving examination. Its management is with different institutions, varying from SCERTs to Boards of Secondary Education. The Central Board of Secondary Education started an Open School at the national level, making it more open in its

recruitment and curriculum.

The first correspondence course for the B.A. (Pass) degree was started at the Delhi University through its School of Correspondence Courses and Continuing Education. The Education Commission of 1964-66 again made a strong recommendation in favour of correspondence education. After the commission report, several universities and other institutions of higher learning started offering courses through correspondence. Today, there are 41 centres, including several universities and institutions of higher learning, offering distance-education courses leading to the award of a degree/diploma/certificate. There are two open universities, including the Indira Gandhi National Open University, which offer great flexibility in admissions, learning modalities, evaluation, etc.

Interest in the growing system of correspondence education is reflected in the number of studies reported in the present survey. Three studies were reported, for the first time, in the Third Survey, one each in university education, agricultural education, and at the school education level. While the first was a broad survey conducted in the late seventies, in the second, distance education for a specific group for a specific purpose was studied. The third study confined itself to Patrachar Vidyalaya at Delhi.

Except for the Open School being managed by the Central Board of Secondary Education since 1979, other boards offer the same courses and the same or similar evaluation. The correspondence system at school level attracts a very small enrolment, 3.10 per cent of the total enrolment of 17 million at the secondary and higher secondary level. The proportion of deprived groups enrolled in distance education is also small when compared with the same ratio in regular schools.

Although institutes of correspondence courses at higher level were only a step ahead, with the first institution having started in 1962, distance education at this level is far ahead of school education, closing at five per cent (1982-83) of the enrolment at this level.

Corresponding to the number of institutions/enrolments at the secondary level, the research on correspondence education at the school level is also very limited. Jagdish Singh conducted surveys of the correspondence education programme of Patrachar Vidyalaya, Delhi (1981), and the Board of Secondary Education, Ajmer (1983). Profiles of the students of the Open School and their reactions towards sub-systems of correspondence education were studied by Dewal

(1983). A study of the functioning of the Institute of Correspondence Education, Allahabad, was conducted by Pandey (1985). Dewal (1982) reported that the percentage of women and SC and ST students in correspondence education were low compared to that of these categories enrolled in schools, being 13.3, 7.8 and 2.4 per cent against 30 per cent, 27.4 per cent and 18.2 per cent in schools respectively. A majority of the students belonged to the age group 18–20, a small minority (8.5 per cent only) being above the age of 30.

Institutions make several despatches, varying from 5 to 16 to a student (Mullick, 1987). Correspondence lessons may not be available in all the subjects offered and, at times, students have to make their own arrangements (Singh, 1983). All the institutions, except the one in Madhya Pradesh, organize Personal Contact Programmes (PCP) of varying durations (from 3 to 10 days). The general experience of the institutions is that PCPs are helpful to students and also help the institutes to understand and analyse the difficulties of the learners (Mullick, 1987). Attendance at these programmes is reported to be low.

Sahoo (1987), in his paper, summarized the findings of several studies and reported that the system was only an extension of the regular college and university courses, but it made higher education available to an additional small group. Students were motivated to join correspondence courses for improving their qualifications. Non-availability of time and finance, over-age, employment, poor performance in the last examination and non-existence of colleges in the neighbourhood were some of the reasons given by learners for joining correspondence courses. Most of the students were employed men from the upper castes and belonged to the age group, 16–35 years. A large number of students were working as teachers and clerks.

Sahoo, in his summary, reported a high rate of dropout, varying from 32 to 85 per cent, from the postgraduate levels. Most of the dropouts were from the higher age-group, with a large time gap between their last qualifying examination and their admission to correspondence courses, and poor academic family background. Most of these were from rural areas or women. Lack of library facilities, non-availability of reference material, not being able to submit the required number of assignments or attend PCPs and difficulties in studying lesson scripts were mentioned as some of the reasons for dropping out of the system.

Institutions used written lessons, assignments and PCPs as major forms of instruction. The lesson scripts

were usually prepared by experienced outside teachers. Most students appreciated the usefulness of correspondence lessons. Both students and teachers thought there was a scope of improvement. Training of teachers and reviewers for preparing distance communication was recommended (Sahoo 1987).

Although most of the students appreciated the requirement of compulsory submission of assignments, it was also treated as a formality for appearing in the examination. More than 50 per cent of the students did not submit any assignment at all. In most cases, evaluators did not provide the required feedback on the assignments. At the college and university level, all the institutes of distance education had provision for PCPs, mostly in cities. Where attendance was compulsory, 70 to 80 per cent of the students attended, otherwise attendance was very thin. Policy regarding choice of work at PCPs was not clear and frequently the topics overlapped the ones covered through written notes. Lectures and question–answer methods were adopted for teaching. The students appreciated PCPs for clarifications of doubts, better preparation for examinations and solving academic problems. More postgraduate students were in favour of PCPs than undergraduates (Sahoo 1987).

The picture of the efficacy of the system, in comparison with regular classroom teaching, is unclear, with Sashi (1971) reporting no difference in the achievement of undergraduate students from Delhi and Utkal, Pandey (1980) reporting higher pass percentages of correspondence students in Meerut, Punjab, Bombay, SV and Madurai Kamraj University, and Biswal (1979) reporting no differences.

Sahoo (1987) quoted the work of Dutt (1978), Biswal (1979) and Khan (1982) to point out that the major sources of finance of distance education were student's fees. Most of the expenditure was on salaries of teaching and non-teaching staff, preparation of learning material, PCPs and library. The unit cost of correspondence course was very much lower than that of regular courses.

Nine studies have been reported in the area of correspondence education in this survey; all of these are with reference to higher education, three were undertaken by the institutions involved in the process.

In her philosophical analysis of the concept of distance education, Indradevi (1985) pointed out the need for continued learning because of continuous changes and advances in technology. Distance education alone can meet these continued and ever-increasing needs.

Open-learning systems, in general, can provide opportunities not easily or quickly available in conventional systems. It was also superior to private study or other informal systems to the extent that it was organized and properly designed, in keeping with the needs of the learner group and growth of knowledge. While retaining supervision, it freed the learner from rigidity of time and space.

Who are the people who enrol in distance education courses? There are some common qualities, but some of these vary with the nature of the course. Nearly all studies reported that most of the students were men (Sahoo 1985, Pillai *et al.*, 1984, Gomathi, 1982). This finding needs to be seen in the context of the proportion of boys and girls successfully completing secondary school or the first degree. Dutt (1987) reports higher enrolment of women candidates—44 per cent in 1985-86 compared to 28 per cent in 1975-76 in the School of Correspondence Courses in Delhi. No other comparison over a period of time is available. Since the major population of this school comes from Delhi itself, some of the local variables, such as inadequate seats in colleges compared to increasing population, long distances with inadequate transport facilities for women to travel safely and comfortably, might have contributed to this change.

Students of correspondence courses are reported to be relatively older (Sahoo, 1985), with some years of gap between their last qualifying examination and present study. Pillai *et al.* (1984) report a similar picture for students enrolled in Madurai Kamraj University, where 37 per cent of their students belonged to the age group 30 to 40 years while 58 per cent were 20-30 years of age. Khan (1982) reported a somewhat different picture for undergraduate students of eight correspondence institutes; most of the learners registered were teenagers.

Socio-economic status of the population enrolled in correspondence courses also varies from place to place or from course to course. Studying 540 B.Ed and M.Ed students registered with Osmania University, Indra Devi (1985) found the clientele of Himachal Pradesh University to be from low and middle income groups, mostly employed and first generation learners; Pillai *et al.* (1984) reported that nearly half of the total population of MKU was from among backward classes, but the majority from middle-income groups. They further reported that 200 convicts in eight central prisons of Tamil Nadu were also enrolled for one course or another. Of the total group, 35 per cent were unemployed, six per cent self-employed, seven per cent housewives; 27 per cent were teachers. Gomathi (1982) found a larger

proportion employed—65 per cent—of which 45 per cent were teachers.

Summing up, it can be said that the clientele for distance education consists of persons older than students in regular colleges. They had probably dropped out of the mainstream after the high/higher secondary examinations and wanted to take a second chance. Compared to the men/women ratio in regular higher education, the ratio is more favourable for women in correspondence education and perhaps also for the students from deprived groups. A large number of teachers joined these courses to improve their qualifications.

Women found it easier to study through the correspondence system than through regular classes. Inability to spare time (fixed hours) and finances required for attending regular, full-time institutions are some of the motivating factors reported by Indra Devi (1985). Economic factors have also been pointed out as a source of motivation by Sahoo (1985). Some joined correspondence courses due to non-availability of admission in regular colleges or due to occupational involvement (Khan, 1982). Candidates joined correspondence education for improving qualifications, gaining financial benefits, improving status, learning further, utilizing leisure and to be able to meet the demands of better jobs. Only the employed (there too teachers more than any other group) pointed out flexibility of the nature of the course as an attractive feature (Indra Devi, 1985). Kumar *et al.* (1986) in their study of the motivation of students of the B.Ed. Correspondence Course offered by the NCERT also reported somewhat similar finding. According to them, teachers already in service found distance education a convenient modality for improving qualifications and, hence, chances of promotion. They also pointed out that the achievement motivation of these students was comparable to that of regular students.

The economics of correspondence education in seven Indian universities was studied by Pandey (1980) and he reported: (i) The correspondence courses depended mainly on students' contributions and thus supported themselves without government subsidy. There was a difference in recurring income of correspondence and regular courses but none in the non-recurring income. (ii) Significant differences existed between per student expenditure on direct cost, indirect cost and total cost at enrolled and appeared level, whereas no significant difference was observed with regard to direct cost per student for the pass level. (iii) There existed differences between per student expenditure on indirect and total cost at pass level. (iv) There was no

in terms of wastage cost per student at direct, indirect and total levels of regular and correspondence streams. (v) The difference of direct cost per student (failure) of the two streams was not significant but the difference of indirect cost and total cost per student (failure) of two streams was significant. (vi) Among all graduation courses, correspondence education was found to be most economical.

Indra Devi (1985) also reports somewhat similar finding in that the major source of revenue was restricted to fees from students; all of it was not utilized. The private cost of postgraduate correspondence courses, specially with regard to instructional costs, was less than that of regular postgraduate students.

Although, in most places, correspondence education is self-sufficient, in some places it is subsidized, subsidies varying from 50 to 72 per cent being reported by Dutt (1987) for the School of Correspondence and Continuing Education. The extent of subsidy decreases as the enrolment increases. Most of the cost, nearly 70 per cent, is attributable to payment of salaries of the teaching and non-teaching staff.

It has been possible to elicit the cooperation of a large number of qualified and experienced teachers in correspondence instructional activities, as reported by Sahoo (1985). One may see this in the light of the fact that payment for services rendered provides some motivation to these teachers. Lack of appreciation of correspondence courses by academicians is reported by Khan (1982). While the utility of distance education in terms of academic and sociological aspects was appreciated, it was not always helpful in job placement and occupational growth. Teachers in employment were more favourably inclined to correspondence course than their counterparts in teacher education colleges. Probably secure in their employment, they see this as an opportunity to strengthen and improve their positions while those still under training are uncertain of finding employment, at least sufficiently quickly.

Evaluating the system, Sahoo (1985) found lesson scripts, personal contact programmes and assignments to be of medium quality. Facilities for library studies and use of media, other than print, were poor. Khan (1982) found teachers almost divided in their opinion on whether the correspondence system was better than face-to-face teaching. Further, students did not consider contact programmes important. Eighty-one per cent of the correspondence students of Madurai Kamraj University found printed lessons most important, but only 31 per cent thought contact lessons were useful. Assignments, response sheets and study centres were

considered least useful by more than 50 per cent of the students. Radio programmes were, however, considered as useful by about 68 per cent (Pillai *et al.* 1985). Kumar *et al.* (1986) appreciated the contact programmes and use of audio/video tapes by B.Ed students. They reported that tutors did not provide comments on the assignments, which were not returned promptly either.

PROGRAMMED LEARNING

In the *Third Survey*, Mishra (1986) reported 'Researchers in India on programmed learning have so far been confined to (i) programmed approach vis-a-vis traditional approach to learning, (ii) different forms of programmed learning material, (iii) different uses of such material, (iv) programmed learning for different subjects, (v) programmed learning and educational media, and (vi) programmed learning and individual differences.' The methodology used was usually the inter-group method. The findings of these studies generally reported higher achievement of the groups exposed to the programmed approach, cutting across subjects and class levels. The retention of learners following administration of programmed material was also reported to be enhanced.

In the *Third Survey*, 18 studies had been reported under programmed learning. Of these, five (30 per cent) were concerned with effectiveness of programmed learning in comparison with other styles of teaching, ten (more than 50 per cent) with the development of programmed material in various subjects, and two with the relationship of personal characteristics. Two of these studies were concerned with an optimal strategy for multi-media programmes. All the work reported was based on Ph.D. theses. In the present survey, 20 studies have been reported, of which only one is a non-Ph.D. work. In most of the studies, PLM is developed by the investigator, even when the objective is to study the approach in relation to other approaches. Some of the studies have development of material as the major or as one of the major objectives. Nearly 26 per cent could be categorized as such, five studies are addressed to the comparison of various styles of PLM, such as linear, branching or mathematical; and nearly an equal number compare the approach with known classroom approaches or those supported by audio-visual material. Five studies explore the relationship between personality variables and learning through programmed material. One investigation studies the relationship between

Five equivalent treatment groups were formed on the basis of subject-to-subject matching on the variable of intelligence from a pooled sample of 443 ninth grade students selected from three Hindi medium schools of Kangra district of Himachal Pradesh. Each treatment group finally consisted of 24 subjects. Programmed text, pretest, criterion test, nine interim tests, and General Mental Ability Test were the tools used in the study for data collection. The data were analysed using analysis of covariance.

The study revealed: 1. The use of interim tests during the course of instruction enhanced immediate as well as delayed performance of students on the summative test irrespective of the fact whether they were taught through programmed instruction or the conventional method of teaching. 2. Immediate as well as delayed performance of the students was better on the summative test when the students were taught with interim tests along with the knowledge of results about these tests in comparison to (a) those who were taught the content matter with interim tests but with no knowledge of results and, (b) those who were taught the content matter without using the interim tests, irrespective of the fact whether the students were taught through programmed instruction or the conventional method of teaching. 3. When the interim tests were used along with the knowledge of results during instruction, programmed instruction seemed to be a superior technique to the conventional method as far as the retention of content matter for a longer period was concerned. 4. When the students were taught through the conventional method, they exhibited the same level of test anxiety, immediately as well as 20 days after the completion of instruction, irrespective of the fact whether (a) interim tests were used with the knowledge of results, (b) interim tests were used without the knowledge of results, or (c) interim tests were not used during the course of instruction. The same was true when students were taught through programmed instruction material. 5. When students were taught through programmed instruction, they exhibited a low level of test anxiety, immediately as well as 20 days after instruction in comparison to those who were taught through the conventional method, irrespective of the fact whether (a) interim tests were used with the knowledge of results, (b) interim tests were used without the knowledge of results, or (c) interim tests were not used during the course of instruction.

The results of the study imply that the use of interim tests during instruction enhances students' perform-

ance on immediate as well as delayed attainment tests. Further, if the interim tests are used with programmed instruction material, the students exhibit a low level of test anxiety after instruction. Thus the use of interim tests in the classroom, specifically with the knowledge of results and using programmed instruction material, may be helpful in increasing performance and reducing the level of test anxiety in the students.

867. BHARTIYA, A., *The Effectiveness of Mathetics in Mathematics in Relation to Certain Students' Characteristics*, Ph.D. Edu., Mee. U., 1979

The objectives of the study were (i) to analyse the relationship between the students' characteristics and mathematical learning performance, (ii) to study the interaction effects of these variables on mathematical learning performance, and (iii) to evaluate the workability of learning packages in terms of internal and external criteria. The hypotheses were: (1) The mathematical learning performance is related to intelligence. (2) Creativity is significantly correlated with mathematical learning achievement. (3) There is a significant relationship between stability and mathematical performance. (4) Introversion scores are significantly related with mathematical achievement. (5) Level of aspiration scores are significantly related with mathematical performance. (6) There is a significant interaction effect among these variables with regard to mathematical performance.

The cluster and stratified sampling was used for selecting the sample. The sample comprised 196 students (100 boys and 96 girls) of class IX. The stratification was done on the basis of students' characteristics for the factorial design treatment by using Kelley's dichotomy. The factorial design was used to study the interaction effects of students' characteristics on mathematical learning. In the analysis the pretest scores were adjusted to the post-test scores. Intelligence was measured by the General Mental Ability Test developed by S. Jalota; creativity through the Verbal Test of Creative Thinking Ability by Baqer Mehdi; neuroticism and extraversion by Eysenck's M.P.I. adapted in Hindi by Jalota and Kapoor; and level of aspiration by the Aspiration Test of Shah and Bhargava. The data were analysed by using product-moment correlation, multiple correlation, analysis of variance and analysis of covariance.

The findings were: 1. Intelligence of subjects was found to be significantly related to their mathematical performance. 2. Creativity was significantly related to

mathematical achievement. 3. The performance of high intelligent high creative subjects was highest and that of low intelligent low creative subjects lowest. 4. The low intelligent low creative girls had higher performance than low intelligent low creative boys. 5. Introversion was significantly related with mathematical learning. 6. Stability of the subjects was significantly related to their mathematical performance. 7. Among girls extraversion was not significantly related with their performance. 8. The mathematical learning performance of stable introvert subjects was highest and that of neurotic extraverts lowest. 9. The neurotic extravert girls had higher performance than the neurotic extravert boys. 10. The level of aspiration of the subjects was significantly related to mathematical performance. 11. The boys and girls were equally benefited by mathematical learning experience. 12. There was a significant interaction effect of intelligence and sex on mathematical performance. The boys and girls did not differ in their performance at high level of intelligence, but girls had higher performance than boys at low level of intelligence. 13. There was a significant interaction effect of extraversion and sex on mathematical performance. The introvert boys and girls did not differ significantly but extravert girls had higher performance than extravert boys. 14. There was a significant interaction effect of intelligence and extraversion on mathematical performance. There was no significant difference between the performance of introverts and extraverts at high intelligence but the introverts had higher performance than the extraverts at low intelligence. 15. Creativity and extraversion had a significant joint effect on mathematical achievement. There was no significant difference in the performance of extraverts and introverts at high creativity level but at the level of low creativity, introverts had higher performance than extraverts. 16. There was a significant interaction effect of the level of aspiration and creativity on mathematical achievement. High creatives and low creatives did not differ in their performance at high level of aspiration, but high creatives had higher performance than low creatives at low level of aspiration. 17. There was no significant interaction effect of intelligence and creativity, creativity and sex, neuroticism and extraversion, neuroticism and sex, level of aspiration and sex, intelligence and neuroticism, creativity and neuroticism, level of aspiration and intelligence, level of aspiration and neuroticism, and level of aspiration and extraversion on mathematical performance. 18. The students' five characteristics—intelligence, creativity, neuroticism,

extraversion and level of aspiration, contributed significantly to pooled variance of mathematical performance.

868. BHAT, V.D., *A Study of the Effect of Simulation on Performance of Teacher Trainees in Educational Psychology*, Ph.D. Edu., MSU, 1982

The objectives of the study were (i) to develop software material for arriving at four instructional strategies differing in terms of the mode of presentation and the presence of simulation, for teaching educational psychology at B.Ed. level, (ii) to establish the effectiveness of the strategies in terms of content validity, trainees' achievement, development of attitude and their performance on a risk-taking behaviour scale, and (iii) to compare the effectiveness of the strategies.

With a view to studying the effectiveness of simulation as an experimental instructional input and its interaction with the basic mode of presentation, a matched groups 2×2 factorial design was chosen. The presence or absence of simulation and self-instruction or teacher based instruction formed the two factors at two levels. One hundred and eighty-six trainees at B.Ed. level of the M.S. University of Baroda were the subjects of the study. They were divided into four groups. Matching of the groups was done on the basis of sex, age, experience, intelligence, reading comprehension, attitude and risk-taking behaviour. Instructional materials were developed for three units of educational psychology. The components of the strategies were simulation, programmed learning material (PLM), structured lecture, library reading, discussion, and assignment. The experiment was conducted for a duration of one semester. The tools used for study of effectiveness of the programme were criterion achievement test, an attitude scale on the role of the teachers in solving the problems of the children, and a risk-taking behaviour scale prepared by the investigator. Further, Govind's (1975) Reading Comprehension Scale and Bale's (1970) Interaction Process Analysis Scale were used. The F-test and t-test were used for arriving at conclusions.

The major findings of the study were: 1. The combination of PLM and simulation led to a significantly superior performance by the trainees as compared to those who underwent the instructional treatment of only PLM or only structured lecture. 2. Simulation combined with the PLM led to a significantly superior performance by the trainees as compared to those who were taught through simulation combined with structured lecture. 3. The trainees' attitude towards 'Role of

the teacher in solving the problems of the children' gained significantly in case of simulation instruction group trainees. 4. Simulation combined with PLM, but not with structured lecture, led to a significant gain in risk-taking behaviour of the trainees.

The educational implication of the study lies in bringing out improvement of the instructional system with the use of an appropriate combination of different methods/techniques of instruction like simulation and its combination with PLM.

869. CHAKRAVARTY, T.R. and others, *Satellite Instructional Television Experiment—a Study of Chhattisgarh*, NIRD, 1982

The objectives of the investigation were (i) to study the social and economic context of the target audience in terms of dimensions relevant to rural development television, (ii) to study the social dynamics of the introduction of TV in relatively backward areas, (iii) to study whether those who were attracted towards TV were different from those who were not in terms of selected characteristics, (iv) to study the TV viewing behaviour of those who watched the Satellite Instructional Television Experiment (SITE) programme more or less regularly, (v) to study how far SITE has been able to attract its target audience, (vi) to assess the relevance and impact of the instructional programme in terms of needs of the audience, (vii) to study the impact of SITE in terms of change in adoption behaviour, social interaction, etc., and (viii) to study the different organizational aspects of TV at the village level.

The study adopted one village for intensive study and four villages for survey. In the intensive study, informal discussion, family set-up in the village, interpersonal communication, and functioning of social, religious and political institutions were studied. In case of survey of the four villages, interviews were held with the heads of the families about the family structure and television programme. After five months of the commencement of the programme, the subjects who said that they viewed the programme daily ($N = 75$) and those who said they rarely viewed it ($N = 75$) were selected. Their opinion regarding four selected agricultural programmes was recorded. Along with this the opinion of teachers and literate villagers was also sought about the programme. The viewers and non-viewers were given a 'knowledge test' about agriculture. The data were also collected through interviews about social

participation, outside visits, interaction with development officials, modernity and awareness about agriculture innovations.

The findings of the study were: 1. Less than one-fourth of the heads of households were found to be regular viewers. 2. The presentation of most of the programmes of TV lacked the local touch. Though the language used was Hindi, the particular touch of Chhattisgarh was missing. 3. Often the custodian of TV who was usually a teacher was not motivated and saw his duty as a burden. 4. There was inadequate participation and involvement of local organizations and agencies because of the absence of a process which should have made all feel their role as participants. 5. There were conditions in which everyone felt constrained and which did not permit any effective dialogue taking place between field level functionaries and SITE officials whose image, to local officials, was that of 'coming from the higher-ups'. 6. There was insistence on form rather than content in the programmes.

870. CHAUDHARY, M., *Preparation and Evaluation of Programmed Learning Material in Geography for the Secondary Level*, Ph.D. Edu., Avadh U., 1985

The main objectives of the study were (i) to prepare programmed learning material on selected items of the geography syllabus, and (ii) to evaluate the programme in terms of learning induced among the readers by reading the programme. The secondary objectives of the study were to evaluate the effectiveness of the programme for, (iii) the rural and urban students separately, (iv) for boys and girls separately, and (v) for the individual institutions separately.

The study was experimental in nature and employed the single group, i.e. pretest/post-test design. The sample of the study comprised 300 students (223 male and 77 female) of classes IX and X drawn from ten secondary institutions (six boys' and four girls') of Faizabad city and rural areas in the neighbourhood. For collecting data the investigator prepared programmed material containing 226 frames (95 on 'movements of earth', 68 on 'air pressure' and 63 on 'major land forms') following the standard procedure; and an achievement test in geography on the content of the programmed learning material. The error rate of the programme was 4.5 per cent. The coefficient of validity of the achievement test was 0.49. The reliability of the test found by the

method of rational equivalence was 0.91. The collected data were tabulated and analysed using suitable statistical techniques.

The findings of the study were: 1. Students gained significantly in the knowledge of the subject by reading the programme. 2. The programme was equally effective in producing learning among the rural and urban population. However, the girls gained slightly more than the boys on this programme. 3. The mean gains for the different institutions varied to a fair extent but all these gains were highly significant.

The educational implications of the study are: (1) The findings affirmed the effectiveness of the programmed material in inducing learning among the students. (2) The programmed material can be effectively used to teach the content to the students of classes IX and X without any fear of failure. It could be used with junior students as well. (3) In view of the dearth of effective geography teachers, a careful preparation of programmed material on the difficult contents of geography could be tried.

871. DESAI, K.V., *An Investigation into Efficacy of Different Instructional Media in the Teaching of Science to the Pupils of Class VIII in Relation to Certain Variables*, Ph.D. Edu., SPU, 1985

The objectives of the study were (i) to compare the achievement of pupils in science learning through different instructional media and the traditional way of teaching, (ii) to compare the achievement of pupils in science learning through the programmed learning approach and the traditional way of teaching, (iii) to compare the achievement of pupils in science learning through slides with discussion approach and the traditional way of teaching, (iv) to compare the achievement of pupils in science learning through the experimental approach and the traditional way of teaching, (v) to compare the achievement of pupils in science learning through the programmed learning approach and slides with discussion approach, (vi) to compare the achievement of pupils in science learning through the programmed learning approach and the experimental approach, and (vii) to compare the achievement of pupils in science learning through slides with discussion approach and the experimental approach.

The density, specific density of a solid, and the cell and its structure were selected for the preparation of the material for instructional media. The programmed

learning material, slides and laboratory experiments were designed. The criterion test was prepared on the units selected for experimentation. The Junior Index of Motivation Scale and the Reasoning Ability Test were used for measuring motivation towards schools and reasoning ability of pupils. The experiment was carried out in two schools of Anand city. Four equivalent groups with respect to motivation towards schools and reasoning ability were prepared. In each group there were 25 students. One group was taught through programmed learning, the second group was taught through slides with discussion approach, the third group was taught through the experimental approach and the fourth group was taught through the traditional approach. The analysis of covariance was used to test the various hypotheses.

The major findings of the study were: 1. The programmed learning approach was more effective than the traditional way of teaching science. 2. The slide with discussion approach was more effective than the traditional way of teaching science. 3. The experimental approach was more effective than the traditional way of teaching science. 4. In the teaching of science, the experimental approach was the most effective of all approaches. 5. The programmed learning approach and slides with discussion approach were equally effective. 6. The use of instructional media indicated the possibility of improvement in the methodology of science teaching, raising the standard of science education in secondary schools and development of taste and interest in the younger generation for the subject of science.

The major educational implication of the study is that there is not one method of teaching science. The teacher should be experimental-minded and should use different approaches in the light of different objectives. Media are effective in science education.

*872. DESAI, R.M., *A Study of Effectiveness of Programmed Learning Strategy in Teaching of Physics in the Eleventh Grade*, Ph.D. Edu., Bom. U., 1986

The main objectives of the study were (i) to prepare programmed material on heat in physics for pupils studying in standard XI (Science) in the schools of Bombay and Greater Bombay, (ii) to try out the programme on a sample of pupils and test its effectiveness as auto-instructional material, (iii) to ascertain the achievement of the pupils after learning physics through a teacher-

made test, and (iv) to find correlations between the achievement of pupils and their abilities and intelligence.

The study employed the experimental design. The method of cluster sampling was used for the selection of 200 pupils from four science classes of standard XI in Bombay and Greater Bombay. A pretest was administered on a small sample to ascertain the pupils' previous knowledge. The difficulty level and items having ambiguous structures were modified and then a post-test was administered on the same sample of the population. The performance of the sample pupils on pretest and post-test was tested against their performance on the science attitude scale and their performance on the intelligence, etc. The tools employed in this study were (i) a Questionnaire for pupils to ascertain the pupils' previous knowledge in science, prepared by the researcher, (ii) Dr. Ahuja's Group Test of Intelligence, (iii) Science Attitude Scale, and (iv) S.S.C. marks obtained by the pupils in the subject of science at the S.S.C. examination of March 1984. The data were analysed by using analysis of variance, F-ratio, product-moment coefficient of correlation and percentile ranks.

The major findings of the study were: 1. Pupils took active interest in reading and learning through programmed material. 2. Pupils solved examples on conversion of scales and on coefficient of linear and cubical expansion of solids. 3. They found the programmed learning approach easy and interesting as each pupil had an opportunity to learn at his/her own speed and capacity. 4. The programmed learning approach proved better than the lecture method in the study of physics. 5. It was found that the pupils scoring high on the Intelligence Test also scored high in the post-test and pretest and those having low scores on the Intelligence Test scored low on the post-test. The results were quite consistent with the concepts of intelligence and achievement. 6. The scores on the post-test had no bearing on the performance of pupils on the science attitude scale. Attitude to science had no direct effect upon the achievement of pupils in science.

873. DHAMIJA, N., *A Comparative Study of the Effectiveness of Three Approaches of Instructions—Conventional, Radio-vision and Modular Approach on Achievement of Students in Social Studies*, Ph.D. Edu., Kur. U., 1985

The objectives of the study were (i) to compare the

achievement of students of class VII in social studies when taught through three different approaches, viz. radio-vision, modular and conventional, (ii) to compare the achievement of students in geography when taught through these three approaches, (iii) to compare the achievement of students in civics when taught through these three approaches, (iv) to compare the achievement of students in history when taught through these three approaches, (v) to compare the retention of students in geography when taught through these three approaches, (vi) to compare the retention of students in civics when taught through these three approaches, (vii) to compare the retention of students in history when taught through these three approaches, (viii) to compare the students' involvement in geography when taught through three approaches, (ix) to compare the students' involvement in civics when taught through three approaches, (x) to compare the students' involvement in history when taught through three approaches, (xi) to compare the self-confidence of students in geography when taught through these three approaches, (xii) to compare the self-confidence of students in civics when taught through these three approaches, and (xiii) to compare the self-confidence of students in history when taught through these three approaches.

The study was conducted at the final study stage and at the confirmatory stage. The sample of the final study comprised 30 students in each of three different schools. The students were selected on the basis of their intelligence scores. In total there were 90 students. The sample of the confirmatory study comprised 90 students belonging to one school. These students were also selected on the basis of their intelligence scores. In the final study stage three schools formed three parallel groups for three approaches of teaching, viz. radio-vision, modular and conventional. So a three-way factorial design ($3 \times 3 \times 3$) was followed where three factors were involved, namely approaches of teaching (radio-vision, modular and conventional), intelligence (high, middle and low) and testing occasions (pretest, post-test and retention test). In the confirmatory study, students in one school were divided into three parallel groups. These groups of students were taught by three approaches of teaching—radio-vision, modular and conventional and later on the teaching methods were rotated in a Latin square design. In both the stages social studies comprised three different disciplines, namely, geography, civics and history. These three subjects were taught one by one by the three different approaches of teaching. The students were administered the achieve-

ment test, retention test, Students' Self Confidence Scale, and Students' Involvement Scale. The achievement and retention tests comprised a criterion test. The Students' Self Confidence Scale and test-retest reliability 0.86 and validity coefficient 0.75. The Students' Involvement Scale and test-retest reliability coefficient 0.89 and validity 0.72 against the criterion of students' achievement scores.

The findings of the study were: 1. The students achieved highest knowledge achievement scores in geography when taught through radio-vision. 2. High intelligent students scored highest knowledge achievement scores in geography when taught through radio-vision. 3. The achievement of students was the highest in comprehension scores in geography when taught through the radio-vision approach. 4. High intelligent students got the highest comprehension achievement scores when taught geography through the radio-vision approach. 5. The students achieved the highest total achievement scores in geography when taught through the radio-vision approach. 6. Students, having high intelligence, attained the highest achievement scores in civics when taught through the radio-vision approach. 7. The achievement of students was the highest in knowledge achievement scores in civics when taught through the modular approach. 8. Students having high intelligence got the highest knowledge achievement scores in civics when taught through the modular approach. 9. The achievement of students was highest in comprehension achievement scores in civics when taught through the modular approach. 10. Students with high intelligence got the highest comprehension achievement scores in civics when taught through the modular approach. 11. The students achieved highest total achievement scores in civics when taught through the modular approach. 12. Students having high intelligence scored the highest total achievement scores in civics when taught through modular approach. 13. The students achieved the highest knowledge achievement scores in history when taught through the conventional approach. 14. Students of high intelligence got the highest knowledge achievement scores in history when taught through the conventional approach. 15. The students' achievement was the highest in comprehension achievement scores when taught history through the conventional approach. 16. High intelligence students attained the highest comprehension achievement scores in history when taught through the conventional approach. 17. The achievement of the students on the total achievement scores was the highest in history when

taught through the conventional approach. 18. Students having high intelligence got the highest achievement scores when taught history through the conventional approach. 19. The retention on knowledge, comprehension and total achievement scores was the highest in that group of students who were taught geography through the radio-vision approach. 20. The retention on knowledge, comprehension and total achievement scores was the highest in that group of students who were taught civics through the modular approach. 21. The retention on knowledge, comprehension and total achievement scores was the highest in that group of students who were taught history through the conventional approach. 22. The involvement of students in the classroom was maximum when they were taught through the radio-vision approach. 23. Self-confidence among the students increased the most when they were taught through the modular approach.

874. DUTT, R., *Status of School of Correspondence Courses and Continuing Education*, University of Delhi, School of Correspondence Courses Project, 1987

The objectives of the study were (i) to study the enrolment structure and courses offered during 1962-87, (ii) to study the background of students of correspondence courses, (iii) to study the instructional system of the school, (iv) to study the cost structure of correspondence courses, and (v) to study the examination results of the courses.

Data were collected from official records and publications of the school correspondence course, University of Delhi, during 1962-87. Data were analysed in descriptive form.

The findings of the study were: 1. The School of Correspondence Courses and Continuing Education was established under ordinance XX of the University of Delhi as a University maintained institution. 2. From 1962 to 1982, the school had been offering undergraduate courses in arts and commerce subjects. Postgraduate level courses in commerce and arts subjects were started during 1982-86. 3. The school started with the modest enrolment of 1,112 in 1962-63 and the enrolment touched a level of 16,735 in 1969-70. In 1986-87, the enrolment was as high as 22,743. Introduction of the 10+2+3 system had affected the enrolment positions adversely for a few years in the late seventies. The major strength of enrolment (93.6 per cent) was occupied by

the undergraduate courses and the remaining 6.4 per cent of enrolment was shared by the postgraduate courses. 4. The admission criteria of the the correspondence courses remained almost similar to those of the regular courses. 5. Although in 1975-76 the courses attracted 29 per cent employed students, over the years the percentage has been declining. In 1985-86 the percentage of employed students was only 13.9. The students of the school belonged to almost all the states and Union territories of the country with a major concentration in Delhi Union Territory (95.01 per cent). The proportion of females showed an increase from about 28 per cent in 1975-76 to about 44 per cent in 1986-87. This helped towards equalization of educational opportunity in the urban society. While most of the students (68.4 per cent) in pass courses of commerce studied through Hindi medium, the reverse was the case of Hindi medium students (12.2 per cent) in the case of honours courses of commerce. Most of the students of B.A. courses (78-95 per cent) opted for Hindi medium of instruction. 6. Instruction was provided through print-based materials, contact classes, response sheets, and library study facilities. Since the major concentration of students remained in Delhi, the contact programmes were organized only in Delhi areas. The students were provided with book bank facilities and fee concessions. 7. The correspondence courses were subsidized from 49.6 per cent to 72.0 per cent during 1980-81 and 1985-86. The increase of enrolment position brought down the rate of subsidy per students. In the case of the lower enrolment of 6,482, during 1980-81, the unit cost was Rs. 801.00 whereas the higher rate of enrolment brought down the unit cost. While the enrolment was 21,466 during 1985-86, the unit cost came down to Rs. 563.00. 8. The major share of cost structure (64 per cent to 70 per cent) remained with the salary of teaching and non-teaching staff. 9. The pass percentages of the undergraduate courses varied from 13 per cent to 91 per cent. For PG courses the pass percentages varied from 40 per cent to 84 per cent.

875. DWIVEDI, S.K., *Performance on Linear Programme in a Segment of Biology in Relation to Level of Aspiration and Socio-Economic Status*, Ph.D. Edu., HPU, 1983

The study was conducted to investigate the effect of the

level of aspiration and socio-economic status on performance in a linear programme. The main objectives of the study were (i) to examine the performance of subjects, on a linear programme in relation to the level of aspiration and socio-economic status, and (ii) to study the interaction between the level of aspiration and socio-economic status.

The study covered the target population of biology students of the higher secondary, Part II, premedical students of colleges in Chandigarh. The institutions and the sample were selected randomly. The sample consisted of 250 boys and girls equal in number. The subjects were classified into nine treatment combinations on the basis of high, average and low socio-economic status and aspiration levels. The experiment was conducted in the framework of 3×3 factorial design. It involved three levels of socio-economic status and three levels of aspiration. A criterion test was developed to measure performance on a linear programme. Its reliability by K.R. formula was found to be 0.93. The content validity of the criterion test was established by ascertaining the correspondence between the criterion test and the representativeness of the content structure in relation to the behavioural objectives. A linear programmed text on 'Vegetative reproduction in plants' was developed by the investigator. The programme was validated against the internal criteria of error rate, programme density and sequence progression and also against the internal criterion of 90/90. Three levels of aspiration tasks, namely (i) Digit symbol substitution test, (ii) Computation task and (iii) Letter cancellation test were developed and used. The reliability and validity of the level of aspiration tasks were determined by split-half and product-moment intercorrelation methods respectively. A modified form of the Dev Mohan Socio-economic Status Scale (1972) was used. Its test-retest reliability was 0.91. The significance of difference in initial and post learning among the experimental groups, taken separately, was analysed by analysis of variance technique.

The major findings of the study were: 1. Level of aspiration as a factor did not influence performance in a linear programme. 2. Socio-economic status significantly affected performance on the criterion test. 3. Higher level of performance on a linear programme was expected of those subjects who belonged to high socio-economic status. 4. Level of aspiration and socio-economic status taken together did not interact with each other to affect performance in a linear programme.

876. GAUTAM, P., *Development of Programmed Instruction in Linear and Branching Styles and Studying the Performance in Relation to Creative Thinking and Level of Aspiration*, Ph.D. Edu., HPU, 1986

The objectives of the study were (i) to develop two programmes, one in linear and the other in branching format, in a segment of science, (ii) to study the performance of students on the criterion test in the selected unit of science, in relation to creative thinking and level of aspiration, (iii) to compare the efficacy of the linear and the branching programme formats with reference to performance on the criterion test, and (iv) to study the interaction effect of creative thinking, level of aspiration and style of programming on the performance on the criterion test. The hypotheses examined were: (1) Creative thinking significantly affects the performance of students on the criterion test in a segment of science taught through the programmed material. (2) Level of aspiration does not affect the performance of the students on the criterion test when taught through the programmed material. (3) The performance of the students taught through the branching programme is significantly higher on the criterion test than those taught through the linear programme. (4) There are no significant interaction effects of creative thinking and level of aspiration, creative thinking and style of programming, level of aspiration and style of programming, creative thinking and level of aspiration, and style of programming on the performance of students on the criterion test.

The study was conducted by employing $2 \times 2 \times 2$ factorial design. It involved two levels of creative thinking, two levels of aspiration and two styles of programming. The dependent variable was represented by scores measured through the criterion test. The study was conducted for a target population of class IX students studying in Hindi medium schools of Mandi district of Himachal Pradesh. A sample of 477 students was drawn from five randomly chosen higher/high schools of Himachal Pradesh. Out of these 477 students, 200 students were selected for eight treatment conditions so that each condition included 25 students. Linear and branching programmes on 'Structure of Seed' were developed. The programmes were prepared while keeping in view the subject matter, the learners' entry behaviour, and terminal objectives. The criterion test consisted of 92 items of varying formats and difficulty levels. The coefficient of reliability by K-R formula was 0.96. The validity of the criterion test was established by examining the test

and the representativeness of the content structure in relation to the behavioural objectives. The other tools used in this study were Mehdi's verbal and non-verbal tests of creative thinking and three levels of aspiration tasks, namely, letter cancellation test, digit symbol substitution test and computation task. The data were analysed by employing ANOVA and ANCOVA.

Some of the major findings were: 1. High creative performed significantly better than low creatives on the criterion test. 2. Level of aspiration as a factor did not affect the performance of the students on the criterion test. 3. Both the programme formats were equally good in terms of their effect on the performance of the students on the criterion test in a segment of science. 4. High creatives performed significantly better than low creatives on the criterion test irrespective of level of aspiration. 5. The difference between the performance of high and low creatives on the criterion test was approximately the same when they were taught either through the linear programme or through the branching programme. 6. The level of aspiration did not affect the performance of students when they were taught either through the linear or the branching styles. 7. Creative thinking, level of aspiration and styles of programming did not interact mutually, hence the effect of creative thinking on the performance of students on the criterion test was independent of the level of aspiration and style of programming.

877. GOEL, D.R., *Educational Television in India: Organization and Utilization*, CASE, MSU, 1985 (UGC financed)

The main objective of the investigation was to study the organization and utilization of Educational Television (ETV) programmes. The organization of ETV was studied in Delhi, Maharashtra, Srinagar, Jaipur, Raipur and Muzaffarpur. The utilization of ETV was studied in Maharashtra State.

The data was collected from the producers of ETV programmes and academic staff of the Educational Technology (ET) Cells, Directorate of Education, through questionnaires and interviews. Information was also culled from official documents.

The major findings of the study were: 1. In 1983-84, Doordarshan Kendra (DDK), Delhi used to telecast 16 programmes per week out of which 13 programmes were for secondary students, two for elementary pupils and one for teachers. In Maharashtra, there were three

School TV (STV) programmes, one each for students of class V, class VI and class VIII. In Srinagar there were two programmes per week for the age group 6 to 13 years. Delhi was producing six programmes per week for classes V to XI for the schools of Jaipur, Raipur and Muzaffarpur. 2. In Delhi, TV handbooks were distributed to all TV viewing schools. In Maharashtra, TV handbooks and other support material were distributed to all schools but they did not reach the schools in time. In Srinagar, Jaipur, Raipur and Muzaffarpur, support material was not supplied to teachers. 3. In Delhi and Maharashtra, script writers and teachers were oriented whereas in other centres there was no similar programme. 4. In Delhi and Maharashtra, STV programmes and/or support material were produced by the ET Cell of the Education Directorate. There was no programme of preparing these in Jaipur, Raipur and Muzaffarpur. In Srinagar, the DDK produced the software. 5. In Delhi and Maharashtra, teachers were oriented in utilizing the ETV programmes for classroom instruction. Such orientation programme was absent in other centres. 6. STV programmes were properly evaluated in Delhi. In Maharashtra, there was no proper mechanism for the evaluation of STV programmes. No systematic evaluation was found in other centres. 7. Except in Delhi and Maharashtra, no systematic attempts were made to study the audience profile and to ascertain the needs of the users. 8. In most of the centres, the synchronization of STV programme scheduling and the school time-table presented problems. 9. In many centres, the programmes were urban-oriented. The rural children found it difficult to understand the language of the presenters of STV programmes. 10. In Raipur, Jaipur and Muzaffarpur, teachers had developed a hostile attitude towards STV. 11. In Maharashtra, there was no provision for a school telecast period in the school time-table which reduced the degree of utilization. 12. The programmes in Marathi in Maharashtra presented problems of language to the multilingual student population in Maharashtra. 13. Most of the students and teachers in Maharashtra had positive reactions to the STV programmes.

*878. GOLANI, T.P., *The Use of Audio-visual Aids in the Secondary Schools of District Thane*, Ph.D. Edu., Poona U., 1982

The objectives of the study were (i) to create awareness among teachers and headmasters of secondary schools

about the importance of audio-visual aids, (ii) to help in raising the academic standard in secondary schools of Thane district, (iii) to know the existing situation regarding audio-visual materials in the secondary schools of Thane district, (iv) to elicit the opinion of the headmasters and concerned teachers about the measures for providing better and improvised materials on audio-visual education, and (v) to present the above measures in the form of concrete proposals and their implications for secondary schools as well as for the professional courses in training of teachers and preparing materials for audio-visual aids in education.

The tools of investigation were questionnaires to schools, headmasters and teachers to assess the availability and use of audio-visual aids in schools, interviews to supplement the information available through questionnaires, and visits and observations.

Some of the important findings of the study were : 1. Schools that were situated in urban areas and the ones which were conducted by rich societies possessed audio-visual aids. 2. Only a few teachers used audio-visual aids in teaching. 3. Teachers who were trained in the use of audio-visual aids were inadequate in number. 4. At many places the audio-visual aids were in a broken-down condition and awaited repairs. 5. At many places the hardware was purchased. However, it was not used as proper software was not available. 6. Audio-visual aids were useful in teaching. 7. Audio-visual aids were not used due to lack of properly trained personnel and lack of accommodation in the schools. 8. There were no incentives to teachers who used audio-visual aids. 9. The state institute for audio-visual education could not provide training to personnel and could not supply proper learning materials.

879. GOMATHI, S., *A Critical Study of the Participants' Evaluation of Selected Postgraduate Courses of Correspondence Education Programme of the Madurai Kamraj University*, Ph.D., Adult and Continuing Education, Madras U., 1982

The main objective of the study was to assess the objectives of the M.A. Correspondence Programme of the Madurai Kamraj University and to study the socio-economic characteristics of the clientele of the course and their attitude towards the course.

A questionnaire was designed by the investigator containing 12 sections. The first nine sections were concerned with objectives of the course, lesson units, as-

signments, textbooks, study centres and evaluation. Section 10 studied the attitude of the students towards the course, section 11, the reasons for joining the correspondence course and section 12, the reasons for choosing the M.A. course. Students were required to express their agreement or otherwise with the statements on a five-point scale. Totally there were 80 statements. The split-half reliability of the tool was 0.67. The content validity was discussed with reference to the objectives. Cluster sampling technique was used to select the sample. The sample was drawn from three randomly selected contact centres and all the students in the second year M.A. offering history, political science, economics, Tamil and English were involved in the study. The questionnaire was mailed to 1800 students and there was only 38 per cent return. The responses of the candidates to the various items in the questionnaire were expressed in percentage frequencies and the association of the selected variables with achievement was studied using the chi-square test.

The main findings of the study were: 1. There was no significant relationship between the achievement of the candidates and their evaluation regarding realization of objectives, lesson units, response sheets, textbooks, contact seminar, study centres and evaluation. 2. Achievement was associated with the evaluation of radio broadcast and instruction. 3. There were more men (61 per cent) than women candidates (39 per cent). 4. Sixty-five per cent of the candidates were employed of whom 45 per cent were teachers.

880. HOODA, R.C., *Effect of Mastery Learning Strategy (MLS) on Pupil Achievement*, Dept. of Education, DAVV, 1982 (NCERT financed)

The objectives of the enquiry were (i) to study the effectiveness of the Mastery Learning Strategy (MLS) method of teaching in relation to pupil achievement in mathematics, (ii) to study pupil achievement in mathematics, adjusted on intelligence, socio-economic status and pre-achievement in mathematics taught through the mastery learning strategy and the conventional method, (iii) to study the effect of MLS on self-concept of pupils, (iv) to study the change in attitude of pupils towards mathematics due to MLS, (v) to study the effect of MLS on different dimensions of non-verbal creativity of pupils, namely, fluency, flexibility, originality, elaboration and total score in non-verbal creativity, and (vi) to study the effect of MLS on different di-

mensions of verbal creativity of pupils, namely, fluency, flexibility, originality and composite creativity.

The experiment was confined to eight units in mathematics. The experimental and control groups were in the same school and taught by the same teacher. The study consisted of three stages. The first stage involved testing of pupils' achievement in mathematics, their intelligence, socio-economic status, self-concept, attitude towards mathematics and verbal and non-verbal creativity. The second stage comprised the experiment over a period of six months wherein the teaching of eight units selected from the syllabus was undertaken. The final stage comprised testing of both the groups on achievement in mathematics, their self-concept, attitude towards mathematics and verbal and non-verbal creativity. Fifty pupils of two sections of class VI of a government boys' middle school formed the sample. They belonged to below average socio-economic strata and varied in age from 11 to 13 years. The tools used were Cattell's Culture Fair Test for Intelligence, Kuppaswamy's Socio-economic Status Scale, a Test of Self-concept of Pupils prepared by Sherry and others, a Scale for Measuring Attitude of Pupils towards Mathematics, Torrance Test of Creative Thinking (Forms A and B), Test of Creativity by Passi for verbal creativity, and an achievement test in mathematics developed by the investigator.

The major findings of the study were: 1. The students taught through the mastery learning technique showed higher gains in mathematics than those taught by the conventional method. 2. Even when statistically adjusted for initial differences in intelligence, socio-economic status and pre-achievement, the treatment group performed significantly better. 3. The self-concept and attitude towards mathematics did not show a significant improvement over the period of treatment though the attitude towards mathematics of students taught through mastery learning showed higher gain scores. 4. The mastery learning strategy for teaching mathematics was more effective in increasing non-verbal and verbal creativity.

881. KAGATHALA, A.B., *Investigation into the Effectiveness of Linear Programmed Material and Branching Programmed Material in the Subject of Commerce—Std. XI, in Relation to certain Variables*, Ph.D. Edu., SPU, 1986

The objectives of the study were (i) to develop pro-

grammed learning material in commerce for higher secondary students of Std. XI, (ii) to compare the achievement in commerce of students learning through linear and branching programmed learning material, and (iii) to study the achievement of learners through the linear and branching programmes controlling personality traits such as emotional stability, suggestibility, radicalism, and self-dependency; adjustment such as social, vocational, educational, family, and personal; social maturity, socio-economic status and general ability.

The investigator prepared linear programmed and branching programmed material on two units of commerce, viz. transport service and banking service. The equivalent group technique was adopted with 138 students given linear programmed material and 138 given branching programmed material. The sample was selected from nine different schools at random. The same students were given the Test of General Ability by Pallavi Patel, SES Scale by Patel and Vora, Social Maturity Scale by J.I. Vora, Personality Inventory by A.S. Patel and Adjustment Inventory by Patel and Parikh. Analysis of covariance was used for the purpose of testing the hypotheses.

Some of the major findings of the study were: 1. The branching programmed learning material (PLM) produced better results than the linear PLM. 2. The branching programmes, on controlling pretesting and SES, proved superior to the linear PLM. 3. The branching programmes, on controlling pretesting and social maturity, proved superior to the linear one. 4. The branching programme, on controlling pretesting and I.Q. proved better than the linear PLM. 5. The branching programme, on controlling pretest and emotional maturity was found better than the linear PLM. 6. The branching programme on controlling pretest scores and suggestibility proved superior to the linear PLM. 7. The students who read the branching programme were found significantly superior to the group of students who read the linear PLM when the groups were controlled on pretesting and self-dependency. 8. When the groups were controlled on pretesting and radicalism, the group taking the branching programme was found superior to the group who took the linear PLM. 9. When the groups were controlled on pretesting and social adjustment, the group taking the branching programme proved superior to the group taking the linear PLM. 10. When the groups were controlled on pretesting and vocational adjustment, the groups did not differ significantly. 11. The group taking the branching programme

did not differ significantly in achievement from the group taking the linear programme when the groups were controlled on pretesting and educational adjustment. 12. The achievements of the groups taking the branching programme and the linear PLM were at par when the groups were controlled on pretesting and personal adjustment. 13. The branching programme was more effective than the linear one when the independent variables pretesting and family adjustment were controlled. 14. The girls were benefited more by programmed learning material than the boys when pre-achievement was controlled. 15. The matched groups on pretesting did not differ significantly in achievement when they studied through the branching programme. Sex did not influence learning through the branching programme. 16. The male students did not differ significantly in achievement when they learnt through the two different programmes. 17. The girls did not differ significantly in achievement when they learnt through the two different programmes.

*882. KALACHERRY, K.A., *Preparation and Experimental Try-out of Programmed Instructional Material in the Syllabus of Chemistry Prescribed for Class VIII (SSC) in Maharashtra State*, Ph.D., Edu., Bom. U., 1987

The major objectives of the study were (i) to prepare programmed lessons on the prescribed topics of the chemistry syllabus, (ii) to try out the programmed instructional materials, (iii) to find out the error rate and time factor, (iv) to finalize the programmed material for actual use, and (v) to determine the effectiveness of the programmed instructional material on the basis of the error rate.

The programmed instructional material was developed in the linear style for the chemistry syllabus of grade VIII, consisting of 11 units for the whole year. The developed instructional material was tried out on five students of grade VIII representing both the sexes. The material was modified on the basis of the feedback received through this individual testing. The edited programmed instructional materials were tried out on 105 students of class VIII of St. Anne's Girls High School in the classroom situation. On the basis of group testing, the error rate, programme density and time taken by the students to go through the programme were estimated. Finally the programmed instructional materials were tried out in four schools in the natural setting. The sam-

ple for the field testing consisted of 200 students out of which 40 were boys and 160 girls. On the basis of the field testing, the error rate, time and programme density were studied. The effectiveness of the materials was judged against the external criterion for validation (90/90 standard on the criterion test)

The major findings of the study were: 1. About 83 per cent learners were able to respond correctly to 83 per cent of the frames. Though 90/90 standard could not be reached, the attainment was considered to be satisfactory. 2. The value of measure of density (T.T.R.) for the whole programme was found to be 0.36. It was found that a few students who scored usually below 50 per cent in the traditional system, scored above 85 per cent through the use of programmed material.

*883. KANADE, H.M., *Trends in CIET's Educational Television Programmes Over a Four-Year Period, 1982-86*, CIET Project, NCERT, 1987

The objectives of the project were to study (i) the total number of ETV programmes produced in CIET during 1982-86, (ii) programmes produced for 5-8 year old children under different series during 1982-86, (iii) programmes produced for 9-11 year old children under different series during this period, and (iv) thrusts of the teachers' programmes and subject-wise classification of programmes.

Data were collected from official records and monitoring reports. They were analysed in descriptive forms.

The main findings of the study were: 1. In all, 321 programmes with an overall duration of 100 hours were produced in the CIET during the four-year span. Out of these, 132 programmes were for the 5-8 year age groups, 140 for the 9-11 year age groups, and the rest for teachers. 2. These programmes were prepared in different phases spreading over four years' time. 3. The ET cell had produced adequate length of material for transmission. As far as the children's programmes were concerned, no programme was to be repeated at least within the same year. 4. Some of the listed programmes had become technically unusable or content-wise outdated. 5. Three important series, viz. story time series, Bal Jagat and Our Body and Health were dominant ones among the 5-8 year age group programmes. 6. Three important series, viz. Air, Story of Man, and Delhi—Our Capital, ran for a considerable period of time for the 9-11 age group children. 7. The programmes classified under different categories were: Knowledge (73.5 per cent), At-

titude (25.4 per cent), and the rest under Skill. In most cases stories were integrated with biographies to strengthen the moral base. 8. Among the teachers' programmes the major thrust had been on low cost teaching aids and experimentation, population education, and on programmes dealing with concepts of science and mathematics.

884. KAUR, R., *Performance of the College Students in Linear and Mathematical Styles of Programming at Information and Skill Levels of Content*, Ph.D. Edu., Pan. U., 1983

The objectives of the study were (i) to compare the effectiveness of linear and mathematical styles of programming for different levels of content (information, skill and information plus skill) with regard to the pupil response on the respective criterion tests, (ii) to work out the sex differences in pupil performance on the criterion test at three levels of content—information (I), skill (S) and information plus skill (I+S) for the linear format, (iii) to find out the sex difference in performance on the criterion test at different content levels for mathematical paradigm, (iv) to study the effectiveness of sex across linear and mathematical styles for the content of information, skill, and information plus skill, and (v) to find out the interaction effect of style and sex at three different levels of content.

The sample of the study consisted of 80 students of the Three-Year Degree Course Part I of colleges of Shimla. These students were formed into four treatment groups on the basis of two experimental variables, namely, style and sex, operating at two levels each for a particular type of content (I, S, I+S). Thus in each treatment group, the number of students was 20. The independent variables in the study were style of programme (mathematics and linear) and sex (male and female). The dependent variable was performance of students on the criterion test. The following tools were developed and used for conducting the study: (i) Two criterion sets (Information and Skill); (ii) Four programme sets (linear information, linear skill, mathematical information and mathematical skill). In this study 2×2 factorial design was followed.

The findings of the study were: 1. There was no difference between the linear and mathematical style of programming in teaching information, skill and information plus skill. 2. There were no sex differences in the pupil performance with regard to teaching of information, skill and information plus skill content through the linear

style of programming. 3. The boys performed equally well as the girls in the content areas under reference. However, the value of F-ratio (5.156) in teaching of skill exhibited significant sex differences at .05 level. The comparison of means of girls ($M=75.1$) and boys ($M=71.85$) exhibited superior performance of girls to that of boys in the skill content. 4. Boys and girls fared alike in the content field of information and they exhibited their differences in the main fields of skill, and information and skill combined. On further analysis, the mean performance of girls in skill content ($M=74.4$) and information plus skill content ($M=128.72$) was higher than the mean performance of boys on skill ($M=71.95$) and information plus skill ($M=125.52$) content fields respectively. The performance of girls was better in the main field of skill content in the mathematical programme and across the two programme paradigms (linear and mathematics) in the content areas of styles and sex as indicated by F-ratio for I (0.72), S (0.56) and I + S (0.002) were not statistically significant. It implied that sex did not interact with the style of programming.

885. KOTHARI, R.G., *An Investigation into Efficacy of Different Instructional Media in the Teaching of Mathematics to the Pupils of Class IX in Relation to Certain Variables*, Ph.D. Edu., SPU, 1985

The objectives of the study were (i) to investigate the efficacy of instructional media I (visual projection) over instructional media II (activities and experiment) in terms of achievement, (ii) to investigate the efficacy of visual projection over programmed learning material, (iii) to investigate the efficacy of activities and experiments over programmed learning material, (iv) to investigate the efficacy of visual projection over the traditional method of teaching, (v) to investigate the efficacy of activities and experiments over the traditional method of teaching, and (vi) to investigate the efficacy of programmed learning material over the traditional method of teaching in terms of achievement.

Factorization of the type $a^2 - b^2$ and expansion of $(a \pm b)^2$ were selected for preparing transparencies for projection through the overhead projector. The same topic was selected for the preparation of materials for activities and experiments as well as for preparing programmed learning material. The criterion tests on both units were prepared. The pretest post-test control group design was adopted for the purpose of studying the efficacy of different media. The experiment was carried out

in two schools. Four groups of class IX pupils having 30 pupils in each group were selected for implementing the instructional media while the other four groups were treated as control groups. The Junior Index of Motivation (JIM Scale) and Test of Reasoning Ability were used for collecting necessary information about the variables under study. The pupils were matched on these two variables. The analysis of covariance was used to draw conclusions.

Some of the major findings of the study were: 1. Visual projection and activities and experiment were equally effective for Unit I while visual projection was superior to the activities and experiment approach for Unit II. 2. Visual projection was superior to programmed learning material for Unit I, while they were equally effective for Unit II. 3. The approach of media activities and experiment was superior to programmed learning material for Unit I but they were equally effective for Unit II. 4. Visual projection was superior to the traditional method of teaching for Units I and II. 5. The activities and experiment approach and the traditional method were equally effective for both units. 6. Programmed learning material and the traditional method of teaching were equally effective for Units I and II. 7. The results clearly indicated that the instructional media I, namely visual projection, was comparatively more effective than any other media like activities and experiment or even programmed learning material. The low achievers were comparatively more benefited by programmed learning material than the high and average achievers.

886. KRISHNAN, S.S., *Development of Multimedia Package for Teaching a Course on Audio-Visual Education*, Ph.D. Edu., MSU, 1983

The major objectives of the study were (i) to develop a multimedia package for teaching a course on audio-visual education for the instructor training programme, (ii) to find the effectiveness of the multimedia package in terms of achievement of trainees and change in attitude of the instructor trainees towards the multimedia package, and (iii) to study the feasibility of the multimedia package in terms of time and cost for the instructor training programme.

To attain the above objectives, a single group design was evolved. As many as 127 instructor trainees enrolled during the year 1981-82 at the Central Training Institute for Instructors, Madras were treated as the sample of the

study. The instructional strategy was prepared in modular form. There were five modules containing the full course units. The components of the modules were programmed slides, programmed instructional materials, non-projected visual aids, self-instructional materials with a manual for practical exercises, self-evaluating unit tests with answer keys, discussions, feedback, etc. The strategy was implemented for one academic session. The tools used for data collection were criterion tests, comprehensive course tests and an attitude scale prepared by the investigator, and an English language ability test designed at the matriculation level.

The major findings of the study were: 1. Ninety-eight per cent of the trainees obtained more than 80 per cent of the marks on the final post-test. 2. The mean percentages of the post-test scores varied from 81.41 to 90.46. 3. The mean gain in the total scores for all the modules was found to be significant at 0.01 level. 4. The mean gain scores of knowledge, comprehension and higher mental abilities were found to be significant at 0.01 level. 5. The mean attitude change was found to be significant at 0.01 level. 6. The achievement of trainees and their language ability were found to be positively related at 0.01 level of significance. 7. The feasibility of the multimedia package was established in terms of cost involved in reproduction of the various resource materials and the time scheduling in an actual institutional set-up.

The implication of the study was that multimedia packages in modular form could be used for training programmes in vocational institutions.

*887. MEHTA, J.M., *Construction of different Types of Programmes on the Unit of 'Interest' in Mathematics of Std. IX and Study of Relative Efficiency of These*, Ph.D. Edu., Sau. U., 1985

The main objectives of the investigation were (i) to study the relative efficacy of three types of programmes on the unit of 'INTEREST' in mathematics, (ii) to find whether one or the other type of programme was better for high achievers or low achievers, and (iii) to find the relationship between achievement through different programmes on the one side and intelligence, numerical ability and achievement in mathematics on the other.

The sample consisted of 104 students of Std. IX of a secondary school divided into four groups. The groups were made almost identical on the basis of IQ, numerical ability and achievement in mathematics. Three

groups were considered as experimental groups and one was considered as the control group. Linear, branched and baboon types of programmes were prepared on the unit of 'INTEREST' for the experimental groups while the controlled group was instructed in a normal way. Simple interest, compound interest, purchase through instalment and savings bank interest were considered as topics for instruction.

The major findings of the study were: 1. The different types of learning programmes on 'INTEREST' were equally efficient compared to the ordinary method. 2. The linear programme on 'SIMPLE INTEREST' was found efficient. 3. The effect of learning through different programmes upon high achievers and low achievers was equal. 4. The coefficients of correlation between I.Q. and achievement for the linear group, branched group and control group were significant. 5. The coefficient of correlation between numerical ability and achievement was significant for only the branched group. 6. The coefficient of correlation between achievement in mathematics and achievement through programmed material was significant for the branched group and for the control group.

888. MENON, M.B., *Evolving a Multimedia Approach to Teaching at Post-graduate Level*, Ph.D. Edu., MSU, 1984

The major objectives of the study were (i) to develop a multimedia strategy in organizing a course in educational technology for postgraduate and research students, (ii) to validate the strategy in terms of students' performance in criterion tests and discussion sessions, and their attitude towards the strategy, (iii) to study the relationship between achievement and intelligence, and achievement and English reading comprehension, and (iv) to study the feasibility of the strategy.

A single group design was worked out for carrying out the investigation over a long period of time. The sample for the validation study consisted of 21 M.Ed. students, 15 M.Sc. Home Science students and eight research students of Education during the 1977-78 session and a combined group of 22 students from M.Ed. and M.Sc. (Home) students of the 1978-79 session. The instructional inputs of the strategy were PLM, structured lecture, team teaching, seminar, slide-tape commentary, work-book presentation, discussion, library work, assignment, feedback session, practical work and summary. The tools used for the study were the criterion test,

an observation schedule, and an attitude scale prepared by the investigator, Govinda's English Reading Comprehension and Raven's Standard Progressive Matrices. Descriptive statistics, F-test, partial correlation and product-moment correlation techniques were used for analysis of data.

The findings of the study were: 1. In the initial year, around 90 per cent Ph.D. students and M.Sc. students scored 60 per cent and above marks on the Comprehensive Criterion Test, and more than 50 per cent M.Ed. students scored 60 per cent and above marks. 2. In the subsequent year around 90 per cent students scored 75 per cent and more marks. 3. An improvement trend was witnessed with regard to discussion sessions. 4. At different stages of implementation of the strategy, the students' attitude towards the multimedia approach went on increasing in a favourable direction. 5. During the period of try-out of the strategy for two years, the relationship between intelligence and academic achievement was found not significant. The relationship between English comprehension and academic achievement was found significant at 0.01 level. 6. The unit cost varied from Rs. 47/- to Rs. 32/- for a range of 25 to 50 students if software suitable to be presented through hardware was to be incorporated. The strategy worked within prescribed periods of time.

The educational implication of the study is that the validated multimedia strategy, with suitable software material can be used to provide instruction in 'educational technology' of one semester duration to postgraduate students in education and related disciplines.

889. MOHANTY, J., and GIRI, A.P., *A Study on School Broadcast Programmes*, Directorate of Higher Education, Orissa, 1976

The objectives of the study were (i) to know about the quality of School Broadcast Programmes, (ii) to identify the problems in the utilization of the programmes, (iii) to ascertain the requirements of students, (iv) to know about the *modus operandi* of organizing the listening centres, and (v) to make necessary suggestions for improvement of the programme.

The sample of the study included 65 teacher monitors who were in charge of listening centres at high school level in Orissa state. A questionnaire prepared by the researchers was used for data collection. Out of 190 school teachers contacted by post, 65 responded to the questionnaire. Besides, the researchers discussed, infor-

mally, the difficulties with heads of a select number of institutions as well as concerned teachers. Data were also collected from the official records of All India Radio, Cuttack.

The findings of the study were: 1. Proportionate weightage was not given to all the classes of secondary level—VIII, IX, X and XI by the All India Radio authorities. 2. The place of listening to the radio broadcasts varied from school to school, such as in classrooms, staff common room, neighbour's house and science laboratory. 3. Emphasis was laid on narration, discussion, dialogue and dramatization. 4. The programmes were within the framework of the curriculum. 5. A majority of the programmes had a good reception. In most of the cases, voice as well as mode of speaking were up to the mark. 6. Most of the programmes contributed towards knowledge aspects of instructional objectives and few programmes contributed towards creative expression and appreciation. 7. A majority of teachers had benefited from such programmes in terms of acquiring more knowledge. 8. Most of the teachers did not hold pre- and post-broadcast discussion. 9. Extract weightage was given to the subjects like general science, English and Sanskrit broadcast programmes. 10. A majority of respondents had suggested an extension of the duration of School Broadcast Programmes. 11. The English programmes had great scope for improvement and the programmes on general science needed improvement as regards presentation, elaboration and discussion.

890. MOHANTY, J., and GIRI, A.P., *An Evaluative Study of the School Broadcast Programmes*, SCERT, Orissa, 1984.

The objectives of the study were (i) to identify the nature of the contents of the programmes broadcast by the All India Radio (AIR) Cuttack, (ii) to know about the suitability of the language used in the programmes, (iii) to ascertain the difficulty in pronunciation, (iv) to know about the format of the lessons broadcast and their presentation, (v) to identify the activities done by teachers in the classroom, (vi) to assess students' growth through the broadcast lessons, (vii) to study the reactions of students, (viii) to study the pre- and post-broadcast discussions, and (ix) to study the opinion of teachers on school broadcast programmes.

The sample included 214 high schools of Orissa State. There were 181 teachers and 181 students in the sam-

ple. Twelve questionnaires were prepared by the investigator and used for data collection. The high schools were contacted by mail for data collection. In all 183 schools responded with filled in questionnaires and thirty-one schools sent back blank questionnaires stating different difficulties in school broadcast programmes.

The findings of the study were: 1. The programmes were syllabus-based. 2. A different programme was broadcast in lieu of the scheduled one on a particular date. 3. A majority of students were not exposed to School Broadcast (SB) programmes. 4. More than 50 per cent of teachers opined that the structures used in all the programmes were up to the standard. 5. Most of the programmes were good with regard to their language. 6. The teacher listeners failed to catch the form of presentation of the lessons. 7. While the presentation was very fast, the voice of the speaker was indistinct. 8. Drilling was done only in 55 per cent of the programmes. 9. The teachers were not aware of the sound effects. 10. The teacher listeners had no idea about follow-up activities. 11. All the programmes had contributed to students' growth with respect to their vocabulary, language pronunciation and appreciation. 12. In a few cases, a positive relationship was established between students' attention and interest in programmes. 13. Pre-broadcast discussion was inadequate. 14. Post-broadcast discussion sessions were not properly organized. 15. Sixty per cent of the teachers wanted longer programmes.

891. MOHANTY, J., GIRI, A.P., and MOHANTY, P.C., *A Study on Educational Television Programmes Telecast during the Inservice Teachers Training Course, 1975*, Directorate of Higher Education, Orissa, 1976

The objectives of the study were (i) to ascertain the impact of educational television programmes, (ii) to identify the success and shortcomings of the programmes, and (iii) to make suggestions for the improvement of the programmes.

The sample of the study included 113 teacher-monitors engaged for conducting the in-service training programmes of teaching science for primary school teachers of Orissa State. In addition, a select number of primary school teachers were interviewed. One questionnaire prepared by the project team and one feed-back pro forma prepared by the Centre for Educational Technology, NCERT, were used for data collection.

The questionnaires were mailed to all the teacher monitors. The data were analysed and interpreted qualitatively.

The major findings of the study were: 1. A large majority of teacher-monitors expressed positive reactions towards all the TV programmes. 2. On an average, 81 per cent of the TV sets used for in-service training programmes functioned well. 3. The software materials of all the programmes were appreciated by 68 to 94 per cent of the respondents. 4. Dubbing of TV programmes in regional languages was not appreciated. 5. Blackboard work was neglected in TV programmes. 6. The trainees found it difficult to follow the programmes on some science topics which were not included in primary school syllabus. 7. Students' participation in the TV lessons was not up to the mark. 8. The duration of 22.5 minutes for each lesson was not adequate. 9. The work of teachers trained through the programme was not supervised by inspecting officers.

892. MOHANTY, J., GIRI, A.P., and MOHANTY, P.C., *A Study on Radio Programmes Broadcast during the Inservice Training Course, 1975*, Directorate of Higher Education, Orissa, 1976

The objectives of the study were (i) to identify the success and failure of the radio programmes, (ii) to ascertain how far the radio programmes have been popular among teacher participants, and (iii) to make necessary suggestions for the improvement of the programmes.

The sample of the study included 118 teacher-monitors involved in conducting in-service training programmes for primary school teachers. A questionnaire prepared by the team and one feed-back pro forma prepared by the Centre for Educational Technology, NCERT, were used for data collection. Data were collected through mailed questionnaires. Moreover, interviews were conducted for collecting data from a select group of primary school teachers.

The major findings of the study were: 1. A majority of teacher monitors (78 to 89 per cent) appreciated to some extent all the radio programmes used for in-service training. 2. Around 50 per cent of the radio programmes were appreciated very much by 3 to 9 per cent of the teacher-monitors. 3. The radio programmes were not syllabus oriented. 4. The speed of description in the radio programme was not slow and steady. 5. Participation of rural area teachers was not encouraging.

893. MOHANTY J., and MOHANTY, P.C., *A Study of the Impact of SITE on Attendance and Enrolment in Primary Schools*, SCERT, Orissa, 1984

The objectives of the study were (i) to ascertain the extent to which the primary school children were enrolled, (ii) to find out whether the attendance increased during the Satellite Instructional Television Experiment (SITE) period (1975-76), and (iii) to study whether the impact of SITE was still continuing during the post-SITE period.

The sample of the study included 436 primary schools of three districts of Orissa covered in the SITE programme. A pro forma and a questionnaire were used for data collection. In the initial stage, 2,175 schools were mailed the tools. All of them responded. Out of them, 20 per cent were treated as the final sample. The schoolteachers were asked to make use of available records while filling up the pro forma. The data were analysed and interpreted in descriptive form.

The major findings were: 1. During August 1975, there was a fall of two per cent in attendance in comparison with data during the pre-SITE period. This might be due to the fact that SITE commenced only on 1 August 1975 and its impact was not felt on attendance. On the other hand there was an increase of attendance by three per cent during the post-SITE period. 2. There was no impact of SITE on attendance during September of the SITE and post-SITE periods as there was a fall by one per cent during SITE period in comparison with the pre-SITE period and three per cent during post-SITE period in comparison to SITE attendance. 3. There was an increase of attendance by two per cent during the month of October 1976 which showed that the impact of SITE upon the school attendance was during post-SITE period. On the contrary, there was a surprising fall by three per cent during the SITE period in comparison with the pre-SITE period. 4. The average attendance during the SITE period in the month of March was marked by a three per cent increase, whereas during the post-SITE period there was a fall in attendance in comparison with the SITE period. 5. Taking the total average attendance of 1974-75, 1975-76 and 1976-77 into consideration, it was found that there was a five per cent increase of attendance during SITE period in comparison to the pre-SITE period and a decrease by two per cent during the post-SITE period in comparison to the SITE year. 6. The total average enrolment in the month of June increased by five per cent during SITE year in comparison with the pre-SITE year and two per cent in

post-SITE year, in comparison with the SITE year. 7. During July, enrolment increased by eight per cent in the case of the SITE year in comparison with the pre-SITE year and seven per cent during the post-SITE period in comparison with the SITE year. 8. The total average enrolment in the month of August increased by five per cent in the SITE period in comparison with the pre-SITE period and seven per cent in the post-SITE period in comparison with the SITE period. On the whole, it was clearly evident that there was a satisfactory impact of SITE on enrolment and attendance.

894. MULAY, V., PHUTELA, R.L., NADIR, R., *Project Report on Correspondence Education in India*, Central Institute of Educational Technology, NCERT, 1986 (UGC-financed)

The present study was carried out (i) to know the status of correspondence education institutes with regard to enrolment, eligibility, standards, relationship with other departments, flexibility of procedures, courses offered, organization of instruction, funds and expenditure and performance of students, and (ii) to study perceptions about the system of the personnel, viz., directors, teachers, students and senior functionaries of the universities having institutes of correspondence courses.

The sample of the study included 23 institutes of correspondence courses at the university stage. Six institutes were subjected to in-depth study. Along with the study of documents and annual reports of the institutes, data were collected from the directors of the sample institutions and vice-chancellors and registrars of the parent universities of the sample institutes. Besides the above sources, data were collected from 63 teachers and 272 students of correspondence institutions of Punjab, SINDT, Bombay, Madurai, Mysore and Utkal universities. Data were collected through mailing the questionnaire, interviews with teachers, directors and other functionaries and record surveys. Data were analysed in descriptive form. The study concentrated on the data of the year 1981-82.

The main findings of the study were: 1. All the institutes offered undergraduate courses, whereas around 45 per cent of them offered postgraduate professional and other miscellaneous courses. 2. The enrolment structure in different courses varied from institution to institution. The enrolment varied from 500 (Meerut) to 68,554 (Madurai). 3. Standards of eligibility for admis-

sion to correspondence courses were found to be generally similar to those for regular courses, with minor modifications in certain universities. 4. Only ten out of 23 institutes had some kind of governing body/committee to guide and supervise the work of the institutes; the rest functioned directly under the vice-chancellor through the registrar and usual university bodies. 5. About half of the institutes had faculty recruited exclusively for them. University teaching department had a great deal of influence in the framing of courses. 6. Directors of the institutes enjoyed complete power over faculty as well as administrative staff. However, the powers of deputation, transfer and promotion of administrative staff were vested with the registrars. Control of academic works by university bodies and the administrative staff by the registrar come in the way of smooth functioning and autonomy of all the correspondence institutes. Moreover, centralization of financial power in the hands of the university blocked progress of the institutes. 7. In a large number of institutes, the revision of instructional materials was carried out by the institutes every three years. 8. Most of the institutes aspired for improvement of facilities with regard to restructuring of courses, use of appropriate technology for teaching activities, production and distribution of materials, and appointment of appropriate staff in the institutes. 9. Out of 23 institutes, nine had surplus and five deficit of funds. The institutes were found to be incurring higher than average expenditure which was found to be Rs. 470/- per student. 10. The performance of correspondence students at pass level was comparable with that of regular students at pass level. 11. Twelve institutes tried some kind of innovative practices in the fields of students' support services, organization of student records and training of academic staff. 12. The student support services were organized by the faculty along with the concerned staff in most of the institutes. Vetting, reviewing and editing of the lessons were carried out by the faculty members of the institutes. Delay took place in the case of nine institutes in terms of timely despatch of lessons. 13. A high (70) percentage of students was satisfied with the content coverage of lesson scripts. Most of the teachers opined that the lessons should have been written in conversational style. They should have included self-check exercises. Usually, the lessons supplied materials from an examination point of view. 14. Around fifty per cent institutions had compulsory assignment system. However, negligence was marked with regard to evaluation of response sheets. 15. Most of the students expressed satisfaction with regard

to PCP activities. They had complained about poor library facilities. The radio programmes were listened to by only 31 per cent of students. 16. A majority of teachers wanted some kind of special qualification/training on distance education methodology. Most of them had expressed views on heavy workload in the institutes. They felt dejected because of their inappropriate representation/non-representation in university academic and other decision-making bodies.

895. NAGARAJU, C.S. and USHA RAMKUMAR, *School Broadcasting: Utilization by High Schools in Bangalore District*, ISEC, Bangalore, 1983

The objective of the study was to know the extent of utilization of school broadcasts and to identify the problems faced by the schools in utilizing the programme along with the opinions of teachers.

The study was conducted through a mailed questionnaire to all the schools having radio sets in Bangalore district. The list was supplied by AIR, Bangalore. Out of 85 schools, 33 responded to the questionnaire. Fifty per cent of schools which did not respond to the questionnaire were selected and an interviewer visited them with the questionnaire, an observation checklist and a teachers' opinionnaire. Heads of institutions and two teachers from each school were interviewed.

The major findings were : 1. The mailed questionnaire revealed that only six out of 33 responding schools made arrangements for listening to the radio broadcasts. About 30 schools had no seating arrangements for large-scale listening. Only six schools had made some arrangement in their timetable for radio lessons. 2. Interviewers' visit to non-responding schools revealed that no schools had made arrangements for listening. 3. An analysis of listening facilities available in schools revealed that 27 out of 57 schools had radio sets in working conditions. Out of these, only 16 schools had listening facilities either through intercom or through loudspeakers. The rest had no listening facilities. 4. A majority of the schools reported non-working condition of radiosets. Further, schools reported difficulty in making proper seating arrangements.

896. PILLAY, G.S., *Educational Television Programme—an Assessment*, Dept. of Education, MKU, 1987

The objectives of the study were (i) to find out the aver-

age time spent by Madurai Kamaraj University students on television programmes, (ii) to identify the types of ETV programmes the students like, (iii) to find out the students' assessment of India-made ETV programmes, and (iv) to identify the students' different likings of the TV programme services.

All the M.Phil. students of Madurai Kamaraj University admitted in university departments during 1986-87 formed the subjects of the present study. For the purpose of data collection, an interview schedule was developed. The students of the Department of Education conducted the interviews. They were given sufficient orientation for the conduct of the structured interview. The data were analysed through the use of percentages.

The major findings were: 1. Of all the M.Phil students admitted in the Madurai Kamaraj University during 1986-87, 28 per cent possessed TV set in their homes. Of them 16 per cent were men and 12 per cent were women students. 2. Among the students who had TV in their home, nearly 40 per cent spent on an average between thirty and sixty minutes on viewing TV programmes. Nearly 27 per cent spent between sixty and 120 minutes and nearly 17 per cent of the M.Phil students spent more than two hours. 3. Of those who saw TV in hostel and places other than home, nearly 41 per cent of the M.Phil students spent less than thirty minutes daily on an average on TV viewing. About 43 per cent of them used to spend between thirty and sixty minutes on TV programme. Hardly 16 per cent of them spent more time on it. 4. Only 48 per cent of the students reported that they used to see ETV programme. 5. About 56 per cent of the M.Phil students who expressed their liking for ETV would like to see programmes of a general nature. Science and humanities programmes were liked by 30 per cent and 14 per cent of them respectively. 6. About 69 per cent of the M.Phil students found Indian produced programmes satisfactory or equally good as imported ones but to 31 per cent of the M.Phil students, Indian programmes were poor when compared with the foreign programmes. 7. More than half of the M.Phil students expressed that the production of Indian TV programme was not attractive and the content not sufficient. For 25 per cent of the students presentation was not good and appropriate and for 17 per cent commentary was not good. 8. The most liked TV item for the M.Phil students was sports and games and the least liked item was the ETV. 9. Students possessing TV in their home were more in science disciplines. 10. Science students spent relatively less time on seeing TV

programmes. 11. There was a significant difference in time spent on viewing TV among those who possessed TV at home and hostel inmates and among the science and social science students. 12. Science students were more interested in seeing ETV programmes. 13. There was significant difference among the students of humanities, science and social science in their liking for the science, humanities and the general programmes of the ETV. 14. Students observation in rating the quality of the Indian produced ETV programmes was independent.

897. PILLAI, J.K., and MOHAN, S., *Impact and Performance of Correspondence Education Programme of Madurai Kamaraj University*, Dept. of Education, MKU, 1984

The major objectives of the study were (i) to identify the primary beneficiaries of the correspondence learning system, (ii) to estimate the impact of correspondence education in terms of economic, social, occupational and psychological indicators, (iii) to examine the response of the participants regarding the performance of the components of this learning system, and (iv) to study the responses of non-participants, some elites as well as some regular college students, towards correspondence education.

The sample comprised 3,000 candidates selected randomly from candidates who had successfully completed correspondence education from the time of its inception and those who were undergoing correspondence education during the year 1981-82. The non-participant sample comprised 50 elites residing in the university area and 400 graduates from arts and science colleges. A questionnaire, a performance rating scale, and interview schedule and an opinionnaire were the tools used for data collection.

The major findings were: 1. Men participants constituted two-thirds of the sample and women participants the remaining one-third. Married candidates constituted 46 per cent of the sample. 3. Forty-five per cent of the sample belonged to backward classes and five per cent were from scheduled classes and scheduled tribes. 4. A majority of the correspondence candidates were from the middle-income group. About ten per cent had monthly income less than Rs. 100. 5. About 37 per cent of the candidates were in the age range of 30-40 years. About 58 per cent were between 20-30 years. The rest were more than 40 years. 6. About 27 per cent of the

candidates were teachers, about 11 per cent were administrative staff working in offices, 35.2 per cent were unemployed. Housewives constituted about seven per cent whereas self-employed constituted about six per cent. 7. About 200 convicts in the eight central prisons of Tamil Nadu took advantage of correspondence education. 8. Of the benefits derived by the candidates, social benefits (31.69 per cent) topped the list followed by educational benefits (29.9 per cent), occupational benefits (17.74 per cent), psychological benefits (11.47 per cent) and economic benefits (9.18 per cent). 9. The candidates undergoing correspondence education took to correspondence education for improving qualifications, learning further, financial benefits, improving status, utilization of leisure, fulfilment of demands, better job opportunities, etc. 10. The elites were unanimous in their view that correspondence education helped people to improve their social status. 11. The graduates from colleges gave the opportunity of personal contact with teachers as a reason for joining regular colleges. They did not have the confidence to learn by themselves in correspondence education. 12. About 81 per cent of the candidates found printed lessons most important. About 38 per cent felt that contact classes were most useful. Assignments, response sheets, and study centres were considered least useful by more than fifty per cent of the students. Radio programmes were, however, considered as most useful or useful by about 68 per cent.

898. PUSHPA GAUTAM, *Development of Programmed Instruction in Linear and Branching Styles and Studying the Performance in relation to Creative Thinking and Level of Aspiration*, Ph.D. Edu., HPU, 1987
(See Abstract 876.)

899. RABINDRADAS, B., *The Development and Try-out of Self-Instructional Materials on Health Education for High School Students with special reference to Communicable Diseases*, Ph.D. Edu., SGU, 1984

The objectives were (i) to develop self-instructional materials which would be helpful to high school students to acquire scientific knowledge about health with special reference to communicable diseases, (ii) to validate the developed self-instructional materials by using an

opinionnaire prepared for this purpose, (iii) to try out the developed self-instructional materials in terms of improvement in the knowledge level, (iv) to find out the effectiveness of the self-learning materials developed, as compared to the conventional method of teaching, and (v) to find out the attitude of high school students towards learning health education through self-instructional materials.

A sample of three Anglo-Indian schools was selected by using the random sampling method. Students of classes IX and X were taken as subjects for a try-out of the self-instructional materials. The sample was divided into three equal groups by matching the means and standard deviations of pre-test scores. The first two groups were used as experimental group in two different learning situations—self-learning technique in the absence of a teacher and self-learning method under a teacher's supervision. The third group was the controlled group where instruction on health education was imparted by a classroom science teacher. The investigator developed a self-instructional package on 'communicable diseases and their preventive measures' with the criterion test and an opinionnaire. A pre-test, post-test control group design was adopted.

The major findings were: 1. The self-instructional materials succeeded in enhancing the learning capacities (gain in knowledge) of the student when self-administered by the students as well as administered under the supervision of the teacher. 2. The self-learning techniques were found superior to the other modes of learning. The self-instructional material administered under a teachers' supervision was found very effective. 3. The relative superiority of the self-instructional material in terms of the retention level was established over the conventional classroom teaching. 4. The self-instructional material had no differential effect by sex of students so far as learning was concerned. 5. A very high proportion of students showed a favourable attitude towards the prepared self-instructional materials.

900. RAO, L.N., *A Study of Factors Influencing the Effective Use of Audio-Visual Equipment and Materials in Classroom Teaching*, Ph.D. Edu., SVU, 1984

The objectives of the study were (i) to find out the present position of the audio-visual equipment and materials in the secondary schools of East and West Godavari

districts of Andhra Pradesh, (ii) to determine the factors hindering the effective use of audio-visual equipment and materials in classroom teaching, and (iii) to ascertain the attitude of the respondents towards the factors influencing the effective use of audio-visual equipment and materials in classroom teaching.

The study was conducted on a sample of eight schools by mailing four types of questionnaires for the availability of audio-visual equipment and materials and their effective use in classroom teaching. The following tools were developed by the investigator for the purpose of data collection: (1) questionnaire on the availability of audio-visual equipment, (2) questionnaire on the availability of audio-visual materials, (3) questionnaire on the effective use of audio-visual equipment in classroom teaching, (4) questionnaire on the effective use of audio-visual materials in classroom teaching.

The major findings were: 1. The position of the audio-visual equipment in the schools was poor. 2. There was a significant relationship between the availability of the equipment and the type of the management of the school. 3. There was association between the availability of the equipment in the schools and their locality. 4. There was a relationship between the availability of the audio-visual equipment and the age of the schools. 5. There was a relationship between the availability of the audio-visual equipment and the type of school. 6. There was no positive association between the availability of audio-visual equipment and the strength of the school. 7. There was no positive association between the effective or ineffective use of audio-visual equipment in classroom teaching and the type of management. 8. There was no significant relationship between the effective use of audio-visual equipment in classroom teaching and the locality of the schools. 9. There was no relationship between the effective use of audio-visual equipment in classroom teaching and the strength of the schools. 10. Most of the respondents checked the factor, 'Absence of sufficient equipment and materials' as the first and foremost hindering factor for the effective use of audio-visual equipment and materials. The other factors hindering the effective use of audio-visual equipment and materials, given in order of importance, were: 'Heavy work load on the part of the teacher', 'Lack of accommodation', 'Lack of funds', 'Lack of trained personnel', 'Lack of time for the teacher' and 'Very expensive.'

901. RAVISHANKAR, S., *Evaluation of Management Training Programmes in Public Enterprises with special reference to the Use of Educational Technology*, Ph.D., Edu., Osm. U., 1982

The objectives of the enquiry were (i) to study the aims and significance of management training in public enterprises in general, (ii) to examine the training practices in enterprises with regard to objectives of training, curriculum, teaching methods and evaluation procedures, and (iii) to explore the employment of various training techniques including audio-visual aids.

The sample consisted of nine organisations, viz., Bharat Heavy Electricals Ltd. (BHEL), Electronics Corporation of India Ltd. (ECIL), Indian Drug and Pharmaceuticals Ltd. (IDPL), Defence Organisation, Hindustan Machine & Tools (HMT), State Bank of India (SBI), Fertilizer Corporation of India (FCI), Indian Air Lines and National Mineral Development Corporation (NMDC). The curriculum of training and level of training of these organizations were studied with respect to, (i) level and type of training, (ii) objectives, methods and evaluation of training, (iii) training policies formulated by top management, (iv) trainers and their role in imparting training, (v) trainees and their role in receiving training, and (vi) trainees' perception of training programmes.

The findings of the study were: 1. In determining training needs, the method of 'inviting the practising managers from within the organization to speak on course' was widely used in public enterprises. 2. The organisational needs and individual needs constituted the criteria for identification of training needs. 3. In the selection of executives for training, the major selection criteria were the needs of the organization, individual training needs and the need for improvement of functional areas. 4. On the job training which included techniques of developing the individual on the same job through job orientation and special assignment had several operational difficulties, as they were not systematically planned and implemented. 5. The method of 'off the job training' was used mostly in case of only the junior level managers. 6. While many external training institutions were used by public enterprises to train their managerial personnel, most of the enterprises did not seem to have evaluated the relative effectiveness of programmes offered by external training institutions. 7. The objectives of the training were formulated according to the managerial levels to which the trainees belonged. In determining the training objective, the 'need of organization' was the

main criterion rather than 'need of the individual'. 8. Curriculum was designed according to the appropriate level of managers. There was not much emphasis on scientific approach and techniques involved in managing organization. 9. While many pedagogical techniques of training were employed in public enterprises, audio-visual aids were not found widely used as a part of training. Educational training technology was not applied in training practices. 10. While evaluating training programmes, only the method of 'Reaction Evaluation' through questionnaire and trainer's report at the end of the programme was widely used. Outcomes of training programme had not been given any consideration. 11. A large number of trainees were not satisfied with the existing training programme as they were pertinent to the needs of the organizations only. 12. Efforts to introduce innovations in training methods to raise the efficiency of the training programme and level of satisfaction of trainees did not appear to have been given adequate consideration. 13. In most of the organisations, qualified and trained trainers with specialized skills in educational training technology were far too short in terms of the needed numbers.

902. SAHOO, P.K., *A Study of Correspondence Education in an Indian University*, Ph.D. Edu., MSU, 1985

The major objectives of the study were (i) to conduct a study of growth and development of correspondence education at the H.P. University from 1971 to 1981, (ii) to conduct an intensive study of the correspondence education system with regard to infrastructural arrangements, students at entrance stage, students at course completion stage and dropouts, instructional and evaluation processes, outcome of the courses and costs, and (iii) to evaluate the correspondence education system against the criteria of a national framework of an effective system, comparability with the alternative system and perceptions of different categories of participants of the system.

The case study method was adopted. The sample of the study included six specialists, 5382 students at entrance stage of 1979-80 and 845 new entrants of 1980-81, 489 students at course completion stage (1981), 154 dropouts (1979-81), 274 successful students of 1971-79, 5,368 correspondence pass students of 1971-81, 2328 pass students of regular courses of 1971-81, and 68 regular postgraduate (PG) students. The tools of the study

were information schedule, pro formas, questionnaires, interview schedules and an observation schedule. These tools were prepared by the investigator. Data were to be collected through record surveys, personal administration and mailing of questionnaires, interviews and observations. Data were collected in four major phases ranging over three complete years, 1979 to 1982. Qualitative approaches and descriptive statistical techniques were used for analysis of data.

The major findings of the study were: 1. The institution under study was the first in the country to start with a number of PG correspondence courses as well as undergraduate (UG) courses, in arts, commerce and education fields. However, it remained more or less static and non-innovative in terms of providing correspondence education. 2. The system proved its credibility in terms of providing educational opportunities to students belonging to different parts of the country, comparatively elder age groups, with some years gap between their last qualifying examination and present study, students of low and middle income groups and having employment, and first generation learners. 3. The system had limitations in terms of attracting students from the women group, lower castes with comparatively better academic experiences and rural regions. The dropouts range varied from 13 to 85 per cent. 4. Academic and economic factors mostly motivated students to join their studies whereas instructional factors, management factors, utilitarian factors and personal factors came in the way of completion of courses. 5. The institution attracted a large number of qualified and experienced teachers to get involved in the instructional activities. 6. The instructional processes were found to be of medium standard, especially with regard to lesson scripts, personal contact programmes and assignments. 7. The library studies and use of other instructional media were very poor. 8. The correspondence students had poorer performance in the examinations in comparison to that of regular students. However, a selected number of correspondence students performed well at the university level. The utility of correspondence courses was realized by the pass students in terms of academic and sociological aspects but a large chunk of students did not perceive the utility in terms of job placement and occupational growth. 9. The major source of revenue was restricted to fees from students. However, all the amount received from students was not utilized for the correspondence institution. The private costs of PG correspondence courses, especially with regard to instructional cost, were less than that of regular PG students.

The study came out with the following major implications: (1) Appropriate planning must be made for introduction of courses suited to the need of the target group of learners. (2) The institution must be systematic in terms of management of instruction and other aspects of the organization. (3) Autonomy must be granted to the system for dealing with its academic and financial aspects of management. (4) The instructional aspects must be streamlined through involvement of special bodies of experts in different phases, starting from course development to evaluation of learners' performance. (5) Use of library studies, distribution of study materials, radio and TV broadcasts, regional study centres, must be strengthened in the institution. (6) Financial assistance must be provided by the UGC and the state government for strengthening the instructional activities of the institution.

903. SAMANT, C.R., *Role Efficacy of Communication Media: A Comparative Evaluation*, Ph.D. Psy, Utkal U., 1983

The main objective of the inquiry was to study the effectiveness of two broadcast media: radio and television, in terms of the extent to which a climate for development was created through measurement of gain in knowledge and attitude, and the extent to which the instructional communication was utilized by the target viewers and listeners through tests of comprehension and retention.

The study made use of a quasi-experimental design of investigation. Four groups of subjects, two experimental and two control, were selected separately for radio and television, from the village communities of two districts of Orissa. In each group there were 40 subjects who were found to have been exposed to the media programmes in the case of the experimental groups, and not exposed to such programmes in the case of the control groups. Observations were made on three different occasions with a gap of ten weeks between occasions. Closed-form questionnaires were developed and used by the investigator for measurement of knowledge (impact) and attitude. One test was prepared and used for study of comprehension and retention. Statistical measures like mean, SD, correlations, t-test and ANOVA were used for analysis of data. The major findings of the study were: 1. The differences between different treatment groups were not systematic so far as the nature of gains were concerned. 2. Such type of unsystematic var-

iations were highlighted by the tests of statistical significance of the mean gain scores. 3. ANOVA revealed that the changes over various lengths of exposure were not only unsystematic but also small in magnitude. 4. Results of ANOVA showed that the 6-space (generated by occasion-impact-attitude dimensions) centroids were widely different but the differences between groups were non-significant. However, the difference between radio experimental and control groups was significant. 5. Difference between occasions were very small in magnitude and the trend of gain from one occasion to another was more or less negative. 6. The results of the comprehension and retention of the programme contents indicated that media programmes were only moderately comprehended, but retained well, and there was no effect, of any remarkable merit, of the durations of exposure on the target audience.

904. SCERT, ORISSA, *An On The Spot Evaluative Study on School Broadcast Programme in the Towns of Cuttack and Bhubaneswar in Orissa*, 1982

The objectives of the study were (i) to collect information about the provision of radio sets, (ii) to know about the utilization of radio programmes, (iii) to identify the problems faced by the schools, (iv) to create an awareness in the schools regarding school broadcast programmes, and (v) to invite suggestions for improving the situation.

The schools visited were 11 upper primary schools, eight middle English schools and 39 schools from Cuttack and Bhubaneswar. A pro forma was prepared and used for data collection. Three officers of the department visited the respondent schools. Discussions were held with the heads of the schools as well as the assistant teachers. Observations were made in the schools at the time of listening to the school broadcast programmes.

The findings of the study were: 1. Around 72 per cent high schools, 13 per cent ME schools and no primary school possessed radio sets. 2. Sixty-two per cent of high schools had sets in working order. 3. Twenty per cent of high schools expressed inability to purchase radio sets due to non-receipt of circulars and non-availability of funds. 4. Only 15 per cent of high schools had kept separate periods for school broadcasts. 5. Only 10 per cent of the schools used radio programmes regularly. 6. Only 10 per cent of the schools made use of pro- and post-

broadcast discussion sessions. 7. Forty per cent of the respondents from high schools and 33 per cent from ME schools had pointed to lack of accommodation and practice of a shift system as the difficulties in the use of school broadcast programmes. Besides, a large number of schools had complained about non-provision of timetable for educational broadcasting, inadequacy of radio sets, non-receipt of circulars and lack of funds coming in the way of successful implementation of the programme.

905. SETH, INDU, *A Study of the Effectiveness of Educational Television on the Educational Development of Primary School Children*, Ph.D. Edu., MSU, 1983

The major objectives of the study were (i) to inquire into the effect of educational television (ETV) on the educational development of primary school children in terms of language development, acquisition of information related to ETV programmes and scholastic achievement (ii) to study the effect of intervention programmes, that is, pre-telecast and post-telecast activities to be conducted by teachers along with ETV on the educational development of primary school children in terms of the above-mentioned dimensions, and (iii) to provide feedback to administrators and producers on different aspects of ETV programmes. The ETV programmes under study were those produced by Delhi Doordarshan.

The study employed pre-test post-test control group design. There were two experimental groups and one control group. The experimental treatments were, (1) ETV programmes without intervention, and (2) ETV programmes with pre-telecast and post-telecast activities to be undertaken by the teacher along with the students. Out of 1450 primary schools run by the Delhi Municipal Corporation, only 155 were provided with TV sets and of these only 45 were found to show the ETV programmes to the children regularly. Of these 45 schools, 12 were randomly drawn and were further randomly divided into the two experimental groups. Six schools similar in most respects to the ones selected for the experimental groups were drawn from those primary schools not provided with TV sets. There were 145 girl students in each of the three groups. The tools used in the study were, (1) Raven's Coloured Progressive Matrices, (2) Tests for Language Development developed by Shukla and Kumar, (3) achievement tests in

science, social studies and language developed by the investigator, (4) a test based on ETV programmes developed by the investigator, (5) a proforma for teachers developed by the investigator and (6) an interview schedule developed by the investigator to get feedback from teachers. The investigator also developed guidance notes for intervention programmes for the second treatment. Analysis of the data was conducted using analysis of covariance, analysis of variance, t-test and pairwise comparison for different treatment groups.

The study generated the following major findings: 1. Language development of children exposed to ETV was higher than those not exposed to ETV. Language development among children exposed to ETV along with intervention programmes was higher than those exposed to ETV alone and those not exposed to ETV. 2. The ETV group was found higher on acquisition of information related to ETV programmes than the non-ETV group. The ETV group with intervention was found higher on acquisition of information related to ETV programmes than those exposed to ETV alone and those not exposed to ETV. 3. The scholastic achievement of students exposed to ETV programmes along with intervention was higher than the ETV and the non-ETV groups.

The important implications of the present study are: (1) Teachers should be trained for the proper utilization of ETV programmes and guidance notes should be sent to them for each programme well in advance. (2) If more programmes related to syllabus are telecast it may contribute more in the achievement in school subjects, (3) Teachers of primary schools and producers of ETV programmes for primary schools should work as a team and decide the content, presentation, etc. of the programme.

906. SHAH, S.G., *Development and Tryout of Programmed Learning Material on Population Education for the Students of Class-IX*, Deptt. of Education, SGU, 1984 (SGU financed)

The major objectives were (i) to develop programmed material on population education for the students of Class IX, (ii) to find out the effectiveness of the programmed material, and (iii) to assess the opinions of students about the programmed learning materials. The nature of the present investigation was an experimental one, where the effectiveness of the programme was to be measured in terms of the achievement. The sample

comprised 40 students of class IX of a secondary school. The research design was pre-test, post-test single group design. The experiment was replicated on another group of 40 students of class IX of a different school. The programmed material was preliminarily tested on ten students of class IX. All the students were successfully pre-tested and post-tested as scheduled by the researcher. The retention test was conducted three months after the experiment. All the students were available for the retention test. Tools used were a linear programme on population education, a criterion test of the linear programme based on the content of population education, and an opinionnaire to know the opinions of learners regarding the programmed material.

The major outcomes and findings were: 1. The programmed material prepared for the present study was simple, self-instructional and easily understandable. It required only three hours of learning. 2. Study of the programme could bring tangible changes in student's knowledge in the area. The programmed learning approach adopted held a promise for the successful use of educational technology in the area of population education. 3. Opinions of the participants regarding the quality of the programme were very positive. They found the programme very interesting and useful. They also showed their willingness to study such programmes if available. The programme was found to be self-explanatory and no external help was required by the participants. They felt no difficulty in 'self study' of the programme.

907. SINGH, B.K., *Technology in Education—Growth and Development in the Secondary Schools of Bihar with special reference to Monghyr District and Its Impact on the Teaching-Learning Process*, Ph.D. Edu., Bih. U., 1980

The main aims of the research were (i) to study the growth and development of educational technology in Bihar with special reference to Monghyr District, (ii) to study its impact on the teaching-learning process, and (iii) to investigate the impact of achievement in Hindi and science due to the utilization of educational technology in the age groups 11 to 15 for class VIII and 12 to 16 for class IX.

The survey technique was used. Two sets of questionnaires and two achievement tests were used.

The study revealed: 1. Educational technology had its significant impact on the achievements of pupils in

the fields of science and language. 2. Sex did not interfere significantly in determining the achievements in the field of science and language due to educational technology. 3. Achievements of the pupils in both fields of studies were not significantly influenced on account of variations in ages of the pupils. 4. A majority of teachers had opined that educational technology had changed the classroom teaching-learning process to a great extent and had also made an attitudinal change among the pupils, 5. Lack of economic resources and unwillingness of the management of the institutions were vital factors held responsible for the inadequate use of educational technology. 6. The teachers by and large were of the view that the combined forces of all other agencies alone could remove the obstacles from the path of the proper use of educational technology. 7. There had been a lopsided quantitative growth of educational technology in the secondary schools of Monghyr. 8. Radio was the only gadget which was utilized by a few schools in classroom teaching-learning situation.

908. SINGH, J., *Audience Profile of INSAT Districts of Uttar Pradesh*, Central Institute of Educational Technology, NCERT, 1985

The objectives of the study were (i) to study socio-cultural and economic aspects of the life-style of the rural people living in the INSAT districts of UP, (ii) to study geographical and historical background of the area, (iii) to study the rural educational scene at the primary level, (iv) to determine the informational and educational needs of the adult population, the children and the teachers of the primary school, and (v) to suggest relevant and need-based themes for communication support that are amenable to solution by the use of the television.

The data were collected by the observation method on the lines followed by anthropologists. A few villages of Basti and Gorakhpur districts were treated as the fields of the study. The field observation notes were contributed by the personnel working in CIET and Doordarshan. The observations were combined with informal discussions with people of different sections in the community, including the children and the teachers. Implications were drawn on the basis of findings of the study in each sub-section.

The main findings of the study were: 1. In Gorakhpur district, the majority of the population was rural. The

land holdings were large, small and marginal. A large part of the rural population was landless. Most of them belonged to backward and weaker sections of the society, and lived below the line of poverty. The recurrent floods and droughts stood against upliftment of the area. 2. Agriculture was the mainstay of the economy of the districts. High-yielding varieties of various crops were becoming popular but their spread was mostly confined to wheat, paddy and sugarcane. The lands were deficient in nitrogen, phosphorus and potash. The total area covered by fertilizers was very limited. 3. Villagers kept domesticated animals for milk and transport. The utilization of various services for animal husbandry practices was very limited. 4. In every village, there was a multitude of castes among Hindus. Besides Hindus, Muslims dominated the population of the districts. Among Hindus, two 'Mafia groups'—one led by the Brahmins and the other led by the Thakurs—were operating in the area. Village panchayats had a limited role in the development of the area, partly due to limitation of funds and mainly due to corruption and quarrels in the panchayat elections and factionalism among castes. 5. Hindi was understood by people of all communities. Bhojpuri, a dialect of Hindi, was popular among all the communities. 6. Varieties of festivals like Basant Panchami, Ram Navmi, Holi, Janmashtami, Ganesh Chaturthi and Shivaratri were celebrated by Hindus, whereas Id and Muharram were important festivals of Muslims. 7. A majority of the villagers were fatalists, having a blind faith in destiny. The Brahmins did not plough their own land. Also Brahmin women folk did not work in the field. 8. Early marriage was a common factor of rural life, especially among low castes. The dowry system and entertainment of the marriage party by the bride's parents was an essential feature of marriage. 9. Even though the people of the area had some idea of nutrition, partly due to economic constraints and partly due to food habits, the intake of nutritious and balanced food was limited. Use of narcotics and intoxicants was very common among the rural folk. 10. Two types of educational institutions, viz., private and government were run in most of the villages. All people wanted their wards to go to private schools only, because they got better quality education there. Private schools were mostly patronized by the children of the upper castes and those with means. 11. There was usually an open space around the primary school. Most of the schools had a pucca structure. Some primary schools were without a building of any sort. The availability of teaching aids in the schools was very limited/

non-existent. 12. The teachers of secondary schools expressed were not satisfied with the quality of the learning in primary schools. In some of the schools, the available aids were not used in the teaching-learning process. The accepted norm for the teacher-student ratio at the primary level was 1:40. The teachers in most of the schools were obliged to teach more than one class at the same time.

909. SINGH, J. and SINGH, A.K., *A Study to Assess the Needs of the Primary School Children of Orissa for ETV Support*, Central Institute of Educational Technology Project, NCERT, 1984

The objectives of the study were (i) to collect background information on primary school teachers, parents/guardians and TV schools, (ii) to study the level of moral development and status of health and hygiene of primary school children, (iii) to assess the opinion of primary school teachers, headmasters and parents about the effective use in education, and the suitable themes of ETV programmes, (iv) to suggest themes for programmes, keeping in view the background of the primary school teachers, and the opinion of the teachers and the parents about the needs of the children for ETV support.

The samples of the study were: 48 TV schools selected at random from two western educational districts of Orissa during 1983, 50 TV custodians/user teachers, 41 headmasters, 211 children studying in selected schools and 85 parents/guardians of some of the children studying in the selected TV schools. The questionnaires, interview schedules and one moral development tool of the Kohlberg type were used for data collection. Data were analysed qualitatively.

The major findings of the study were: 1. About 88 per cent of the teachers had not received any training in teaching before joining the service. 2. More than two-thirds of the teachers handled two or more than two classes at the primary level. Most of them complained about heavy workload. 3. The TV sets were mostly installed in the upper primary schools, and to some extent in the upgraded middle English schools and in the lower primary schools in that order. 4. The average number of total children (class I-V) varied from 95 to 228 in different types of schools. The number was too large to justify watching of the ETV programmes by all the children at one time. 5. The TV schools did not have proper AV aids. 6. Dropping out and irregular attendance were

common features in primary schools. 7. The parents in general did show interest in enrolling their wards in the schools, but did not show equal interest in their attending school regularly. 8. The parents were aware of ETV programmes shown in the schools. 9. Around 75 per cent of the teachers favoured the ETV programmes being syllabus based. Most of the parents favoured this idea of the teachers. 10. Most of the teachers felt that environmental studies for classes I and II, and general science for classes III, IV and V should be given top priority. Next priority should be given to mother-tongue for classes I, II and III and to social studies for classes IV and V. Arithmetic came at third priority for classes I, II and III and English for classes IV and V. 11. Moral education and health education were emphasized by the parents. 12. A majority of the students were at stage I of moral development in the Kohlberg model of moral development. It was suggested that telecasts on moral education would be appropriate to this stage.

910. SINGH, J., and SINGH, A.K., *Report on ETV Utilisation in Orissa*, Central Institute of Educational Technology Project, NCERT, 1984

The objectives of the study were (i) to study the rate of recovery of reports from TV schools during the year 1983, (ii) to study the functioning of TV set and the reasons of their non-functioning, (iii) to gather opinions of viewers regarding the clarity of picture and sound and the manner of watching TV, and (iv) to gather information about the number of TV viewers in schools.

Data were collected through mailed questionnaires sent to the schools using TV in Sambalpur, Dhenkanal and Bolangir districts of Orissa and also from monthly reports of these schools sent to the ETV resource centre during the year 1983. Data were analysed in descriptive form.

The findings of the study were: 1. All TV schools did not send TV monthly report. The recovery of reports varied from month to month, and from district to district. It was quite poor in the beginning, but it improved later on. 2. The position with regard to the functioning of the TV sets was more encouraging in Dhenkanal and Bolangir compared to Sambalpur. On an average, it functioned in 70 per cent of the TV schools in the former districts compared to 50 per cent in the latter district. 3. All the schools which operated TV sets did not do so regularly. In fact, the percentage of schools using TV on all the school days in a month was quite limited,

ranging from about 10 per cent to 33 per cent. 4. The functioning of the TV sets in the different schools was not consistent over a period of time. 5. Reception of picture and/or sound was not clear in all cases. On an average, it was reported that the picture was partly clear or not clear at all in about 15 per cent of cases. The position about the reception of sound was only a shade better. 6. In 60 to 70 per cent of the TV schools, children of varying age groups watched television together. The total number of children of class I to V and the other children who watched the TV programmes ranged from 90 to 190, with an average of about 125 children per TV set. 7. TV being out of order was the major reason for under-utilization of the TV set, followed by failure of electricity. The former cause was more prevalent in Sambalpur district, while the incidence of failure of electricity was far greater in Dhenkanal and Bolangir districts.

911. SINGH, J., and UMARE, R.S., *A Report on ETV Utilisation in Maharashtra State*, Central Institute of Education Technology, NCERT, 1986

The objectives were to study (i) the coverage of educational television (ETV) in the schools, and (ii) monitoring ETV utilization during 1985-86 in Maharashtra State.

The data were collected through analysis of records, inviting TV monthly utilization reports from the TV custodians, visits of research teams to nine villages having TV sets in schools and obtaining feedback reports from the field investigations.

The findings of the study were: 1. In Maharashtra, four districts, namely, Nagpur, Bhandara, Chandrapur and Gadchiroli were covered under the INSAT for Education Project. This project provided free of cost supply and maintenance of the TV community receiving sets by the state. In all, 880 ETV sets were supplied till 1986 to four districts of the state. 2. A majority of schools (77 per cent) having TV sets did not send monthly ETV utilization reports. All schools which responded did not do so regularly. 3. The main reason for not sending reports were identified as lack of funds with the schools to cover postage expenses. 4. In quite a good number of schools (63 to 93 per cent) TV sets did function. Better functioning of TV sets in Nagpur could be due to VHE sets which were less prone to develop faults compared to DR sets. Easy availability of maintenance facilities in Nagpur could be another factor responsible for better func-

tioning of TV sets in Nagpur. 5. The actual functioning of the TV sets was considerably lower than that indicated by the analysis of the monthly reports. 6. It was found through on the spot visits that rarely were TV sets actually used for the children of schools. Teachers' presence in particular school shifts acted as a major factor of accessibility of TV programmes to students. 7. Most of the direct reception sets (80 per cent) did not function at any given point of time. 8. The percentage of the schools which used TV all the school days in a month varied from 11 to 25. In most cases (55 per cent) TV was used for varying periods from one week to less than three weeks a month. 9. The factors affecting the ETV programmes were identified as: inadequacy of facilities for expeditious maintenance of the TV sets, the large size of the schools, lack of a separate TV room in the schools, lack of motivation of teachers, lack of motivation of TV custodians, non-receipt of transmission schedules by TV custodians, lack of linkage between TV programmes and the syllabi, and breakdown of supply of electricity during the time of telecasts.

912. SINGH, U., *Effectiveness of Media with reference to Classroom Ethos*, Ph.D. Edu., SGU, 1983

The major objectives of the study were (i) to know the effect of programmed learning material (PLM) in book format, PLM in tape-slide format, PLM in audio-tape format, and teaching in the traditional way, as media of instruction, on classroom ethos, (ii) to compare the 'actual' classroom ethos of four groups in terms of authenticity, legitimacy and productivity (ALP) after receiving instruction through different media, (iii) to compare 'ideal' with 'actual' classroom ethos of a group after receiving instruction through each of the four media, and (iv) to compare the effectiveness of different media used in teaching general science in the tenth standard in terms of mean gain scores achieved by the students based on pre- and post-criterion tests. In the light of these objectives, null hypotheses formulated were: (1) There will be no difference between the perceived 'actual' pre- and post-ALP ethos of a classroom receiving instruction through PLM in book-format, PLM in tape-slide format, PLM in audio-tape format, and teaching in the traditional way. (2) There will be no difference between 'actual' ALP scores of four groups after receiving instruction through different media. (3) There will be no difference between perceived 'ideal' and 'actual' ALP ethos of a classroom after receiving instruction

(treatment). (4) There will be no difference between mean gain scores of different groups of students receiving instruction through different media.

The present study was developmental-cum-experimental in nature and consisted of two parts. The first part consisted of development and tryout of programmed learning material in three formats on 'reproduction', based on the syllabus of the tenth standard. Each PLM consisted of three sub-units. The second part of the study was concerned with the comparison of their effectiveness in terms of ALP scores of classroom ethos and achieved gain scores. In this study the different instructional media were the independent variables (treatments) and students achievement on the post-test and ALP scores of classroom ethos were the dependent variables. A pre-test post-test single group design was used to test the null hypotheses. In all, 240 students selected from four secondary schools of Sardar Shaher formed the sample. Four pairs of groups were formed by matching their age, science attitude scores and intelligence scores. Each school had two groups and each group consisted of 30 students. Out of eight groups, four were formed for replication of the experiment. In order to collect data, a number of research tools were developed or acquired. These tools included Thelen's ALP Classroom Ethos Instrument, 1972, Jalota's Group Test of Mental Ability, Grewal's Science Attitude Scale, criterion tests and PLM on 'reproduction' in three formats in Hindi for the tenth standard. The classroom ethos and its patterns were computed with the help of prototype profiles developed by Thelen (1972). Analysis of variance was used to test the significance of difference among the mean achievement scores of the four groups and their replicates.

The major findings were: 1. The underlying basic pattern of congenial group educative life for 'actual' classroom before and after the treatment of PLM in book-format, tape-slide format and traditional treatment by teacher revealed the obvious differences between the top and bottom clusters of their pre and post situations. 2. The different groups perceived differently the 'actual' post-classroom situations after getting treatment. The group during instruction through PLM in book-format gave more emphasis to the authenticity aspect of the ethos. The group felt highly authentic during treatment, in comparison to other groups. Other groups gave top priority to the productivity aspect of the ethos. The experimental group II which underwent tape-slide treatment gave second preference to the legitimacy aspect whereas the experimental group III, which had

audio-tape treatment, gave second preference to the authenticity and then the legitimacy aspect of ALP ethos. 3. All the groups and their replicates, except the PLM in book-format group, gave top priority to the productivity aspect of the ethos for 'actual' and 'ideal' classroom situations. All the groups, except the PLM in audio-tape format group, had perceived an 'actual' post-ALP ethos nearer to their perceptions of an 'ideal' classroom. The audio-tape as an instructional medium was not found effective in creating an 'ideal' classroom ethos with special reference to the legitimacy and authenticity aspects. 4. Both traditional and tape-slide treatments were found to be significantly better in achieving mean gain scores than the PLM book or the audio-tape treatments. 5. If use of any media treatment in the teaching-learning process is capable of creating ideal classroom situations, it would be also helpful in achieving high scores. 6. The study indicated some relationship between media and classroom ethos.

913. SOOD, KUSUM and SURAJ LAL, *Evaluation of Educational Broadcasts in Haryana Schools*, First Series, 1981-82, SCERT, Haryana, 1982

The objectives of inquiry were (i) to study the broadcast programme, procedure of selection topics, the teachers' role during pre-broadcast and post-broadcast periods and aims of educational broadcast programmes, and (ii) to evaluate the programme.

A pro forma developed for the study was sent to 897 middle high/higher secondary schools of Haryana State. In all, 180 schools responded. A pro forma of ten items was developed. The first two items were on collecting about the schools. The rest of the items were on finding out actual situation of the radio sets purchased and being used in the schools.

The findings of the study were: 1. In the layout, the summer broadcast timings were 8.40 a.m. to 9.10 a.m. (school period starting from 8.30 a.m.) and in winter announcement, timings were from 1.40 p.m. to 2.10 p.m. (school period starting from 1.30 p.m.). Each day was fixed for a particular class for a particular subject. 2. The subject-wise topics for the whole session were discussed and chosen much in advance, before the start of the academic year, by AIR field workers who were invited to a meeting in the SCERT, Gurgaon. Thereafter, AIR sent the selected topics to script writers for recording. The programme charts and small pamphlets were prepared in plenty and sent out by AIR to be used by the schools during a pre-broadcast ten-minute period.

3. The role of the teacher was to refer to the lesson to be broadcast, to introduce it, to place illustration needed for it during prebroadcast ten minutes out of a 40-minute period. The next 20 minutes were for the lesson broadcast. In the remaining ten minutes, the teacher had to correlate the broadcast with as many subjects as possible, without being rigid with his own subject. 4. The main aim of the educational broadcast was to supplement teaching/learning strategies. 5. On the basis of analysed responses of 180 schools, the educational broadcast programmes in the responded schools were evaluated. 6. Seventy-four per cent of the schools had electricity. 7. Ninety-three per cent of the schools had radio sets with 64 per cent having repairing arrangements. 8. Seventy-eight per cent had radio awarenesses. Forty-seven per cent were supplied the programmes. Thirty-seven per cent listened the programmes. 9. Twenty-eight per cent of schools had teachers in charge of school broadcast. Twenty-seven per cent teachers made pre-broadcast preparation whereas 21 per cent undertook post-broadcast activities. Ten per cent undertook follow-up activities. 10. Nine per cent maintained broadcast records. 11. Seventeen per cent of the students reported that they liked the programmes. 12. Sixty-four per cent of the teachers were aware of Saturday programmes for teachers. Of these, 41 per cent listened the Saturday programme.

914. TAWAB, A., *A Critical Study of the Value and Importance of School Broadcasts in Modern Secondary School Education in India*, Ph.D. Edu., AMU, 1980

The objective of the research was to study the value and importance of school broadcasts of All India Radio in modern secondary school education.

Chapters I to IV deal with the importance, history, supervision, control and budget of school broadcasts in India. Relevant statistics have been quoted where needed. Chapter V describes the curricula covered, teaching methods employed and the efforts made to coordinate school broadcasts with school systems. This chapter also highlights the problem of the multiplicity of languages in India vis-a-vis school broadcasts. Chapter VI discusses the importance of the technical conditions of the receiving equipment in schools and suggests measures to improve reception and future development of this system. Chapter VII assesses the role played by school broadcasts in attaining the educational objec-

tives. It also points out the pitfalls and barriers encountered in implementing school broadcast programmes and measures to overcome them.

- *915. VISHEN, C.L., *Systems Engineering Approach to Management of School Organisation*, Ph.D. Edu., Kashmir U., 1986

An empirical attempt was made at developing a systems model of management of school organization. This was based on making a comparative study of theory-X and theory-Y designs of management as given by Douglas McGregor discussed in his book 'The Human Side of Enterprise, 1960'. The present work was based on long-drawn experimentation conducted in a school setting.

Theory-X and theory-Y elements were experimentally pitched against each other with respect to job effectiveness and job commitment and different variables mainly responsible for improving performance and developing job commitment were identified. These variables were first cumulatively withdrawn from each design of management to see the impact of their explicit manipulation on job effectiveness and job commitment. In developing the systems model of management, the investigator tried to build upon a school as a system composed of a number of sub-systems, viz., control components, input components, output components and flow components. The measurement was made with respect to the following variables; job manageability, opportunity to exert autonomy, awareness, interaction within and without the system, reward and theory-X administrative structure variables.

The main findings were: 1. The Y-design of administration was significantly better than the X-design of administration. 2. Immediate intangible and tangible rewards were very essential to performance. 3. The manageability factor was found to be very important for performance. 4. The interaction factor was found to be significant for X-system growth. 5. Opportunity to exert was also found an important factor for performance.

- *916. WAD, V., *A Study of the Scope of Communication Media Such as Radio, Television in Education at High School Level in Maharashtra State*, Ph.D. Edu., Bom. U., 1984

The main objectives of the inquiry were (i) to study the

effectiveness of educational television in terms of educational utility to students and teachers, (ii) to study the attitude and views of parents about educational programmes on radio and television as far as their growing children were concerned, (iii) to study the attitude, views and opinions of high-school teachers towards the educational programmes given by radio and television and to ascertain their wants from these media, (iv) to study the merits and demerits of radio and television as communication media with respect to education, and (v) to study the attitude of students towards these programmes. The hypothesis of study was that radio and television had made a considerable impact on education.

The study employed the descriptive survey method, using documentary analysis and library research. In order to collect the relevant data, the investigator critically referred to various encyclopaedias, directories, theses, research studies, reports, periodicals, and journals and analysed them in view of the specified objectives. The other tools employed in this study were questionnaires, interviews, visits, observations and correspondence. The questionnaires, which were developed by the author, were duly filled in by 900 teachers, 500 students and 400 parents selected from different schools in Maharashtra State. The researcher interviewed headmasters of schools, parents of children of school-going age and eminent educationists to gain information about the scope and impact of radio and television on education of school-going children. The data were analysed, using descriptive statistics.

The main conclusions of the study were: 1. The school TV programmes were liked by children for their variety, their authenticity and as a change in the learning process. 2. Children were more influenced by the entertainment TV programmes than the school TV programmes. 3. School broadcasts gave programmes which were excellent in their content and standard. They were useful in increasing the span of attention of school-going children. 4. School broadcast programmes, even though useful, interesting and rich in content, were used rarely in the teaching-learning process in the urban areas of Maharashtra and less than 50 per cent of the total programmes were used in the learning process in rural areas. 5. School telecast programmes were fair in their content-wise standard as far as the English language programmes for standard V and VI were concerned. The content-wise standard of science programmes for standard VIII given in the school telecasts was good. 6. The percentage of good science programmes considera-

bly increased due to the production of biology programmes. 7. For teaching English, school telecast programmes brought presenters whose pronunciation was too sophisticated for the village students and they found it difficult to follow the language used in the programmes. 8. TV lessons for standards V and VI in English as a second language and that of science for standard VIII were just insufficient as far as the needs of the students were concerned. 9. There was a need of school TV programmes specially prepared to give guidance to students who appeared for scholarship examinations. This was very necessary for the students who were deprived of many facilities just because they stayed in rural areas. 10. The need of communication media in the teaching-learning process had been felt by the teachers and parents also, but yet the radio and TV programmes had not attained a 'must value' in the learning process. 11. The teachers teaching in the rural areas were more keen on using radio and TV programmes in the learning process. 12. The communication media remained a complementary aid of classroom teachers and they were keen on using these media in the learning process if the syllabus to be completed was not heavy. 13. School radio was doing valuable work for SSC students but not school TV. 14. It was found from the headmasters' opinion that the scope of these media was restricted because of lack of adequate participation of students, teachers and parents in these programmes.

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