

## Research in Curriculum

### A TREND REPORT

P. N. DAVE

JYOTSNA P. DAVE

---

#### INTRODUCTION

It has been often claimed that the destiny of a nation is shaped in its classrooms. That this shaping to a great extent depends upon the kind of curriculum that a nation constructs and, thereafter, on the steps it takes for its proper implementation at all stages of education, is hardly debatable. Thus, national issues are invariably linked with both the system of education and curriculum. For example, the post-independence educational scenario of the country has been dominated by a singular curricular issue of language learning in general and that of learning of English in particular. No solution is yet in sight, even when the nation is launching on the implementation of the National Policy on Education-86 (NPE) and its subsequent Programme of Action (POA), both of which have the approval and support of Parliament.

It is no exaggeration to say that the curriculum of a country not only reflects its genius but also its ethos, philosophy, cultural heritage, as well as its concern for national development, particularly development of its most precious resource, namely, the human resource. In view of this, one may assert that policy statements on education are, by and large, statements of curriculum reform.

#### IN RETROSPECT

Curriculum development is a dynamic process. At any particular juncture it represents both the past and the

future, the present representing continuance of the past and the prospects for future. Hence it is necessary to have a look into the past first.

One has to give credit to the British for establishing in India an organized modern system of education. From the objective point of view, one cannot condemn the efforts of the British rulers to develop an educational system which served their purposes better than Indian purposes. Even the harshest critic of Macaulay's system would agree that it was effective in producing results, i.e., creating the manpower needed to run the British Empire in India. From the sheer academic point of view, one is wonderstruck by the fact that, even after forty years of freedom, it has not been possible to derive a similar kind of satisfaction at having developed a system of education (and constructed a curriculum) relevant to the needs and aspirations of our people!

Recognizing the threat posed by the colonial system of education, especially the alienation of those so educated from their cultural roots, Gandhiji proposed an indigenous system of education, namely, *Buniyadi Talim* (Basic Education) as expressed in the Wardha Scheme. The curriculum developed under this scheme aimed at the total development of the child, reflecting the Gandhian philosophy of education, i.e., development of Body, Mind and Soul. The failure of this curriculum to emerge as a national curriculum and an alternative to the prevalent alien curriculum, in spite of the fact that it had the full support of the then Congress Ministries in seven provinces, indicated the magnitude and complexity of the problems involved in changing the established structure of education and pattern of

curriculum and posed a challenge to the Indian nation. Evolving a curriculum commensurate with the country's needs, aspirations and genius is, indeed, a formidable task. The earlier this truth is realized, the better for all concerned with the policy, content and process of curriculum.

Since then, serious efforts have been continuing to restructure the pattern of education and to reconstruct the curriculum. The curriculum reforms generated as a consequence of the recommendations made by the Secondary Education Commission (1952-53), the Education Commission (1964-66) and the National Policy on Education-1986 (NPE-86) and Programme of Action-1986 (POA-86), are concrete evidence of the efforts being made to generate an indigenous curriculum. While a lot has yet to be attained, considerable success has been achieved in establishing a common structure of education throughout the country, i.e. the 10+2+3 pattern, in accepting a common scheme of studies for boys and girls, and in incorporating science and mathematics as compulsory subjects and assigning a prime place to work experience therein. Recently, the NPE-86 has taken a bold initiative in including some common components as a *core* part of the national curriculum. Thus, one would like to assert that, though quite slowly, the challenge for change in the educational system and curriculum is being met.

#### CONCEPT/COMPONENTS OF CURRICULUM

Analysis of trends and evaluation of research in an area cannot be undertaken in isolation from fundamental theoretical/conceptual considerations and what, under the name of curriculum, is prescribed for and transacted in the system of education. This precisely was the reason for dwelling upon some cultural imperatives and historical aspects of curriculum development in the country. It is, therefore, necessary to create a reference/criterion-base against which analysis and evaluation of the appropriateness, adequacy and quality of the research work carried out in this area until now, can be done.

The concept of curriculum generally comprises four major components, namely, (a) objectives defined in terms of expected learning outcomes, (b) content, (c) learning experiences (teaching and learning strategies), and (d) tools and techniques of evaluation. It is only for convenience that the concept has been defined as four separate components and it needs to be emphasized

that curriculum must be conceived as *a totality or sum total of experiences provided for the optimum growth and development of the potential endowed to an individual*. A curriculum design, therefore, defines the scope of development in observable and measurable terms, indicates the content and teaching-learning strategies required for development, and spells out modes, procedures, tools and techniques for assessing the development attained. Thus it can be seen that these four are the inseparable parts of a single concept.

#### PRINCIPLES OF CURRICULUM DEVELOPMENT

Theorists in this area seem to converge on the issue as to what the guiding principles of curriculum construction should be. They are: Flexibility, Relevance, Functionality and Productivity. No doubt, these are ideals which the curriculum framers would like to achieve. However, a quick appraisal of curricular scenario the world around in general and that of the developing countries in particular, would indicate that they are achieved in varying degrees. Our discussion above on the Indian context suggests that it is not only an uphill task but also is strewn with insurmountable impediments, socio-cultural as well as pedagogic ones. And yet, efforts must continue to make curriculum flexible, relevant, functional and productive to cater to the needs and aspirations of diverse groups of learners, especially those who have so far been denied the access to and opportunities of education. Needless to mention, the question of equity in a democratic set-up is of paramount importance in curriculum construction.

Tied up with these are the principles of the process of curriculum development. Although not universally accepted, they are emerging as corollary to the principles of curriculum mentioned a while ago. Being debatable, they are presented as questions: Should curriculum development be: a. centralised or decentralised (done at the macro level or the micro level); b. subject/discipline based or real life problem-centred (or put differently, should content be drawn from books on subject/discipline or straight from life itself); c. the responsibility of the experts in the field or the functionaries involved in its implementation at the grass roots level, and at either level, undertaken by only those who are conversant with education (i.e., functionaries in education sector) or also other developmental sectors/life occupations; and d. knowledge—or manipulative-skill—or socio-emotion-trait oriented? These critical principles

and processes are significant indicators of judging the efficacy of curriculum models/schemas and their transactions. The authors intend to make full use of these concepts and principles in analysing the information available in the abstracts on the subject, identifying the major trends, evaluating the quality of research work and suggesting the areas where further research need to be conducted.

#### FRAMEWORK FOR TREND ANALYSIS

Since curriculum development has been conceived as a dynamic and continuous process, and so is the research in the area, it has been decided to cover all the abstracts included in the four Surveys (now on be referred as S1, S2, S3, S4 and T-Total), although special emphasis would be laid on the trends emerging from the abstracts included in the fourth one. The abstracts and the important details in the surveys have been analysed in respect of various aspects mentioned below:

1. **Stages:** Frequencies of studies under each stage of education—(a) Pre-school, (b) Elementary—Classes I-VIII, (c) Secondary—Classes IX-X, (d) Higher Secondary—Classes X-XII, (e) Higher Education—Graduate and Postgraduate, (f) Entire Stage, and (g) General, not related to any specific stage of education (see Table 11.1). Two important points need attention in this regard: (a) Over the years the structure of education has been changing, e.g., 11+4 has now changed into 10+2+3 and b. Even at this juncture, although the 10+2+3 structure has been accepted nationally, the demarcation between stages and within a stage, specially the primary stage, differs from state to state of the Union. For instance, some states include class VII in primary level and bifurcate 4+3 as the primary and the upper primary stages (against 5+3, recommended in the NPE). The write-up has taken the NPE-86 classification as reference.
2. **Areas of Learning:** Frequencies of studies under each of the areas of learning—(a) Language, (b) Mathematics, (c) Science (Environmental Studies, Natural, Physical and Home Science), (d) Social Sciences (Environmental Studies, History, Geography, Economics, Civics and Psychology), (e) Work Experience and Vocational/Technical Education, (f) Health and Physical Education, (g) Population/Sex Education, (h) All Areas, and (i) General (no specific area, see Table 11.2). The basic classi-

fication with regard to this aspect has been the National Curriculum for Elementary and Secondary Education brought out by the NCERT in 1988.

3. **Components of Curriculum:** Frequencies of studies in respect of each of the curriculum components—(a) Objectives and Syllabus (Learning Outcomes, Content/Subject-matter), (b) Learning Experiences (Teaching and Learning Strategies, e.g., methods, techniques, modes, etc.) (d) Textbooks, (e) Evaluation (Tests, Techniques, Procedures, etc.), (f) Access (Provision of Education Facilities), (g) All components, and (h) General (not relating to any components but still about curriculum (see Table 11.3).
4. **Research Methodology:** Frequencies of studies employing research methods such as Survey, Experimental, Historical, Combined, Evaluation and Developmental and/or Evaluation and Observation (see Table 11.4).

#### TREND ANALYSIS AND INFERENCES

Before the trends related to various aspects of curriculum mentioned above are discussed, the position and importance of this area vis-a-vis other areas of research needs to be reviewed. The data presented in the Overview of S3 (Buch and Govind, 1986), under Table 11.6 entitled 'Area-wise Classification of Educational Research' shows that out of 3051 studies conducted until then, 261 studies (8.6 per cent) were related to this area. In the context of 17 areas of research mentioned therein, this area obtains the fourth rank, indicating thereby that it has received adequate attention from research workers all through these years. For comparison, it is reported that the three other areas in order of rank were as follows: (i) Sociology of Education (429, 14.1 per cent), (ii) Educational Management and Administration (377, 12.4 per cent), and (iii) Learning, Personality and Motivation (372, 12.2 per cent). In the same overview, data indicating the progress of research in this area has been also presented. The decade-wise frequencies of studies suggest that the period 1971-80 registered a quantum jump of research in this area, nearly a three-fold increase over the previous decade, reflecting perhaps the post-NEP-86 spurt in curriculum development and, subsequently, in curriculum research. Since the number of studies in the area during the current decade comes to 148 (41+107—S4), it is reasonable to infer that the number at the end of decade will at least rise propor-

tionately to the total rise, indicating thereby that the momentum of research in this area will continue. If there existed a relationship among the new education policy, curriculum development and curriculum research, one would venture to forecast a substantial increase in research in coming years as a result of the implementation of the NPE-86 and POA-86. The increase in the financial outlay, particularly in the sectors of elementary education and vocationalization of education, speed, and efforts in changing curricula and textbooks, and overhauling of the management system should provide extra impetus to research in this area.

Buch and Govind have further made the following observation regarding the quantum of research in this area:

Yet, considering the fact that this number (261 mentioned above) represents researches on more than 20 school systems operating in different parts of the country with their own curricula and textbooks, the quantum of the research seems to have touched only the tip of the problem.

The discussion and inferences made by these authors do not tally with this inference. One has to view the question of adequacy in an area of research in relative terms and not in absolute terms. First it needs to be established whether the total number of researches, i.e., 3051 is adequate or not, when one considers the vast field of education comprising 17 areas of research. It is, indeed, not. Then it may be surmized that the total inadequacy pervades all the areas, and, therefore, is not specific to any one area. On the contrary, in relative terms, this area ranks fourth in the total hierarchy of research conducted until the end of the third survey. Hence it appears to have received the proportion of attention it deserves.

#### TRENDS RELATED TO STAGES OF EDUCATION

It is common knowledge that education is imparted to an individual through well-defined stages. These have been mentioned above. It is but natural that the first question to be addressed is the trends discernible at various stages of education. The data presented in Table 11.1 indicate the following trends:

\* A negligible percentage of studies were conducted at the Pre-school Stage, i.e., 1.3 per cent (T). The trend

which was evident during the period of the first survey continued through all the following surveys, 1.4 per cent (S1), 3.7 per cent (S2), 0.9 per cent (S3), 0.0 per cent (S4) and 1.3 (T). No doubt, this is the most neglected stage of education, in spite of the fact that it is the most important and sensitive stage of growth and development in the life of an individual. It is not an exaggeration to say that Pre-school Education or Early Childhood Education, relevant to the needs and aspirations of the Indian people, has yet to take root in the country.

\* The largest percentage of studies (35.0 per cent-T) were conducted at the Elementary Stage. The trend,

Table 11.1

#### SURVEY-WISE FREQUENCY DISTRIBUTION OF RESEARCH STUDIES WITH REGARD TO STAGES OF EDUCATION

Stage	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Total
Pre-School	1 1.4%	3 3.7%	1 .9%	-	5 1.3%
Elementary	30 43.0%	30 37.9%	41 37.9%	31(23)* 25.8%	132 35.0%
Secondary	17 24.2%	15 18.9%	30 27.7%	43(33)* 35.8%	105 27.8%
Higher Secondary	7 10.0%	4 5.0%	4 3.7%	17(11)* 14.1%	32 8.4%
Entire Stage	7 10.0%	12 15.1%	10 9.2%	6(12)* 5.0%	35 9.2%
Higher Education	2 2.8%	8 10.1%	16 14.8%	20 16.6%	46 12.2%
General	6 8.5%	5 6.3%	3 2.7%	3(8)* 2.5%	17 4.5%
Not stated	-	2 2.5%	3 2.7%	-	5 1.3%
Total	70(69)	79(71)	108(100)	120(107)	377(347)

\* Figures in brackets indicate exclusive number of studies.

which was evident in S1, persisted through S2 and S3. However, during the period of the fourth survey,

the largest percentage of studies were conducted at the Secondary Stage, i.e., 35.8 per cent (S4). This indicates that adequate attention has been paid to the Elementary Stage of education by researchers.

- \* The Secondary Stage was paid due attention through all the surveys, the successive percentages being as follows: 24.2 per cent (S1), 18.9 per cent (S2), 27.7 per cent (S3), 35.8 per cent (S4) and 27.8 per cent (T). It comprised the second-largest percentage of total studies. Further, during the period of the present survey, the largest percentage of studies were conducted at this stage, indicating thereby the importance given to curriculum development at this stage.
- \* So far as the Higher Secondary Stage is concerned, due attention was given during the period of the first survey. However, the percentage of studies declined during the period of S2 (5.0 per cent) and S3 (3.7 per cent), which increased to 14.1 per cent during the period of S4, thereby indicating that it received the attention which it deserved.
- \* It is heartening to note that the Entire Stage also received necessary attention through all surveys—10.0 per cent (S1), 15.1 per cent (S2), 9.2 per cent (S3), 5.0 per cent (S4) and 9.2 per cent (T), although there was a gradual decline during the periods of S3 and S4 respectively. Curriculum studies covering the entire school stage are important as they deal with problems and issues in a broader perspective. The percentage of studies, although again declining from survey to survey, indicates that general issue of curriculum have caught the researchers' attention.
- \* A few more observations are warranted under this aspect. In the same Overview, Buch and Govind have observed that the Lower Primary Stage and Collegiate Education have been grossly neglected. As shown above, and as can be seen in Table 11.1, the largest percentage of studies have been conducted at the Elementary Stage and the category of Higher Education ranked third, right after Secondary Education. As a matter of fact, the Higher Secondary Stage seems to have received less attention than Higher Education. Further analysis of the Elementary Stage shows that the Lower Primary (now the Primary) Stage comprised a substantial number of studies out of 132 (35 per cent) conducted at the Elementary Stage, suggesting thereby that it has not been neglected, let alone grossly neglected. It is rather heartening to note that although Elementary Education

itself has been terribly neglected, research in the area has not.

#### TRENDS RELATED TO AREAS OF LEARNING

Frequencies of studies conducted in different areas of learning are presented in Table 11.2. The rank order of areas of learning (subjects) showing the quantum of

Table 11.2

SURVEY-WISE FREQUENCY DISTRIBUTION OF RESEARCH STUDIES WITH REGARD TO AREAS OF LEARNING

Area	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Total
Language	39 56.5%	44 62.0%	8 8.0%	21 19.6%	112 32.3%
Mathematics	5 7.2%	2 2.8%	13 13.0%	15 14.0%	35 10.1%
Science	4 5.7%	6 8.4%	23 23.0%	22 20.5%	55 15.8%
Social Sciences	6 8.6%	4 5.6%	7 7.0%	10 9.3%	27 7.7%
Work Experience and Vocational/ Technical Education	2 2.8%	3 4.3%	13 13.0%	8 7.4%	26 7.4%
Health and Physical Education	2 2.9%	2 2.8%	8 8.0%	6 5.6%	18 5.1%
Population Education	-	1 1.4%	3 3.0%	9 8.4%	13 3.7%
All Areas	8 11.6%	4 5.6%	12 12.0%	6 5.6%	30 8.6%
General	2 2.9%	2 2.8%	5 5.0%	7 6.5%	16 4.6%
Miscellaneous	1 1.4%	3 4.2%	8 8.0%	3 2.8%	15 4.3%
Total	69	71	100	107	347

studies carried out so far is as follows (see Total line in Table 11.2): (1) Language, 112 (32.3 per cent); (2) Science/Environmental Studies/Home Science, 55 (15.8 per cent); (3) Mathematics, 35 (10.1 per cent); (4) Social Sciences 27 (7.7 per cent); 5. Work Experience, Vocational Education, Technical Education & Engineering, 26 (7.4%); 6. Physical Education, 18 (5.1 per cent); 7. All Areas, 29 (8.6 per cent); (8) General, 16 (4.6 per cent) and (9) Population/Sex Education, 13 (3.7 per cent). Studies numbering less than five carried out under other areas have been categorized as Miscellaneous. They are: Cocurricular (3), Audio-visual (1), Moral Education (2), Educational Television (1), Art/Music Education (2), National Integration (1), Agricultural Education (1), Creativity (1), Educational Psychology (1), Mental Disability (1) and Mass Education (1), totalling 15 (4.3 per cent). This rank order clearly shows how much attention each area has received from the researcher. From this, one generalization is inescapable, viz., non-cognitive areas of learning have been, by and large, neglected, although physical education has received some attention. However, a further probe of this area shows that some physical education studies were highly technical researches. e.g., on physiological changes while exercising, having little to do with it as an area of learning. The over-emphasis on the cognitive areas of learning seems to reflect the importance the system of education gives to various academic subjects.

It is necessary to probe the progressive trend from survey to survey with regard to each learning area.

#### *Language*

During the periods of S1 and S2, proportionately larger frequencies of studies are observed in this area, i.e., 56.5 per cent and 62.0 per cent respectively, indicating that it received much more attention than any other area. However, the percentage slumped to a disproportionately meagre eight during the period of S3, when the total number of studies increased from 71 (S2) to 100 (S3). While the percentage during the period of S4 rose to 19.6, it could not be matched with those observed during the first two surveys. A further probe of the areas in respect of stages of education shows that the rank order of number of studies was as follows: 1. Elementary, 2. Secondary, 3. Higher Secondary, and 4. Entire Stage. A majority of them were vocabulary or linguistic studies, some of which could hardly be classified as curriculum studies *per se*.

#### *Science*

Frequencies of studies observed through surveys in this area are as follows: 5.7 per cent (S1), 8.4 per cent (S2), 23.0 per cent (S3) and 20.5 per cent (S4). There was a gradual rise in the percentages of studies from survey to survey, although there was a slight decline, from 23.0 per cent to 20.5 per cent during the period of S4. Considering the fact that this area comprises many disciplines, the total frequency of 55 studies appears to be inadequate. Further examination in respect of stages of education indicates the following rank order: (1) Elementary, (2) Secondary, (3) Higher Secondary, and (4) Entire Stage, which suggests that the lion's share (27) of studies was claimed by the Elementary Stage. If the remaining 28 studies are divided into four major disciplines of science, one is constrained to remark that adequate attention was not paid to this area. In an era which is increasingly becoming the age of science and technology, it is in the fitness of things that special attention be paid to the problems and issues relating to all curricular aspects of science education.

#### *Mathematics*

Being a subject allied to science, the trend in this area was similar to that observed for science. The increase in Language studies during the period of S2 was accompanied by a decrease in the other important cognitive areas, viz., Mathematics, Science, All Areas and Social Sciences. All the same, being treated as a holistic subject, especially for the purpose of examination, unlike physics, chemistry and biology, it had received fairly adequate attention, i.e., 35 (10.1 per cent—T).

#### *All Areas*

This category has to be evolved to accommodate the studies which viewed curriculum as a totality, inclusive of all areas of learning. It is gratifying to note that the holistic concept—school curriculum, primary curriculum, secondary curriculum, etc.—attracted the attention of researchers. Survey-wise frequencies of studies are as follows: 8 (11.6 per cent)—S1; 4 (5.6 per cent)—S2; 12 (12.0 per cent)—S3; 6 (5.6 per cent)—S4 and 30 (8.6 per cent)—T. These data indicate that during the periods of S1 and S3, adequate attention was paid to this area but the same amount of attention was not paid during the periods of S2 and S4. Mention needs to be made that studies in this area are of vital importance,

for many issues are curriculum-specific and not area/subject-specific. As was pointed out earlier, the issues relating to the principles and/or processes/mechanics of curriculum development require equal, if not more, attention in order to improve the design of existing curriculum as well as to enhance the effectiveness and efficiency of the implementation of a newly-devised design of curriculum. The slump in such studies during the last survey suggests the need for sustaining the thrust observed during S3.

#### *Social Sciences*

Frequencies of studies reported in surveys for this area have been similar to those observed for Mathematics, Science and All Areas. But the total frequency of only 27 studies in terms of proportion to 10 areas of learning indicates that this area had not received sufficient attention. Since the effort of integrating various subjects, viz., history, geography, civics and economics, has not been successful, it also deserves some more attention, at least until the complex issue of teaching this area as an integrated one or otherwise is fully settled by curriculum developers.

#### *Work Experience, Vocational Education, Technical Education and Engineering Education*

The total frequency under this area is 26 (7.4 per cent), almost equal to the one observed for Social Sciences. It is heartening to note that a non-cognitive area, which has been made part and parcel of the curriculum and which has yet to be treated as at par with the cognitive subjects, received a fair amount of attention from researchers. Needless to mention, one of the most important issues in Indian education, which also has serious repercussions for all educational thought and practice, is related to the place of work in education from the pre-school stage of education. The caution against optimism needs to be voiced, for the increase in the studies observed from S1 to S3 was not sustained in the last survey (13.0 per cent in S3 and 7.4 per cent in S4). The momentum will have to be maintained, particularly in the wake of the far reaching recommendations regarding this subject made in the NPE-86.

#### *Population/Sex Education*

The following frequencies with regard to this area are observed during surveys: 00.0 (0.0 per cent)—S1;

1 (1.4 per cent)—S2; 3 (3.0 per cent)—S3; 9 (8.4 per cent)—S4 and 13 (3.7 per cent)—T. Population/Sex Education is the newest addition in the school curriculum in India and does not entail separate existence as a subject. Considering this, it seems to have made an impressive entry into this area. One would hope that, being identified as one of the core components in the NPE, it would not only find its place in the newly devised curriculum but also attract due attention as an area of research. The fact of the matter is that, from the viewpoint of national concerns, this ought to be construed as a priority area of curriculum development and research at all stages of education. All one can say is that a good beginning has been made, which should be sustained.

#### *General*

Sixteen studies, in which the subject was treated in a general manner, are placed under this category. Subjects as varied in nature as phonetic sounds in language, work values, attitudes, etc. Frequencies according to the surveys are as follows: 2 (2.9 per cent)—S1; 2 (2.8 per cent)—S2; 5 (5.0 per cent)—S3; 7 (6.5 per cent)—S4 and 16 (4.6 per cent)—T. As can be seen, there was a steady increase in such studies from survey to survey, indicating the need for expanding the vistas of investigation in this area. For example, sex-bias in textbook is a topic which may not fit in the schema followed here for analysis of studies, but deserves special attention from researchers, since it has now been spelled out as an important common core component to be included in all the curricula of the country. In other words, this indicates that the scope of studies should widen.

### TRENDS RELATED TO COMPONENTS OF CURRICULUM

Component-wise total frequencies of studies (347) are presented in the Total line in Table 11.3. The rank order of seven categories is as follows: (1) Learning Experiences (Teaching-Learning Strategies), 102 (29.3 per cent); (2) All Components, 80 (23.0 per cent); (3) Objectives, 76 (21.9 per cent); (4) Evaluation, 42 (12.1 per cent); (5) Textbooks, 26 (7.4 per cent); (6) General, 12 (3.4 per cent), and (7) Access (Educational Facilities), 9 (2.6 per cent). This rank order presents a very interesting pattern of research undertaken till now. Under "Framework for Trend Analysis", it was observed that the concept of curriculum must be viewed as a *totality* of

experiences provided to a learner for full development of the potential endowed to her/him by nature. The words 'experience' and 'totality' are of great significance. The data indicate that, intuitively, the researchers have concentrated on both components. Component Objectives, etc. rightly received as much attention as 'All Components'. Adequate attention was also devoted to "Evaluation" without ignoring the components of 'Textbooks and Educational Facilities'.

The status and progress of research in respect of each component from survey to survey are examined below.

Table 11.3

SURVEY-WISE FREQUENCY DISTRIBUTION OF RESEARCH STUDIES WITH REGARD TO COMPONENTS OF CURRICULUM

Component	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Total
Objectives and Syllabus	21 30.4%	24 33.8%	17 17.0%	14 13.0%	76 21.9%
Learning Experiences	13 18.8%	15 21.4%	36 36.0%	38 35.5%	102 29.3%
Textbooks	-	9 12.8%	9 9.0%	8 7.4%	26 7.4%
Evaluation	17 24.6%	11 15.7%	7 7.0%	7 6.5%	42 12.1%
Access	2 2.8%	-	3 3.0%	4 3.7%	9 2.6%
All Components	15 21.7%	11 15.7%	18 18.0%	36 33.6%	80 23.0%
General	1 1.4%	1 1.4%	10 10.0%	-	12 3.4%
Total	69	71	100	107	347

#### *Learning Experiences (Teaching-Learning Strategies)*

The distribution of frequencies of studies in respect of this component from survey to survey is as follows: 13 (18.8 per cent)—S<sub>1</sub>; 15 (21.4 per cent)—S<sub>2</sub>; 36 (36.0 per cent)—S<sub>3</sub>; 38 (35.5 per cent)—S<sub>4</sub> and 102 (29.3 per cent)—T. The data indicate that the importance of

transaction of curriculum or, put differently, providing appropriate and adequate learning experiences to learners, was recognized from the very beginning. The percentage of studies steadily increased from S<sub>1</sub> to S<sub>3</sub>. As was observed earlier, the period of S<sub>3</sub>, being the one for implementing the first National Curricular Framework, recorded a substantial increase along with the increase in the total number of studies. One would hope that the stagnation observed during the period of S<sub>4</sub> will not continue.

#### *All Components*

Survey-wise frequency distribution of studies conducted so far is as follows: 15 (21.7 per cent)—S<sub>1</sub>; 11 (15.7 per cent)—S<sub>2</sub>; 18 (18.0 per cent)—S<sub>3</sub>; 36 (33.6 per cent)—S<sub>4</sub> and 80 (23.0 per cent)—T. As has already been observed, it is encouraging to note the trend of conceiving the curriculum as a totality comprising all components. The data indicate that, from the initial survey, there was awareness of this issue, which has been revived greatly after a slight slump during the periods of S<sub>2</sub> and S<sub>4</sub>. In fact, during the period of S<sub>4</sub>, an almost equal number of studies were conducted in respect of this and the transaction component. Needless to emphasize, this healthy trend needs to be continued.

#### *Objectives and Syllabus (Learning Outcomes)*

Frequencies of studies carried out during the entire period are as follows: 21 (30.4 per cent)—S<sub>1</sub>; 24 (33.8 per cent)—S<sub>2</sub>; 17 (17.0 per cent)—S<sub>3</sub>; 14 (13.0 per cent)—S<sub>4</sub> and 76 (21.9 per cent)—T. It is quite clear from the data that research in the area, which received serious attention during the periods of S<sub>1</sub> and S<sub>2</sub>, showed a significant decline during the periods of S<sub>3</sub> and S<sub>4</sub>. The steep fall during the period of S<sub>3</sub>, which registered an increase of 29 studies and during which "Teaching-Learning Strategies" received special attention, is perplexing. The new Curricular Framework brought out during this period recommended substantial curricular changes which would help achieve the goal of national development, thereby becoming a powerful instrument for attaining desired changes in learners. Thus, considerable emphasis was laid on reformulating and redefining the educational objectives. And yet, the decline.

#### *Evaluation*

This area receives the fourth rank with a total of 42 (12.1 per cent) studies. This can be interpreted as an indication



that the area has received adequate overall attention. However, a further probe of frequencies during the period of the four surveys presents a different picture: 17 (24.6 per cent) —S1; 11 (15.7 per cent) —S2; 7 (7.0 per cent) —S3 and 7 (6.5 per cent) —S4. It had the second rank in S1, the third in S2 and the sixth in both S3 and S4. The inference, that the researcher has lost interest in this area, is unquestionable. If this was not the consequence of original categorization of studies, i.e., included only under Examinations, the situation should be considered alarming. The importance of other components diminishes if the evaluation component of the curriculum schema is weak. It is this component which provides the evidence in support of attainment of objectives and effectiveness of teaching-learning strategies. Development and assessment, being two sides of the same coin, must be fully balanced. This balance has been lost and needs to be restored.

### Textbooks

Before this area is examined, it is necessary to clarify that the separation of 'Textbook Evaluation' is not consistent with the conceptual/theoretical framework evolved at the initial stage. Just the same, the authors found it equally difficult to lump it either with Syllabi (Content) or Evaluation. In the Indian context, "Textbook Evaluation" has acquired a distinct identity. Hence it was retained as such. The previous surveys also had given a special status to it.

Frequencies of studies from survey to survey are as follows: 0 (0.0 per cent)—S1; 9 (12.8 per cent)—S2; 9 (9.0 per cent)—S3 and 8 (7.4 per cent)—S4. As it was a national-level decision to critically examine textbooks brought out by different states/UTs from the viewpoint of national integration during the period of S2 only, no study was reported in S1. It is also not surprising that the largest percentage of studies were carried out during the period of S2, the percentage thereafter declining over the period of the two subsequent surveys. While there is indeed a need for evaluation of textbooks, it is opined that such evaluations should form part of a total evaluation of a curriculum. Besides, it must be noted that many evaluations were not complete, since they touched content part, and that too from the national integration angle only.

### General

As in the areas of learning, it was difficult to fit a few studies which, though belonging to a specific area, did

not relate to any curriculum component. They were classified under this category. Except during the period of S3, their percentage was negligible, S4 recording none at all. It may be mentioned that this category was created to keep other categories by and large exclusive, so that interpretation of trends is reliable and valid.

## RESEARCH METHODOLOGY

There is no gainsaying that methodology, may it be of collection or analysis of data-measurement or evaluation, is the most crucial question in research. Thus, it is also most pertinent to find out what research methods were employed by researchers in conducting the studies. Frequencies of studies employing different methods

Table 11.4

SURVEY-WISE FREQUENCY DISTRIBUTION OF RESEARCH STUDIES WITH REGARD TO RESEARCH METHODS

Research Method	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Total
Survey	39 56.5%	36 50.7%	40 40.0%	46 42.9%	161 46.4%
Experimental	13 18.8%	14 19.7%	33 33.0%	30 28.0%	90 25.9%
Historical	1 1.4%	3 4.2%	4 4.0%	2 1.8%	10 2.9%
Combined	5 7.2%	3 4.2%	6 6.0%	10 9.3%	24 6.9%
Evaluation	11 15.9%	13 18.3%	12 12.0%	14 13.0%	50 14.4%
Developmental and/or Evaluation	-	2 2.8%	5 5.0%	3 2.8%	10 2.9%
Observation	-	-	-	2 1.8%	2 0.6%
Total	69	71	100	107	347

from survey to survey are presented in Table 11.4. The rank order for total frequencies in respect of various methods is as follows: (1) Survey, 161 (46.4 per cent); (2) Experimental, 90 (25.9 per cent); (3) Evaluation.

50 (14.4 per cent); (4) Historical, 10 (2.9 per cent); (5) Combined, 24 (6.9 per cent); (6) Developmental and/or Evaluation, 10 (D 5 + DE 5, 2.9 per cent) and (7) Observation, 2 (0.6 per cent). Before the categories are further examined, use of evaluation as a research method needs clarification. On two counts the authors faced some difficulty in classifying the methods: (1) Most studies employed more than one method in their investigations. Put differently, the tendency of the researcher has been to expand the scope of the study, which, in turn, called for the use of more than one method. (2) As pointed out earlier, evaluation of an aspect or more than one aspect of curriculum such as textbook, audio-visual aid, curriculum, project, etc. has been emerging as a methodology distinct from the usual research methods. It may follow quantitative techniques such as content analysis, check list, rating scale, etc. for arriving at qualitative judgements. These are not surveys, experiments, nor even pure statistical analyses. By and large, a team of judges engage in an activity of assessing the worth of a curricular aspect with reference to an *a priori* model/scheme of criteria. Hence, it has been designated as a separate research method here.

#### *Survey*

The frequency distribution related to this method from survey to survey is as follows: 39 (59.5 per cent)—S1; 36 (50.7 per cent)—S2; 40 (40.0 per cent)—S3 and 46 (42.9 per cent)—S4. Obviously, even in an area like curriculum, the survey method seems to be the most preferred, although the trend showed a consequent decline during the periods of S2 and S3, with a small upward trend in S4. While this method had a place in educational research and should be used as and when most appropriate, the data at hand indicate its over-use by researchers. It is pertinent to recall an observation made by Buch and Govind (see '—An Overview' in S3, pp.24, 'Methodological Shortcomings'): 'A major weakness of the educational research in India is its over-dependence on the use of questionnaires and test... 'A related point is that a great majority of studies are descriptive surveys'. 'Two points need highlighting: 1. The over-use of this method in the area of curriculum is a manifestation of its disproportionate use in the whole gamut of educational research, and 2. Therefore, the researcher is opting for an 'easy-way-out', a soft option for conducting research. It is not out of place to recall that Dave (see 'Extensive Research' under the trend report on 'Correlates of Achievement' in S1, p.321) lamented 'the pref-

erence of the researchers...for large samples, for a large number of variables, hypotheses, etc.' Although two different areas have been examined, the trend seems to be identical and all-pervasive, as commented upon in the same vein by Buch and Govind also. That not much has changed in this regard, survey after survey, does not augur well for educational research in the country.

#### *Experimental*

Frequencies of studies related to this method during the period of surveys, viz. 13 (18.8 per cent)—S1; 14 (19.7 per cent)—S2; 33 (33.0 per cent)—S3 and 30 (28.0 per cent)—S4, indicate that the use of this method substantially increased during the period of S2, but showed a downward trend in that of S4. One would hope that in the wake of the development of a new National Curricular Framework and a new package of instructional material, there will be a spurt of experimentation in this area.

#### *Evaluation*

The survey-wise frequency distribution of studies with reference to this method during the entire period is as follows: 11 (15.9 per cent)—S1; 13 (18.3 per cent)—S2; 12 (12.0 per cent)—S3 and 14 (13.0 per cent)—S4. Although slight ups and downs were observed from survey to survey, the method has been in constant use by researchers. One would hope for both its appropriate and adequate use.

#### *Combined*

Repeatedly, the authors have been emphasizing the need for a holistic approach to researching problems in this area. The nature and scope of curriculum call for an innovative approach which is total, integrated, interrelated and interdisciplinary. One sees some evidence in this direction in the following frequency distribution of studies using such a strategy of investigation, however imperfect it may be: 5 (7.2 per cent)—S1; 3 (4.2 per cent)—S2; 6 (6.0 per cent)—S3 and 10 (9.3 per cent)—S4. It may be noted that a study was assigned this category only when it used more than two or three different methods for studying a problem.

#### *Historical*

The survey-wise distribution in relation to this method

is as follows: 1 (1.4 per cent)—S1; 3 (4.2 per cent)—S2; 4 (4.0 per cent)—S3 and 2 (1.8 per cent)—S4. This indicates that the researcher is gradually abandoning the use of a very useful and sensitive technique of investigation. One would wish that a judicious balance among various research methods is maintained.

#### *Developmental and/or Evaluation*

Frequencies of studies using this method from survey to survey are as follows: 0 (0.0 per cent)—S1; 2 (2.8 per cent)—S2; 5 (5.0 per cent)—S3 and 3 (2.8 per cent)—S4. It is obvious from this data that the use of this method, or maybe labelling a research as such, has just started. Suffice it to say that a clearer definition and subsequent categorization would be necessary. For example, developing and trying out a test has not been included under this category. It has been taken as curriculum-specific. It is conceded that no very sharp demarcation has been made in this analysis and hence the probability of error.

#### *Observation*

The observation method is considered as very useful in investigating a phenomenon by both natural and social scientists. It is regretted that the educational researcher has not fully exploited this technique as it has been by sociologists, anthropologists and other social scientists. A major breakthrough was observed when a number of studies were taken up to analyse the patterns of teacher behaviour with the help of 'interaction analysis' observation schedules. Maybe these studies have not been included under this category and hence no frequencies have been recorded in S1, S2 and S3. The two studies included under this area of research could not be put under any category other than this. It is felt that the potential of this method needs to be exploited. Some unusual and unorthodox questions will have to be raised. For example, can one use the participant observation technique in finding out how a school plans implementation of a prescribed curriculum? Can someone investigate how a voluntary agency ushers in the educational development of a selected community within the prescribed curriculum? A number of possibilities come to the fore, if one breaks out from the ruts that educational research has fallen into. A word of caution needs to be voiced, lest one misinterprets the authors' intention. Whatever may be the method employed, there is no substitute for obtaining evidence which is valid, reliable and can be objectively verified.

## TRENDS IN THE FOURTH SURVEY

Efforts were made to scan a wide canvas of curriculum research, moving through a long span of time. It helped identify general or overall research trends in respect of different aspects of curriculum spelled out at the initial stage. Since this survey is meant to specifically examine the studies conducted from 1982–88, it is imperative to identify emerging trends during this particular period. The presentation and discussion will be organized in the following way: Starting with a stage of education, an attempt will be made to ascertain what the major findings are in respect of the areas of learning and, subsequently, with regard to the components of curriculum investigated under each of them.

### *Elementary Stage*

A total of 23 studies were conducted at the elementary stage. They were related to different areas of learning in the following order of rank: Eight in Language, five in Mathematics, five in Environmental Studies I and II, two in Work Experience, one in All Areas and one in General.

#### *Language*

Brahma (1984) investigated the educational implications of children's literature. The study, while throwing light on factors such as children's interests, liking for various forms of literature, need for help in selection, preference for authors, colour, etc., reported revealing findings that, on an average, 0.70 book per child was available in the school library and only 29 paise per child were spent on the purchase of books per year. The number of books issued per child was also very discouraging. A comparative study of post-independence children's literature in Hindi and Marathi (Sadhle, 1987) indicated that a tremendous change was noticed in the case of Hindi literature immediately after a few years of independence. Marathi literature received such incentives only after 1960. Improvement was evident in all aspects of writing and production of books and magazines for children in both the languages. The study by Brahmabhatt (1983) showed that students who studied specially prepared material in English performed better than those who were not. Similarly, specially prepared modular reading material was found to significantly improve the cumulative performance and reading competence of the girl dropouts from Delhi slums (Khanna?

1983). The study of the relationship between comprehensibility of the science textbook and science achievement by Mukhopadhyay (1983) strongly suggested that comprehensibility of language used in a science textbook was significantly related to pupil achievement in science, an evidence of considerable curricular relevance, particularly for the authors of science textbooks. Nature and incidence of reading disability was investigated by Rao (1986). About 20 per cent of reading disability was found in primary schools. Rural children lacked in reading skills compared to their urban counterparts. However, it is encouraging to note that low reading achievement was found not to be evidence of low reading potential and reading deficiency in several cases could be improved by remedial teaching and constant practice. S. Kanthakumari's (1987) survey-cum-experimental study on reading skills also corroborated some of the findings just discussed, viz. reading ability of urban children in English was better than their counterparts, and the intervention strategy helped improve the reading ability of the students of both the high and low groups, the increase in the low group being higher than in the high group (1987). Dave, *et al.* (1988) reported the findings of attainment of pupils in language, mathematics and environmental studies I and II as a result of a massive national evaluation study of project and non-project schools involving 23 states/UTs which participated in Project Primary Education Curriculum Renewal. The language attainment of pupils in Class I was found to be excellent (combined mean = 63.75 per cent), good in Class II (combined mean = 55.22 per cent), minimum in Classes III and IV (combined means = 41.27 per cent) and 34.69 per cent respectively). It further demonstrated that children in project-schools in Classes II, III and IV who were exposed to a new curriculum package performed better than those who were not in non-project schools, thereby confirming other findings of the positive impact of innovative/experimental intervention programmes reported above.

As far as language education is concerned, the foundation is laid at the pre-school and primary stage of education. Needless to mention, although the number of studies is the highest in this area, yet they are insufficient. Except those on reading skills, no study has been conducted in respect of other language skills such as listening, oral and writing skills. It is rather disturbing that, with so many regional languages, no evidence is available about how the young child masters his mother-tongue or how the bilingual child, specially the

disadvantaged tribal or the minority-language child, acquires proficiency in the mother-tongue and the regional language, and what the average attainment of children at the elementary stage is in respect of various basic language skills in the regional languages. (An exception is the recent national NCERT study on pupil achievement, Dave *et al.* 1988). While one can understand the easy-way-out attitude of Ph.D. students, it is hard to understand why independent researchers also should have neglected the field. The neglect is more reproachable when research facilities in so many training institutions and research organizations (including special language institutes) along with universities are available in the country.

#### *Mathematics*

The use of a mathematics textbook (Class II) was studied by Krishna Kumari *et al.* (1980). It was reported that only 15 per cent of teachers studied the textbook thoroughly and tried to assimilate the new concepts and methods suggested therein. The SCERT, AP (1981) reported that the mathematics and physics textbooks not only comprised modern concepts and were in conformity with the principles of syllabus construction but also catered to the needs and interests of pupils. Paulchoudhury's (1983) investigation of courses of studies revealed that there existed a wide gap between the NCERT mathematics syllabus prescribed for Central Schools and those prescribed by the north-eastern states. The factor analysis on the tests of number system in mathematics carried out by Mondkar (1984) showed that the ability to learn number systems was chiefly composed of three factors, viz., general intelligence, number factor and perceptual factor. Dave *et al.* (1988) reported that the national attainment of pupils in mathematics was excellent in Classes I and II (combined means 61.25 per cent and 67.08 per cent respectively), good in Class III (combined mean = 50.80 per cent) and poor in Class IV (combined mean = 32.31 per cent). Again, curriculum renewal efforts helped the project schoolchildren to achieve higher mean scores in all classes than those in non-project schools.

#### *Environmental Studies (EVS) I (Science) and II (Social Sciences)*

The SCERT, AP (1980) found that, according to the teachers and headmasters, the new science curriculum was relevant to the environment of children, whereas

the parents and children felt that it increased the cognitive load. The multi-media instructional strategy for teaching science developed by Vardhini (1983) was found effective in increasing the level of performance on the total test as well as on the test of scientific attitude. A study on the environmental education programme in the primary schools of Bangladesh (Eshan, 1985) disclosed that, in the experts' opinion, the objectives of the programme should be specific, stated in behavioural terms and should lay stress on cognitive, psychomotor and affective development of children. Further, it was opined that the content topics of the modified programme was up-to-date and suitable to the learners' needs, interests, abilities and experiences. A critical study of science teaching programmes in the middle schools was conducted by Desai Shantidevi (1986). One of the findings was that teachers were not specialized in teaching science subjects. Lambhate (1987) reported that the instructional material for science teachers helped them perform better than those in the control group on selection and organization of content, use of scientific terminology, teaching aids and experimentation, and maintaining classroom discipline by sustaining the attention of pupils. Dave *et. al.* (1988) reported that pupil achievement in EVS was excellent in Classes I and II (combined means 73.23 per cent and 68.22 per cent respectively); in EVS I, minimum in Classes III and IV (combined means 48.94 per cent and 34.28 per cent respectively); in EVS II, minimum in Class III (combined mean = 47.90 per cent) and poor in Class IV (combined mean = 31.94). As in the case of language and mathematics, project-school pupils attained significantly greater means than their counterparts in non-project schools in all classes. Thus studies in science also demonstrate the effectiveness of the intervention of materials and methods in improving teaching and performance of pupils.

#### *Work Experience*

Problems associated with the implementation of the socially useful productive work (SUPW) programme were investigated by Sindhe (1985). The problems involved in the planning and preparation were centred on motivation, selection and organization. The large number of students in the classroom, lack of ability of teachers to integrate the other subjects with SUPW, the tendency to equate it with child labour, apathy of the community and non-availability of funds were the main problems hindering its proper implementation.

#### *All Areas/Other Areas*

Dave (1980) studied the dimensions of Basic Education. The major finding confirmed the general notion that the system of Basic Education had failed to satisfy the needs of the present age. The most interesting finding was that students, heads of schools and teacher-educators more harshly condemned the system than basic teachers, social workers, leaders and government administrators. The SIERT, Rajasthan (1982) conducted a case study of the implementation of Project Primary Education Curriculum Renewal. Since the project was introduced as a total curriculum package, it had a salutary effect on all aspects of primary education, viz., provision of physical facilities to match attainment of children, including the change in attitude of teachers, parents and the community at large.

When the research at this stage is viewed in the total curricular perspective, one cannot help observing that, while cognitive areas of learning have been paid some attention, the non-cognitive areas have been totally ignored, for no studies were conducted in art education and physical & health education, only a lone study was reported on SUPW. While research on transaction is important, there is a dire need to diversify efforts on many other aspects of curriculum. One needs to recognize the merits of investigating curriculum in a holistic way. Much more needs to be done in the same direction. In general, one would like to see a greater thrust and quantum of research at the primary stage. There is also a need for doing in-depth investigation within each area of learning as was observed under language. For example, learning of numbers, fractions, solving puzzles and the like should be seriously investigated to understand the styles of learning of the Indian child. Non-cognitive areas are most challenging from this point of view, since they are virgin fields of research.

#### **Secondary Stage**

In aggregate 33 studies were carried out exclusively under this stage, covering various areas of learning in the following descending order: Seven in Social Sciences, six each in Mathematics, Science and Population Education, three in Language, two in Work Experience and one each in Physical Education, Moral Education and All Areas.

### *Language*

Only three research studies were conducted on language, one each in English, Hindi and Urdu, touching different components of curriculum. Khare (1986) reported that students' achievement was better under a structural approach than that under the traditional method in respect of spelling, comprehension, composition, applied grammar and vocabulary. A critical study of development of Urdu curriculum in secondary education in Maharashtra done by Kazi (1986) demonstrated that the Urdu curriculum was able to fulfil the aims of secondary education and was of practical utility for the students in particular and society in general. Andharia (1987) explored the poetry preferences of students which showed that intelligence and creativity of students affected the preference but not sex.

### *Mathematics*

Vyas (1983) demonstrated that students who were taught with the help of the Symbol Logic Picture Programme showed better achievement in mathematics than the control group students. Yadav (1984) reported that the mastery training strategy did not yield the desired gains in the experimental group. Although Bhalwankar (1985) experimented on the expository and guided discovery methods of teaching mathematics, he drew implications from his findings that all teaching methods are effective in certain situations and not so effective in other situations, as objectives and content determine the methods to be employed. Rao (1986) also confirmed that no significant difference in mathematics achievement was evident when students were taught by the guided discovery and expository methods. This implication about the methods was ratified by Chitkara (1985) who found lecture-discussion, induction-drill and auto-instruction group discussion methods to be equally effective in terms of achievement in mathematics, regardless of levels of intelligence, sex and personality type, a very useful finding indeed. Even when Girdhari Lal (1986) found evidence to show that individualized instruction was more effective than the other two, programmed instruction was found less effective than even traditional instruction, thereby supporting the general trend of a sort of irrelevance of methods in teaching of mathematics. One is tempted to observe that some very selective methods of teaching may be effective in increasing achievement in mathematics. One cannot help feeling that attempts at investigating the ef-

fectiveness of general methods for teaching special subjects may not yield fruitful data. It is surmised that, as recommended in the document 'Teacher Education Curriculum—A Framework' (1978), research should concentrate on identifying subject-specific special methods. It stands to reason that, when the quantum and depth of subject matter (discipline) increase, different kinds of learning processes need to be aroused by the teacher.

### *Science*

A self-instructional package on health education was tried out by Rabindradas (1984) in three different learning situations, viz., self-learning in the absence of a teacher, under a teacher's supervision and instruction imparted by the teacher, and the regular one. Both self-learning techniques were found to be more effective than regular teaching. Agnihotri (1987) reported that the method of teaching physics systematically was found to be more effective than four other methods, namely, lecture-cum-demonstration, laboratory, programmed instruction and assignment-cum-discussion. Arun Kumar (1985) found that reorganization of a prescribed chemistry curriculum frame and its execution through a dynamic model of instruction positively affected the 'combinatorial reasoning' and 'controlling of variables' of students when compared to those who were not exposed to such an exercise. Having made a comparative study of the summative evaluation of the science curriculum of the Board of Secondary Education, Rajasthan, and the CBSE, Goyal (1982) drew the implication that the science curriculum needs to be structured as per historical, social and cultural influence on the society. The demands made by the rapid technological developments in the society need to be incorporated in the science curricula of both the boards. A comprehensive survey of the science education programme in Bangladesh was conducted by Md Anowarul Aziz (1984). In a similar survey of science education in Nepal, Bajracharya (1986) observed that the curricular objectives were neither systematically drawn, nor sufficient. Further, the content was theory-oriented and, thus, was far removed from the pupils' daily life.

### *Social Sciences*

Bhattacharya (1984) studied the effectiveness of the teaching of geography through the Concept Attainment Model, Inductive Model and traditional teaching meth-

od in relation to institutional resources. While students taught with the help of the Concept Attainment Model and traditional method did not differ significantly in high-resource-status educational institutions, they did in average- and low-resource-status educational institutions. Further, students taught through the inductive Teaching Model were found to obtain higher achievement scores in geography than those taught by the other two methods. Patil (1985) investigated the position and problems of teaching geography in the rural secondary schools of Sholapur District. One of the interesting findings was that while physical and educational facilities were inadequate for effective instruction in the subject, the percentage of students passing geography was very high, i.e., 74 per cent. The position of teaching history was investigated by Ingole (1985) in the same district. It was revealed that nearly 40 per cent of the teachers had not offered history as a special subject at the graduate level, and yet the pass percentage of students was found to be very high. The results of a similar survey in respect of geography indicated that the status of teaching geography in Gujarat was not satisfactory. The post-independence history curriculum in Tamil Nadu was studied by Muthappan in 1986. The findings indicated an overall unsatisfactory status of the curriculum studied. Dasgupta, Dipti (1987) reported no significant difference in the achievement and attitude of students who were taught with the help of a Personalized System of Instruction and a Conventional Lesson Plan, although the former group retained significantly more than the latter group.

#### *Population Education*

It is but natural that the researcher focused their attention on attitudinal changes of pupils in this area. Sattarshakwala (1981) tried out a strategy to bring about attitudinal changes in pupils. The results indicated that the group exposed to a special learning package showed significant positive attitude towards population education. Bhandarkar (1983), while reinforcing the finding relating to attitudes, reported that students in general possessed poor knowledge of population education and males and females differed significantly in both knowledge and in attitudes towards the subject. Mishra (1985) demonstrated that the materials developed by the SCERT, Orissa, increased the total awareness of students regarding population problems. Mohanty (1986) found that the concept of population education was not clear to many teachers and pupils. A

large majority of teachers (69 per cent) and pupils (73 per cent) were negative in their responses to enquiries about the adequacy of their knowledge of the subject. Nanavati (1981) reported the effectiveness of a multimedia package in teaching the content of population education. The teaching of population education, in addition to general education, was found to affect attitudinal changes towards family planning in pupils (Kumar, 1984).

#### *Work Experience*

Two surveys, one each in Rajasthan (Vijavargiya, 1969) and Assam (Mishra, 1985) were conducted to determine the status of the subject in these states.

#### *Physical Education*

Desai (1986), with the help of an attitude scale, showed that sex was not related to attitude towards physical education, but the provision of facilities such as playground, equipment, gymnasium, etc. in the school exerted a significant influence on the attitude of pupils.

#### *Moral Education*

A hypothesis that the brain-storming technique is superior to the traditional method in providing value-oriented education was supported by the findings of the study conducted by Dilima and Puri (1985).

#### *All Areas*

Gupta (1984) found that different dimensions of behaviour were related to teaching of different subjects, which corroborated a generalization drawn while discussing the results under research in mathematics teaching.

#### **Higher Secondary Stage**

All in all, 11 studies were conducted solely under this stage, covering the areas of learning in the following descending order: Four in Science, two each in Language and Physical Education, and one each in Physical Education, All Areas and General. While in relative terms, this stage has attracted fair attention from researchers, the distribution of studies indicates that the Vocational Stream did not receive the attention that it should have. Needless to mention, during the time when the 10+2

pattern of education was being established, a lot of attention should have been paid to problems of vocationalization. A lone study was carried out in this area, and that too, by a visiting student scholar from Bangladesh. One would indeed wish that the new policy on education would serve as an impetus to research in this area. Like universalization of elementary education, this is also a priority area in the context of the socio-economic imperatives of the country.

#### *Language*

The reading ability of pupils in English was the subject of critical study by two investigators, Bhatt (1986) and Vimaladevi (1986). According to the former, the readability of the textbook for Class XII was more than that for Class XI. The implication of the study by the latter was that the important critical reading skills such as identifying, organizing, relating, predicting, reasoning, judging, questioning and applying could be developed through probing questions by teachers.

#### *Science*

Ramesh (1984) reported that both the objective-based curriculum and conventional curriculum in chemistry were equally effective so far as achievement in science was concerned. However, with regard to acquisition of process skill, the objective-based curriculum was found to be more effective than the conventional one. Gangoli, *et. al.* (1985) found that the guided open-ended approach was superior to the traditional laboratory approach in developing the content matter and practical skills in physics. Khalwania (1986) established that the concept-based curriculum was more effective than the conventional curriculum in the acquisition of process skills and cognitive structures. Singh (1986) studied the teaching strategies utilized by the teachers for competitive examinations, including the IIT competitive examinations

#### *Physical Education*

Verma, Urmila (1984) surveyed the state of affairs with regard to physical education in MP. Brar (1985) measured the comparative effects of training and interval training on selected physiological measurements and running performance of females. Circuit training and interval training were effective in improving running performance.

#### *All Areas*

Basu's analysis of syllabi of different boards of education revealed that they emphasized almost all elements of national integration (1983). Regardless of sex, teachers showed positive attitudes to promotion of national integration.

#### *General*

Kaldate, Sudha (1985) did a detailed study of the provision, administration and effective utilization of facilities such as textbooks, libraries, accommodation, meals and health services available to Scheduled Caste students in Aurangabad district.

#### *Vocational Education*

A survey of commercial education in Bangladesh was carried out by Miyan (1986).

#### *Entire Stage*

It may be recalled that it was difficult to classify certain studies under a particular stage, for they either covered all stages or selected subjects from classes cutting across the stages. This type of studies have been collected under this area. Out of 12 studies, six belonged to the area of Language, two each to Science and Social Sciences, and one each to Mathematics and Vocational Education.

#### *Language*

Vyas (1969) studied the reading habits of pupils of Classes IX, X and XI in Rajasthan. As expected, the results confirmed other findings as well as the general opinion that the reading habit among pupils was poor and teachers did not help cultivate it in pupils. Koul (1981) made a critical study of the fundamental curricular issues relevant to the teaching of English in India leading to an Alternative Integrated English Language Teaching/Learning Curriculum (ELT/L), collecting data from the States of Rajasthan, Andhra Pradesh and Kashmir. Sharma (1982) made a comparison of individual and group correction of written work in English in Classes VII to X. No significant difference was found between the mean performance of students. The problems of teaching English in Bihar were studied by Sharma (1986), who concluded that, during the past



three decades, there had been a gradual lowering of standards of English due to various reasons like socio-political problems of teaching English. Tharwani (1982) critically examined the prescribed textbooks in Hindi lower-level from Classes V to X in Maharashtra. He found the books defective on many counts. A critical evaluation of the nationalized English textbooks for Classes VI to X in Haryana was conducted by Singh (1984). He also reported that the textbooks suffered from a number of drawbacks.

#### *Mathematics*

Rao (1983) studied the effect of programmed and conventional learning methods in imparting instruction in mathematics to pupils from two extreme Classes, i.e., V and X. Programmed instruction was found to be superior to conventional instruction.

#### *Science*

A comparative study of the science curricula of Kerala and Tamil Nadu (Krishnan, 1981) revealed that both were moderately satisfactory with respect to all dimensions except the methodological-instructional ones. A critical study of science education of Assam and Meghalaya indicated many defects (Bhattacharya, 1979).

#### *Social Sciences*

Two studies—one each in geography and history—were conducted by Ponkshe (1983) and Patel (1984). The former study indicated that the state of affairs in teaching history in Gujarat was as unsatisfactory as has been reported for some other states. The latter study concluded that the geography syllabi for Classes VII, VIII and IX of Maharashtra were not concept-oriented. Inadequacy was also observed regarding many other aspects of the syllabi.

#### *Vocational Education*

Problems related to vocationalization of education in the north-eastern region were examined along with the curricula at the primary and middle stages (Deshamukhya, 1984). It was suggested that the peculiar problems of the region should be kept in view while implementing vocational education.

#### *General*

Altogether eight studies were clubbed together under this category. Area-wise distribution was as follows: Two each were related to Language and Physical Education, and one each to Mathematics, Science Education, Sex Education and Textbook Production.

Keskar's (1984) survey of the implications of the three-language formula revealed that the Hindi-speaking states of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh neglected the study of a modern Indian language, whereas, except in Maharashtra and Gujarat, all other states neglected the study of Hindi (1984). Parmar examined the educational references in Gujarati social novels published during the pre-independence decade. Giri (1977) made a comparative analysis of the principles of curriculum development projects in mathematics. It was found that there existed well-formulated curriculum development and appraisal principles in the developed and developing countries, although their aims differed significantly. The development of school science education in India from 1947 to 1977 was studied by Sharma (1984). It is interesting to find that some controversial issues such as general science versus separate subjects, etc. are still plaguing science education policy. The trends in physical education and sports in India since 1947 were examined by Kanwal (1985). The effect of training and recovery technique on the cardiovascular variables during rest and exercise was investigated by Mall (1982). Desai (1985) surveyed the programmes of sex education in different schools of Gujarat. The results strongly indicated that formal or non-formal sex education was effective in changing the opinions, adjustment and knowledge of pupils. The textbook production set-up and programmes in India were studied by Mehta (1983). It was reported that some or all school textbooks up to primary and secondary stages were nationalized. Twelve states had established autonomous bodies for production of textbooks.

Before the discussion on research on school education is closed, it is necessary to reflect upon the extent to which the general principles of curriculum development have been met. While there remains much to be desired, a definite movement has started to ascertain whether curriculum is becoming flexible, relevant, functional and productive or not. The spurt in the studies covering the entire stage and on broad curriculum issues indicates

the concern for understanding curriculum as a global concept. Similarly, efforts at finding out the effectiveness of a large number of analytical approaches/methods/techniques in transacting curriculum are indicative of the prime place given to the component of 'learning experience' in developing and evaluating different curriculum schema and models. It appears that the psychological paradigm, which has dominated research in education all these years, is being expanded into a more comprehensive socio-cultural one.

### Higher Education

The total number of studies conducted under this stage were 20. The following descending order in respect of several learning areas was observed: Four belonged to Work Experience, four to Science, three to General, two each to Language and Population Education, and one each to Mathematics, All Areas, Mass Communication, Arts and Educational Psychology.

#### *Language*

Saraswathi (1982) explored the nature of communicative competence in relation to learning a language for specific purposes, i.e., designing an English course for official purposes for the undergraduate in Tamil Nadu. Kudesia (1987) conducted a study on teaching of technical English to first-year students of a polytechnic. The discussion method was found to be more effective than the lecture method.

#### *Mathematics*

Aram (1986) made a comparative study of mathematics education in the People's Democratic Republic of Yemen and India, which revealed more contrasts than similarities.

#### *Science*

Verma, Amita *et al.* (1983) studied the relevance of child development curriculum to job competencies expected in the field using the alumni of the department of M.S. University. Miyan (1983) developed and evaluated a programme of curricular content and methodology in the areas of science and agricultural science for Teachers' Training Colleges of Bangladesh. Brachadeeswaran (1986) analysed the effectiveness of chemistry curriculum of the polytechnics. It was found

that 57 per cent of the objectives were mastered by students. Achievement of higher-order abilities was far from satisfactory. Further, it was found that knowledge objectives were emphasized at the expense of comprehension and application objectives. Out of 30 variables, only seven principal factors explained 63.98 per cent variance. Singh (1985) attempted to find out as to what extent development of undergraduate courses in science was influenced by the recommendations in policies, expert opinion of educationists, UGC policy frame, etc. It was reported that all general objectives were considered to be relevant, but none realized, thereby indicating a wide gap between the intentions and implementation of the policy.

#### *Work Experience*

Bhat (1984) attempted to identify competencies in mathematics relevant to a core curriculum in technician mathematics. The net outcome was a document consisting of 20 mathematical competencies found relevant to a core curriculum. Deshpande (1985) enquired into the relevance of the courses in the Marathwada University to the needs of the region and locality. It was the general feeling that the job-oriented courses were introduced in the University without adequate preparation. Wakade (1985) assessed the nature of law courses as well as the facilities available in the colleges of Marathwada. The state of affairs was found to be rather unsatisfactory as so many surveys about other stages and areas have reported. Utilization of time in different activities by the faculty of the government polytechnics in Goa was studied by Kudesia (1986). It was revealed that the maximum time was devoted to classroom teaching and the least time to extra-curricular activities. No time was devoted to supporting services or professional growth.

#### *All Areas*

Prasada Rao (1984) found that teacher's preparation, securing student's attention, explanation of subject matter clearly and detailed description of subject matter made a lecture effective in teaching arts, commerce and science students. In another study, Patted (1984) dissected further the lecture pattern of college teaching and found that out of one hour's duration, 56 minutes and 10 seconds were used in information processing, 30 seconds in soliciting, 25 seconds in responding to students' queries, nine in reacting to students' answers/

ideas, 51 seconds to directing students, one minute and eleven seconds in pausing and 51 seconds for giving scope to student participation—a terrible one-way communication system.

#### *General*

A critical study of the organization and utilization of libraries in higher educational institutions in Kerala by Bavakutty (1984) revealed a very unsatisfactory state of affairs. Joshi and others (1984) studied classroom climate in the faculties of science, arts and home science colleges of Indian universities. In general, it was found that there existed sufficient democratic climate in the classrooms in the colleges and faculties under study. Most of the students had cohesive feelings, a master image of their teachers and a sense of achievement, a very different picture indeed from the one generally imagined.

#### *Population Education*

Jain (1986) made a comparative study of perceptions, knowledge, awareness and attitudes of youths of the Panjab and Himachal Pradesh universities towards population and sex education. The study indicated the need for guidance and counselling services made available to students. The SCERT, Maharashtra (1986) evaluated the implementation of teaching-learning of population education as a part of the National Population Education Project. The project appears to have achieved most of its objectives.

A study on participants' evaluation of selected post-graduate correspondence courses in arts revealed that achievement was associated with the evaluation of radio broadcasts and instruction (Gomathi, 1982).

An evaluation of the system of mass communication education in Indian universities by Thottam (1983) showed that no infrastructure for it existed, although these institutions appeared to be the best training grounds for this purpose.

Bhat's study (1982) demonstrated that a combination of programmed learning material (PLM) and simulation led to significantly superior performance by teacher trainees in educational psychology as compared to those who underwent either PLM or the structured lecture alone.

As this review of research conducted during the period of the Fourth Survey comes to an end, it is possible to make some generalizations. The Indian researcher has found the area of curriculum worth investigating. Perhaps, in absolute terms, the quantum of studies is still not adequate, its relative position nonetheless should be considered satisfactory. Doubtless, there is a dire need to increase the overall output of quality research in education in India. However, this field is so vast and of such great consequence to the nation that extra attention is required to boost the research output.

From the point of view of principles and processes of curriculum development and evaluation, the direction in which the research is moving appears to be healthy and sound. There have been conscious efforts not only to treat the subject in a holistic manner but also to examine it in the socio-cultural, economical and political contexts. Thus there has been a gradual blending of the macro and micro-level considerations in selection of problems, planning the investigation, developing the strategies of collection and analysis of data, and derivation of conclusions and implications. One would hope that the next survey will see both a quantum jump and an accent on quality in research in this area.

## ABSTRACTS : 647—692

647. ANDHARIA, R.R., *A Study of Poetry Preferences in Hindi of the High School Students in relation to Sex, Intelligence and Creativity*, Ph.D. Edu., SPU, 1987

The objectives of the study were (i) to develop a Hindi Poetry Preference Scale (HPPS) to measure the poetry preferences of students of standard X, (ii) to study the differences in the characteristics and content of the poems, (iii) to ascertain the trends of poetry preferences for the poems of different groups of students of Std. X, (iv) to explore rank orders for the preferences of the poems in HPPS, (v) to find out the most and least preferred characteristics of the most and least preferred poems, (vi) to study the effect of sex, I.Q. and creativity upon the preferences of the characteristics of the poems in HPPS, (vii) to study the main and interactive effects of sex, intelligence and creativity upon poetry preferences of students of Std. X, and (viii) to assess the differences in the magnitude of the intercorrelation among the replications of the sets of the poems.

The Hindi Poetry Preference Scale (HPPS) was constructed by adopting the scale discrimination technique. The judgements of judges and responses of the subjects were both used in developing the preference scale. The reliability of the scale was established by test-retest method and it was found to be 0.89 for one set of poems while for another set of poems it was found to be 0.83. Other tools that were used were (i) Desai-Bhatt Group Intelligence Test and (ii) Creative Expression test by J.G. Dave. The  $2 \times 2 \times 2$  factorial design was used for the study.

The major findings were: 1. Sex of the students did not affect Hindi poetry preferences. 2. Intelligence and creativity of the students affected the preferences for the poem on social problems. But so far as the preferences for the poems on human relationships were concerned, the I.Q. of the students had some effect on this and for the poems on upliftment of life, the creativity of the students affected their preferences. 3. There were no differences in magnitude of three intercorrelations among the three replications of the three sets of the poems. The poems chosen in each set reflected various characteristics equally. 4. The different groups showed different preferences with respect to different poems. 5. There were no particular rank orders of the preferences for the six poems. 6. The content of the poems affected

the preferences more significantly than any other characteristics. 7. The contents of the poems were responsible for the preferences of the least preferred poems. 8. There were no interactive effects of sex and creativity upon the preferences for the poems on social problems, nationalism, love, human relationships and nature, but there was interactive effect of sex and creativity upon the preferences for the poems on upliftment of life. 9. There were no interactive effects of sex and intelligence upon the preferences for the poems on love, upliftment of life and human relationships. But there were interactive effects of sex and intelligence upon the preferences for the poems on social problems, nationalism and nature. 10. There were no interactive effects of sex, intelligence and creativity on preferences for the poems on social problems, love, nature, upliftment of life and human relationships but there were for the poems on nationalism.

The major implication was: In order to satisfy the various levels of intelligence and creativity of secondary school boys and girls, the poems should be selected on the basis of the content. The content should have a wide range of area. The editor of the textbook should consider content as a much more important characteristic than any other characteristic at the time of poetry selection for the students.

648. ARUN KUMAR, P., *A Study of the Effect of Reorganizing the Prescribed Curricular Framework on the Combinatorial Reasoning and Controlling of Variables on Grade IX Students*, Ph.D. Edu., MSU, 1985

The major objectives of the study were (i) to assess the level of reasoning of students of grade IX with regard to combinatorial reasoning and controlling of variables, (ii) to analyse the chemistry portion of the curriculum of grade IX with a view to reorganizing it to suit the level of reasoning of students, (iii) to study the effect of reorganizing the curriculum frame on combinatorial reasoning and controlling of variables in comparison to the existing curriculum frame, (iv) to study the effect of pre-assessment on the development of the above reasoning patterns, and (v) to study the interaction between the treatment and the pre-assessment.

The problem was examined through a Solomon Four Group Design where four clusters were taken from class IX of an English medium school of Baroda City which did not have any specific criterion for the allotment of

students into each section. The total sample size was 204 with groups of 50, 52, 52 and 50. Two of these groups belonged to one academic year and the remaining two groups belonged to the immediate following year. The four groups were matched on age and intelligence variables. Raven's Standard Progressive Matrices were used for measurement of intelligence. An observation schedule called System of Observation of Cognitive Processes in Science Instruction was prepared by the investigator for study of the instructional processes. Clinical interviews based on Piagetian tasks were conducted by the investigator for assessment of the reasoning pattern of students. Moreover, unstructured interviews were used for the investigation. For analysis purposes qualitative techniques and t-test were used.

The major findings were: 1. The reorganizing of the prescribed curriculum frame and executing it through a dynamic model of instruction had positively affected the 'combinatorial reasoning' and 'controlling of variables' of students when compared to those students who had undergone the normal classroom teaching based on the prescribed curriculum frame. 2. The pre-assessment of these reasoning patterns of students through tasks has no significant effect on the same reasoning pattern. 3. There were no significant interactions between the experimental treatments and the pre-assessment of the above reasoning patterns of students. 4. History and maturation had no significant effect on the reasoning patterns.

The educational implication of the study is that the instruction following the reorganization of the existing science curriculum can be carried out for enhancement of reasoning patterns of students, viz., combinatorial reasoning and controlling of variables.

649. BASU, B., *Curricula Prescribed by the Board of Secondary Education for the High School Level: An Analysis in relation to the Promotion of National Integration*, Ph.D. Edu., Osm. U., 1983

The objective of the study was to analyse the curriculum in relation to promotion of national integration. The hypotheses framed were: (1) When the standard and quality of education are controlled at the national level, the syllabi prescribed by different boards of secondary education give almost the same emphasis to the objective of promotion of national integration. (2) When the teachers possess a positive attitude towards national integration through education, it affects the students posi-

tively. (3) When the schools function as an effective medium to promote integrated feeling, there will not be any variation among the students in attainment of the same. (4) If the existing administrative facilities have an impact on the attainment of educational goals, schools under different managements vary in the attainment of the objective of the promotion of national integration. (5) If the socio-economic background has any effect on the promotion of integrated feeling among the individuals, there will be variation among the rural and urban schools in their attainment of goals. (6) When a common syllabus is given to the school on a compulsory basis, but the implementation part varies from institution to institution, students achieve emotional integration more at the cognitive level than at the affective level.

The sample for the study consisted of 100 eminent educationists, 20 judges to judge the syllabus, 100 teachers of schools and 100 students. The tools used in the study were: (i) An opinionnaire for the educationists. This consisted of items relating to knowledge, understanding and application objectives. It was a three-point scale for judging the curricula about national integration keeping in mind cognitive level objectives. (ii) The Syllabus Analysis Schedule was used to get the opinion of the judges about the elements of national integration in the syllabus. (iii) A questionnaire for teachers to explore their attitude about national integration through education. (iv) The Situational Test for students constructed on the basis of ten elements of national integration. Its split-half reliability was 0.88 and validity against teacher attitude criterion was 0.66.

The findings of the study were: 1. All syllabi prescribed by different boards of education emphasized almost all elements of national integration. 2. All sample teachers taken together, indicated that they were equally distributed in their positive and highly positive attitude towards the promotion of national integration. 3. There was no significant difference in the percentage of male and female teachers within 35 years of age and teachers above 35 years of age in their positive attitude. The teachers irrespective of their sex had a positive attitude towards the promotion of national integration. 4. The scores obtained about various activities going on in the school showed a variation. This indicated that the activities were implemented with differing emphasis in schools depending on management. 5. There was no significant difference between the scores of boys and girls in integrated feeling. 6. The students scored more in integrated feeling at the cognitive level than at the affective level.

tive level. 7. The students following the Central Board of Secondary Education syllabus scored more on the Situational Test than the students following the State Board of Secondary Education syllabus. 8. The urban students scored more than the rural students in integrated feelings. 9. There was no positive correlation between the attitude of teachers, activities being implemented in the schools and the development of integrated feeling amongst the students.

\*650. BHATIA, K.L., *An Evaluation of Sindhi Textbooks for Standards VIII to X Prescribed in Secondary Schools of Maharashtra State*, Ph.D. Edu., Bom. U., 1987

The objectives of the study were (i) to assess objectively the external characteristics of Sindhi textbooks prescribed by Maharashtra Government, (ii) to assess objectively the internal characteristics of Sindhi textbooks prescribed by Maharashtra Government, and (iii) to suggest improvements in textbook preparation based on the data collection through analysis sheets, questionnaire, score card and interview schedule. The hypotheses of the study were: (1) The content might not be fully relevant to the syllabi prescribed by the Maharashtra Government and might not be based on child psychology and educational psychology. (2) The language of the textbook might be difficult and not within the comprehension of the learners.

The study employed descriptive research design and the method of purposive random sampling was used for the selection of the sample. The sample consisted of 619 teachers from all the 37 Sindhi medium schools in Maharashtra State. The data were collected through (i) documentary analysis with analysis sheets, (ii) opinion analysis of teachers through questionnaire, (iii) score card (modified form of rating scale) for experts in Sindhi literature, (iv) visits to the Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune and NCERT, New Delhi in order to get information regarding Sindhi textbooks. All the tools were developed by the author. The data were analysed using descriptive statistics.

The major findings of the study were: 1. Content selected for the textbook was helpful in achieving the instructional objectives of the Sindhi language and helped in achieving the national goals too. 2. Generally the content of the textbooks was based on psychological principles. 3. A glossary of new words was given at the end of

every lesson in the textbook. Sometimes difficult words were neglected. 4. The number of prose lessons given in the textbooks was less, whereas the number of poems was more. 5. There were spelling mistakes in the textbooks but errata was not given in the books. 6. Forms and formats of the literature were interesting to the students. 7. Lessons included in the textbooks did not contain a variety of literature. 8. Exercises were not given in the textbooks. 9. Binding and stitching of the textbooks was not durable. 10. The cover page was not durable enough to withstand rough handling by the students. 11. The cover page was not attractive enough to catch the eye of the students.

651. BRAHMA, D., *A Study of the Educational Implications of Children's Literature*, Ph.D. Edu., Utkal U., 1984

The major objectives of the study were (i) to trace the growth and development of children's literature in the international, national and state perspectives, (ii) to know the bases of children's literature, (iii) to clarify the meaning and concepts of children's literature, (iv) to find out the reading interests of children, (v) to evolve suitable criteria for children's books, and (vi) to ascertain the context of utilization of children's literature in the primary schools.

The sample of the study consisted of 200 primary schools of Orissa situated in the rural and urban areas of 13 districts of the state, 200 headmasters of those schools, and 500 students of classes IV to VII of age group 8 to 11 drawn from those schools. The researcher made use of three tools, Reading Interest Questionnaire, Utilization of Children's Literature Questionnaire and Evaluation Proforma. The first two tools were administered to the sample children and sample headmasters respectively. The data were analysed in descriptive and qualitative form.

The findings of the study were: 1. The children expressed their interest in order of preference as science, lives of great men, lands and people, mythology, animals and birds, wonders, objects and events of daily life, supernatural elements, games and sports, travels and adventures, history, society and social science, humour, natural sciences, and accidents and natural calamities. 2. The children expressed that story was best liked as a literary form followed by poetry, play, comic, novel, one-act play, biography, autobiography, travelogue, adventurous story, composition, essay, folktale,

encyclopaedia, fairytale and picture dictionary. 3. While the highest number (49 per cent) of children expressed that they liked to read literature as desired by their superiors, around 32 per cent of children opted for reading according to their own wish. 4. The highest number (32 per cent) of children expressed that they needed the assistance of their teachers in selection of books. 5. Among children's authors the popular ones at the time were Uday Nath Sarangi, R.K., Nanda and Jogannath Mohanty. 6. The majority of children (64 per cent) had expressed their opinion that they liked coloured illustrations. 7. Around 66 per cent of schools provided library facilities. 8. On an average, 0.70 book was available in the school library per child. 9. Approximately 29 paise per child per year were spent on the purchase of children's literature in the primary schools. Only 48 per cent of primary schools added books to their library. The addition of titles per year in those schools was 18 per cent. 10. The number of books issued per head was very discouraging. 11. Around 75 per cent of the headmasters observed a positive impact of literature on the children.

652. BRAR, G.S., *Comparative Effects of Circuit Training and Interval Training on Selected Physiological Measurements and Running Performance of Females*, Ph.D. Phy. Edu., Pan. U., 1985

The objectives of the study were (i) to compare the effect of circuit training and interval training methods on endurance running of females, (ii) to compare the effects of circuit training and interval training methods on cardiovascular endurance, (iii) to compare the effects of circuit training and interval training methods on conventional resting pulse rate, (iv) to compare the effects of circuit training and interval training methods on conventional resting systolic and diastolic blood pressures, (v) to compare the effects of circuit training and interval training methods on haemoglobin, (vi) to compare the effects of circuit training and interval training on body fat percentage, and (vii) to compare the effects of circuit training and interval training on lean body mass.

This was an experimental study where 105 women students with an age range of 16 to 18 years, studying in the certificate course in physical education in a college formed the sample. The criterion measures were (i) 800-metre running, (ii) cardiovascular endurance, (iii) number of pulse beats per minute during conventional resting

position, (iv) blood pressure—systolic and diastolic during conventional resting position, (v) haemoglobin content per 100 millilitres, (vi) skinfold thickness measured by using skinfold calipers. On the basis of performance in 800 metres, the subjects were divided into three groups so as to make them equal on performance in the 800 metre run. These subjects were designated on the basis of treatment given to them, viz., circuit training, interval training and control group.

The findings of the study were: 1. Circuit training and interval training methods were effective in improving running performance. 2. Circuit training and interval training methods were effective in developing cardiovascular endurance in female students. 3. Circuit training and interval training methods were effective in lowering conventional resting pulse rate, diastolic blood pressure and fat percentage. 4. The two methods of endurance development had similar effects with respect to running performance, cardiovascular endurance, conventional resting pulse rate, blood pressure, haemoglobin and fat percentage. 5. In case of lean body weight, the circuit training group was superior to the interval training group. 6. The control group did not show any significant change in running performance, cardiovascular endurance, and other selected physiological measurements.

653. CHAND, R., *Effects of Personalized System of Instruction and Bloom's Mastery Learning Strategy on the Retention of High School Students in a Segment of Science*, Ph.D. Edu., HPU, 1984

The major objectives of the study were (i) to compare the immediate retention, measured in the form of performance on the summative criterion test, of three groups of students, one following instruction in science through the personalized system of instruction (PSI), the second through Bloom's mastery learning strategy, and the third through the conventional method of teaching, (ii) to compare two weeks' retention, measured in the form of performance on the summative criterion test of the three groups of students, and (iii) to compare six weeks' retention, measured in the form of performance on the summative criterion test of the same three groups of students.

Three groups randomized matched subjects design was used in the present study. A sample of about 160 students was selected from the Government Higher Secondary School, Galore, and three equivalent groups

were formed on the basis of subject-to-subject matching on the variable of intelligence. The groups were assigned at random to different teaching strategies. Immediately after the completion of the instruction of the selected content, the summative criterion test was administered to measure immediate retention. The summative criterion test was re-administered after two and six weeks to measure two weeks' retention and six weeks' retention respectively. At the end of the instruction of the selected content, no instruction of such content was imparted to any of the groups till the end of the experiment. An analysis of covariance was employed to analyse the data.

The major findings of the study were: 1. The immediate retention, measured in the form of performance on the summative criterion test immediately after the completion of the instruction of the group following PSI was found to be the same as that of the group taught through Bloom's mastery learning strategy. 2. The immediate retention measured in the form of performance on the summative criterion test, of the group taught through PSI was found to be superior to that of the group taught through the conventional method. 3. The immediate retention measured in the form of performance on the summative criterion test of the group taught through Bloom's mastery learning strategy was found to be superior to that of the group taught through the conventional method. 4. The two weeks' retention measured in the form of performance on the summative criterion test administered two weeks after the completion of the instruction, of the group following PSI was found to be equal to that of the group following Bloom's mastery learning strategy. 5. The two weeks' retention, measured in the form of performance on the summative criterion test of the group following PSI was found to be superior to that of the group following the conventional method. 6. The two weeks' retention, measured in the form of the performance on the summative criterion test, of the group following Bloom's mastery learning strategy was found to be superior to that of the group following the conventional method. 7. The six weeks' retention measured in the form of performance on the summative criterion test administered six weeks after the completion of the instruction, of the group of subjects imparted instruction through PSI was found equal to that of the group imparted instruction through Bloom's mastery learning strategy. 8. The six weeks' retention, measured in the form of performance on the summative criterion test of the group of subjects imparted instruction through PSI was found to be superior

to that of the group of subjects imparted instruction through the conventional method. 9. The six weeks' retention, measured in the form of performance on the summative criterion test of the group imparted instruction through Bloom's mastery learning strategy was found to be superior to that of the group imparted instruction through the conventional method.

The study implies that PSI and Bloom's mastery learning strategy have equal effects on immediate and delayed retention. Thus both these strategies help the students equally well in retaining the material for a long time. In the light of this it would be worthwhile for a teacher to make use of these strategies in the classroom situation. However, it may be pointed out that the introduction of PSI may need a lot of finances because for every discipline additional material in the form of study guides had to be prepared. The schools which can afford to spend some extra finances in the preparation of such material, can safely make use of this strategy. But the schools which cannot afford extra expenditure, can make use of Bloom's mastery learning strategy because this strategy needs extra effort on the part of the teacher but no financial implications are involved.

\*654. CHAUDHARI, R., *Attitudes of Teachers and Administrators towards Population Education in Rajasthan*, Ph.D. Edu., M. Sukh. U., 1985

The major objectives were (i) to concretize the concept and scope of population education with particular reference to school environment, (ii) to evolve an attitude scale for finding out the attitude of teachers and administrators of the department of education, Rajasthan, towards population education, (iii) to find out the reliability and validity of the attitude scale, (iv) to develop sex-wise norms of attitude in relation to teachers and administrators, and (v) to compare the attitudinal differences between the teachers and administrators of the Department of Education, Rajasthan.

An attitude scale based on the Likert type was prepared and standardized on the teachers and administrators of the state. The scale was based on the accepted principles and procedures used for the attitudinal measurement and scaling in the educational world.

The study revealed: 1. The reliability of the attitude scale ranged from 0.516 to 0.887. 2. The validity coefficients of the scale varied from 0.05 to 0.54 in case of teachers and from 0.15 to 0.35 in case of administrators. 3. There was no significant difference between the



opinion of male and female teachers of Rajasthan, towards population education. 4. There existed a significant difference between the attitude of male and female administrators. 5. The higher scores of the administrators, both male and female, could be attributed to the fact that the administrators were more seasoned and experienced persons in comparison to the teachers, and therefore, could better understand the importance of population education. 6. The opinion of female teachers and female administrators was, by and large, the same in the case of population education. 7. The teachers and administrators differed significantly in their opinion towards population education.

655. DESAI, J.J., *A Study of the Attitude of the School Going Adolescent towards Physical Education Programme in the School with reference to Personality Characteristics*, Ph.D. Edu., SPU, 1986

The objectives of the study were (i) to construct a valid and reliable scale to measure the attitude towards physical education of school going adolescents, (ii) to study the attitude towards physical education of school going adolescents in the context of their body build, (iii) to study the attitude towards physical education of school going adolescents coming from rural and urban areas, (iv) to study the attitudes towards physical education of school going adolescents in the context of personality characteristics, (v) to investigate whether there were any sex differences with regard to attitude towards physical education of school going adolescents, and (vi) to investigate whether family interest in sports and games had any relation to attitude towards physical education of school going adolescents.

The investigator constructed an attitude scale for measuring attitude towards the physical education programme by adopting the Likert Method of Summated Ratings. He constructed statements on the six aspects of physical education, namely, physical aspect, psychological aspect, sociological aspect, educational aspect, moral aspect and organizational aspect. Initially 150 statements were prepared and subjected to item analysis by using t-test technique. Out of 150 statements, 60 statements were selected on the basis of t-value. Ten statements in each of the aspects were selected out of which five were positive and five were negative. The reliability of the whole scale by test-retest method and split-half method was 0.924 and 0.865 respectively. The validity of the scale was established by correlating the total score with the score on each aspect of physical edu-

cation. The percentile norms were established. For measuring personality trait 16 PF was used. The study was based on a sample of 773 students,  $2 \times 2 \times 3$  factorial design was contemplated and analysis of variance approach and multiple regression technique were used for analysing the data.

The major findings were: 1. The sex of the students did not influence significantly their attitude towards physical education. 2. The students of classes VIII, IX and X did not differ significantly in their attitude towards physical education. 3. The students from urban areas excelled in their attitude towards physical education, as compared to the students from rural areas. 4. The Aloofness-Warmth, Silent-Enthusiasm, Simplicity-Sophisticated and Conservative-Experimental traits played some part in attitude towards physical education. 5. The provision of facilities such as playground, equipment, gymnasium, etc., in the school had a significant effect on attitude towards physical education. 6. The parents' interest did not play an important role in developing the attitude towards physical education. 7. The students having normal weight did not significantly differ in their attitude towards physical education from the students who were overweight and underweight. 8. There was no significant interaction effect of the facility of the school and the area of the school on the student's attitude towards physical education.

656. DESAI, K.G., *A Survey of the Programmes of Sex Education in Different Schools of Gujarat and to Find out their Impact on the Social and Psychological Adjustment of Boys and Girls*, Dept. of Education, Guj. U., 1985 (UGC financed)

The objectives of the study were (i) to try out a programme of sex education in grades VIII, IX, X and XI to see the difference in pupils' responses, (ii) to see how far sex education affected the opinions of pupils of grades VIII, IX and X towards matters pertaining to sex, marriage, etc., (iii) to see how far sex education affected the adjustment of boys and girls of grades VIII, IX and X, (iv) to study the sex difference in changes of attitudes and adjustment, and (v) to find out whether the socio-economic status of boys and girls affected their attitudes, adjustment and sex knowledge.

In the study, three tools were newly developed. An opinionnaire consisted of 50 items selected from a preliminary script of 135 items after item analysis. It had test-retest reliability of 0.41 (N=118, three months' interval). Its construct validity was checked by factor

analysis using Hotteling's Principal Component Method. Eighty items of an adjustment inventory were selected from 196 items by correlating the score on each item with the total score on the inventory ( $N=266$ ). Its test-retest reliability was 0.62 ( $N=118$ , three months' interval). It was also analysed factorially in the same fashion. In the preliminary script of the sex knowledge questionnaire there were three parts—sex knowledge (54 items), anatomy (16 items) and vocabulary (34 items). After item analysis, the final script was evolved with 28 items in the sex knowledge test and 16 items in the anatomy test, dropping the vocabulary part in toto. Test-retest reliability of the sex knowledge test and anatomy test were 0.43 and 0.60 respectively ( $n=118$ , three months' interval). The fourth instrument used was the standardized socio-economic status questionnaire. Pretest-posttest control group design was tried out in three schools. Since the differences in posttest scores of the control and experimental groups were not great, "only posttest design" without a control group was practised in seven other schools.

The major findings were: 1. The programme of sex education administered to the experimental group was very successful. 2. The results of the programme depended on the scholastic achievements of pupils rather than on who conducted the programme and how it was conducted. 3. Greater adjustment was achieved in the higher classes. 4. In adjustment, girls were found to be better than boys while in opinions and sex knowledge, no sex difference was observed. 5. The boys and girls of higher socio-economic status showed better scores on adjustment and sex knowledge. 6. It was proved beyond doubt that a formal or informal sex education programme was effective in changing the opinions, adjustment and knowledge of the school pupils regarding sex and related matters.

657. D'LIMA, C.G. and PURI, M., *An Experimental Study of the Effectiveness of Creative Value-oriented Education on the Value Patterns of the Pupils*, H.J. College of Education, Bombay, SIE, Pune, 1985

The objectives of the study were (i) to find out the effectiveness of the brainstorming technique in providing value-oriented education, and (ii) to find out the relative effectiveness of the brainstorming technique and ordinary method of teaching in providing value-oriented education.

The variables studied were attitude towards selected values, attitude towards making various discoveries, inventions and innovations, attitude towards the improvement of quality of life, intelligence, and creativity. The pretest-posttest parallel matched group design of experiment was employed for the study. The sample of the study included all the 166 boys studying in standard IX from an English medium school of Bombay. The tools used for the study were attitude scales prepared by the investigator, Raven's Standard Progressive Matrices and Torrance Tests of Creative Thinking. The t-test was used for analysis of data.

The findings of the study were: 1. A significant difference was observed between the pretest-posttest mean scores of pupils with regard to the value of 'righteousness'. The experimental treatment produced a significant effect on the attitude of pupils towards 'righteousness'. 2. The experimental treatment produced a significant effect on the attitude of pupils towards the value of 'selflessness'. 3. The experimental treatment was effective in lowering the pupils' attitudes towards doing anything just for fame. 4. The experimental treatment did not bring about a significant change in the attitude of the pupils towards the value of 'persistence', 'wealth', and 'power'. 5. The various discoveries, inventions and innovations listed by the pupils during the post-test were more related to improving the environment. 6. Within two classroom sessions (70 minutes) by using the brainstorming technique it was possible to make the pupils of the experimental group realize the value of inventing methods of conserving resources as well as increasing their score on fluency of ideas regarding ways and means of conserving natural resources and minimizing pollution whereas this was not possible to achieve through the ordinary method of teaching. At the same time, the value of sharing natural resources with others could not be affected in any direction even through brainstorming sessions.

\*658. EKBOTE, N.T., *Linguistic Analysis of the Textbooks of Marathi Mother Tongue Prescribed for Standards I to X by the Maharashtra State Board of Secondary Education*, Ph.D. Edu., Nag. U., 1985

The objectives of the inquiry were (i) to study the textbooks mainly from a linguistic point of view, (ii) to find the number and proportion of unknown words in

various lessons, (iii) to classify the words according to origin (Farsi, English, Urdu, Kannad, Sanskrit), region and culture and to find their proportion to the total number of words, (iv) to classify the words in the textbooks on the basis of standard vocabulary and to find their proportion, (v) to find the average length of a sentence in each lesson and in the whole textbook, (vi) to find the number of proverbs and sayings in the textbooks, (vii) to measure the proportion of known and unknown proverbs in the textbooks, (viii) to find the number and proportion of different kinds of sentences, (ix) to analyse various classical and historical references in the textbooks, (x) to identify and investigate the values depicted in various lessons in the textbooks, and (xi) to give suggestions for fostering linguistic development in future textbooks.

The sample for the study consisted of the textbooks 'Balbharti' for classes I to VII and 'Kumarbharati' for classes VIII to X. The criteria for analysing each textbook were identified. The books were rated according to these criteria.

The findings were: 1. Not a single textbook was without fault with reference to various factors. 2. Developmental sequence was not properly followed in respect of all factors while preparing the textbooks. 3. The principles of the process of linguistic development were not adhered to while preparing the textbooks. 4. The textbooks were prepared by traditional methods. 5. The textbook producers did not take care to get the lessons written by experts, taking into account the age, mental development and power of understanding of the students. 6. In consequence, these textbooks were incomplete and unsuitable for bringing about linguistic development of the students.

659. GIRDHARI LAL, *To Compare the Effect of Individualized and Conventional Instruction on Students' Achievement, Personality Types, Intelligence and Levels of Thinking*, Ph.D. Edu., Pan. U., 1986

The objectives of the study were (i) to compare mathematical achievement of the students exposed to the personalized system of instruction (PSI) with that of students exposed to the conventional lecture method of instruction, (ii) to see whether there was any interaction between the mode of instruction and levels of intelligence, (iii) to see whether introverts and extraverts differed in mathematical achievement with respect to dif-

ferent modes of instruction, (iv) to know if content comprehension (thinking) levels of students had any effect on achievement in mathematics.

In this study, pretest post-test experimental-control group design was followed. A sample of 180 students was taken randomly from class IX students enrolled in government and privately managed schools of Jammu city. The sample was divided into three groups and to each group a mode of instruction was assigned randomly. The modes of instruction included the individualized mode of instruction, programmed mode of instruction and traditional mode of instruction. The individualized mode of instruction meant learning packages, the programmed mode of instruction was the branching type of programmed learning material, and the lecture mode was chosen as a conventional mode of instruction. Intelligence level, personality type and level of content comprehension were independent variables. The criterion variable was achievement in mathematics. The following tools were used to collect the data: (i) the Jalota Group Test of General Mental Ability (1972), (ii) the Jalota and Kapoor Eysenck's Maudsley Personality Inventory, (iii) The Sodhi Content Comprehension Test (1982), (iv) The Achievement Test in mathematics, (v) The Branching Programme in mathematics, (vi) The Learning Package. The data so collected were analysed with the help of analysis of variance.

The findings of the study were: 1. Learning packages were found to be the most effective mode of instruction out of the three modes in terms of mathematics achievement. 2. Programmed material in the branching style was found to be the least effective of the three modes, because the mean achievement scores of the other two groups were found to be significantly higher than the group exposed to scrambled book. 3. High ability students scored higher than low ability students irrespective of the mode of instruction. 4. Levels of thinking (content comprehension) and personality types acted as redundant factors so far as achievement in mathematics was concerned. 5. Extraverts and introverts did not differ on achievement in mathematics when taught through either individualized strategies or through lecture strategy. 6. Levels of intelligence did not interact significantly with modes of instruction to produce differential achievement. 7. Interaction between levels of thinking (content comprehension) and modes of instruction was also found to be insignificant. 8. Levels of personality did not interact significantly with modes of instruction to produce differential achievement.

mathematics at high school level. 9. Intelligence level did not interact significantly with thinking levels to produce differential achievement in mathematics. 10. Interaction between levels of intelligence and types of personality was found to be insignificant. 11. Levels of comprehension did not interact significantly with personality types to produce differential achievement in mathematics at high school level. 12. The three variables, namely, instructional mode, intelligence level and personality type did not interact significantly to produce differential achievement. 13. The variables of instructional mode, thinking level and personality type did not interact significantly to produce differential achievement. 14. Interaction between levels of intelligence, levels of comprehension (thinking) and types of personality was found to be insignificant. 15. The interaction effect involving the variables of instructional mode, intelligence level, personality type and operative comprehension level was insignificant, proving that the achievement of the students was not affected by crossing levels of these variables.

660. GIRI, S.N., *Studies in Comparative Analysis of Works of Curriculum Development Projects in Mathematics*, Ph.D. Math., Jad. U., 1977

The main objectives were (i) to study the principles of curriculum development and appraisal with special reference to mathematics, (ii) to study the curricular reforms in school mathematics in India, and (iii) to collate and analyse the international activities in school mathematics through projects of developed countries, innovations in developing countries and the role of international and national organizations on mathematics education.

The nature of the study was exploratory in a wide perspective for the search of a framework of curriculum development projects in India. The data were generated through the perusal of reports of various international and national agencies involved in curriculum development, along with publications of professional societies of mathematics learning. The data were analysed in descriptive languages, interspersed with tables, charts, diagrams (inclusive of a Venn diagram of contents of different projects).

The major findings and recommendations were: 1. There existed curriculum development and appraisal principles well formulated, applied and found practical in school subjects, including mathematics. 2. Experi-

mentation in innovative programmes should be continued in India on national as well as on state levels. 3. The results of experimentation with new materials in other developed and developing countries should be used in selecting strategies for tackling problems of innovations. 4. Various projects in developed countries like USA, UK, European countries and Japan were enormous and rich in findings, but they were based on widely differing goals; projects in USSR and Japan aimed at developing a scientific outlook. 5. The aims of reform in developing countries in Asia, Africa and Latin America were directed to national goals for development of their countries. 6. In India, the chief aim was to develop a society which was transforming itself into an industrial and technological society, where mathematical literacy was essential for every child. 7. The developed countries were going in for both sophisticated and utilitarian material in mathematics, while the developing ones inclusive of India were seeking to adopt the essence of modern thinking of curriculum development which catered to the needs of many. 8. Research in content selection, integration of mathematics with the general school curriculum, methodologies, linguistic problems, textbooks, teaching aids and teacher training and orientation, examination and evaluation were the focal areas of future work in all countries.

661. GUPTA, K.S., *Development of Effective Teaching Methods for School Subjects*, Dept. of Education, Cal. U., 1984 (NCERT financed)

The purpose of this pilot study was to explore the dimensions of effective teacher behaviour and evolve hypotheses of effective teaching methods.

It was a survey type correlational study. A seminar was arranged to arrive at a consensus on teaching objectives. A convenient sample of 180 class IX pupils was drawn from four average schools. The sample comprised an equal member of boys and girls. Eight attitude scales were developed. One scale comprised general teacher behaviour and the rest were for teaching subjects. Cluster analysis was used to isolate the various dimensions of teacher behaviour.

Some of the findings were: 1. The broad dimensions of general teacher behaviour were dynamism, meaningfulness and potential mobilization. 2. For Bengali and the mother tongue, the teacher behaviour dimensions were identified as language structure, thought concretization and appreciation. 3. For mathematics, mathe-

mathematical reasoning, practice facility and appreciation were identified. 4. As regards physical sciences the behaviour dimensions identified were concretization, appreciation and scientific spirit. 5. The teacher behaviours identified as those of life science teachers were concretization, scientific spirit and appreciation. 6. Those identified as behaviours of geography teachers were concretization, scientific insight and appreciation. 7. Concretization, social consciousness and objective insight were the three clusters identified as teacher behaviours of history teachers. 8. The behaviours of teachers of English as a second Language comprised thought concretization, linguistic skill, language structure and appreciation.

662. HARNAMSINGH, *Effect of Ephedrine on Muscular Performance*, Ph.D. Phy. Edu., Pan. U., 1981

The objectives of the study were (i) to find out the effect of Ephedrine on Spontaneous Motor Activity (SMA), (ii) to compare the effect of Ephedrine on SMA of randomly bred and inbred rats, (iii) to compare the effect of different doses of ephedrine (2mg, 5mg, and 10mg) on SMA.

This was an experimental study where four groups of twenty albino rats each were taken. One of the groups was injected with saline, the second group with 2mg Ephedrine, the third group with 5mg of Ephedrine and the fourth group was injected with 10 mg of Ephedrine. The SMA of these rats was tested through Technophotometer and Techno-swimming test.

The findings of the study were: 1. Ephedrine modified SMA as well as spontaneous activity under stress of the rats. 2. The minimal doses of Ephedrine produced a detectable effect on SMA. A dose of 5mg produced effects on randomly bred and inbred rats. 3. Ephedrine in doses of 5 mg and 10mg produced dual action. The activity (SMA) decreased during the first hour and increased at a later time. 4. Female rats were more active as compared to male rats. Ephedrine decreased the activity (SMA) of female rats throughout the period of observation. 5. Almost all toxic doses of Ephedrine increased the activity of inactive rats but decreased the activity of active rats. 6. Ephedrine reduced the activity (SMA) of both active and inactive rats under stress.

663. JAIN, N., *Behavioural Dimensions of Population Education And Sex Education: A Comparative Study of Youth in Punjab And Himachal Pradesh Universities*, Ph.D. Soc., Pan. U., 1986

The objectives of the study were (i) to gain an insight into the perception, the extent of knowledge, awareness and attitudes of university youth towards population education and sex education, (ii) to analyse the attitudes of the students towards various issues such as marriage, family formation and other dimensions of the population problem in general, (iii) to investigate the opinions and attitudes of the parents of the students and their teachers towards population problems, population education and sex education. The hypotheses of the study were as follows: (1) Some of the demographic and socio-cultural characteristics such as sex, age, type of schooling, day scholar or hosteler, enrolment in the faculty of study, family socio-economic background including education and occupation of parents, and so on, of the university youth will be related to their perception and attitudes towards the population problem. (2) Boys as compared to girls will have better awareness and knowledge of population education and sex education. (3) Knowledge of the human reproductive system will be sex specific (i.e. girls will have more knowledge of the female reproductive system and boys will have more knowledge of the male reproductive system). (4) Both the girls and the boys will show or express apprehensions, doubts, fears and misconceptions regarding sex and contraception. (5) Parents will tend to show differential treatment to boys and girls in the family in regard to their mixing and interactional pattern with persons of the opposite sex. (6) Communication between teachers and students, parents and children on matters related to sex issues and problems will be limited due to social and cultural norms.

A random sample of 250 students of both the sexes, (110 females and 140 males) was drawn from the post-graduate classes of eleven departments in the faculties of arts and science of two universities. Apart from students, 44 teachers in the Himachal Pradesh University (HPU) and 46 in the Panjab University (PU) were interviewed. Parents of 46 students in the total sample (16 in HPU and 30 in PU) were also interviewed. For data collection three interview schedules were constructed and administered separately to the students, the teachers and the parents of the students. The data were analysed on the basis of methods of classification and cross tabulation.

The findings of the study were: 1. Students in the PU had a better socio-economic background as compared to those in the HPU. 2. The PU students had relatively more knowledge about the male/female reproductive behaviour and family planning mechanism than the students of the HPU. 3. A larger percentage of students in the HPU wanted a marriage counselling bureau. 4. A larger number of them could also communicate with their parents and teachers regarding the population problem and population education to a greater extent because of relatively more informed social structure existing in their setting than those in the PU. 5. Students were more satisfied with the information they received from friends, etc. regarding sex. 6. With regard to communication with the members of the opposite sex, more students in the PU than those in the HPU said that they could do so freely. 7. A larger number of students in the HPU preferred an absolutely arranged marriage themselves whereas more PU students wanted to marry on their own.

- \*664. KANADE, V.K., *A Study of the Utility of Yogic Exercises in the Promotion of Physical Fitness and Selected Athletic Events*, Ph.D. Edu., Nag. U., 1988

The objectives of the study were (i) to discover whether general physical fitness could be improved with selected yogic exercises, (ii) to discover whether different items of Fleishman's Physical Fitness Test Battery also recorded significant improvement, (iii) to determine the effect of selected yogic exercises on cardio-vascular efficiency, (iv) to determine the effect of selected yogic exercises on the performance of high jump, and (v) to determine the effect of selected yogic exercises on the 1500 m. run.

The sample for the study consisted of 60 subjects drawn randomly from the student population of the College of Education, Aurangabad. The tools used were: (i) Fleishman Battery of Basic Fitness Tests, (ii) Harvard Step Test. Two sets of yogic routines formed the independent variables. The first set of yogic routine consisted of the following asanas: (i) Ardha-halāsana, (ii) Halāsana, (iii) Viparita Karani, (iv) Sarvangasana, (v) Matsyasana, (vi) Ardha-shalabhasana, (vii) Shalabhasana, (viii) Bhujangasana, (ix) Dhanurasana, (x) Paschimottanasana, (xi) Yoga Mudra, (xii) Vajrasana, (xiii) Supta-Vajrasana, (xiv) Tadasana, (xv) Chaurasana and (xvi) Shavasana. The second set of yogic routine consisted of Udpliyana Bandha,

Kapalabhati and Ujjayi in addition to the exercises mentioned in the first set. A simple randomized design was employed in the study. The statistical technique used was the t-test.

It was concluded that the selected yogic exercises contributed to improvement of physical fitness and also the improvement in high jump and 1500 m. run. The study recommended that schedules of yogic exercises should be included as an integral part of physical fitness training as well as coaching in athletics.

665. KESKAR, S.U., *A Survey of the Implications of the Three Language Formula Enunciated by the Government of India with special reference to its Impact on Maharashtra State*, Ph.D. Edu., Bom. U., 1984

The major objectives of the study were (i) to study the position of language instruction in various states and Union territories in India, (ii) to study the place of Hindi in the school curriculum of the southern states, (iii) to study the place of the first and the third language in tribal areas, (iv) to study the attitude and views of Maharashtrian parents about English as the medium of instruction, and (v) to study the implications of the Three Language Formula in Maharashtra and compare it with other states.

The study employed historical and extensive field survey method. The sample consisted of 520 parents whose wards were studying in English medium schools in Bombay, Thane, Dombivli, Kalyan, Bhivandi, Pune and Nagpur. The sample represented different socio-economic and cultural sections of the society. Tools employed in this study were a questionnaire, documentary analysis, observation, visits and correspondence. The data were analysed with the help of percentages.

Major findings of the study were: 1. Parents admitted their children to English medium schools predominantly for securing admission to engineering, medical or science colleges in future. Securing employment was another reason. 2. Children studying in English medium schools found difficulty in understanding the concepts of Marathi and Hindi grammar. 3. The majority of students spoke in Marathi or Hindi or English mixed Marathi. 4. Students' interest in literature in the mother tongue was limited by the English medium, 5. Hindi-speaking states of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh neglected the study of a modern Indian language. 6. The southern states of Andhra

Pradesh, Karanataka, Kerala and Tamil Nadu neglected the study of Hindi. Tamil Nadu had totally avoided the study of Hindi in secondary schools. Instead of the three language formula, the two language formula was being implemented. 7. States like Orissa, Punjab and West Bengal also neglected the study of Hindi. They had to study three different scripts for three different languages. 8. In states like Manipur, Meghalaya and Nagaland, the study of Hindi was neglected and more importance was given to English which was accepted as the official language. 9. Union territories like Andaman and Nicobar, Arunachal Pradesh, Mizoram and Pondicherry also neglected the study of Hindi in secondary schools. 10. The 'Three Language Formula' was followed in its real sense in Maharashtra and Gujarat. All children studied Hindi with the exception of those who offered a classical language as their second language. Equal importance was given to all the three languages in secondary schools

666. KHANNA, K., *Preparation of Reading Material for Girl Dropouts in Delhi Slums*, Ph.D. Edu., Del. U., 1983

The objectives of the study were (i) to develop need-based, relevant and interesting reading material for girl dropouts living in Delhi slums, and (ii) to test the effectiveness of the reading material developed for the study.

The methodology of the study was concerned with the main theme, i.e. (i) development of the module and (ii) testing of its effectiveness. The module was developed on the topic 'Our food'. For the testing of field effectiveness of the module, the tools developed were: (i) ability test to assess reading competence, (ii) interview schedule to collect personal information, family information and the immediate and long-term impact of the module, and (iii) achievement test and opinionnaire to assess the cognitive and affective achievements of the girl dropouts. A sample of 103 girl dropouts was selected from the slum area of Delhi. The research design involved a formative and summative evaluation using before and after measurements on a single group.

The findings of the study were: 1. The girl dropouts selected for the sample, by and large, belonged to nuclear families of seven members on an average and with Rs 3000/- as an average annual income. 2. The girl dropouts had been out of school for a period ranging from a few months to three years. The most common reason for dropping out was 'parents' wish' as the girls had en-

tered puberty. 2. All the mothers and 56 per cent of the fathers were illiterate; of the remaining, 18 per cent had education up to the primary level and 13 per cent each up to the middle and secondary levels. 3. Muslim parents, instead of sending their daughters to school, sent them to special centres where they learnt to read the Holy Koran. 4. Although 71 per cent of girl dropouts were the eldest in the family, only about 29 per cent were fully involved in household affairs including decision-making. 5. A majority of the girl dropouts had enough free time to engage themselves in any kind of self instructional activity. 6. The girl dropouts who were fluent readers took on an average, 75 minutes for reading the module and another 35 minutes for attempting the tests. Those who were poor readers took almost double the time. 7. The mean scores at knowledge level at the entry point and after first, second and third trial were 16.95, 39.25, 68.36 and 84.03, respectively. The mean score of retention was 70.62. 8. All the background variables, viz., age, schooling, years away from school, involvement in the home, status among siblings and reading competence, except father's education, were positively and significantly related to cumulative performance and retention. The correlation between performance and father's education was almost negligible. 9. The value of R between the three components of reading ability and the cumulative learning was 0.71 which was significant and substantial. 10. On the affective side it was found that after exposure to the module, the average score of the girl dropouts on the opinionnaire increased from 7.5 to 13.5, indicating a positive shift. 11. When the module was discussed in the homes of the girl dropouts, a majority of them tried to introduce some change or the other. 12. All the girl dropouts expressed a desire for reading more of such material. 13. The results of the follow-up carried out with 12 girl dropouts selected from the original sample indicated that the module was remembered by all the 12 girl dropouts. They were able to recall not only the treatment given to them but also some of its contents.

667. KUMAR, K., *Teaching of Population Education* Ph.D. Psy., Agra U., 1984

The hypotheses were: (1) There will be no significant difference between the scores obtained on the attitude scale towards family planning by the subjects of high, middle and low socio-economic status experimental group and control group in pre and post-testing

(2) There will be no significant difference between the scores obtained on the attitude scale towards family planning by the subjects of rural, sub-urban and urban experimental group and control group in pre and post-testing. (3) There will be no significant difference between the scores obtained on the attitude scale towards family planning by the subjects whose parents' education is high, average and low in the experimental and control groups in pre and post-testing. (4) There will be no significant difference between the post-testing scores on the attitude scale towards family planning obtained by subjects of high, average and low SES experimental and control groups. (5) There will be no significant difference between the post-test scores on the attitude scale towards family planning made by the subjects of rural, sub-urban and urban experimental and control groups. (6) There will be no significant difference between the post-test scores on the attitude scale towards family planning made by the subjects of parents with high average and low education experimental and control groups.

The sample comprised 360 students studying in classes IX and X during the session 1982-83 and who were in the age group of 13 to 17 years. The study employed pretest post-test experimental control group design. The experimental group in addition to general education underwent the population education course. Attitude was measured with the help of the Attitude Scale towards Family Planning developed by M.A. Harkin and Yashveer Singh. Its test-retest reliability coefficient was 0.85. The data were analysed with the help of t-test and correlation.

The findings were: 1. For SES, location of residence and parents' level of education, the experimental group showed effective attitudinal change towards family planning. 2. The teaching of population education had a significant effect on attitude towards family planning.

668. MALL, N.N., *Cardiovascular Responses of Active, Passive and Yogic Recovery Procedures and Maximum Work Output*, Ph.D. Psy. Edu., Pan. U., 1982

The objectives of the study were (i) to find out and compare the effect of training and recovery technique on the cardiovascular variables during rest and exercise of the four experimental recovery groups, (ii) to find out and compare the effect of active, passive and yogic recuperative techniques on cardiovascular variables during recovery period, (iii) to find out and compare the effects

of training and different recovery techniques on the variables of maximum work output, (iv) to find out and compare the effect of training on selected anthropometric variables of active sitting, passive sitting, passive lying and yoga groups, and (v) to find out and compare the girth measurements of selected anthropometric variables with total cumulative work output of active sitting, passive sitting, passive lying and yoga groups.

The sample of the study consisted of 120 male students of non-residential high schools. The age of these students ranged from 16 to 18 years. They were divided into four groups of 30 each after matching them according to one minute all out cycle ergometer revolution scores and total three girths (thigh, knee and calf). These groups were randomly designed as (i) active sitting recovery group, (ii) passive sitting recovery group, (iii) passive lying recovery group and (iv) yoga lying recovery group, based on the treatment given to them. The criterion variables consisted of (i) scores on one minute pedalling on a mechanically braked ergometer, (ii) the cardio-vascular variable of measurement of heart rate, systolic, diastolic and pulse pressures during conventional resting stage, (iii) the anthropometric variables comprising height, weight, three girths (thigh, knee and calf) and skinfold measures. All these criterion variables were recorded before training and after four months of training. The training consisted of running on the spot, squat jumps, jumping jacks and short bouts of exercise. All groups were provided this training.

The findings of the study were: 1. Supramaximal short bouts of exercises intercepted with four different recovery techniques significantly reduced the resting heart rate, and systolic and diastolic pressure of all the four recovery groups. 2. Yogic relaxation technique showed significant heart rate decrease from 3rd minute to 9th minute recovery, highest total recovery index score and total cumulative work output than the other recovery techniques. 3. Training had increased the total girths and lean body mass of all the groups significantly. However, the group possessing the highest measurement in total three girths did not show significant improvement in the total cumulative work output as compared to other groups.

\*669. MANJULA, M., *Development of a Curriculum of Family Life Education for Higher Secondary Students and a Study of its Effectiveness*, Ph.D. Edu., MSU, 1987

The major objectives of the study were (i) to develop a



curriculum of family life education phase-wise, for grade XII science students, (ii) to validate the curriculum of family life education in terms of students' achievement, relationship between socio-economic status and family adjustment, self-attitude and family adjustment, achievement and attitude, and (iv) to study the cost and time involved in developing and implementing the curriculum.

The investigation was a one-shot study where the curriculum of family life was developed and validated on a single group for a period of three months. The curriculum was developed on the basis of the needs and interests of the pupils measured through a questionnaire developed by the investigator. The developed curriculum was tried out on grade XII science students of IPCL School. On the basis of the data obtained the curriculum was modified. Finally the curriculum was implemented on 28 students, (18 boys and ten girls). Besides the sample of 28 students in the experimental group, the study also involved 28 students belonging to different schools in the control group. The groups were matched on the basis of age, sex, economic status and stream. The tools used for data collection were Socio-economic Status Scale, Family Life Inventory, an Attitude Scale, achievement tests and a reaction questionnaire. The obtained data were analysed computing mean, SD, percentiles, t-test and coefficient of correlation.

Major findings of the study were: 1. Validation of the curriculum inferred from the achievement of students on criterion and comprehensive tests indicated good performance of students showing that the curriculum had been effective. 2. The curriculum was found effective in terms of students' attitude towards their self, opposite sex members, sexual matters, marriage and family. 3. Students' reactions towards the curriculum were found positive. 4. There was no relationship observed between socio-economic status and family adjustment. 5. A significant relationship was found between the family adjustment and the self-attitude in both the groups except girls belonging to the experimental group. 6. A significant relationship was found between the achievement and the attitude. 7. The curriculum was found feasible when seen in terms of its reproducibility and the cost.

\*670. MEHTA, J.N., *Motivational Factors as Reflected in the Hindi Text-books Prescribed in Gujarat State in the Post-Independence Era*, Ph.D. Edu., SPU, 1988

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

percentage of stories having achievement imagery, task imagery and unrelated imagery in the textbooks prescribed for different classes, viz., classes VIII, IX & X, after independence in Gujarat State, and (ii) to compare the mean n-Ach score obtained from the study of stories having achievement imagery (AI) included in different textbooks prescribed for classes VIII, IX and X.

The investigator analysed 11 textbooks prescribed for class VIII, ten textbooks prescribed for class IX and 12 textbooks prescribed for class X. Prior to analysis, the investigator established the reliability of scoring the story from the textbooks by correlating her scoring of stories with the scoring by two experts. The reliability of the scoring was found to be 0.84. The reliability of scoring and re-scoring the same stories after an interval of some days was found to be 0.79.

The major findings were: 1. About 39.24 per cent of stories from 11 textbooks had achievement imagery (AI), 17.20 per cent had task imagery (TI) while 43.56 per cent had unrelated imagery. 2. Every textbook had a different number of stories having AI. The number ranged from two to ten. In terms of percentage it ranged from 23.8 per cent to 57 per cent. 3. There was a difference in average n-Ach score of each textbook. The average n-Ach score ranged from 3.5 to 7. 4. The percentage of stories having AI was 42.59, for stories having TI it was 13.58 and for stories having unrelated imagery it was 43.79 in the ten textbooks analysed for class IX. 5. Every textbook prescribed for class IX before the existence of the Board had a different number of stories having AI. The number ranged from 2 to 13 and in terms of percentage it ranged from 16.66 to 61.90. 6. The average n-Ach score of the textbooks ranged from 2.00 to 5.87. 7. The textbooks prepared by the Gujarat State Textbook Board were, by and large, found equal from the view-point of stories having AI and average n-Ach score. 8. The eleven textbooks prescribed for class X had different numbers of stories. The number ranged from ten to 17. The number of stories ranged from 25 per cent to 50 per cent. The number of stories having AI was 48.22 per cent, stories having task imagery were 16.13 per cent and stories having unrelated imagery were 35.46 per cent. Every textbook had a different number of stories having AI. The number ranged from 1 to 10. The average n-Ach score of the textbook ranged from 2.00 to 7.00. There were two textbooks having only one story in each having AI. Out of 11 textbooks, eight textbooks were, by and large, equal in respect of average n-Ach score. One textbook was found to be superior to the other textbooks in respect of n-Ach

score. The average n-Ach score of the superior books was 7.00. The textbooks that were prepared and prescribed for class X by the Gujarat State Textbook Board were also not found superior, in respect of n-Ach scores, to textbooks prescribed prior to the existence of the Textbook Board. 9. Out of the textbooks prepared by the Gujarat State Textbook Board for classes VIII, IX and X, the textbook for class IX had only two stories having AI. The average n-Ach score of the textbooks for classes VIII and X was not significant. 10. Out of the textbooks prepared by the Board for the second time for classes VIII, IX and X, the textbook for class X had only one story having AI. The average n-Ach scores for textbooks of classes VIII and IX were not significant.

671. MEHTA, S.I., *Comparative Study of Textbook Production Set-up and Processes in India*, Ph.D. Edu., MSU, 1983

The study was conducted (i) to analyse the diversity of set-up and procedures adopted by different state textbook agencies and locate the best features, (ii) to investigate the present position of nationalized textbooks in different states in order to have an idea of the magnitude of the entire task ahead, and (iii) to find out the best methods and procedures for textbook production which might be useful to improve the quality of production of textbooks.

This was a normative survey study. Data sheets, opinionnaires and interview schedules were used for data collection purposes. The study include all the agencies concerned with the production of the nationalized textbooks in the country except West Bengal. The study included 50 experts as the sample of the study. Besides this, the textbook agencies of six states, Gujarat, Maharashtra, Madhya Pradesh, Assam, Karnataka and Haryana were included in the sample for intensive study.

The main findings of the study were: 1. Most of the states in India had nationalized some or all the school textbooks upto the primary and secondary stages. 2. Along with the textbooks, other materials produced were workbooks, teachers' handbooks and other supplementary literature. 3. Twelve states had established autonomous bodies for the production of textbooks. 4. Various methods adopted for the preparation of manuscripts were: by an individual author; by a panel of authors; by departmental officials; by public notification; and by adopting the textbooks of other agencies.

5. Three main modes of remunerating authors were royalty, fixed amount per page and fixed amount per textbook. 6. All the textbook agencies got their manuscripts edited. 7. The agencies fixed adequate rates of remuneration so as to attract good editors. 8. Most of the agencies got their manuscripts reviewed at the pre-publication stage. 9. All the textbook agencies built up adequate machinery for continuous evaluation of their textbooks. 10. The agencies published revised editions of the textbooks. 11. Five main methods followed for providing textbooks of core subjects in minority languages were: preparing textbooks in the language concerned, translating textbooks prepared originally in the regional language, adopting nationalized textbooks of other states or NCERT, adapting nationalized textbooks of other states or NCERT, and prescribing textbooks of private publishers. 12. The textbooks in nonregional languages were prepared as per the criteria fixed for the textbooks in regional languages. 13. A period of about three months was allowed for the translation and evaluation of the manuscripts. 14. Of the various sizes of prevalent textbooks, size B<sub>5</sub> seemed to be most suitable for primary level textbooks, while size A<sub>5</sub> was found suitable for the remaining grades. 15. An up-to-date roster of private presses having adequate printing facilities was considered useful for selection on the basis of their technical potentials. 16. The agencies normally used 80 gsm paper for the textbooks. 17. The process of wirestitching was found to be a suitable process of binding for the nationalized textbooks. 18. Every textbook agency developed a quality control cell to maintain the quality of production. 19. Most of the agencies worked on the basis of no-profit no-loss policy. 20. The pricing formula of 60:40 seemed to be reasonable for textbooks. 21. The main forms of organizations prevalent in different states were government departmental undertakings and autonomous bodies in the form of a registered society or statutory public corporation.

672. MISHRA, A., *An Evaluation of Work Experience in the Secondary Schools of Assam*, Ph.D. Edu., Gau. U., 1985

The objectives of the study were (i) to ascertain in detail, the present position and practices relating to the scheme of work experience as a link between education and productivity, (ii) to study the attitude of the students towards the subject, (iii) to study the work experi-

ence programme of different schools of Assam in relation to the actual life situation of the students in general, (iv) to ascertain in detail the difficulties faced by the connected teaching staff of the different schools of Assam for introducing work experience as a subject, (v) to study the different tools and plants that have been used to teach the subject in the different schools of Assam, (vi) to find out ways and means for standardization of the work experience scheme in all the schools of Assam in relation to the climatic as well as the environmental condition, (vii) to study the different methods that were being suggested from time to time by the different educationalists for proper implementation of work experience as a subject in schools of Assam, (viii) to establish a relationship between work experience and other subjects that were being taught in the schools, and (ix) to establish a relationship between achievement in work experience and aptitude towards work experience. The major hypothesis was that the objectives for which the work experience scheme was introduced in the secondary schools of Assam from 1973 were not realized. To test the major hypothesis seven minor hypotheses were formulated and tested.

A survey covering all factors involving the work experience was undertaken. A questionnaire was prepared and circulated to the headmasters/principals of 100 secondary schools. Eighty schools responded. An intensive survey of 24 secondary schools of greater Guwahati as well as of Kamrup district as a whole was made. An interview was conducted on 90 boys and 60 girls of class X. Discussion with the teachers, students, parents/guardians was also held. Teachers were interviewed about the process of evaluation.

The major findings were: 1. One of the important causes of backwardness in work experience was the poor command over basic skills of the subject. 2. Attitudes were directly linked with the achievements. 3. The basic skills could categorically be mastered through the course of self-help as developed during the study. 4. The suggestions made by the authority were not being implemented. 5. The locally available materials that were to be used to mitigate the needs of the students had been neglected totally. 6. This negligence prevented the students from taking interest in the subject. 7. The subject teachers of work experience could not adjust the methods of teaching to the students' needs and individual differences. 8. The non-availability of trained teachers and non-standardization of the tools and plants of work experience in the schools were major blockages in the effective implementation of the programme. 9. The

discrepancy in gradation of marks in accordance with the performance in the subject caused discontent among the students. 10. The schools had adopted both traditional and modern methods in teaching work experience.

673. MISHRA, B.S., *A Study of the Improvement of Population Awareness among the Secondary School Students through a Try-out of Population Education Materials Developed by the SCERT, SCERT, Orissa, 1985*

The objectives of the study were (i) to expose the pupils to the population education materials in classroom situations and to assess their reaction, (ii) to determine the population awareness of the pupils before and after exposure to the materials, (iii) to find out the extent of the improvement of awareness in various content matters and to suggest necessary modifications, and (iv) to study the effectiveness of the presentation of the materials, language, graphical representations, examples, etc. and suggest necessary modifications.

The sample of the study included three urban schools and three rural schools with 120 boys and 80 girls of class IX. A pretest post-test design was used for the study. The investigator made use of population education materials prepared by the SCERT. He exposed the students to the materials through classroom lectures and discussions. The investigator prepared an attitude scale with 16 items as a criterion measure. The test was administered to the students before and after the use of materials. The data were analysed in descriptive form.

The major findings of the study were: 1. There was a significant difference between the achievement of the students in all the criterion areas. Hence it was concluded that the materials developed by the SCERT were effective in increasing the total awareness of the students regarding population problems. 2. It was inferred that population information could be taught at the class IX level. 3. The materials were found effective in all the cases, i.e. urban, rural, boys and girls. 4. A greater range of achievement was found among urban students than among rural students. 5. The boys and girls of rural areas had almost the same achievement. 6. The girls were comparatively shy in their responses in comparison with boys.

674. MOHANTY, J., *A Study of the Knowledge and Reaction of Teachers and Students towards Introduction of Population Education in the Secondary School Curriculum*, SCERT, Orissa, 1986

The objectives of the study were (i) to make an assessment of the existing knowledge of secondary school students and teachers about population education, (ii) to ascertain the reaction of students and teachers towards the introduction of population education, and (iii) to suggest ways and means for making the fundamental concepts clear and the reaction of students and teachers favourable towards population education.

The sample comprised 70 teachers and 260 students of five secondary schools of Puri district of Orissa. Two sets of questionnaires prepared by the investigator were used for data collection. The data were analysed in descriptive form.

The major findings of the study were: 1. The concept of population education was not clear to many teachers and students; however around 20 per cent of teachers and students expressed that population education was related to awareness of population growth. 2. The highest percentage of teachers and students pointed out that population education was related to awareness about population effects and family welfare. 3. A high percentage of teachers (36 per cent) and students (39 per cent) expressed that they had read some publications of the SCERT on population education. 4. Only 17 per cent of teachers had participated in some form of training programme. 5. The majority of teachers (69 per cent) and students (73 per cent) expressed negative responses about their adequacy of knowledge on population education. As high as 64 per cent of teachers pointed out that students should be given adequate knowledge about population education. 6. Teachers (67 per cent) and students (64 per cent) favoured a separate period in a week for population education. They suggested the incorporation of this subject in the syllabus and textbooks. 7. A high percentage of teachers and students suggested the use of TV and experts' lectures for population education. 8. A large number of respondents endorsed the idea of having a handbook of population education. Also, the teachers appreciated the idea of in-service training programmes on population education.

675. NANAVATI, U.R., *To Develop a Learning Package on Population Education and the Study its Effectiveness*, Ph.D. Edu., SGU, 1981

The major objectives were (1) to develop a multi-media

package on population education, and (ii) to find out its effectiveness in terms of achievement.

The investigator selected three schools—one each from a city, a town and a village. The multi-media package was tried on the pupils of Standard IX. In each school two groups matched in terms of age, sex, socio-economic status, previous achievement scores and achievement scores on the special test on population education were formed for experimentation. The multi-media package under reference comprised a tape-recorded dialogue of three experts on population education, work books, three films (Danger Signal, Personal Hygiene, The Boat), and 18 slides, with relevant recorded commentary cassettes.

The major findings of the study were: 1. The results clearly indicated that the learning package was more effective than the traditional method in teaching the content of 'Population Education' to the pupils of Class IX. 2. The gain in respect of the city group was higher than the gain in the remaining two groups. 3. Performance of the town pupils was the lowest amongst the three sub-groups.

The use of learning packages in the teaching-learning process is an innovative strategy. This strategy, if planned effectively, could help in minimizing the expenditure on teaching and optimizing the use of technical expertise as well as human resources, thus resulting in both qualitative and quantitative improvement.

- \*676. PANDE, P., *An Analytical Study and Development of Secondary School Curriculum in Maharashtra*, Ph.D. Edu., Nag. U., 1984

The main objectives of the study were (i) to find out whether the curriculum was rational and/or traditional in scope, (ii) to find out whether the curriculum was of practical utility for the students in particular and society in general, (iii) to find out whether the curriculum was flexible, (iv) to find out whether the curriculum had enough variety to allow for individual differences in terms of abilities, interests and needs, (v) to find out whether the curriculum was integrated at all levels—primary, secondary and university, (vi) to find out whether the curriculum was rich enough to meet the new demands, (vii) to find out whether the curriculum was dominated by a system of examination, (viii) to find out whether the curriculum was able to fulfil the aims of secondary education, (ix) to find out whether the language curriculum built the personality of the students, (x) to find out whether the curriculum of social studies developed democratic citizenship among the

school students, (xi) to find out whether the curriculum of science built up personality, and (xii) to find whether the curriculum of mathematics improved vocational efficiency.

Data were collected by administering an opinionnaire constructed by the researcher to a sample of (i) experts, (ii) heads of secondary schools, (iii) teachers of secondary schools, (iv) guardians and (v) students studying in different faculties of education chosen from all over the state of Maharashtra. It was a normative survey kind of research.

The following were some of the findings: 1. The consensus of the experts, heads of schools, teachers, guardians and students was that the curriculum was rational in scope. 2. More than two-thirds of the members of all the groups thought that the curriculum was traditional. 3. Only half of the persons from all the groups thought that the curriculum was of utility to the students in particular and to society in general. 4. Opinion seemed equally divided on the point that the curriculum had to be flexible. 5. Nearly half of the persons from different categories agreed that the curriculum had enough variety to allow for individual differences in terms of abilities, interests and needs. 6. Half of the total persons, mostly teachers, agreed that the curriculum was integrated at all levels—primary, secondary and university. 7. Experts disagreed with the statement that the present curriculum prepared the pupils for the next stage of education.

677. PARMAR, I.D., *A Criticism of Educational References in Gujarati Social Novels Published during Pre-independence Decade A.D. 1937-47 and Post-independence Decade A.D. 1967-77*, Ph.D. Edu., Sau. U., 1986

The objectives of the study were (i) to compile educational references from selected social novels in the study, (ii) to analyse social references based on their content, (iii) to know the categorywise proportion of educational references and analyse them, (iv) to examine the significance of educational references in the contemporary situation, (v) to compare educational references in social novels of both the decades as far as possible, and (vi) to implicate solutions for the present educational situation in educational references.

The novels were selected from the published social novels written by some selected authors. Only such novelists were selected for the study whose contribution

was considered noteworthy. It was decided not to study more than five novels of any novelist. Fifty novels per decade (100 novels in all) were selected for the study. Six hundred and twenty educational references were compiled from the selected novels. These references were divided into six categories. These categories were education, school, teacher, student, examination and educational administration. References under these categories were also divided into 30 subcategories. These references were analysed and criticized.

The major findings were: (1) Educational references were in more or less proportions in most of the social novels of the decades. (2) The proportion of educational references was more in social novels published in the post-independence decade. (3) Most references in the novels of both the decades concerned the teacher. Teacher-student relationship was narrated much more in the novels of both the decades. (4) Next to teachers, more references were found regarding students. In the novels of both the decades, references regarding student agitations were found to a large extent. (5) Transfer of teachers was narrated more in post-independence novels. (6) In novels of both the decades, the pre-primary stage remained untouched. (7) References in considerable proportion were regarding primary teachers. (8) Relationship with the students of college teachers was described more than for other levels of teachers. (9) Examinations were described more in post-independence decade novels. (10) References were found regarding school inspection and teacher transfers from the novels of the post-independence decade.

\*678. PATADIA, H.J., *A Strategy for Mastery Learning in Fifth-Grade Geometry*, Ph.D. Edu., MSU, 1987

The major objectives of the study were (i) to develop a strategy for mastery learning in geometry for the pupils of the fifth grade, and (ii) to validate the effectiveness of the developed strategy.

This was a developmental study in which an instructional strategy for fifth grade geometry was developed which consisted of the following components in suitable combinations: (1) Introduction, (2) Structured lecture, (3) Discussion session, (4) Problem solving, (5) Mathematical models, (6) Individualized tutorial, (7) PLM, (8) Textbooks and workbooks, (9) Small group study sessions, (10) Mathematical games, (11) Review and Practice, (12) Assignments, (13) Feedback sessions,

(14) Formative and summative tests. The strategy was initially tried out on 110 pupils of the Convent of Jesus and Mary School. The students were divided into two matched groups, viz., experimental and control group on the basis of their intelligence measured by the intelligence test developed by G.B. Shah. The experimental group was taught through the strategy and the control group through the lecture method. The pupils' achievement was measured through criterion achievement tests developed by the investigator. On the basis of the feedback received from the initial try-out, the strategy was modified. The strategy was finally tried out on 94 pupils of the Baroda High School, 51 in the experimental group and 43 in the control group. The pupils' achievement was measured through criterion tests, and reactions of students were obtained through a questionnaire. The data were analysed through statistical techniques such as percentiles, mean, standard deviation, coefficient of correlation and t-test.

The major findings of the study were: 1. The strategy developed worked well as 88.24 per cent pupils of the experimental group scored a minimum of 70 per cent marks. 2. The achievement of the experimental group was found to be significantly higher than that of the control group. 3. Dependence of the achievement of pupils on their I.Q. could be reduced considerably by using the strategy for mastery learning developed by the investigator. 4. The strategy was liked by the pupils and was feasible in the real classroom situation.

679. PAUL CHOUDHURY, R., *Change in the Courses of Studies in Secondary Education of Nagaland*, Ph.D. Edu., Gau.U., 1983

The main aim of the study was to find out the desirable course contents in mathematics for the students of grades V to VIII in Nagaland and to assess how far the course contents under the existing syllabi of Nagaland were effective.

The study was divided into three parts, viz., (i) comparison of objectives of mathematics education in the light of Bloom's taxonomy, (ii) comparison of course contents of various mathematics syllabi, and (iii) evaluation of effectiveness of the mathematics syllabi adopted in Nagaland schools. The final sample (N=2003) was selected from grades V to VIII of ten high schools covering all the seven districts of Nagaland by adopting the stratified random sampling technique. A General Mathematics Assessment Test (GMAT) was construct-

ed and standardized for classes V through VIII separately. Syllabi of mathematics of the north-eastern states, NCERT, Central Schools and School Mathematics Study Group were examined for enabling a comparison of the subject contents. School examination marks were used for computing correlation between the GMAT scores and the school achievements.

The major findings were: 1. The GMAT was reliable and valid. 2. The quantum of the subject matter prescribed in the existing syllabus was too heavy. 3. In as many as five common items of GMAT, the gradient curves of V to VIII were almost horizontal. 4. Bloom's taxonomy omitted the vital ingredient in mathematics education—the development of imaginative understanding. 5. The Central Schools had the most advanced syllabus. The syllabus of the NCERT was superior to all other syllabi of the north-eastern states. Nagaland had very recently adopted the NCERT syllabus, and so it was evident that a wide gap existed between the 'past' and the 'present'. 6. The examination of the effectiveness of the NCERT syllabus in Nagaland schools, which was undertaken through administration of GMAT on a random sample of schools of the state, revealed that the students of classes V to VIII failed to recognize mathematical structures or patterns. Boys performed better than girls but the difference in performance was not always significant. 7. The statements of objectives developed by the NCERT and the north-eastern states of India were in conformity with the goals of mathematics education. But the statements were not supplemented with spelling out of work-activities in order to be really effective. NCERT and the Central Schools had emphasized the structure of mathematics in organizing the subject matter. 8. There was nothing which could be called completely new in new mathematics. There had been a shift of emphasis from manipulation skills to conceptual learnings. 9. The practical values of the outline of contents so prepared were examined and it was found that this formed an essential part of usable mathematics.

The significant educational implication was that the study proposed to bring about a worthwhile change in the course of studies in mathematics for classes V to VIII of the schools in Nagaland.

680. RANDHAWA S.S., *Normative Study of Skills of Soccer Players of High and Higher Secondary Schools of Haryana State*, Ph.D., Phy. Edu., Kur. U., 1984

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

ent level of skills among soccer players of high and higher secondary schools of Haryana state, (ii) to find out differences in soccer skills of school students enjoying facilities and those not enjoying adequate facilities to play the game, (iii) to find out differences in soccer skills of rural and urban students, (iv) to prepare norms for five selected soccer skills for rural students, (v) to prepare norms for five selected soccer skills for urban students, (iv) to establish norms for five skills for students in schools where facilities are available, and (vii) to establish norms for five soccer skills for students in schools where adequate facilities are not available.

A sample of 1100 students was selected by the randomized clustered method from 106 schools of Haryana. The basic unit of sampling was the school. Once a school was selected all soccer players of that school formed the sample of study. These schools were from both rural and urban areas. Some of the schools were from those areas where facilities of playfields, equipment, coaching, etc. were available while in some of the schools these facilities were not available. The sample students were measured for five soccer skills of kicking, dribbling, penalty kicking, trapping and throw-in. These skills were measured through the following tools: (1) kicking was measured by the Warner Test of Soccer Skills (1950); (ii) dribbling was measured with the help of the Warner Test of Soccer Skills (1950); (iii) trapping was measured by the Vanderhoof Soccer Skill Test (1932); (iv) throw-in skill was measured with the help of the Rodger and Heat Skill Test in Soccer (1932). The data so collected were analysed using descriptive statistics and t-test.

The findings of the study were: 1. In case of kicking with the right foot, the scores of the sample were not normally distributed. The range of scores was between 9.20 and 31.82 metres. The players residing in urban areas performed better on this skill than their rural counterparts. The performance of the group of students enjoying adequate facilities was better on this skill than the students who did not have facilities. 2. In case of kicking with the left foot, the scores of the subjects were not normal. The curve was positively skewed and was leptokurtic. The scores ranged between 0.63 and 17.13 metres. The urban group gave a better performance than the group belonging to rural areas. There was a significant difference between the scores on this skill of the groups belonging to facility and non-facility areas. 3. The results for the skill of dribbling showed an uneven distribution of scores. The curve was positively skewed. The scores of most of the students lay between 14.33

and 38.22. A significant difference was found between the means of rural and urban students on this skill. This skill was greater in the rural students than in the urban students. In the facility and non-facility group, the t-ratio was significant in case of the skill of dribbling. It was in favour of the facility group. 4. The distribution of scores on the skill of trapping was not normal. The scores ranged from 0.01 to 11.20. There was a significant difference between the performance of the urban and rural groups on this skill. Similarly the mean scores of the facility group were more than those of the non-facility group. 5. The scores for the skill of throw-in were not normally distributed. The curve was positively skewed and leptokurtic. The range of scores on this skill was between 0.01 and 11.72. There was a significant difference between the mean performance of the rural and urban groups. It was in favour of the rural group. The difference between the mean scores of the facility and non-facility groups was significant at 0.1 level. The difference was in favour of the facility group. 6. The distribution of scores on the skill of penalty kick was not normal, though it had a definite trend towards normality. The range of the scores for the skill of penalty kick was between 1.43 and 11.62. The urban students performed better on this skill than their rural counterparts. Similarly there was a significant difference between the scores of the facility and the non-facility groups. Students belonging to the facility group performed better than those from the non-facility group.

\*681. ROY, J., *A Study of Some of the Correlates of Reading Ability amongst Primary School Children of Delhi*, Ph.D. Psy., JNU, 1987

The objectives of the study were (i) to ascertain the correlates of reading ability, (ii) to ascertain the relationship between reading ability and academic performance, (iii) to ascertain the relationship between reading ability and personality traits, personal attributes and home-background of students, (iv) to ascertain whether reading ability differed in terms of different types of schools, and (v) to ascertain whether improvement in reading ability led to improvement in the academic performance of students.

The study was conducted in two phases. In Phase I, the correlates of reading ability were delineated and in Phase II an attempt was made to ascertain in improvement in reading ability led to improvement in the academic performance of students. A sample of 360 stu-

dents was taken randomly from classes II, III and IV of four different types of schools (public school, missionary school, Navyug school and central school). For Phase II, 45 students of class III studying in the Navyug school were taken with 15 students each (seven with good reading ability and eight with poor reading ability) for the experimental group, control group I, and control group II respectively. The tools used for the two phases of the study were: (i) Reading Ability Test (devised by the researcher), (ii) Intelligence Test (A.N. Mishra, 1971), (iii) Phonic Ability Test (J.M. Hughes 1975), (iv) Personal Attributes Instrument, Home-background Instrument, Personality Traits Instrument (devised by the researcher), and (v) Standard books prescribed by NCERT for reading proficiency. The data were analysed using inter-correlation matrix, stepwise regression analysis, t-test and trend analysis.

The major findings were: 1. Reading ability was influenced by a number of factors such as personality traits, intelligence, phonic ability, reading habits of students, reading interests of students, health of students, availability of reading materials at home, parents' education, parents' occupation and reading habits of parents. 2. Reading ability was positively and significantly correlated with academic performance. 3. Reading ability was a function of the types of school; specifically, mission school students had the highest reading ability scores, followed by students of the public school, Navyug school and central school in that order. 4. Reading ability varied in terms of differential personality traits amongst students. 5. Reading ability of students differed significantly in terms of their personal attributes. 6. Reading ability was positively and significantly correlated with home-background. 7. Reading ability did not differ as a function of sex, except in the case of class II missionary school students, wherein girls had significantly higher reading ability scores than boys. 8. Improvement in reading ability led to better academic performance amongst students.

682. ROY, S.C., *Evolution of Bengali Textbooks*, Ph.D. Bengali, Jad. U., 1975

The objectives of the study were (i) to trace the evolution of Bengali grammar and textbooks, and (ii) to make a comparative analysis of five common Bengali primers of the last 150 years, beginning with Iswar Chandra Vidyasagar's 'Barnaparichay' and ending with Rabindranath Tagore's 'Sahajpath'.

The study was mainly descriptive, library research of different grammars and textbooks of Bengal, past and present. Primary sources, like books on English grammar by Joseph Priestly (1761), Robert Lowth (1762), 'A Grammar of the Bengali Language' by N.B. Halhed (printed at Hooghly in Bengal, 1778), 'A Grammar of the Bengali Language' by W. Carey (1805), Reports of the Bethune Society (1836), Macaulay's Minutes on Education, Report of Calcutta School Book Society (1819), were analysed for making inferences. Much use of secondary sources was not made. The study was divided into two main streams, Bengali grammar and Bengali textbooks, with further subdivision of nine chapters on grammar and ten chapters on textbook.

The major findings were: 1. Bengali grammar as written by Halhed, Rammohan, Brajokishore Gupta and Shyama Charan Sharma could not be 'The' dominant trend in the history of evolution of Bengali grammar. The strong tide of Sanskrit grammar rode over the little influence of English grammar and submerged the nascent stage of Bengali grammar. 2. Analysis of five common primers, viz. Barnaparichay, Balyasiksha, Hasikhushi, Sachitra Barnaparichay and Sahajpath, reveals two distinct phases of development of textbooks (a) 1820-50: the period of the School Book Society with emphasis on spelling and grammar at the cost of literary composition, and (b) 1851-84: the period of children's literature beginning with Modan Mohan Tarakalankar's 'Sishusiksha' and reaching the quality of excellence in Rabindranath Tagore's 'Sahajpath'.

683. SADHLE, D.A., *A Comparative Study of Children's Literature in Hindi and Marathi during Post-Independence Period*, Ph.D. Hindi, Poona U., 1987

The objectives of the study were (i) to trace the development of children's literature in Hindi and Marathi in the post-independence period in the context of political developments, national and international understanding, socio-economic and cultural development, (ii) to recognize and appreciate the works of reputed Hindi writers of children's literature as well as Marathi writers of children's literature, and (iii) to compare the children's literature in both the languages with respect to different kinds of materials produced, their style, application, and language.

The study was conducted on the basis of a survey of available children's literature in Hindi and Marathi lan-



guages, books and articles on the works done by different writers in Hindi and Marathi, and discussions with reputed literary scholars of both the languages. Library survey and discussion approach were used for data collection purposes. Data were analysed qualitatively.

The major findings of the study were: 1. Children's literature in Hindi and Marathi was produced since the beginning of the 19th century. However, it flourished during the post-independence period. 2. A few years immediately after independence a tremendous change was marked in the case of children's literature in Hindi; however, special incentives were provided for the production of Marathi children's literature in the sixties. After the creation of Maharashtra state in 1960, such incentives were encouraged. 3. Varieties of subject areas like the description of nature, play songs, prayers, awareness songs, modern songs, songs regarding birds and animals, rhymes, etc. were incorporated into Hindi and Marathi children's literature. 4. Along with the subject areas, varieties appeared in the languages and style of children's literature. 5. Children's stories were written on various new subjects. Such stories could be classified as related to birds and animals, history, science, adventure, psychology, music, etc. 6. Children's novels could be classified as historical, geographical, adventurous, scientific and detective types. In both Hindi and Marathi literature most of the novels were about adventure. There was less geographical novels in both the languages. 7. Contemporary life styles and problems of social life had significant effects on the language and style of presentation of novels in both the languages. 8. Drama literature was found to have incorporated modern feelings and sentiments. 9. A number of life histories were produced for children's studies in both Hindi and Marathi languages. Much emphasis was not given to books on sports, games, etc. 10. Comics were very popular in Hindi. Comics like 'Amarchitra Katha' and 'Indrajal' have been popular in Hindi and Marathi. 11. Children's magazines like 'Parag', 'Nandan', 'Balbharati' and 'Champak' in Hindi and 'Kishore', 'Anand', 'Gokul', 'Kumar', 'Tarzan' in Marathi were produced in both the languages. 12. Pictorial presentation was popular in children's literature of both Hindi and Marathi languages.

\*684. SAINI, J.K., *A Comparative Study of the Effectiveness of Programmed and Textbook Material Presentation of Sociological Concepts at the Secondary Stage*, Ph.D. Edu., HPU, 1978

The study sought to compare the effectiveness of pro-

grammed learning and the textbook method in the learning of sociological concepts.

The population covered all the students of high classes in English medium schools. A sample of 270 was randomly selected from the Central Schools of Chandigarh for the purpose of the experiment. The study was conducted within the framework of  $2 \times 2 \times 3$  factorial design and the tools used for the study were Linear Programmed Text, Textbook material and Jalota's Intelligence Test. The data were statistically analysed with the help of analysis of variance.

The findings of the study were: 1. The main effect of the factor relating to modes of teaching was found significant at both the levels of confidence, showing that the programmed text was more effective in regard to the learning of sociological concepts than the textbook material. 2. The main effect of sex was not significant at any level, which showed that there was no difference between the attainment of the boys and that of the girls. 3. The differences between the three levels of intelligence were statistically non-significant. 4. There was no significant interaction between the modes of teaching and the sex. This implied that boys and girls would have the same performance whatever the mode of teaching. 5. The modes of teaching had no significant effect on the performance of the students at all levels of intelligence. 6. The difference in the performance of boys and girls was independent of intelligence. 7. The mode of teaching, sex and intelligence taken together did not interact with each other. It could be said that the mode of teaching was independent of the factors of sex and intelligence.

685. SINDHE, A.S.R., *An Investigation into the Problems Associated with the Implementation of Socially Useful Productive Work*, Ph.D. Edu., Mys. U., 1985

The major objectives of the study were (i) to make a conceptual analysis of SUPW clarifying its meaning, scope, and its place in the programme of general education, (ii) to analyse the psycho-sociological problems involved in the selection, planning and preparation of SUPW programmes in schools, (iii) to assess the problems involved in the implementation of the SUPW programme, and (iv) to examine the issue of the place and mode of evaluation of SUPW in the total assessment system of the school.

The case study method was adopted for this inquiry.

The sample included 340 students, 30 teachers, nine administrators and 100 parents and members of the locality—all belonging to and connected with four willing schools selected for the study. The study extended over a period of 30 months from November 1979 to April 1982. Forty different activities suggested by educational authorities including NCERT were studied. The tool used was an opinionnaire covering the main aspects of SUPW like its objectives, administrative and organizational, psychological, sociological and economic factors. Records of the programme of activities, observations and pupils' reactions were maintained. A tape recorder was used to record discussions, decisions, etc.

The major findings were: 1. SUPW should essentially be an educative experience. It should be an extension, enrichment or deepening of the academic learning of the student. This necessitates integrating the SUPW activities effectively with different disciplines taught in the school. It should entail manual work on the part of students and result in the production of some tangible, consumable article or service useful to the society. With all its importance in the scheme of education, it should not be treated either as the core of the curriculum or as a distinct academic subject. 2. The problems involved in the planning and preparation of SUPW activities were centred round motivation, selection and organization. The problem of motivating students, teachers and parents was found to arise from lack of clear conception of SUPW. Lack of resources, cost involved and lack of guidelines for the teachers were the major problems in the selection of activities. Lack of training and absence of knowledge of 'know-how' were problems connected with the organization and coordination of various activities. 3. The problems in the implementation of the programme were the large number of students in the classes, teachers' lack of ability to integrate the subjects with SUPW, doubts about SUPW likely to hinder academic learning, a tendency to equate SUPW to child labour, apathy of the community towards school activities and non-availability of funds. The conditions favouring SUPW were children's natural love for activities and group work, their enthusiasm for service and desire for social involvement. 4. The major problems in evaluating SUPW were difficulty in making assessment comprehensive and objective, and predominance of the examination system for promotion.

The major educational implications of the study are: (1) the necessity of building the leadership role of headmasters, district education officers and state level au-

thorities for planning and implementing the programme of SUPW through developing conviction about its academic utility among teachers, students and parents, (2) special orientation of teachers for a smooth and successful implementation of the programme, and (3) convincing the community about the academic value of the programme and securing its active involvement.

\*686. SINHA, S.K., *Impact of Physical Education in the Development of Leadership Qualities and Academic Pursuits among School Students*, D. Litt, Edu., Ran. U., 1981

The main purpose of the research was to study the impact of training in N.C.C. and N.F.C. and participation in sports and games in the development of leadership qualities and academic pursuits among school students.

A random sample of 900 class IX, X and XI students undergoing training in N.C.C., N.F.C. and sports and games and also other students was selected from Patna. In each class two groups (A and B) were formed. Group A included 50 N.C.C., 50 N.F.C. and 50 sportsmen and Group B included 150 students who were not undergoing any training. All of them were males, comparable in respect of age, school, class, intelligence, SES and marks obtained in the preceding two school annual examinations. Five dimensions of leadership (ability to plan, dependability, industriousness, initiative and self-confidence) were selected. The Graphic Rating Method was adopted and those who secured high scores were given Cassel's Leadership Ability Evaluation Inventory. The results of ratings by raters ( $N = 107$ ) were cross-checked in all possible available avenues. To test the objectivity of school marks, NCERT's Sequential Tests of Achievement in Mathematics were applied. Chi-square, t-test, analysis of variance, etc. were employed. Factor analysis was also used.

The major findings were: 1. There was a positive relationship between training and development of leadership qualities among school students. 2. Scores on leadership of Group A students improved more rapidly with the passage of time in comparison to those who were not receiving such training. 3. On completion of training, students were rated slightly superior to their counterparts on each dimension of leadership by both student and teacher raters. 4. Five dimensions of leadership were related to each other and measured different characteristics of leadership. 5. Training did not interfere

with academic achievement. 6. Academic subjects were related to each other. 7. Training given in N.C.C. or N.F.C. or sports and games helped to develop leadership qualities in school students and it did not interfere with academic achievement.

- \*687. VARADARAJAN, K., *Action Research to Improve the Interest of Polytechnic Students in Co-curricular Activities*, TTTI, Madras, 1987

This study attempted to identify the causes for the poor interest in co-curricular activities in students.

Data were gathered from 70 students randomly selected from among those who underwent Diploma courses in different branches of engineering in the Government Polytechnic, Vennikulam (Kerala). A check list containing 44 items was prepared and their views obtained.

The major findings were: 1. The educational level of the parents was not very high. 2. Most of the parents depended on agriculture, some carried on business and only a few of them were employed. 3. Most of the students did not have any members in their family to provide motivation. 4. The indoor game facilities available in the institutions were significantly poor. 5. Enough lodging facilities were not available in the vicinity of institutions. As such the students wasted their time in commuting to and from the institution. 6. Students' poor financial conditions did not permit them to think of involving themselves in any other activities.

688. VASANTHA, L., *A Comparative Analysis of Music Education with its Implication for Improved Music Education in India*, Ph.D. Edu., Ker. U. 1985

The main objectives were (i) to spell out the concept of music education as relevant in the modern context, (ii) to analyse the philosophy, the aims and specific objectives of music education in different cultures, (iii) to identify the dominant features of music education in the social context, particularly those relating to social philosophy, and to study the way in which this philosophy influenced the theory and practices of music education in a culture, (iv) to analyse the integrative and interdisciplinary approaches to music education, and (v) to inquire into the practice of nurturing of musicians in certain families and gharanas.

Textual analysis supplemented by analysis of record-

ed and broadcast materials were the techniques employed. Musicological analysis and survey were also carried out. Structured and unstructured interviews were held with about 40 music experts, 50 education officers, 500 school teachers, and a large group of students. Ten western schools and 12 professional music schools in South India and 100 general schools in which music was being taught were observed by the investigator to identify the normal conditions.

The main conclusions were: 1. The major characteristics of the developed systems of music education were that music was an important integrated part of the curriculum. It was a way of 'educating a human being'. If the right conditions were provided, everyone could reach a basic level of music competency. 2. The curriculum and methods were varied and comprehensive as well, integrating practice and theory, taking off from natural singing and natural rhythms to the deepest complexities to make the child develop a sense of critical appreciation and evaluation of even the great composers like Bach and Beethoven. 3. The materials for different components like listening, singing, reading, creativity, rhythm and movement, and voice culture were all carefully planned and presented to children for their practice, experience and discovering those phases to which they responded most readily and which might become their own happiest self-expression. 4. Music education was essential for national awareness and integration and for international understanding. 5. In contrast to these features of the developed system of music education, the state of music education in Indian (general) schools did not reveal even an awareness of such progressive steps. 6. Some specific drawbacks noticed in Indian (general) schools were: (a) lack of recognition of music as a part of the curriculum and a meagre allotment of time which too often got diverted to other subjects; (b) non-appointment of music teachers even when there was provision; (c) choosing a select group of pupils for music competitions, performances, etc.; (d) an almost total neglect of whole group-training even in simple and essential objectives like singing the National Anthem with joy and in perfect unison. 7. In the professional schools, teaching of classical music was done, but only with a limited repertoire losing many of the benefits of the Gurukula System and not building on the best institutional practices known from abroad. Since listening and critical-appreciation training were not given sufficient importance, many students were not able even to identify *ragas* which they were not taught to sing under the prescribed syllabus. 8. Apart from the mo-

ern developments in music education not reaching the Indian school system in practice, most of the music teachers and others engaged in any other organized music education in India did not believe that it was either possible or necessary to introduce all the modern revolutionary methods of music education known from other parts of the world.

689. VEERASWAMI, B.M., *The Effect of Play Festival Programme on Elementary School Children*, Ph.D., Edu., Poona U., 1985

The purpose of this study was to examine the effects of play festival activities on physical fitness, academic achievement, rhythmic sense, and personal and social traits of children studying in the elementary schools. The major hypotheses of the study were: (1) Participation in play festival does increase the physical fitness of children. (2) Participation in play festival does increase the academic achievement of children. (3) Participation in play festival does increase the rhythmic sense of children. (4) Participation in play festival does increase the awareness and observance of desirable personal and social traits.

The study was divided into two phases—survey and experimentation. The sample of the survey included 500 fifth grade children from 13 participating schools and 500 fifth grade children from 13 non-participating schools of Tamil Nadu. The participating schools were those who had participated in the play festival programmes in the two previous years of the conduct of the study. The tools used for data collection were: North Carolina Physical Fitness Battery, 1971, school quarterly tests on Tamil, English, mathematics, science, history and geography, Rating scale for measuring rhythmic sense, and an Inventory of measuring the awareness and observance of desirable personal and social traits. The investigator had prepared the tools for measurement of rhythmic sense and measurement of personal and social traits. For experimentation, a randomized design was used. The subjects were selected by random sample, 50 boys and 50 girls from the participating schools and an equal member of boys and girls from the non-participating schools. The subjects were administered the tests prior to and after a play festival project conducted for eight weeks. The t-test and F-test were used for analysis of data.

The results of the survey were: 1. Improvement was found in all the components of physical fitness in both boys and girls of participating groups while this

improvement was greater in boys than in girls. 2. Participation improved academic achievement in both and girls. 3. Participation brought significant improvement in the rhythmic factor. 4. This improvement in case of girls was greater than that of boys. 5. As a result of participation the boys and girls improved in social qualities. 6. Girls showed greater improvement than boys in the social traits. 7. Girls achieved better traits than the boys with regard to leadership, self-control and social norms through their participation in play festivals.

The results of the experimental study revealed: Exposure to three consecutive annual play festivals brought better progress among the participants with regard to physical fitness, rhythmic sense, academic achievement, social and personal traits, than in those children who participated in the play festival of one year.

690. VERMA, A., SARASWATHI, T.S., *The Child Development Curriculum and its Relevance to Job Competencies Expected in the Field*, Dept. of Child Development, MSU, 1983 (ICSSR financed)

The main objectives of the study were (i) to identify the nature of jobs taken up by the alumni of the Department of Child Development, M.S. University, Baroda and the competencies required in the jobs, (ii) to evaluate the extent to which the curriculum of the department had helped the alumni in developing these competencies, and (iii) to make necessary modifications in the curriculum with a view to increasing its relevance in the light of competencies expected in the field.

Six hundred and three (603) alumni were identified from the enrolment registers since 1950, and of these, the addresses of 440 alumni were procured. The number of alumni who responded to the initial questionnaire was 197. Based on the information received from these alumni, as well as from additional contact addresses obtained from them, 215 alumni who had been employed at some period or the other after graduation, were contacted through a second questionnaire. Of these, 107 responded. A sample of 41 experts in the field of child development and related disciplines and employers of child development workers were interviewed regarding the child development training programme from Baroda, Ahmedabad, Bombay, Poona, New Delhi, Udaipur, Madras, Bangalore and Mysore. The research tools used were (i) a semi-structured questionnaire to obtain preliminary background information from the alumni, as well as some generic feedback on

the curriculum and the alumnis' professional experience, (ii) a structured questionnaire on competencies required for various job positions and to seek recommendations for improving the curriculum, and (iii) an unstructured open-ended interview schedule for the experts and employers to seek information on jobs held by child development workers, responsibilities associated with these jobs and competencies required to fulfil these responsibilities, gaps in the training, need for para-professional child development workers and related information. Data were analysed separately both quantitatively and qualitatively. Percentages were calculated.

The major findings were: 1. A majority of child development graduates had taken to university and school teaching, some (10 per cent) master students assumed administrative positions. Nearly 25 per cent of the B.Sc., and 10 per cent of the postgraduate students obtained further qualifications and entered the professions in welfare programmes and clinical settings. Some 10 per cent of the postgraduates became full-time research workers. 2. Areas of knowledge considered important in the field and which received highest emphasis were knowledge of human relations and behaviour, physical growth and development, environmental factors affecting development, characteristics of various age groups, individual differences, and parent and community education. 3. A knowledge of case-work techniques including individual approach, group work and guidance and counselling was emphasized by all except research workers. 4. Knowledge in selected areas received emphasis only from those who held specific job positions which included the knowledge of family and society, knowledge of early childhood education, knowledge of special education, etc. 5. Abilities emphasized in the area of cognitive competence by the majority of the respondents included long range vision, clarity of thought, creative thinking, proper perspective, and ability to integrate, interpret and utilize necessary information, whereas abilities emphasized in the area of social competence included group work related competencies, competencies related to working with individuals, ability to handle emergencies, and to maintain and promote professional ethics. 6. Skills emphasized by a large majority included those involved in working with others, such as building rapport, being observant, getting along with and relating to children, adults, colleagues and the management, as well as communication skills. 7. Skills in interviewing were considered important only by research workers and social-workers; skills in guidance and

counselling were considered important by a majority of university and school teachers, and social workers, but were not considered important by the research workers. 8. Personal qualities considered important by all categories of employees, included open-mindedness, alertness, imagination, intelligence, flexibility perceptibility, perseverance, creativity, good memory, objectivity, sensitivity, tolerance and patience, understanding, integrity, confidentiality, sincerity, involvement and interest, a sense of professional ethics and analytical thinking. 9. Experts and employers suggested an urgent need to include courses related to child health and nutrition, infancy, special education for the handicapped and exceptional children, and psychological measurement. 10. In terms of practical training, it was felt that there was a need for exposing the trainees to varied and intensive field experiences especially with the underprivileged urban, tribal and rural population, and for adopting a work approach. 11. In order to make the curriculum more meaningful the content should be made more culturally relevant to the Indian situation and alumni experience be used as a feedback loop.

691. VERMA, U., *Physical Education in Madhya Pradesh—A Critical Study in the Context of Higher Secondary Schools*, Ph.D. Edu., RDVV, 1984

The major objective of the study was to know the existing state of affairs with respect to physical education in the state of Madhya Pradesh.

This was a survey study where the sample was limited to those higher secondary schools of Madhya Pradesh which had classes from VI through XI. In this way 2145 schools of Madhya Pradesh were supplied the questionnaires to obtain the relevant information. These questionnaires were of three types: (A) For the principals of the schools, (B) for the sports-in-charge of the schools, and (C) for the students who were selected for the national competition. Apart from these, information was collected from sports specialists, officers of the sports selection committees, sports activists, activists of the sports organizations, etc. The contents of the questionnaires were divided into five parts, viz., (a) information pertaining to school campus, (b) information related to physical education and training, (c) facilities for physical education and training, (d) competitions, and (e) major problems in the school. Of the 2145 schools, 1164 schools returned the questionnaires, duly filled, to the investigator. The collected data were analysed by co

puting the percentages, means, frequency distribution, etc.

The analysis of data revealed: 1. About 63.5 per cent of the students were being taught with inadequate furniture facilities. In more than 34 per cent of the schools there was no facility for pure drinking water, and in more than 28 per cent of the schools there was no toilet facilities. 2. Only 31 per cent of the schools had sufficient playground facility. In 35 per cent schools it was insufficient and in 34 per cent of the schools there were no playgrounds at all. In 51 per cent of the schools there were no entertainment rooms and 38 per cent of the total schools were without electricity. 3. Only 29 per cent of the schools had adequate ratio in respect of physical education teachers and students, whereas, in the rest of the schools, this ratio was not maintained. 4. Even in the schools where physical education teachers were present they were not adequately qualified. Of the physical education teachers, 36 per cent were matriculates, 29 per cent were graduates and 35 per cent were postgraduates. Only 15 teachers were trained physical instructors (B.F.Ed.) and 230 were C.P.Ed. Only 20 teachers had taken training in special sports (coach) at N.I.S. 5. Most of the physical education teachers were devoting their time to activities which had little to do with physical education. About 62 per cent of them were assigned the teaching of other subjects also and 20 per cent of them had to do office work also. 6. The role played by physical education teachers in the sports organization of their city was negligible. 7. Physical education teachers were discontented on account of inadequate salaries and allowances, lack of opportunity for work, lack of opportunity for promotion, favouritism, and lack of facilities. 8. Only 9 per cent of the schools had periods for physical education in their school curriculum. 9. Only 34 per cent of the students were found to take part in the physical education programme. 10. Only 21 per cent of the total schools had sufficient support material (sports goods) and only 6 per cent of the schools had facility for first aid. (11) Most of the principals (98 per cent) were of the opinion that there should be proper evaluation of physical education activities, whereas 2 per cent were not in favour of this evaluation. 12. Only 40 per cent of the schools had provisions for annual sports. 13. Major problems which were felt as crucial to physical education by the respondents were related mainly to lack of funds, lack of playground and sports material facilities, over-crowdedness in the classes, lack of interest on the part of students, lack of cooperation from other teachers, lack

of proper guidance and lack of time.

692. VIJAI VARGIYA, D.P., *A Survey of Work Experience Activity in the Schools of Rajasthan*, SIERT, Rajasthan, 1969

The aims of the project were (i) to study three aspects of work experience, viz., activities, their financial management and future programmes, (ii) to identify the problems in organizing this activity and (iii) to find its impact on academic, co-curricular and other activities.

The sample consisted of all the 90 schools of Rajasthan where work experience activities were being organized. A questionnaire and an observation schedule were used. The statistical devices used for data analysis were mean and percentage.

The main findings were: 1. Out of 90 schools, 56 schools started work experience activity in the year 1967-68. Nineteen different activities were provided to which 23 new ones were added in 1968-69. In this year the number of boys' schools which took up this activity increased from 19 to 39 (73 per cent) and those for girls from 17 to 64 (31.5 per cent). The schools where craft was being taught, introduced work experience. The new activities introduced were cane work, radio, repairing, photography, glass polishing, making holdalls, etc. 2. The time of work experience activities was set keeping in view the convenience of the teachers and the students. 3. Help was sought from other agencies and individuals also. 4. The expenses were met from boys' funds or the students were asked to bring the materials from their homes. 5. About 9.52 per cent students returned 75 per cent to 100 per cent of the loan taken on interest but 11.90 per cent did not return the amount. 6. More profit was earned on the readymade articles. The average gain per student was Rs.10.96. 7. The maximum profit was Rs.87.10 and the minimum 00.45 paise. The profit was used in buying uniforms and books for the students. 8. After the introduction of this activity, better results were obtained in curricular and co-curricular activities. 9. Some of the main problems in selling the products were rise in cost due to the rising cost of raw materials, scarcity of water for agriculture and wastage of raw materials.

#### ALSO SEE

809. AGNIHOTRI, S.K., *Study of Influence of some of the Methods of Teaching Physics on the Achieve-*

- ment in Physics of X Class Students in Delhi*, Ph.D. Edu., Del. U., 1987
- ANOWARUL AZIZ, *A Study of Science Education Programme in the Secondary Schools of Bangladesh*, Ph.D. Edu., MSU, 1984
228. ARAM, S.A., *A Comparative Study of Mathematics Education in People's Democratic Republic of Yemen (PDRY) and India*, Ph.D. Edu., Del. U., 1986
812. ARORA, S.K., *Validation of a Science Education Curriculum to Develop Instructional Competence at the B.Ed. Level*, Ph.D. Edu., Kur., U., 1986
813. BAJRACHARYA, R.K., *Study of Science Education in the Secondary Schools of Nepal with a view to Evolve a Functional Model for Improving the Science Education*, Ph.D. Edu., Del. U., 1986
1213. BAVAKUTTY, M., *A Critical Study of the Organization and Utilization of Libraries in Higher Secondary Educational Institutions in Kerala*, Ph.D. Edu., Ker. U., 1984
1178. BHALWANKAR, A.G., *A Study of Effects of Expository and Guided Discovery Methods of Teaching Mathematics on the Achievements of Students of Different Levels of Intelligence*, Ph.D. Edu., Poona U., 1983
771. BHANDARKAR, K.M., *A Study of Population Education Knowledge and Attitudes of Secondary School Students and Teachers*, Ph.D. Edu., Bhopal U., 1983
786. BHAT, N.R., *To Formulate Objectives and Select Content for a Core Curriculum in Mathematics for Technicians*, Ph.D. Edu., SGU, 1984
696. BHATT, D.C., *An Investigation into the Various Components of Textbooks in English in Standards XI and XII of Gujarat State*, Ph.D. Edu. SPU, 1986
772. BHATTACHARYA, G.C., *Effectiveness of Various Models for Teaching Geography in Relation to Institutional Resources*, Ph.D. Edu., BHU, 1984
818. BHATTACHARYA, P., *A Critical Study of Science Education in Assam and Meghalaya Schools*, Ph.D. Edu., Gau. U., 1979
1443. BISWAS, N.B., *A Study of the Curriculum for Primary Education in Bangladesh*, Ph.D. Edu., MSU, 1986
819. BRACHADEESWARAN, D., *An Analysis of the Effectiveness of Chemistry Curriculum of the Polytechnics*, Ph.D. Edu., Kar. U., 1986
698. BRAHMBHATT, J.C., *A Study of Preparation of Language Programme in English for Pupils of Class VIII and its Effect on Achievement in relation to some Psycho-Socio Factors*, Ph.D. Edu., SPU, 1983
788. CHITKARA, M., *To Study the Effectiveness of Different Strategies of Teaching on Achievement in Mathematics in Relation to Intelligence, Sex and Personality*, Ph.D. Edu., Pan U., 1985
789. CHITRIV, U.G., *Evaluation of Differential Effectiveness of Ausubel and Bruner Strategies for Acquisition of Concepts in Mathematics*, Ph.D. Edu., Nag., U., 1983
1449. DAVE, P.N., and Others, *Pupil Achievement at the Primary Stage*, Dept. of Pre-School and Elementary Education, NCERT, 1988
1220. DAVE, S.K., *An Investigation into the New Dimensions of Basic Education*, Ph.D. Edu., Guj. U., 1980
822. DESAI, SHANTADEVI, S., *A Critical Study of Science Teaching Programme at Middle School Level in Karnataka State*, Ph.D. Edu., Kar. U., 1986
773. DASGUPTA, D., *Teaching School Economics by the Personalized System of Instruction (PSI): An Experimental Study*, Ph.D. Edu., Cal. U., 1987
1488. DESHAMUKHYA, M.L., *Vocationalization of Secondary Curriculum in Assam*, Ph.D. Edu., Gau. U., 1984
1489. DESHPANDE, K.S., *Job Oriented and Reconstructed Courses at the Degree Level in Marathwada University -- A Case Study Report prepared for the Project, 'A Study of Regional Imbalance in Vocational Education and Manpower Planning in Marathwada'*, Swami Ramanand Teerth Research Institute, Aurangabad, 1985
791. DORASAMI, K., *Development of a Competency-Based Curriculum Design for Methodology of Teaching Mathematics and its Validation*, Ph.D. Edu., Mys. U., 1986
233. ESHAN, MD. A., *An Evaluative Study of the Environmental Education Programme in the Primary Schools of Bangladesh*, Ph.D. Edu., Del. U., 1985
825. GANGOLI, S.G., and GURUMURTHY, C., *A Comparative Study of the Effectiveness of Open-ended Approach of Doing Physics Experiments versus Traditional Approach at Higher Secondary Stage*, RCE, Mysore, 1985 (NCERT financed)
879. GOMATHI, S. *A Critical Study of the Participants' Evaluation of Selected Postgraduate Courses*

- es of Correspondence Education Programme of the Madurai Kamraj University, Ph.D. Adult and Continuing Education, Madras U., 1982*
829. GOYAL K.M., *A Comparative Study of Summative Evaluation of Science Curriculum: Board of Secondary Education, Rajasthan and Central Board of Secondary Education, Ph.D. Edu., Raj. U., 1982*
774. GUPTA, B.P., *A Critical Study of the Social Studies Curriculum with Special Reference to Secondary Stage in Himachal Pradesh, Ph.D. Edu., HPU, 1983*
775. INGOLE, R.N., *A Critical Study of the Present Position of Teaching History in Secondary Schools of Solapur District, Ph.D. Edu., Shi U., 1985*
716. JAIN, N., *Determination of Communicability in the New Delhi Poetry from the Point of View of its Teaching in the Upper Secondary Schools of Rajasthan, Delhi U., 1981 (NCERT financed)*
776. JANI, J.I., *A Study of the Present Position of Teaching of Geography in the Secondary Schools of Gujarat, Ph.D. Edu., SPU, 1987*
1545. JOSHI D.C., JOSHI, S.D., JOSHI, S.M., and PATANKAR, S.D., *A Study of the Classroom Climate and Methods of Teaching adopted by Indian Universities, MSU, 1984 (UGC financed)*
1612. KALDATE, S., *Survey of the Provision, Administration and Effective Utilization of Facilities such as Textbooks, Libraries, Living Accommodation, Meals, Health Services available to Students of Scheduled Caste in Aurangabad Distirct, IIE, 1985*
65. KANWAL, S.C., *A Critical Study of the Trends in Physical Education and Sports in India since 1947 with special reference to Punjab, Ph.D. Psy., Edu., Punjabi U., 1985*
1184. KATHURIA, R.P., *The Effect of Teacher Led, Self Learning, Peer Group Discussion and Mass Media Approaches of Teaching Population Education to Classes IX and X on Knowledge, Attitudes and Beliefs of the Students about Population Explosion in India, M.P. Field Office of NCERT, 1983*
722. KAZI, S.A., *The Critical Study of Development of Urdu Curriculum at Secondary Education in Maharashtra, Ph.D. Edu., Nag. U., 1986*
833. KHALWANIA, N.S., *Effectiveness of Concept Based Science Curriculum in Developing Cognitive Structures and Acquisition of Process Skills among High School Students, Ph.D. Edu., Pan. U., 1986*
725. KHARE, M., *A Comparative Study of Traditional and Structural Approaches to Teaching of English with Reference to their Learning Outcomes, Ph.D. Edu., Garh. U., 1986*
726. KOUL, B.N., *A Critical Study of the Fundamental Curricular Issues Relevent to the Teaching of English in India Leading to an Alternative Integrated ELT Curriculum, Ph.D. ELT, CIEFL, 1981*
796. KRISHNA KUMARI, et al., *An Investigation into the Use of Mathematics Textbook (Class II) as a Tool of Teaching, SCERT, Haryana, 1980*
834. KRISHNAN, K., *A Critical Comapartive Study of the Secondary School Science Curricula of Kerala and Tamil Nadu, Ph.D. Edu., Ker. U., 1981*
1235. KUDESIA, U.C., *Utilization of time in Different Activities by Faculty of Government Polytechnic, Panaji, Goa, TTTI, 1986*
727. KUDESIA, U.C., *A Study of the Teaching Aspects as Viewed by the Polytechnic Teachers of Induction Programme (12.11.85 to 13.12.85), TTTI, Bhopal 1986*
835. LAMBHATE, M.V., *Development of Instructional Material for Teachers Teaching Science to Class VI in Rural Areas of M.P., Ph.D. Edu., DAVV, 1987*
241. MD. ANOWARUL AZIZ, *A Study of Science Education Programme in the Secondary Schools of Bangladesh, Ph.D. Edu., MSU, 1984*
244. MIAN, M.A., *Developing a Programme of Curricular Content and Methodology in the Areas of Science and Agriculture Science for Teachers Training Colleges of Bangladesh, Ph.D. Edu., Del. U., 1983*
245. MIYAN, MD. S.H., *A Study of Commercial Education in Bangladesh, Ph.D. Edu., MSU, 1986*
798. MONDKAR, S.M., *Factor Analysis of some Tests in Number Systems in the Mathematics Syllabus Prescribed from June 1972 for Standard VIII in the State of Maharashtra, Ph.D. Edu., Bom. U., 1984*
839. MUKHOPADHYAY, B., *The Relationship between Comprehensibility of Language Used in the Science Textbook and Science Achievement in Terms of Learning Objectives at Primary Level in the State of Rajasthan, Ph.D. Edu., Mee. U., 1983*



777. MUTHAPPAN, A., *A Study of the History Curriculum in Schools in Tamil Nadu since Independence*, Ph.D. Edu., Anna U., 1986
778. PATEL, A.M. *A Study of the Present Position of Teaching History in the Secondary Schools of Gujarat State*, Ph.D. Edu., SPU, 1984
779. PATIL, T.B., *An Inquiry into the Present Position and Problems of Teaching Geography in the Rural Secondary Schools of Solapur District*, Ph.D. Edu., Shi. U., 1985
1561. PATTED, G.M., *Lecture Pattern of College Teaching—A Study in College Teaching*, Kar. U., 1984
738. PILLAI, S.S., *A Study of English Needs of Polytechnic Students*, Ph.D. Edu., SGU, 1984
780. PONKSHE, D.B., *To Enlist and Analyse the Concepts in Geography Covering the Syllabi for Standards VII, VIII & IX of Secondary Schools of Maharashtra State and to Develop Methodology of Teaching Concepts in Geography Effectively*, Ph.D. Edu., Poona U., 1983
1566. PRASAD RAO, YFW, *Factors that Make a Lecture Effective at College Level*, Ph.D. Edu., MSU, 1984
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
844. RAMESH, *Development of Objective Based Science Curriculum and to Study its Efficacy in the Acquisition of Process Skills among High School Science Students*, Ph.D. Edu., Pan U., 1984
800. RAO, RAGHAVENDRA, A.V., *An Investigation into the Relative Effectiveness of Guided Discovery and Expository Approaches of Teaching Mathematics*, Ph.D. Edu., And U., 1986
742. RAO, SRINIVAS, R., *Nature and Incidence of Reading Disability among School Children*, SVU, 1986 (NCERT financed)
801. RAO, T.G., *A Comparative Study of Programmed Learning and Conventional Learning Methods in the Instruction of Mathematics—A Psychological Approach*, Ph.D. Edu., Osm. U., 1983
263. ROY, S., *A Critical Evaluation of the High School General Science Textbooks in Bangladesh*, Ph.D. Edu., MSU, 1988
746. SARASWATHI, V., *Towards a Communicative Course Design in EOP: A Study in Applied Linguistics*, Ph.D. Linguistics & Phonetics, CIEFL, 1982
781. SATTARSHAKWALA, H.G., *Trying out a Strategy of Bringing about Attitudinal Changes in the Context of Population Education*, Ph.D. Edu., SGU, 1981
852. SHARMA, H.L., *A Critical Study of the Development of School Science Education in India from 1947 to 1977*, Ph.D. Edu., JMI, 1984
749. SHARMA, I.S. *A Study in the Comprehensibility of Language Used in Science, Social Science and Language Textbooks at Primary Level*, NCERT, 1985 (ERIC financed)
750. SHARMA, O.P., *An Experimental Comparison of Effectiveness of Individual Group Correction of Written Work in English in Classes VII and IX*, Ph.D. Edu. Kur., U., 1982
756. SHARMA, R.K., *A Study of the Problems of Teaching English in Bihar*, Ph.D. Eng., Bhagalpur U., 1986
850. SCERT (Andhra Pradesh), *Evaluation Study of Textbooks in Environmental Studies of Classes III and V Based on Revised Curriculum in Science*, 1980
783. SCERT (Maharashtra), *An Evaluation to the Teaching Learning of Population Education, National Population Education Project*, Pune, 1986
1478. SIERT (Rajasthan), *Primary Education Curriculum Renewal Project in Bagadia Phalan (Banswara)—A Case Study*, 1982
1479. SIERT (Rajasthan), *Primary Education Curriculum (Dungra Chotta) Rajasthan*, 1982
571. SINGH, B.D., *A Study of the Effect of a Specially Designed Teaching Strategy and Some Socio-psychological Factors on Creativity among Middle School Children*, Ph.D. Edu., Avadh U., 1985
1197. SINGH, H., *Effective Teaching Strategies Used for Preparing for Examinations as Perceived by Students*, Ph.D. Edu., Mee. U., 1986
755. SINGH, M.A., *A Critical Evaluation of Nationalized English Textbooks for Classes VI to X of Haryana*, Ph.D. Edu., Kur. U., 1984
1198. SINGH, O., *Effects of Mastery Learning Strategies on Certain Non-cognitive Variables of High School Students*, Ph.D. Edu., HPU, 1983
856. SINGH, SURENDRA PRATAP, *A Study of Courses, Their Objectives and Methods of Teaching Followed at Undergraduate Level in Biological Sciences*, Ph.D. Edu. BHU, 1985
758. SKANTHAKUMARI S.K., *Development of Strategies for Improvement of Reading Skills in English at Middle School Level*, Ph.D. Edu., Madras U., 1987

759. SOUMINI, P., *A Course Design Based on Communicative Approach for English Language Teaching in Regional Medium High Schools*, Ph.D. Edu., And. U., 1984
764. THARWANI, T.C., *A Critical Study of the Prescribed Textbooks in Hindi Lower Level from Standard V to X in Maharashtra State with a View to Their Improvement*, Ph.D. Edu., Bom. U., 1982
1579. THOTTAM, GEORGE, *An Evaluation of the System of Mass Communication Education in Indian Universities with a View to Propose a Four-Tier Infrastructure*, Ph.D. Edu., Bom. U., 1983
861. VARDHINI, V.P., *Development of a Multimedia Instructional Strategy for Teaching Science (Physics and Chemistry) at Secondary Level*, Ph.D. Edu., MSU, 1983
769. VIMALADEVI, P., *Strategies for Developing Critical Reading Abilities in Higher Secondary Students in English*, Ph.D. Edu., Madras, U., 1986
612. VYAS, B.C., *Study of Utilization of Library for Promoting Proper Reading Habits amongst the Students of Higher Secondary Classes*, SIERT, Rajasthan, 1969
807. VYAS, C.S., *Development of Symbol Picture Logic Programme and to Study its Effect on Mathematics Achievement—A System Approach*, Ph.D. Edu., SPU, 1983
1505. WAKADE, S., and DESHMUKH, P., *Legal Education in Marathwada—A Case Study Prepared for the Project, 'A Study of Regional Imbalance in Vocational Education and Manpower Planning in Marathwada'*, Swamy Ramanand Teerth Institute, Aurangabad, 1985
770. WALIA, A., *An Evaluative Study of English at the Secondary Level in Rajasthan*, Ph.D. Eng., Raj. U., 1981
1204. YADAV, P.S., *Effect of Mastery Learning Strategy on Pupils' Achievement in Mathematics, Their Self-concept and Attitude towards Mathematics*, Ph.D. Edu., Kur. U., 1984