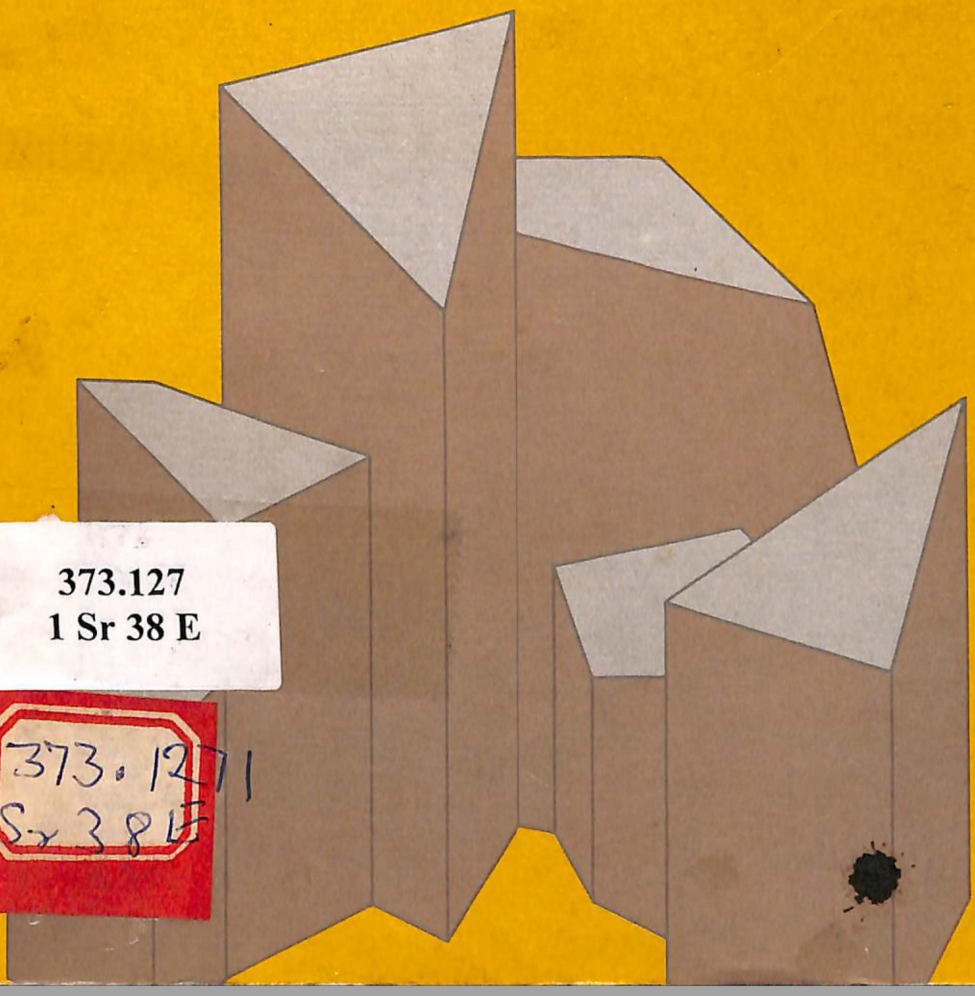
International Bureau of Education

Experiments and innovations in education 41
Asian series

Examination reforms in India

H. S. Srivastava

A study prepared for the International Educational Reporting Service



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* Asian series

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Preface

This is one of five case studies commissioned by Unesco's Regional Office for Education in Asia (Bangkok). The other four concerned Malaysia, the Philippines, the Republic of Korea and Thailand. The study of examination reform in India was considered to be of sufficient international interest to warrant inclusion in the International Bureau of Education's series 'Experiments and innovations in education'.

The author, Professor H. S. Srivastava, is Head of the Examination Reform Unit, National Council of Educational Research and Training (NCERT), New Delhi. He is one of the pioneers of the examination reform movement in India and has been instrumental in guiding the strategies of the programme since 1958. Today, Professor Srivastava is an international authority on curricula and evaluation and, through his contribution to a number of international meetings, has influenced the trends of curriculum renewal and examination reform in a number of countries.

Professor Srivastava expresses his gratitude to his colleagues among the faculty and staff of the Examination Reform Unit who have helped in the completion of this study. In turn, the Secretariat of the International Bureau of Education records its own appreciation of the author's work.

The author is responsible for the choice and presentation of the facts contained in this book and for the opinions expressed therein, which are not necessarily those of Unesco and do not engage the responsibility of the organization.

Contents

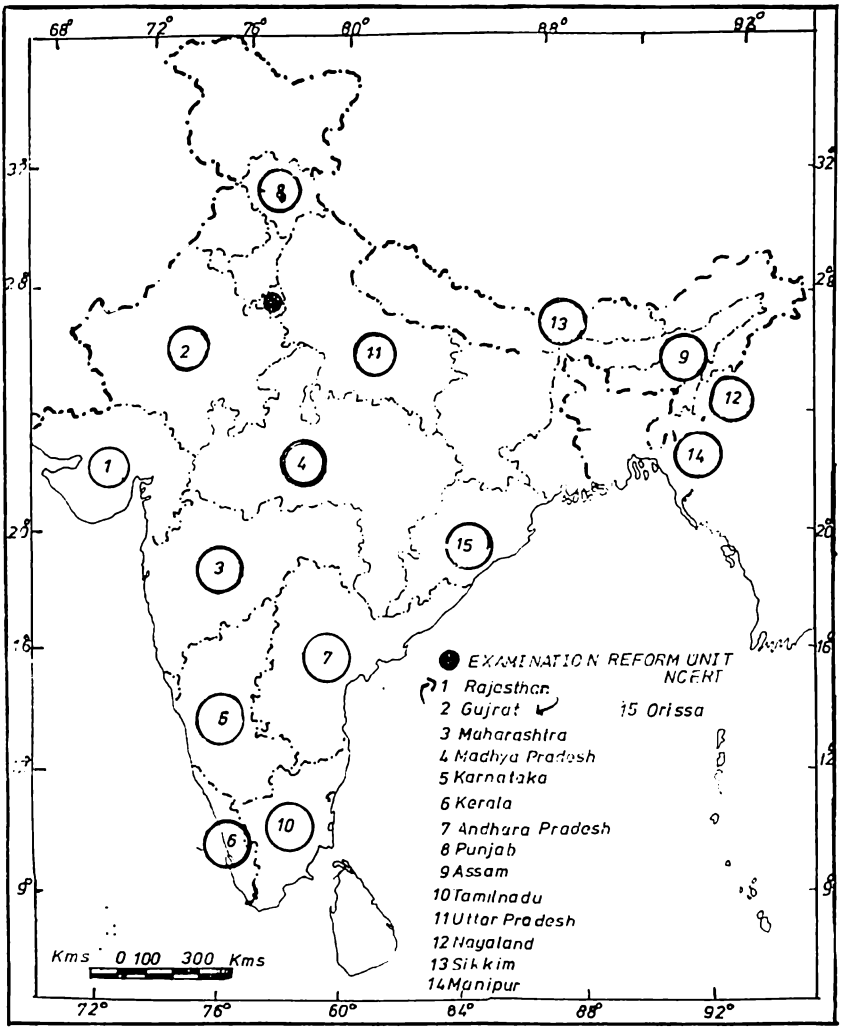


FIGURE 1. The spread of examination reform in India.

The boundaries shown on this map do not imply endorsement or acceptance by Unesco.

Introduction

For one who has lived within the movement of examination reform in India since its inception, it has been a great joy to develop this monograph, particularly at the present time when the programme is some way past the trials of establishing itself as a reform of national importance.

In the main, the study deals with external examinations at the school stage of education. There is particular emphasis on the secondary level, not only because most of the reform work to date has been done there, but also because the *effects* of these examination reforms have percolated downwards into primary education and have influenced the university level as well. The reform programme entered universities almost a decade after it had made an impact at secondary level.

In writing this monograph the greatest challenge, of course, was to compress, within the prescribed limits, the enormous volume of pertinent facts and data concerning the reforms. At times it was difficult to decide to drop the consideration of several challenging issues, interesting experiments, valuable investigations and innovations.

PLAN OF THE BOOK

The text divides into nine sections. *Section I* describes the historical background out of which the examination reform programme eventually developed. *Section II* provides an overview of the programme's goals, areas and directions of work, operational strategy, and its review-evaluation procedures and their findings.

Section III deals with reforms in written examinations. After outlining the practical approach, it describes a brief 'unit test' as one example of many which are widely used as formative-evaluation tools of diagnosis and remedial instruction. *Section IV* has, as its theme, reforms in the practical examinations of science subjects. Besides describing the scheme for

evaluating practical work, it includes the experimental try-out, supported by statistical data, from which this scheme emerged.

Section V covers the reforms in oral examinations. Here there are two main schemes propounded by different schools of thought: (*a*) that advocating orals for supplementary validation of the level of academic achievement of pupils in subject areas already assessed by written and practical examinations; and (*b*) that proposing only the evaluation of oral expression.

Section VI introduces the concept of 'Prep Index' (the Index of Proficiency in an Educational Practice): a procedure for quantitative assessment of qualitatively conceived situations. It has proved to be a real breakthrough in this area of evaluation. The section shows how to evaluate educational pratices and compute the index, and is illustrated by a flowchart.

Section VII outlines one of the most important directions of our programme: we envisage the ultimate abolition of external examinations, and their replacement by assessments undertaken by the teachers. A scheme of comprehensive in-school evaluation, covering both the scholastic and non-scholastic areas of pupil growth, is described. This scheme is an outcome of three years of experimentation and try-out, and is fast catching on. The section also discusses evaluations in some new areas of the curriculum (such as health education, and work experience) which are being completely entrusted to the schools themselves. Section VII ends with a brief note on two autonomous schools established in 1975 in Rajasthan. The progress of this experiment is being watched very closely.

Reforms in the mechanics of conducting examinations are the theme of *Section VIII*, which describes some innovations aimed at the qualitative improvement of examination procedure and practices. *Section IX* looks at objectives in relation to curriculum, which have been set for examination reform programmes in the ten-year primary and lower secondary school, and in classes XI and XII of higher secondary education.

A comprehensive bibliography is provided.

THE REFORM PROCESS IN RETROSPECT

In this Indian case study you will read of what we have been able to accomplish so far in such a large country. Along the way, there have been many obstacles to surmount. For instance, I recall very vividly how difficult it was, at first, to negotiate with the states about getting our proposals implemented. Resistance to change was widespread, and appeared in many guises. On several occasions the state authorities, when approached,

politely asked us to try out our approaches in the 'neighbouring state' and to tell them the results. It proved a tedious task to discover this pioneer willing state until, in 1963, Maharashtra came forward. Then Rajasthan followed suit with comprehensive prospects of reform. After that, state after state indicated readiness to proceed, and projects were initiated in them (see Figure 1 at the beginning of this Introduction).

The examination reform programme was by no means a standard one for all states. Different problems occurred in each. Whenever one problem had been solved, new ones tended to appear in the course of progress. All reforms are difficult, and examination reform is one of the most taxing. The impact that the programme in India has been able to make, with its acceptance by almost all of the states, testifies to the sustained efforts of a band of devoted workers who confronted resistances and problems with the resolve to overcome them. Their identification with the programme, and the pride they took in it, makes me feel confident that if 'examination reform' was animate, it would be proud of them.

I. Historical perspective

Ever since they were instituted, with the establishment of the Universities of Calcutta, Madras and Bombay in 1857, examinations have been under criticism. Their effectiveness, the purposes they serve, and their relevance, have remained controversial issues.

Even the earliest of the reviews of education in India, dating from 1886, points out that the university entrance examination 'matriculation' has apparently stimulated the holding of at least six external examinations extending down to the lower primary stages.

The Indian University Commission (1902) [22, p. 43] [1], which also considered the matriculation examination and its effects, carried forward the recommendations of the Hunter Commission (1882) [20, p. 254] when it stated, 'It is beyond doubt that the greatest evil from which the system of Indian university education suffers is that teaching is subordinated to examination and not examination to teaching.'

The Calcutta University Commission (1917-19) [24] recommended the creation of Boards of Secondary Education so as to end the domination of school education by the universities. Intermediate classes were also introduced as a buffer between the universities and secondary education. They were of two years' duration after ten years of schooling and provided preparatory education for universities and professional education. This commission also identified several shortcomings in the examination system and specifically indicated its unhappiness about alternative questions, the mechanical system of marking, grace marks, frequency of examinations, and so on.

The transfer of administrative responsibility for education from the British to the Indian Ministers in 1921-22, and the emergence of provincial autonomy in 1935, brought all the stages of education under the effective

1. Numberings in the text are those of the main bibliography which begins on page 91.

control of Indians themselves. This political development led to the establishment of Boards of Secondary Education in the states. The main function of these boards was to conduct external examinations at the school-leaving stage. Even though such boards began holding examinations, the matriculation examinations, which were conducted by the universities simultaneously with the boards' own, continued to dominate the scene.

The Hartog Committee Report (1929) [25, p. 107] criticized the academic bias of examinations at the school level which continued to be geared to the needs of university entrance and provided no opportunities for the majority of students to take up industrial, commercial, or technical courses as a preparation for life.

The report of the Central Advisory Board for Post-War Educational Development in India, known as the Sargent Plan (1944) [26, p. 20], again criticized the subordination of the high school curriculum to the requirements of universities, particularly in view of the fact that only one out of ten or fifteen high school leavers went on to a university.

POST-INDEPENDENCE ERA

After India became an independent nation, the University Education Commission (1948) was equally vocal in its criticism of examinations, stating that, if members were asked to make just one recommendation for reforming education, they would identify the area of examinations as the one where greatest priority and urgency for introducing reforms should be applied.

Almost at the same time, the state governments became increasingly conscious about improving their systems of education. In 1948, the United Provinces (nowadays Uttar Pradesh) Government appointed a Committee on the Reorganization of Primary and Secondary Education [27, p. 54]. In the same year, a Committee on the Reorganization of Secondary Education was also appointed by the Government of Central Provinces and Berar [28]. Both committees deliberated on the problems of examinations in the context of education and suggested immediate action for reforming them. Soon afterwards, a Secondary Education Reorganization Committee (1953) [31] was appointed in Uttar Pradesh. This committee made the positive suggestions that external examinations might be replaced by an assessment made by the teacher, and that continuous evaluation could be the main basis for a final assessment of a student. We are still working to forward these aims.

MUDALIAR COMMISSION

The Secondary Education Commission, popularly known as the Mudaliar Commission (1952-53) [30, p. 237], made the following specific recommendations in regard to examination reform:

1. The number of external examinations should be reduced, and the element of subjectivity in the essay-type tests should be minimized by introducing objective tests and also by changing the type of question.
2. In order to assess the pupil's all-round progress and to determine his future, a proper system of school records should be maintained for every pupil. These would indicate the work done by him during successive periods, and his attainments in each of the different spheres.
3. In the final assessment of the pupils, due credit should be given to the 'internal' (in-school) tests and the school records of the pupils.
4. A system of symbolic rather than numerical marking should be adopted for evaluating and grading the work of the pupils in external and internal examinations, and in maintaining the school records.
5. There should be only one public examination at the completion of the secondary school course.
6. The certificate awarded should contain, besides the results of the public examination in different subjects, results of the school tests in subjects not included in the public examination; as well as the gist of the school records.
7. The final public examination should be transformed into a system of compartmental examinations. These were conceived as supplementary to the main public examination. They provided an opportunity for students who had secured the minimum qualifying marks in most subjects, but had failed in one or two subjects by a small margin, to retake the examinations in the deficient subjects.

THE ALL INDIA COUNCIL FOR SECONDARY EDUCATION

After the Mudaliar Commission submitted its report, the Union Ministry of Education appraised these recommendations and began seeking ways of implementing them. For this purpose, the All India Council for Secondary Education (AICSE) was established. The then Minister for Education, Maulana Abdul Kalam Azad, summarized the main functions of

this body as 'an organization to advise the Government of India and state governments on the manner in which the recommendations of the commission could be effectively implemented' [34].

The AICSE started working on a variety of problems but soon realized that, to be effective, it should concentrate its efforts on a smaller number of specific priority problems. If therefore circulated a questionnaire to a large number of educational agencies and eminent individuals, to help determine priorities for a plan of action. From analysis of responses the following priorities in its various fields of work were identified: examination reform; pre-service and in-service teacher education; curriculum for higher secondary schools; methodology, apparatus, and equipment for science teaching; administration and organization of multi-purpose schools.

Without losing time, AICSE organized a seminar on 'Examination reform' at Bhopal, 22-29 February 1956. Besides other recommendations for improving examinations, the seminar also recommended the creation of an expert body—to be called the Central Examination Unit—to work in this specialized area.

EXAMINATION REFORM AS A NATIONAL PROGRAMME

The growing consensus among Indian educationists about the need for reform was receiving the active attention of the Ministry of Education, Government of India. The decision accepting Bhopal Seminar's recommendation regarding establishment of a Central Examination Unit (CEU) was the earliest outcome. The next task became one of developing a comprehensive plan of action for moving forward quickly and effectively. In doing so, the Ministry was eager to draw upon the experiences of other countries as well as the expertise available at the national level. In 1957, it invited Dr. Benjamin S. Bloom, then Chief Examiner of the University of Chicago, to advise on the examination reform task. In the course of his brief stay in India, Dr. Bloom met with Indian educationists and educational administrators in different parts of the country and worked with about 300 school and university teachers in seven workshops. He then assisted the Ministry of Education in developing the required plan of action.

Due to a paucity of trained personnel to man the CEU, it could only be started on 13 January 1958 as a pilot unit with five officers within AICSE. Simultaneously, ten other educators selected from different parts of the country were sent for training in Curriculum and Educational Evaluation at the University of Chicago under Dr. Bloom. These officers (of whom the author is one) joined CEU in August 1958, when it became a full

fledged unit. It was with this event that the Examination Reform Programme took the form of a national movement.

In 1959, AICSE and its Central Examination Unit were absorbed into the Union Ministry of Education. This occurred in a period when a supporting project of State Evaluation Units, sponsored and financed by the Ministry, was being initiated. In 1961, with the establishment of the National Council of Educational Research and Training (NCERT), the CEU became part of a body which already had a strong involvement with secondary education and which, in 1967, was given responsibilities for the improvement of primary education as well. By this time, too, several universities had approached CEU for help in reforming their examinations. NCERT's reorganized and re-named Examination Reform Unit has functioned as such since 1974.

KOTHARI COMMISSION

The examination reform movement was given strong impetus when the Kothari Commission was established in 1964 by the Government of India [32]. This commission was different from the earlier ones as its terms of reference extended to all stages of education. It could, therefore, study India's education system as a whole and, inter alia, give concrete recommendations on examination reform for all stages of education. The programme now being pursued is largely based on the Kothari recommendations, which were as follows:

1. The new approach to evaluation will attempt: (*a*) to improve the written examination so that it becomes a valid and reliable measure of educational achievement; and (*b*) to devise techniques for measuring those important aspects of the student's growth that cannot be measured by written examinations.
2. Evaluation at the lower primary stage should help pupils to improve their achievement of basic skills, and in developing constructive habits and attitudes.
3. It would be desirable to treat classes I to IV as an ungraded unit. This would enable children to advance at their own pace. Where this is not feasible, classes I and II may be treated as one block divided into two groups—one for slow and the other for fast learners. Teachers should be appropriately trained for the ungraded system.
4. At the higher primary stage, in addition to written examinations, an appropriate weighting should be given to oral tests as a part of internal

assessment. Diagnostic testing should be done through simple teacher-made tests. Cumulative record cards are important in indicating pupils' growth and development. Even so, at this level they should be very simple and should be introduced in a phased manner.

5. Although the first national standard of attainment is to be set at the end of the primary stage, it is not considered necessary or desirable to prescribe a rigid and uniform level of attainment tested by a compulsory external examination. However, for the proper maintenance of standards, periodic surveys of the levels of achievement in primary schools should be conducted by district school authorities, using refined tests prepared by state evaluation organizations.
6. The district educational authority may arrange for a common examination at the end of primary stage for schools in the district, using standardized and refined tests. This examination will have greater validity and reliability than the in-school examination, and will provide inter-school comparability of levels of performance.
7. The certificate at the end of the primary course should be given by the school and should be accompanied by the cumulative record card and the statements of results of the common examinations, if any.
8. In addition to the common examinations, special tests may be held at the end of the primary course for the award of scholarships or certificates of merit and for the purpose of identifying talent.
9. External examinations should be improved by raising the technical competence of paper-setters; orienting question papers to objectives other than the simple acquisition of knowledge; improving the nature of questions; adopting scientific scoring procedures; and mechanizing the scoring of scripts and the processing of results.
10. The certificate issued by the state board of school education on the basis of the results of the external examination should give the candidate's performance in different subjects for which he has appeared, and there should be no remark to the effect that he has passed or failed in the whole examination. The candidate should be permitted to appear again, if he so desires, for the entire examination or for separate subjects in order to improve his performance record.
11. The student should receive a certificate also from the school, giving the record of his internal assessment as contained in his cumulative record card. This should be attached to the one given by the board.
12. A few selected schools should be given the right to assess their students themselves. This would mean holding their own final examination

at the end of class X; one which will be regarded as equivalent to the external examinations of the state board of school education. The latter body will issue certificates to the successful candidates of these schools on the recommendation of the schools. A committee set up by the state board of school education should develop carefully worked-out criteria for the selection of such schools. The schools should be permitted to frame their own textbooks, and conduct their educational activities without external restrictions.

13. Internal assessment by the schools should be comprehensive enough to evaluate all aspects of student growth, including those not measured by the external examinations. It should be descriptive as well as quantified. Written examinations conducted by schools should be improved, and teachers trained appropriately. The internal assessment should be shown separately from the external examination marks.
14. During the transition period, higher secondary students will have to appear for two successive external examinations (at the end of classes X and XI) within one year. Where, however, the courses in classes IX to XI are integrated, the examination at the end of class X need not be insisted upon.

FRAMEWORK OF CURRICULUM FOR THE TEN-YEAR SCHOOL

Another historical landmark in education was the development of a curriculum framework for the ten-year school. This document has now received a national consensus and is a charter of directions for our future work. One of the sections of this document entitled 'Evaluation and feedback' spells out the targets we are aiming to achieve in the area of examination reform. It is in Section IX of this book [83, p. 697].

INTRODUCING VOCATIONAL CONTENT INTO HIGHER SECONDARY EDUCATION

Details of the proposed evaluation scheme for classes XI and XII will also be presented in Section IX. Some introductory comments about the scheme are quoted here [84, p. 1].

The characteristic feature of the last two years of schooling (called Higher Secondary) is to be diversification, a main aim of which is to avoid forcing students into the academic channel alone. Instead, it should offer them opportunities to choose subjects and programmes of study in a much wider field of education, in keeping

with their aptitudes, interests and abilities. As well as increasing their employ-ability, such diversification provides society with personnel having a wide spectrum of knowledge and training for its developmental needs. The scheme also aims at reducing the prevalent frustration among the youth which is an outcome of the non-productive and aimless education offered at present.

II. Programme overview

OVERVIEW

Whatever their limitations, examinations have come to occupy a very dominant position in our education system. Be this as it may; the modern reform point of view asserts that they should, as a part of sound educational strategy, be wisely employed to bring about qualitative improvements in education.

The Examination Reform Unit proposal envisages a programme aimed at delivering the learner from the disabling influence and irreversible judgements of an unfair examination system. The approach comprises a broad-fronted campaign to remedy the shortcomings of the traditional examination system: memorization was over-emphasized; coverage of the pupil growth process was limited; mercurial subjectivity was omni-present; inadequate use was made of test results; and receptivity to reform and change was discouraged. The traditional situation not only nullified all the criteria of a sound evaluation system, but also encouraged the adoption of slipshod methods of teaching and learning. Besides, it provided wide openings for malpractices to enter.

APPARENT IMPEDIMENTS TO EXAMINATION REFORM

The very term 'reform' envisages the existence of something to be changed. Reform is invariably a difficult task to accomplish, because the traditional procedures and practices have become deeply rooted in the system. In the process of examination reform, the following hurdles have been encountered:

1. Inherent resistances to change:
   (*a*) by the State Departments of Education and Boards of Secondary Education. This is because examination reform involves a re-organization of the administrative machinery and procedures.

(*b*) by the teachers, because of their unpreparedness for taking up the challenges of the new system and because of additional work involved.

(*c*) by the students, as post-reform examinations are likely to become valid and reliable, and will require more precise and regular study.

(*d*) by unscrupulous elements, since malpractices are likely to lose ground as examinations are improved.

(*e*) by vested interests which are desirous of maintaining a *status quo* which protects their powerful positions and (sometimes) financial gain.

2. Lack of suitable sample evaluation material of a sort that provides illustrations of the nature of reforms envisaged.
3. Lack of financial support, as the reform measures, in terms of over-all cost, tend to make the new examinations more expensive than the traditional ones.
4. Inadequate training of the teachers for keeping up with the changed situation.

Even though many other difficulties, problems and shortcomings pervade India's system of education, those in the area of examinations are undoubtedly very serious. They are not intrinsic to examination activities, but these are the ones which can be remedied through effective measures. This is a challenge to educators which also radiates hope.

PROGRAMME GOALS

Basic purposes

External examinations under the reform programme were instituted mainly to serve the following purposes [57]:

1. To act as a sort of quality control by delineating certain minimum standards for teachers, students and administrators.
2. To help in finding out whether pre-set educational objectives have been achieved or not, and if achieved, to what extent.
3. To help in assessing the strengths and weaknesses of students and, in that respect, help also to improve instruction.
4. To help in diagnosing the effectiveness of teaching methods.
5. To help in motivating students towards higher achievement.

General objectives

The major goals of the proposed programme of examination reform are to improve examinations so as to ensure:

1. The value of examinations as valid and reliable measures of pupil growth.
2. The pedagogical value of examinations, by making them powerful instruments for improving teaching and learning.

In functional terms, these major goals imply:

1. As far as possible, elimination of scope for examiners' and workers' subjectivity.
2. Placing less emphasis on memorization.
3. Discouraging selective study and selective teaching.
4. Broader coverage of pupil growth in both academic and non-academic areas through the extension of the techniques of evaluation to oral examinations, practical examinations and other observational techniques, and through the use of a wider variety of tools like checklists, rating scales, interview schedules, inventories, and so on.
5. Scientifically sound interpretation of marks.
6. Functional and meaningful declaration of results for effective use by teachers, students and parents.
7. Wider uses of test results for purposes of guidance, academic prediction, and curriculum evaluation.
8. Improvement of the mechanics of conducting examinations.
9. Introduction of concomitant changes in instructional materials (textbooks, teaching aids, etc.) and instructional methodology by harnessing the best teaching–learning situations and techniques.

Specific objectives

Efforts to achieve the goals of the programme are being applied to the multi-dimensional improvement of written examinations, practical examinations, oral examinations, and observational and other techniques.

Though each of these fields of effort will be dealt with in detail, it seems appropriate at this point to highlight the salient features:

1. Reform of *written examinations* [54, p. 119-39] mainly consists of improvements in:

(*a*) questions, by making them specific in terms of objectives, content and language;

(*b*) question papers, by making them balanced in various aspects, by limiting options and by the provision of a detailed marking scheme;

(*c*) scoring procedures, through the development and use of a detailed marking scheme.

2. Reform in *oral examinations* [140, p. 31-7] mainly consists of:

(*a*) identification of the abilities and subject areas of oral expression that have been under educational development;

(*b*) comprehensive coverage of the identified abilities/subject areas of oral examination;

(*c*) improvement of objectivity in the assessment of these abilities/ subject areas.

3. Reform in *practical examinations* [127, p. 27-30] mainly consists of:

(*a*) evaluation of proficiency in a wider variety of skills, by requiring a student to perform a number of small experiments instead of just one big one;

(*b*) evaluation of both the process and product of performance;

(*c*) minimizing inter-examiner and intra-examiner variability in scoring, through the development and use of a detailed marking scheme.

4. Introduction and improvement in the *use of a wider variety of evaluation techniques and tools* [103] through:

(*a*) identifying areas of pupil growth, not covered through other tools of evaluation;

(*b*) designing tools such as checklists, rating scales, inventories and observation schedules, for evaluating the above mentioned areas;

(*c*) developing procedures of recording, classifying, analysing and interpreting the data so obtained, and of communicating these meaningfully;

(*d*) developing procedures for the effective use of results of such evaluation; that is, to promote further growth of pupils' understandings.

PROGRAMME AREAS AND ASPECTS

A wide variety of activities have been incorporated in the programme of examination reform, so as to attain its stated goals. There are several distinct categories of activity:

1. Research studies [70], investigations and experiments in the areas of external examinations and of school evaluation.
2. Training and extension programmes in educational evaluation to orient key persons and staff in the examination reform programmes at state, national and international levels.
3. Production of literature and evaluation material:
   (*a*) conceptual literature in educational evaluation [65, 66];
   (*b*) sample evaluation material in scholastic and non-scholastic areas of pupil growth;
   (*c*) reports of workshops, seminars and conferences;
   (*d*) test library, consisting of an item bank, unit tests based on specific units of content in different subjects, and full tests (based on the prescribed syllabuses) for comprehensive examinations in different subjects for different classes.
4. Co-ordination of nation-wide programmes of examination reform. This is an important function which is executed by the National Council of Educational Research and Training (NCERT) [46-52].
5. 'Clearing house' functions to disseminate information about examination reform projects, programmes and investigations within the country and abroad [104].
6. Consultative services to educational agencies concerning the development and implementation of their tasks in the programme of examination reform.

THE SCALE OF PHASED PROGRAMME IMPLEMENTATION

Making evaluation an integral part of the teaching–learning process and extending it beyond the narrow limits of academic achievement serves to bridge the gap between the school and the needs and aspirations of the society. For a successful implementation of the programme objectives it is necessary to change the attitudes of teachers, parents and pupils.

The task involved in the reform process seems stupendous. The proposed changes will ultimately have to be introduced in more than 600,000 primary schools, 100,000 middle schools, 40,000 high and higher secondary schools, 1,200 primary teacher training institutes, and 400 secondary teachers colleges. They will thus be directed to influence more than 2,500,000

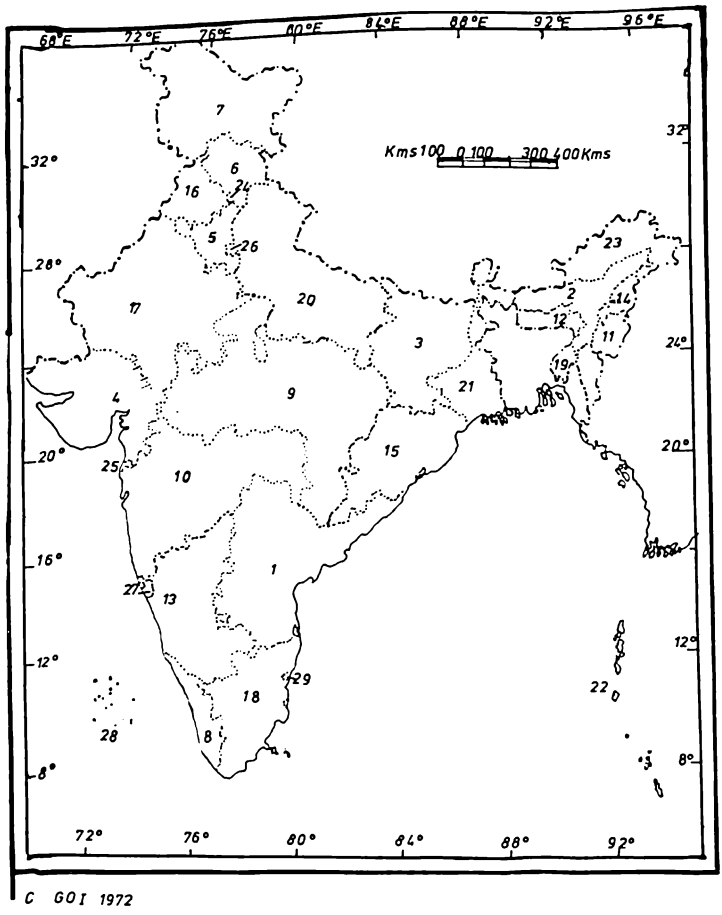
teachers, a large number of supervisory staff, and a multitude of parents and pupils. Since such a large number of people are affected by the proposed changes, implementation was likely to meet with resistance from various quarters. A realistic strategy had to be developed, to help ensure that these changes occurred smoothly and were well co-ordinated with those in other components of the system.

Changes in evaluation practices imply concurrent changes in courses and their objectives, instructional methodology, textbooks and other teaching aids, and teacher training (both pre-service and in-service). This necessity required simultaneous action on the part of different agencies and institutions responsible for running the education system. The organizational and financial implications were considerable; therefore, long-term plans and projects for bringing about the necessary reform had to be developed. Allocation of adequate funds proved to be a major problem for the programme at the central and state levels.

Because of the huge scale of the task, the examination reform programme is being implemented in a phased manner. As we have already seen, the total programme incorporates improvements in organizational as well as academic aspects of written examinations, oral examinations and practical examinations. In the first phase of the programme, attention was focused on improving the reliability of tests as well as their pedagogical value. Because statistical measures could only be applied when these examinations have been rendered adequately reliable, reform measures such as scaling, ensuring comparability of scores and so on were not introduced until the second phase. Several new innovations in the field are being planned for subsequent phases in the ongoing programme.

HOW A PROGRAMME IS IMPLEMENTED

In its collaboration with state educational agencies, NCERT normally undertakes the responsibility for training key personnel and in helping them to sample evaluation material for circulation within their institutions. The state educational agencies (departments, Boards and Institutes of Education; Councils of Educational Research and Training; evaluation units; university departments of education; and teachers colleges) attend to the printing and circulation of this material; the orientation of teachers and other allied activities; and measures related to the mechanics of conducting examinations. Up to now, the following states and union territories have sought and received NCERT's help in the development and implementation of their programme:



STATES

1. Andhra Pradesh
2. Assam
3. Bihar
4. Gujarat
5. Haryana
6. Himachal Pradesh
7. Jammu and Kashmir
8. Kerala
9. Madhya Pradesh
10. Maharashtra
11. Manipur
12. Meghalaya
13. Mysore
14. Nagaland
15. Orissa
16. Punjab
17. Rajasthan
18. Tamil Nadu
19. Tripura
20. Uttar Pradesh
21. West Bengal

UNION TERRITORIES

22. Andaman and Nicobar Islands
23. Arunachal Pradesh
24. Chandigarh
25. Dadra and Nagar Haveli
26. Delhi
27. Goa Daman Din
28. Laccadive, Minicoy and Amindivi Islands
29. Pondicherry

FIGURE 2. The states and union territories of India.

The boundaries shown on this map do not imply endorsement or acceptance by Unesco.

1. Andhra Pradesh
2. Assam
3. Delhi
4. Goa
5. Gujarat
6. Haryana
7. Himachal Pradesh
8. Karnataka
9. Kerala
10. Madhya Pradesh
11. Maharashtra
12. Manipur
13. Nagaland
14. Orissa
15. Pondicherry
16. Punjab
17. Rajasthan
18. Sikkim
19. Tamil Nadu
20. Uttar Pradesh

The examination reform programme has emerged, then, as an excellent illustration of the central-state collaboration in the field of education.

Eventually, in a particular state, the date for the introduction of the improved system of examinations is announced by the educational agencies. This announcement, in effect, notifies students and teachers to prepare themselves to meet the challenges of the examination reforms.

Involvement of the teaching community in the programme is a most important ingredient for the success of the programme. Orientation programmes for the teachers are planned and conducted by the state agencies. These assume an importance for the teachers and rouse their interest in learning the genesis of the envisaged programme and its practical implications for them.

PROGRAMME EVALUATION

Programme evaluation is a built-in aspect of the strategy of the examination reform programme. It is undertaken at each step. Comprehensive evaluation of the programme also occurs every three to five years.

Continuous programme evaluation

As a matter of policy, whenever a new scheme or project is planned, 'status evaluation' is the first step in the task. This is attempted through the checking of records and materials, questionnaires, interviews and on-the-spot study.

In comprehensive evaluation, representatives of state-level educational agencies and experts in the field are involved, as well as NCERT personnel. The findings of these periodical evaluations of the schemes, projects and programmes are a constructive help in identifying areas of shortcomings and success. These studies invariably enlighten us about priority themes

for further research; aspects of training to be intensified or abandoned: types of literature and evaluation material required to be developed; the nature and mode of better co-ordination; and which consultative services should be provided for the effective implementation of the programme.

The most recent of such reviews, for example, indicated that we need to:

1. Conduct intensive studies on: (*a*) the operational aspects of our programmes; and (*b*) the mechanics of conducting examinations.
2. Develop literature for providing constructive help to teachers in the effective execution of projects under the new programmes.
3. Develop more samples of evaluation material in the non-scholastic aspects of pupil growth.
4. Try out some experiments in autonomous schools.
5. Augment activity in the development of the NCERT test library.
6. Explore the possibility of contemporary ideas like 'open-book' examinations.

These recommendations are being followed up in designing our forthcoming projects and programmes.

It seems that no other educational programme has enlisted so much interest among the Indian public as the examination reform programme. In the press there are frequent references to our moves. This is yet another powerful source for giving us new ideas for further improvements.

Programme evaluation by the Kothari Commission

The NCERT examination reform programme was also evaluated by the Kothari Commission in the following words [32, p. 243]:

> During the seven years of its existence, the Central Examination Unit has made a multi-pronged attack for the popularization of the new concept and techniques of evaluation. It has worked with thousands of secondary school-teachers in seminars and workshops, introduced hundreds of training college lecturers to the new techniques, established a very large pool of test items, trained paper-setters attached to different Boards of Secondary Education, published a good deal of literature on evaluation, and carried out or sponsored several studies and investigations on various practical problems in examinations. As the work of this unit expanded, the Government of India approved the establishment of Evaluation Units in different states.

It is also significant that the commission has not only appreciated the work of the Examination Reform Unit, but has also accepted it as a model

for undertaking a similar movement of examination reform at the university stage. The recommendation of the commission in this regard is as follows [34, p. 291]:

> There is need for a central source to guide and activate the movement of examination reform, without which no early and effective progress is possible. For instance, the activity that one now sees in this matter in the state Boards of Secondary Education is due largely to the Central Examination Unit in the National Council of Educational Research and Training. We recommend that the University Grants Commission should set up immediately a similar examination reform unit for higher education at a sufficiently high level which would work in collaboration with universities. This could become a starting point of an effective programme or reform.

SOME OUTCOMES

The outcomes of the programme are many and varied. It is really not easy to compile all the data regarding them, particularly at the school level, where students are prepared for external examinations. However, some information is available in respect of external examinations conducted by various state Boards of Secondary Education. These have been summarized in Table 1.

TABLE 1. Steps in examination reform introduced by various states and institutions.

Steps in examination reform	*Introduced by the following states and institutions*
1. Development of policy statements (designs) for each question paper.	Andhra Pradesh, Assam, Gujarat, Kerala, Maharashtra, Punjab, Rajasthan, Council of Indian School Certificate Examinations (CISCE).
2. Appointment of paper-setters from among those trained in evaluation.	Andhra Pradesh, Gujarat, Kerala, Maharashtra, Orissa, Rajasthan, CISCE.
3. Appointment of panels of paper-setters for each question paper.	Andhra Pradesh, Assam, Gujarat, Kerala, Maharashtra, Rajasthan, CISCE.
4. Allocation of definite proportionate percentages of marks in question paper for testing different abilities.	Andhra Pradesh, Assam, Gujarat, Maharashtra, Kerala, Rajasthan, CISCE.

5. Ensuring an effective coverage of the syllabus through the question paper.	Andhra Pradesh, Assam, Gujarat, Kerala, Maharashtra, Rajasthan, CISCE, Central Board of Secondary Education (CBSE).
6. Introduction of specific pin-pointed questions in the question paper.	Andhra Pradesh, Assam, Gujarat, Karnataka, Kerala, Maharashtra, Rajasthan, CISCE, CBSE.
7. Inclusion of short-answer ques-questions in the question papers, besides the essay-type ones.	Andhra Pradesh, Assam, Gujarat, Karnataka, Kerala, Maharashtra, Manipur, Orissa, Punjab, Rajasthan, Tamil Nadu, CISCE, CBSE.
8. Introduction of objective-type (multiple choice) questions in the question papers.	Andhra Pradesh, Gujarat, Karnataka, Kerala, Maharashtra, Manipur, Orissa, Punjab, Rajasthan, Tamil Nadu, CISCE.
9. Use of question banks for setting question papers.	Gujarat, Rajasthan, CISCE.
10. Abolition of over-all options in the question papers.	Andhra Pradesh, Assam, Gujarat, Karnataka, Kerala, Orissa, Rajasthan, CBSE.
11. Development of marking scheme, accompanying each question paper, by the setter himself.	Assam, Gujarat, Karnataka, Kerala, Maharashtra, Punjab, Rajasthan, CISCE.
12. Division of question paper into two separate sections for fixed response and free response questions with fixed separate time limits.	Andhra Pradesh, Gujarat, Karnataka, Kerala, Punjab, Rajasthan, Tamil Nadu, CISCE.
13. Introduction of centralized or spot-evaluation of scripts.	Andhra Pradesh, Assam, Gujarat, Karnataka, Kerala, Tamil Nadu, CISCE, CBSE.
14. Introduction of mechanical processing of examination results.	Andhra Pradesh, Gujarat, Karnataka, Kerala, Maharashtra, Rajasthan, CISCE, CBSE.
15. Adoption of the system of giving grades instead of marks.	Maharashtra, CISCE, CBSE.
16. Scaling of subject-wise results to make them comparable.	Gujarat, Kerala, CISCE.
17. Abolition of the system of declaring students as pass or fail.	CISCE, CBSE.
18. Allowing students to clear the examination in parts.	Andhra Pradesh, Gujarat, Karnataka, Kerala, Maharashtra, Punjab, CISCE.

19.	Permitting students to improve their grades by appearing at subsequent examinations.	Andhra Pradesh, Karnataka, Kerala, Rajasthan, Punjab, CBSE.
20.	Reckoning both the product and performance in evaluation of practical work science subjects.	Assam, Gujarat, Kerala, Maharashtra, Punjab, Rajasthan, CISCE.
21.	Incorporation of both academic and non-academic areas of pupil growth in the scheme of internal assessment.	Rajasthan, Tamil Nadu.
22.	Issue of separate certificate of internal assessment along with that of external examination.	Rajasthan.

LESSONS FROM EXPERIENCE

During two decades of reform we have learned that some of the main bases on which a programme of examination reform should rest are:

1. The desired changes to be brought about in children as a result of education ought to be clearly enunciated. These should not be confined merely to the areas of scholastic achievement but should cover non-scholastic areas of pupil growth as well.
2. All educational efforts directed towards pupil growth need to be evaluated in order to judge their effectiveness in bringing about pupil growth.
3. Those who teach should test. Thus, we should place greater faith in the teacher and accept his assessment of the pupil for all practical purposes.
4. An examination should become an instrument for promoting growth rather than simply measuring it. Its results should be used for diagnostic and prognostic purposes rather than merely for classification, grading and certification.
5. An examination should not be considered as a multi-purpose tool. Special procedures and tools need to be developed for each specific purpose. Pupil evaluation and comparison of standards ought not to be attempted through a single examination. It is not desirable to make decisions regarding varied and dissimilar aspects of the personality on the basis of a single test.
6. To be reliable, evaluation should become a continuous process occurring over a period of time.

7. A variety of procedures, techniques and tools ought to be evolved to suit the requirements of lifelong supplements to the school such as non-formal education.
8. An examination should be conducted from the point of view of the individual rather than the examinating agency.
9. External examinations, particularly at the secondary level, ought not to be crucial admission/rejection tests for jobs and higher studies (see 2 below).

Some practical directions with specific reference to external examinations also emerge. These are:

1. The declaration of examination results in terms of pass/fail and similar divisions has lost its significance and ought to be discontinued. Instead, a 'clearance certificate' awarded after having completed a course or a part of it may be given.
2. Specially designed tests or procedures ought to be introduced for admission to courses of higher education and for selection to jobs.
3. An examination should not be made a screening device for every purpose. Every student should not necessarily have to take an external examination. Such examinations need only be taken by those who want to pursue higher studies.
4. In an external examination, the hurdle of 'simultaneous passing in all subjects, otherwise fail' should not be imposed. Clearance certificates could be given as and when an individual succeeded in one or more of them. Examinees should, however, be in a position to obtain a comprehensive certificate after clearing the minimum number of subjects. They should also have an opportunity of improving upon their grades in different subjects through subsequent attempts.
5. The schemes of autonomous schools deserve a fair trial. To avoid complications, the boards may, as an interim measure, give their attestation to the certificate issued by the schools concerned.
6. Measures may be taken to create a special climate against malpractices through the co-operation of the students and the community at large.
7. Results may be declared in terms of grades (5 to 7 point scale) rather than marks.
8. Declaration of results on the basis of raw scores should be discontinued. Suitable scaling procedures can be evolved and adopted instead.

III. Reforms in written examinations

In one form or another, examinations have always been an important part of the total educational process. Examinations are designed and administered at different stages of education and their results can be used for various purposes like grading, classification, certification, guidance, and so on. In all these situations they continue to be sources of motivation, whether positive or not, for the students and the teachers.

Examinations in our country, external or internal, fall into three major categories: (*a*) written examinations; (*b*) oral examinations; and (*c*) practical examinations. Of these three, the written examinations, because they are most commonly used, play a very important role. They have developed some serious shortcomings which can be remedied with a little thoughtful effort.

THE EXISTING SITUATION

Prominent among these shortcomings are: emphasis on memorization; subjectivity; poor content coverage; and administrative shortcomings. We will examine how each of these shortcomings can be overcome and in what way their eradication will make evaluation better.

Emphasis on memorization

Until quite recently memorization occupied a dominant place in all written examinations, which almost completely overlooked the testing of higher objectives like understanding, and the application of knowledge and skills. This, in turn, reflected very badly on the instructional programmes where the development of these higher abilities on the part of the students was also invariably overlooked.

The following corrective measures will help improve the validity of the question paper in terms of objectives, instead of rewarding examinees for

their rote memorization: (*a*) identification and definition of instructional objectives for the subject in question; (*b*) giving proportionate weights to each of these instructional objectives in preparation for framing questions which will test states of progress towards the objectives; (*c*) framing questions of different forms which are most suitable for testing the abilities associated with the particular instructional objectives.

Subjectivity

Subjectivity within written examinations operates at three levels: (*a*) the subjectivity of the person who is setting a question paper; (*b*) the subjectivity of the examinee in writing answers; and (*c*) the subjectivity of the person who evaluates the answer books.

It is symptomatic of many paper-setters' subjectivity that we often find lop-sided question papers where some content areas are over-emphasized and other areas completely neglected. Indeed, sometimes questions have been set which do not synchronize with the course content and the text-books !

The subjectivity of the examinee operates when he is answering the questions. Very often, due to the vague wording of the questions, he interprets the dimensions of the expected answer in his own idiosyncratic way. This leads to a host of differences of approach to answering the same question.

The subjectivity of the person who marks papers (and may or may not have set the examination) is also very dangerous, as it operates in a haphazard manner. In the absence of precise directions regarding the scoring of the answer scripts, he tends to judge the answers from the viewpoint of his own biases. He might even veer into recklessness in attempts to save time or, among other preoccupations, to meet his examination reporting deadlines.

To prevent such shortcomings, the examining agency should develop a design or policy statement of the question paper, and communicate it to the paper-setter. This design should give specific directions regarding the dimensions of the question paper and the considerations to be kept in mind while setting it. Such a design would indicate weightings according to objectives, according to areas of content, and the different forms of questions that should be included. It should prescribe, too, the scheme of options. For example, these could be complete elimination of over-all options; or options might be allowed only in essay questions, subject to the condition that they are comparable in respect of objective, content area, form, difficulty level, expected time for answering it, and so on. Finally, the design

should include directions regarding administration of the question paper. Another precaution against subjectivity is to require the setting of at least some questions which can be assessed objectively; that is, short answer and objective-type (multiple choice) questions. Furthermore, questions should be worded specifically so as to delimit the scope and length of the expected answer.

It is most important that the paper-setter should prepare a scoring key and a detailed marking scheme as he completes setting the question paper itself. The key and marking scheme have to be supplied to all the paper's examiners to guide them in scoring answer scripts. Preparing a scoring key and marking scheme while one is setting the question paper helps the setter to detect many mistakes in the questions which could otherwise go unnoticed. A detailed marking scheme, giving the value points in terms of the outline of the expected answers, will reduce inter-examiner variability to a minimum. Notwithstanding all the care that has to be taken by the paper-setter, a most important pre-requisite will still be that the key and marking scheme are *used*, and appropriately so by each examiner for purposes of scoring.

Poor content coverage

Formerly, ineffective coverage of the content by question papers had become such a common feature that nobody seemed to take any serious view of it. This phenomenon was unmistakably impairing the entire teaching–learning process. It exerted undesirable influences by encouraging selective study on the part of the students and selective teaching on the part of the teacher.

Measures to ensure an effective coverage of content through a question paper are: (*a*) to define the major areas of content, giving proportionate weights to each of them when framing the series of questions; (*b*) to include numerous short answer and objective-type questions; (*c*) to restrict the numbers of options, retaining them only in the essay-type questions, and ensuring their mutual equivalence as alternatives there.

Administrative shortcomings

Even when there is excellent paper-setting and marking, the value and success of the examination can still be spoilt by poor administrative procedures when the examination takes place. Advance precautions to be taken in this regard include:

1. The division of the question paper into two parts: Part A consisting of fixed-response questions, and Part B, free-response questions.
2. Both sections may be handed to examinees simultaneously, but Part A will need to be collected earlier, after the expiry of a specified time limit—say half an hour or so. This will prevent students from getting opportunities to copy from others' scripts, which is very easy in respect of fixed-response questions.
3. In administrative matters, giving precise directions to the setters for setting and to the examiners for scoring the question papers.

A COMPREHENSIVE PLAN OF ACTION

The foregoing discussion has focussed on several prevalent defects and how to overcome them. The general plan of action that emerges can now be sketched.

A question paper is not and ought never to be treated as just a random assortment of questions. To be an effective instrument of evaluating academic achievement it has to be structured according to a pattern decided in advance. The following steps are necessary for setting good question papers.

Preparation of a design for a question paper

Design is not only the first, but also the most important step in paper setting. It lays down the chief dimensions of the question papers and, in that respect, is a policy statement. Its various parts are:

1. *Weighting among objectives.* This means selecting the learning objectives to be tested, and allotting marks to each in terms of their relative importance. This will help reduce emphasis on memorization and enable due emphasis to be given to the testing of higher abilities.
2. *Weighting among different areas of content.* This entails analysis of the syllabus beginning with the delimitation of the scope of each topic, and then the allotment of marks to each of the major areas for the purpose of framing questions.
3. *Weighting for different forms of questions.* Working on the principle that, for testing a particular ability and content, the most suitable form of question should exclusively be used, we may wish to choose different forms of questions for inclusion in the question papers instead of just

one single traditional form, such as the essay type. The marks to be allotted to each form used have also to be decided.

4. *Scheme of options.* As discussed earlier the design may also indicate the pattern of options. This may represent the complete elimination of over-all options and the limited retention of internal options. Among themselves, the latter should be comparable in respect of the learning objectives to be tested, the major area of content covered, the form and difficulty level of the question.

5. *Sections in the question paper.* The inclusion of fixed response questions (short-answer and objective type) may require the division of the question paper into sections and the allotment of a time limit for answering the fixed-response section. As explained earlier, these questions are usually answered quickly and need not remain with the pupils for longer than the reasonable time allowed for attempting them.

Preparation of a 'blueprint'

The 'blueprint' is a detailed plan based on the design for preparing a question paper. It is a multi-dimensional chart giving the placement of the different questions in respect of: (*a*) the objective tested by each; (*b*) the content area covered by each; (*c*) the form of question which is most suitable for testing (*a*) and (*b*).

In addition to the above three dimensions, the blueprint may also indicate: (*d*) the numerical weight given to each question individually; and (*e*) the scheme of options to be adopted in framing the questions.

Preparation of questions based on the blueprint

After the specifications of all the questions have been included in the blueprint, the next step is the preparation of the questions themselves. Each of these questions has to be framed to satisfy the requirements of its respective position in the examination plan.

The framing of questions based on the blueprint calls for knowledge of learning objectives and specifications, mastery of the subject matter, and skill in framing different forms of questions.

While writing or selecting questions the paper-setter must keep in mind that: (*a*) each question is based on a well-defined objective; (*b*) it relates to a specificcontent area; (*c*) it is written in the form required by the blueprint and satisfies the rules for framing that form of question; (*d*) it is at the desired level of difficulty; (*e*) each question is so worded as to be well within the comprehension of the pupils, and that it clearly indicates the scope and

length of the answer; (*f*) it is so worded in the original language that its scope, meaning and difficulty level will not change in the process of translation; (*g*) it has good discrimination value.

Editing the question paper

Editing the question paper is a step of crucial importance. It consists of the following procedures:

1. *Assembling the questions* into sections is usually done on the basis of their form. That is, the fixed-response type of questions may be put in one section and the free-response type questions in another. Within each section, again, there could be sections based on the content area divisions, if necessary. Whether there are sub-sections or not, the questions are to be organized in a graded order of difficulty from easy to difficult. Such a grading gives examinees confidence in their ability to attempt the questions and reflects the complexity of the mental abilities required.
2. *The instructions to examinees* need to be clear, specific and pointed. General instructions should be given at the beginning of the paper, and specific instructions related to each section should appear at the head of the corresponding section.
3. *Implications for administration.* Editing may have important implications for the administration of the question paper. For instance, in view of the division of the question paper into sections based on forms of questions, it may be necessary to give a specific time limit to the section containing fixed-response type of questions. This will help to reduce the opportunities for malpractice.

Preparation of the scoring key and the marking scheme

Very often, when we start thinking of the answers to particular questions we discover mistakes in the present phrasing of questions; so it is essential to frame the scoring key and the marking scheme concurrently with the framing of the question paper.

The scoring key is to be prepared for the objective-type brief questions, and the marking scheme for the essay and short answer questions. The marking scheme gives the expected outlines of the answers and the marks that each point or aspect of the answer deserves. In case there are more points than provided for in the marking scheme, and the student has the freedom to choose only a limited number of them, it could be indicated that any combination of the valid points up to the required number may be

taken as correct. As far as possible, then, all the answer points that may be relevant to the question should be listed in the marking scheme, irrespective of the number asked for in the question. Detailed instructions for scoring will also need to be worked out and issued to the examiners.

This will ensure a high degree of reliability in scoring by an examiner and uniformity in scoring when many examiners evaluate answer scripts.

Preparation of the question-wise analysis

The question-wise analysis will enable us to know the strengths and weaknesses of our question paper more thoroughly. It will also give us a check to compare our question paper with the design and the blueprint. Each question will be analysed in terms of the following elements: (*a*) objective tested by the question; (*b*) specification on which the question is based; (*c*) topic covered by the question; (*d*) sub-topic covered by the question; (*e*) form of the question; (*f*) estimated difficulty level (easy, average or difficult); (*g*) approximate time required for answering; (*h*) marks allotted to the question. These details could be given in a tabular form. If so, each column of the table can be summarized to give us the distribution of questions, either over the different objectives, or the areas of content, or the forms of questions.

The question-wise analysis can also be undertaken in a different form; that is, resembling a blueprint, by indicating the serial number of questions within the cells for which they satisfy the dimensions of the blueprint. This should tally exactly with the design and the blueprint and is the best way of checking that the questions fill the places located in the original blueprints.

Administrative steps [15, p. 529]

The scheme as outlined above is in vogue in several Indian states. For its successful implementation, the following specific measures have been taken by the examining agencies:

1. Training of paper-setters and other resource persons with the help of NCERT.
2. Development of sample evaluation material by trained persons on the lines indicated.
3. Circulation of brochures of sample evaluation material (question papers and units tests) to schools.
4. Orientation of teachers so that they can prepare their students for the improved type of examinations.

The date for the introduction of the improved examinations is announced at least two years in advance to enable appropriate preparation. The necessary changes in rules and regulations of the examining agencies are also made well in advance. The entire machinery has to be made ready for the improved examinations.

A UNIT TEST

To illustrate an outcome of the Plan of Action, an example of a unit test in physics is given. The unit on 'reflection' from the area of 'light' is the theme of this test. While the example has all the other characteristics of a full question paper it is not divided into two sections as a question paper is. This is because it is meant for administration during a class period. Such 'unit tests' are widely in use in the country as a tool of 'formative evaluation' for purposes of diagnosis and remedial instruction. They also help train students for taking the improved comprehensive external examination [90].

Unit: Reflection
Class: IX/X

Time: 40 minutes
Maximum marks: 25

A. DESIGN OF THE UNIT TEST

1. *Weighting by objectives*

Objective	*Weighting*
Acquisition of knowledge	8
Development of understanding	10
Application of knowledge	4
Development of skills	3
Total marks	25

2. *Weighting by areas of content*

Area of content	*Weighting*
Reflection at a plane mirror	9
Reflection at a concave mirror	7
Reflection at a convex mirror	9
Total marks	25

3. *Weighting by form of question*

Form of question	*Weighting*
Objective type	8
Short answer type	12
Essay type	5
Total marks	25

4. *Pattern of options*

No options.

5. *Scheme of administration*

To be administered within a class period.

B. BLUEPRINT

Unit: Reflection
Class: IX/X

Time: 40 minutes
Maximum marks: 25

	Objectives												
	Knowledge			*Understanding*			*Application*			*Skill*			
	E	*SA*	*OT*	*E*	*SA*	*OT*	*E*	*SA*	*OT*	*E*	*SA*	*OT*	*Total*
Reflection at a plane mirror			1(1)		1(1)* 1(1)*	2(2)		2(1)			1( )* 1( )*		9
Reflection at a concave mirror			1(1)		2(1)	2(2)			2(2)				7
Reflection at a convex mirror	4(1)*	2(1)			2(1)					1( )*			9
Sub-totals	4(1)	2(1)	2(2)	–	6(4)	4(4)	–	2(1)	2(2)	1( )	2( )	–	25(15)
Grand total		8			10			4			3		25

NOTE: Figures within parentheses indicate the number of questions, and figures outside the parentheses indicate marks.
E = essay-type questions; *SA* = short answer questions; *OT* = objective-type questions.
* Indicates that skill is connected with knowledge or understanding in the same question.

C. TEST

Class: X/IX

Time: 40 minutes
Maximum marks: 25

INSTRUCTIONS

A. All questions are compulsory.

B. Read the question carefully before trying to answer it.

C. Answers have to be written on the answer book provided.

D. Be quick in answering the questions.

E. Do not waste time on a question if you are not sure about the answer. Pass on to the next.

F. In questions 1 to 8 there are five answer alternatives marked A, B, C, D and E. Only one of these answers is correct or best. The letter indicating the correct or best answer should be written in bold letters against the question number in the answer book.

G. Questions from 1 to 8 carry 1 mark each. The remaining questions carry 2 marks each except for question no. 14, which carries 5 marks.

1. A ray of light makes an angle θ with a plane mirror. The angle of reflection will be

   A. θ
   B. $90-\theta$
   C. $90+\theta$
   D. $180-\theta$
   E. $180+\theta$

   1 ( )

2. A ray of light is incident at an angle a on a plane mirror. The angle of deviation suffered by the ray will be

   A. $2a$
   B. $90- a$
   C. $180- a$
   D. $180- a$
   E. $180-2a$

   2 ( )

3. An object is placed between two plane mirrors inclined at an angle. The number of images formed is 19. The angle of inclination between the mirrors is

   A. 24°.
   B. 19°.
   C. 18°.
   D. 12°.
   E. any angle.

   3 ( )

4. The image of an object placed below the principal focus and centre of curvature of a concave mirror is

   A. erect, magnified and virtual.
   B. erect, diminished and real.
   C. inverted, diminished and real.
   D. inverted, magnified and real.
   E. erect, magnified and real. 4 ( )

5. The image of an object formed by an optical instrument is magnified, erect and virtual. This optical instrument is

   A. a concave mirror.
   B. a convex mirror.
   C. a concave lens.
   D. a prism.
   E. a plane mirror. 5 ( )

6. An object is placed 20 cm. away from a concave mirror of focal length 10 cm. If the object is 10 cm. long, the position and size of the image will be

	Position	*Size*
A.	25 cm.	20 cm.
B.	20 cm.	10 cm.
C.	20 cm.	20 cm.
D.	15 cm.	10 cm.
E.	10 cm.	20 cm.

6 ( )

7. The distance of an object and its image from the focus of a concave mirror are 8 cm. and 32 cm. respectively. The focal length of the mirror is

   A. 8 cm.
   B. 12 cm.
   C. 16 cm.
   D. between 16 and 20 cm.
   E. none of the above. 7 ( )

8. An object is placed at the centre of curvature of a concave mirror of 12 cm. radius. Then the object is shifted towards the focus by 4 cm. The size of the image now is

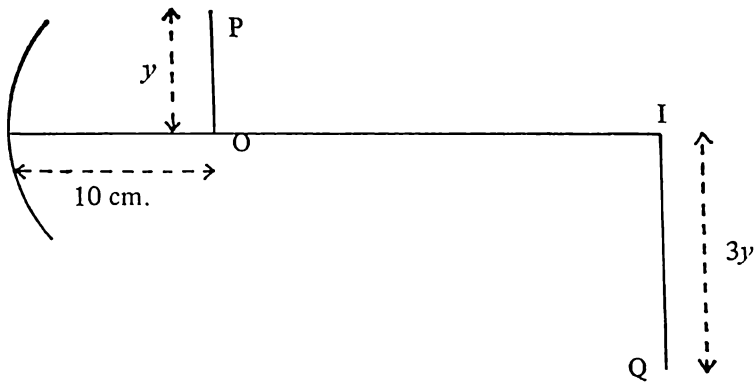
   A. three times the object.
   B. double the object.
   C. same as the object.
   D. half the object.
   E. one-third the object. 8 ( )

9. (*a*) Define the terms 'principal axis' and 'centre of curvature' of a convex mirror.

   (*b*) Explain why the convex mirror is used by automobile drivers.

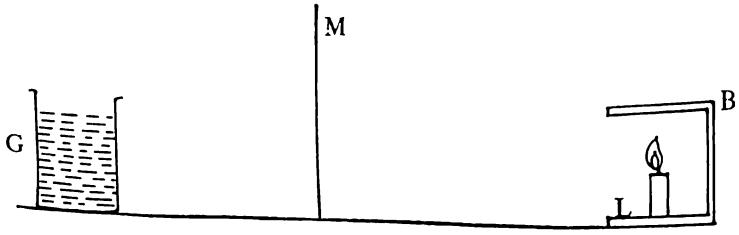
10. The distance between an object and its image formed by a convex mirror is 36 cm. The image is half the size of the object. Find the focal length of the mirror and also its distance from the object.

11. In the following diagram, OP is the object and IQ is its image. Find the focal length of the concave mirror.



12. Two plane mirrors are inclined at an acute angle such that a ray of light coming parallel to either of them retraces its own path. Draw the required diagram and calculate the angle between the mirrors.

13. A candle (L), a plane unsilvered glass (M) and a blackened wooden box (B) covering three sides of the burning candle are given below. Copy the sketch in your answer book and show the position of the eye and the direction of the rays so that a person can see the candle burning in water in the beaker (G).



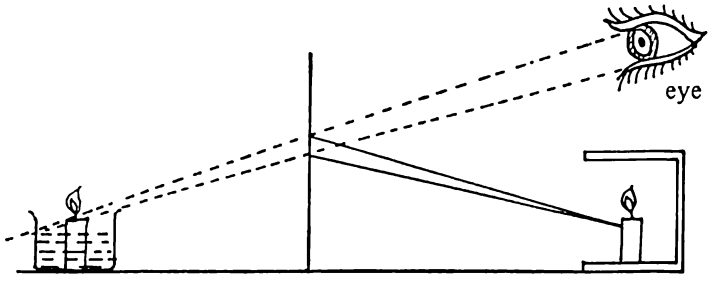
14. Deduce the relation $\frac{1}{v} \div \frac{1}{u} = \frac{1}{f}$ for a convex mirror. Draw a neat necessary diagram.

D. SCORING KEY

Questions no.	1	2	3	4	5	6	7	8
Key	B	A	C	D	A	B	C	A

Questions 1 to 8 carry 1 mark each

Q. no.	*Value points*	*Marks for each*	*Total*
9. (*a*)	Definition of principal focus	½	
	Definition of centre of curvature.	½	
(*b*)	Reasons	1	**2**
10.	Focal length 24 cm.	1	
	Object distance from the mirror 24 cm.	1	**2**
11.	Calculation v (30 cm.)	½	
	Using the formula $\frac{1}{v}+\frac{1}{u}=\frac{1}{f}$	½	
	Finding the focal length 7.5 cm.	1	**2**
12.	Correct diagram.	1	
	Angle of inclination 45°.	1	**2**
13.	Correct diagram as follows	1	



	Position of eye	½	
	Direction of rays	½	**2**
14.	Deduction of formula	4	
	Necessary diagram	1	**5**

E. QUESTION-WISE ANALYSIS

Q. no.	*Objective*	*Specification*	*Topic*	*Form*	*Marks*	*Est. time in mts.*	*Est. diff. level*
1	K	Recognizes	Plane mirror	OT	1	½	B
2	U	Sees relation	» »	OT	1	½	B
3	U	Sees relation	» »	OT	1	1	B
4	K	Recalls	Concave mirror	OT	1	½	C
5	U	Discriminates	» »	OT	1	1	B
6	U	Sees relation	» »	OT	1	1½	A
7	A	Establishes relation	» »	OT	1	1½	A
8	A	Finds relation	» »	OT	1	1½	A
9	K	Recalls	Convex mirror	SA	2	4	C
10	U	Sees relation	» »	SA	2	5	B
11	U	Sees relation and draws	Concave mirror	SA	2	3	B
12	U & S	Sees relation and draws	Plane mirror	SA	2	4	B
13	A	Suggests methods	» »	SA	2	3	A
14	K & S	Recalls and draws	Convex mirror	E	5	8	B

K = knowledge; U = understanding; A = application; S = skill; OT = objective-type question; SA = short answer question; E = essay-type question.

IV. Reforms in practical examinations for science subjects

INTRODUCTION

While the examination reform programmes for different school subjects were being envisaged, it was realized that work in the area of science subjects would remain incomplete if practical work were not included in the range of reforms [68; 127, p. 27-30].

The sixth conference of the Chairmen/Secretaries of the Boards of Secondary Education, held in 1964, deliberated on this problem in great depth and passed a resolution that the boards, in collaboration with the Examination Reform Unit (then called Central Examination Unit) of NCERT, should take up work in this area. Shortly after the conclusion of the conference, the Rajasthan Board of Secondary Education got in touch with NCERT in order to launch a programme in this area. One was duly developed, and a series of experimental try-outs were undertaken to evolve an improved system of practical examinations. The Rajasthan Board implemented the new plan in its Higher Secondary Examination of 1968 in the subjects of physics, chemistry and biology after making adequate change-over preparation in collaboration with NCERT.

We will now give a brief résumé of the experimental study conducted for the development of an improved pattern of practical examinations in science subjects, and for its large-scale implementation.

SHORTCOMINGS OF THE TRADITIONAL PATTERN

A qualitative study based on verbal reports by a number of experienced examiners in different parts of the country revealed that the traditional pattern of practical examination in science subjects suffered from several major shortcomings:

Poor sampling

Because each experiment then being given was very complex, comprehensive and time consuming, only a few experiments (e.g. two in physics) could be undertaken in the limited time available. As such, they could only measure a small fragment of the content and a few of the many aspects of skill that practical work is expected to develop. These limitations reduced both the validity and reliability of the practical examinations. In practice, therefore, the pattern was very discouraging to the pupil as well as to the teacher, especially on account of the excessively high chance factor operating in such a system.

Absence of reliable assessment criteria

The criteria of assessment were very general, and examiners were assessing the performance of students according to varied individualistic standards, leading to loss of consistency and uniformity.

Non-comparability of experiment exercises

The exercises varied so much in complexity and the nature of skills involved that it was not justifiable to attempt a comparison. The performance/proficiency of two individuals can only be compared when the ability and content tested, the level and difficulty, and the time required are comparable.

In the traditional pattern of practical examinations for science subjects only one or two experiments were given to each student. Since equipment in schools was often limited, the same experiment could not be performed by all the students. It was thus a matter of chance which experiment fell to which student. And the experiments that were allotted to each student were compulsory.

BASES FOR A NEW PATTERN

Practical tests are relatively costly and time-consuming: thus it was felt that they should be used only when other more convenient techniques such as written tests could not be used. In science subjects, it is in the realm of practical skills that written tests are not usable. Hence, practical tests should essentially be used to measure practical skills, although other objectives such as knowledge, understanding, or application need not be entirely overlooked. For this purpose, practical skill was conceived as a

combination of two components: (*a*) the process of performance; and (*b*) the product of performance. These two components were further subdivided in respect of each subject, to delimit their scope.

Process of performance

The pupil:

1. Selects appropriate apparatus, tools, etc.;
2. Checks apparatus, tools and other equipment, to ensure that they are in working order;
3. Detects errors and limitations in the fitting up of apparatus;
4. Rectifies errors, if possible, under laboratory conditions;
5. Cleans apparatus, tools, etc.;
6. Sets up apparatus, tools, etc.;
7. Sketches arrangement of apparatus (if necessary, at the outset);
8. Prepares and follows a systematic and sequential plan for taking observations;
9. States the principle or formula (explaining the symbols and so on, which are pertinent to the experiment);
10. Manipulates apparatus, tools, etc., while performing the experiment;
11. Measures quantities and accurately reads instruments and other indicators;
12. Takes precautions in handling instruments, equipment and materials;
13. Makes accurate observations of parts, specimens, processes, and so on;
14. Records observations, and makes calculations where necessary;
15. Verifies observations;
16. Performs experiments with reasonable speed;
17. Performs experiments with reasonable accuracy;
18. Performs experiments with neatness;
19. Adapts himself with somewhat new and different apparatus in setting novel experiments;
20. Explains orally the procedures, principles, etc., involved in the experiments.

Product of performance

The pupil:

1. Summarizes observations;
2. Calculates and finalizes the results;
3. Interprets data and draws conclusions;
4. Records experimental procedure and conclusions;
5. Dismantles and cleans the apparatus, where necessary;
6. Arranges the apparatus, equipment and materials in their appropriate places at the end of the work.

Sessional practical work

The practical exercises performed by a pupil in the secondary classes are recorded in specially developed record books. The skills and traits attained while performing these exercises also deserve to be evaluated as a part of practical work in science subjects. It may not be possible and perhaps not desirable to evaluate all the traits developed, but a few like 'completeness', 'neatness' and 'regularity' do deserve the attention of the evaluator.

Some of the skills that may be appraised from this aspect of practical work are: (*a*) drawing of diagrams and sketches from observed facts; (*b*) collection of specimens like ores, minerals, crystals, etc.; (*c*) display of material collected; (*d*) improvisation of simple apparatus; and (*e*) construction of models.

DEVELOPMENT OF NEW PATTERN

For the purpose of improving their validity and reliability, the practical examinations were modified in the following respects:

Increasing the number of exercices

Instead of giving a few long exercises, many short exercises were introduced. For example, in physics one of the two major comprehensive experiments was retained and the other one replaced by four or five short exercises. The maximum marks and the time, however, were kept the same.

Making the exercises objective-based

Exercises were set to test pre-determined specific aspects of skill (or understanding), as laid down in the educational objectives and as defined as part

of the process and product of performance. This tended to improve the validity of the practical examination.

Improving scoring procedures

Very detailed marking schemes, giving minute assessment data of pupils performance, were developed not only for major and short exercises but also for sessional work and orals. Detailed instructions for the use of examiners and candidates were also developed. This helped in improving the objectivity of scoring and controlling reliability by minimizing the variability in scoring by examiners (emerging from extraneous factors like personal likes and dislikes).

Improving the reporting and interpreting procedures

Detailed instructions were developed for the use of examiners. When these reports are properly used by schools, science teaching will be improved in many respects.

EXPERIMENTAL TRY-OUTS

Four examiners for each of the subjects of physics, chemistry and biology, who were involved in the development of the new pattern, tried out these procedures three times under examination conditions especially arranged for this purpose. In the first try-out ten candidates, and in the second and third fifteen to twenty candidates, were involved in all three subjects. During each try-out the four examiners observed simultaneously and marked independently. The experience of an earlier try-out was always invariably used to improve the exercises and to refine the scoring schemes of the subsequent try-outs. The results of assessment were then studied and correlations found. The findings in the try-outs of biology are given in Table 2 as an illustration. The results are comparable with those for the other subjects.

TABLE 2. Comparative study of three sets of examiner inter-correlations in biology: practical examination in three try-outs.

A. Averaged across question

Examiner/try-out	*AE*	*AC*	*AD*	*BC*	*BD*	*CD*	*N*
I.	.78	.65	.67	83.	.74	.68	12
II.	.94	.95	.95	.92	.94	.93	15
III.	1.00	1.00	1.00	.99	.99	.99	15

B. Based on total test scores

Examiner/try-out	*AB*	*AC*	*AD*	*BC*	*BD*	*CD*	*N*
I.	.89	.88	.59	.78	.82	.63	12
II.	.87	.45	.84	.55	.90	.45	15
III.	.97	.99	.98	.98	.98	.97	15

C. Based on ranking of difficulty indices of questions

Examiner/try-out	*AB*	*AC*	*AD*	*BC*	*BD*	*CD*	*N*
I.	.88	.90	.90	.98	.78	.75	9
II.	.93	1.00	.98	.93	.97	.98	9
III.	.98	1.00	1.00	.98	.98	1.00	9

Significance levels of rhos:

When $N = 9$: .05 = .600; .01 = .783
When $N = 12$: .05 = .506; .01 = .712
and When $N = 15$: .05 = .439; .01 = .623

In this subject (biology), during the first try-out three out of six examiner inter-correlations are not significant at the .01 level but are significant at the .05 level. The agreement among the examiners in try-out II is at or above .92. All the inter-correlations substantially increased in try-out II. Again, in try-out III, the examiner inter-correlations averaged across the questions reached unity in 3 out of 6 cases, and in the rest they are at .99. Thus the inter-examiner agreement in biology practical tests reached almost the optimum level as a result of intensive training, practice and development of well-designed scoring procedures.

IMPLEMENTATION OF THE SCHEME

Preparation

Encouraged by the above findings, the Rajasthan Board decided to launch the reform programme on a large scale throughout the state. It developed brochures for each subject, entitled 'Improved pattern of practical examination', with the help of NCERT and the examiners who had participated in

the try-outs, and circulated them to schools. The board also trained all examiners in the new pattern of practical examination in these three science subjects. Through four-day workshops organized for the purpose, they were given training in the theory of conducting the examinations. They acquired practical experience in conducting the new-type practical tests in actual examinations, which were specially arranged at various places as a part of the training programme.

Implementation

With these and other preparatory steps carefully executed, the board introduced the new pattern in the Higher Secondary Examination of 1968. Its impact on school practices has been found to be quite encouraging according to the follow-up studies.

Some problems

During implementation, some problems were encountered which had already been envisaged.

1. *Lack of equipped laboratories.* Many schools did not have good laboratories. For want of these, it became difficult to conduct the new examination effectively. This was also true of the old pattern of examination. Some laboratories, too, did not have trained assistants. Services of trained assistants are essential.
2. *Number of candidates per examiner.* The new pattern envisages close observation of pupil performance during the period of examination. One examiner obviously cannot cope with forty candidates at a time, as at present. Perhaps twenty may be a manageable number.
3. *Trained examiners.* Not only in the initial stages, but continuously thereafter, the authorities will have to ensure that examiners are acquainted with the new pattern of examination, including its spirit and technique, before they are entrusted with the job.

Implications

For the efficacy of this new examination, co-operation from different agencies will be needed. Some implications of the scheme for such agencies are indicated below:

1. *Departments of Education and Boards of Secondary Education:* (*a*) school laboratories will have to be better equipped; (*b*) syllabuses of practical

work in science subjects may need to be reviewed; (*c*) flexible timetabling will have to be permitted; (*d*) better inspection and guidance programmes will have to be developed; (*e*) only qualified and trained examiners can be selected; and (*f*) examiners' reports will have to be scrutinized and the findings reported to schools for action.

2. *Schools:* (*a*) greater initiative on the part of individual teachers and pupils will be needed; (*b*) rigidity of timetables will have to be reduced; and (*c*) the evaluation data should be used for remedial and improvement actions.
3. *Teachers:* (*a*) variety of practical activities will have to be designed and organized to develop specific skills among pupils and to discourage the tendency of mechanical repetition of standard experiments; and (*b*) initiative on the part of pupils will have to be encouraged.

CONCLUSION

Practical work in science subjects is aimed at achieving some specific purposes, which cannot be otherwise realized. Practical examinations, therefore, have to be so planned that they measure the degree of success achieved by practical work, as a contribution towards the multi-faceted development of pupils' innate powers and subsequent achievements. The new pattern suggested here aims at this. It defines the outcomes of the process and the product of performance, stresses the need for developing valid and reliable tools of measurement, and has built-in ways to evaluate the results of measurement. It also envisages sound feedback procedures to utilize the results of evaluation in improving school practices. It is hoped that, given a fair trial, this pattern will work as a catalytic agent in making science education a dynamic process and a creative activity in our schools.

The scheme, as described, has attracted, the attention of science teachers and experts and is acknowledged to be of great help in their effort to make evaluation of practical work an integral part of science teaching. They are increasingly using this approach.

V. Reforms in oral examinations

INTRODUCTION

The need for oral examinations in our education system is no longer a matter for debate. But there are currently two basic schools of thought in India regarding the purpose and scope of oral examinations. One of the two believes that the purpose of oral examinations should be to help to test the validity of evidence obtained through other modes of assessment, such as written and practical examinations. The other school of thought, consisting mostly of language teachers, believes that an oral examination should emphasize the assessment of oral expression only, and that is should address aspects like pronunciation, grammatical correctness, vocabulary, and use of language.

ASSESSING KNOWLEDGE OF CONTENT AREAS THROUGH ORAL EXAMINATIONS

Advocates of the first-mentioned school support their viewpoint by stating that oral examinations provide an excellent opportunity for evaluators to know precisely what an examinee actually knows on a particular subject about which he may be questioned. They emphasize that oral examinees have absolutely no scope for dodging the examiner's line of inquiry, as is sometimes possible in other modes of examination.

The supporters of this point of view also assert that the oral test serves a valuable purpose as a means to evaluate how quickly and how well a student can give a co-ordinated response to a question asked of him, on the content of a particular subject. They stress that the student gets an opportunity to display how effectively he can defend his answer and argue a case.

The West Bengal Board of Secondary Education, Calcutta, believes in this approach. It apportions 100 marks for oral examination in different subject fields, with the following distribution: languages, 40; physical sciences, 20; life sciences, 20; history of India, 10; geography of India, 10.

Oral examination in languages

In respect of languages, the West Bengal examiners attempt to evaluate the candidate's power of expression, precision in answering, demeanour, and the manner of handling a question. Marks allotted to this area are distributed as follows: questions about prose and poetry, 5 marks; questions about supplementary reading, 8 marks for prose and 7 marks for the rest; reading four lines from prose (supplementary reading), 6 marks; recitation of six lines from poetry (supplementary reading), 10 including 2 marks for memorization; general impression, 4 marks.

Oral examinations in physical and life sciences

In physical and life sciences the only criterion of evaluation is a correct and precise answer. An attempt is made to preclude the subjectivity of the oral examiner in this area by providing him with a set of questions divided into two groups. In the first group there are general questions like: 'What is the name of an apparatus under which a person can see plants or animals which cannot be seen with the naked eye?' In the second group are some more difficult questions like: 'State what happens when a red flower moistened with water is dropped in a jar of sulphur dioxide.' 'Name another gas which has this property.' The complete set of questions is sent in a sealed envelope to the Examination Centre by the Board of Secondary Education, and the oral examiner opens this question packet just before the examination. The only freedom that the examiner has is to select which questions he wants to ask of a particular student.

The total of twenty marks are distributed as follows in each of the two subjects areas (physical sciences and life sciences): one general type of question from the first group of given questions, 6 marks; two specific questions from the second group of given questions, 10 marks; one question for judging the merit and excellence of the students, chosen from the supplementary questions which appear in brackets appended to questions of the second group, 4 marks.

Oral examinations in history and geography (India and her people)

As in the previous case, the requirement of a correct and precise answer is the only criterion applied. The question papers in this area follow the same pattern as in physical and life sciences, except for the merging of subject marks so as to provide an option.

The distribution of marks is as follows: one general question from history, 3 marks; one general question from geography, 3 marks; one specific

question from history, 5 marks; one specific question from geography, 5 marks; one question of higher difficulty level either from history or geography, 4 marks.

The scheme is operated by allotting approximately 300 students to each examiner. The examiner is expected to devote about 6 to 10 minutes to each pupil.

Evaluation of oral expression through oral examinations

The advocates of this school of thought are mostly involved with language teaching. They believe that speaking is the most important of the four linguistic behaviours. Therefore, they hold the view that oral examinations should test the ability of a student to speak correctly, fluently and effectively. As part of the Examination Reform Programme, an experiment was conducted by the NCERT, in collaboration with the Central Board of Seconday Education, New Delhi, for evolving a system of evaluating speech on the basis of this approach. This system was defined by R. G. Misra and K. G Rastogi in the following terms: (*a*) to speak with correct articulation, pronunciation, and intonation; (*b*) to speak in grammatically correct language; (*c*) to make an appropriate use of words, phrases and idioms (vocabulary and usage); (*d*) to express rich and relevant thought content in an organized way; (*e*) to speak fluently (delivery); (*f*) wherever necessary to use appropriate physical gestures for what is being expressed in speech (manners and gestures); and (*g*) to speak effectively.

Aspects of evaluation and evaluation criteria

These aspects of oral expression were further sub-divided for purposes of evaluation. These are given in Table 3 with the criteria developed for each aspect.

Conduct of the oral examination

The experiment provided for three parts in the oral examination. The first one was that of 'conversation'; its chief purpose being to establish a rapport with the examinee. The other two parts were a 'short speech' and 'questions'. The main purpose of these was to test an examinee's qualities of oral expression.

In clear contrast with the West Bengal approach, the test situations selected for assessing oral expression were deliberately selected so that they did not involve any specialized knowledge of any subject of study. Themes

TABLE 3. Evaluation of oral expression

Area of evaluation	*Aspect of evaluation*	*Evaluation criteria*
Pronunciation	Articulation Accent Rhythm Pitch Intonation	Correctness Distinctness Appropriateness
Grammatical correctness	Structure Semantics	Correctness Appropriateness
Vocabulary and usage	Words Phrases Idioms Proverbs Sentence patterns	Extensiveness Appropriateness
Thought content and its organization	Approach Ideas Arguments Conclusion	Spontaneity Richness Relevance Organization
Delivery	Fluency Modulation Speed Verbal mannerism	Naturalness Smoothness Adequacy Courtesy to interviewers
Manners and gestures	Linguistic Courtesy Attention and respect to interviewers (gestures, posture and body action)	Courtesy and appropriateness
Effect	Intellectual Emotional	Confidence Conviction Appeal

were chosen from: (*a*) the experiences of students in their daily life (like accidents, shopping, and so on); (*b*) the immediate environment (like guests

in the home, school examinations, etc.); and (*c*) their co-curriculum activities (likes debates, exhibitions, etc.).

For purposes of evaluation, five-point rating scales (0 to 4) were developed and the students were evaluated on them. The categories on the rating scales were 'superior', 'good', 'average', 'poor' and 'very poor'. Each student was rated on the seven identified areas of expression. The weights given to these aspects of oral expression were as shown in Table 4.

TABLE 4. Weighting given to oral expression.

Aspects of oral expression	*Weighting*	*Weighted score factors for use with the rating scale*
Pronunciation	1	4
Grammatical correctness of language	2	4
Vocabulary and usage	2	8
Thought content and its organization	2	8
Delivery	1	4
Manners and gestures	1	4
Effect	1	4

For convenience in the use of the five-point rating scale, each of the weightings was multiplied by 4. The total of weighted scores for each student was divided by 4 to get the score obtained by the student.

In the experiment each examiner was allotted twenty students per day and each set of three examiners was given 8 to 10 minutes for examining each student. While evaluating a candidate on the various areas of oral expression, each of the seven areas was constantly kept in view. Each examiner scored independently. In actual practice, however, it will be desirable to proceed to the next student after comparing and moderating the scores for the previous candidate given by the different examiners in a set.

Statistical details of the experiment.

The experiment included three try-outs, performed on 10, 20 and 500 students respectively, with a view to establishing the degree of reliability of the procedure. Table 5 shows the results of three try-outs of the experiment [57, p. 113-15].

TABLE 5. Rank-order correlations among examiners

The first try-out ($N = 10$)

Examiners	*E1*	*E2*	*E3*
E1	—	.69	.85
E2	—	—	.59
E3	—	—	—

Significance level of rhos when $N = 10$, .05 = .564, .01 = .764.

The second try-out ($N = 20$)

Examiners	*E1*	*E2*	*E3*
E1	—	.75	.72
E2	—	—	.65
E3	—	—	—

Significance level of rhos when $N = 20$, at .05 = .377, .01 = .534.

The third try-out

Students	*Examiners*			
	XY	*XZ*	*YZ*	*N*
A	.89	.89	.90	65
B	.97	.67	.78	70
C	.61	.78	.62	121
D	.99	.99	.99	78
E	.99	.99	.99	50
F	.91	.95	.96	42
G	.92	.91	.89	74
	.95	.94	.94	500

X and *Z* = external examiner; *Y* = internal examiner; therefore, *XY* = internal and external examiners; *N* = number of students.

CONCLUSION

While, in our opinion, it is difficult to support the rigidity of the West Bengal scheme, our own Delhi experiment cannot be presumed to be the ultimately correct approach to all oral testing, for it is specially suited only to the area of languages. There could, of course, be no hard and fast rule about the use of oral testing and its scope. Both 'content', as well as 'speech' are important in their own right; either or both may be emphasized according to the specific purpose of evaluation and the situation in which it is being conducted.

VI. 'Prep Index' and evaluation of educational practices

INTRODUCTION

The evaluation of educational practices has usually been an arbitrary type of assessment, judging mainly in qualitative terms what can be interpreted differently by different people. In fact the evaluator on the one hand, and the user of an evaluation on the other, often lacked correspondence in their points of view. This had very serious consequences for the person evaluated as well as creating confusion about the precise definition of the terms used.

In the spirit of approaching some practical solution to this difficulty the concept of 'Prep Index' (the index of proficiency in an educational practice) was evolved by the Examination Reform Unit. The concept was initially applied to teacher education in the area of student teaching. It was later extended to the area of games and sports. Since 1976 it has been applied on an experimental basis to the area of medical education [54; 58; 125, p. 115-34].

The Prep Index concept and method has found great acceptance in the area of teacher education. It is currently in use in the teacher colleges of Kerala, Gujarat and Tamil Nadu, and the idea is fast catching on. In other fields it is still at the try-out stage.

After being introduced to participants of the Unesco-sponsored International Seminar on Curriculum Development and Evaluation held at Granna, in Sweden in 1971, the Prep Index evoked great interest in several developed and developing countries and generated a lot of inquiries and requests for its evaluation tools (particularly rating scales). The inquiries were answered and materials supplied to the concerned individuals and agencies.

The meaning of evaluation

'Educational evaluation' is a process of estimating and appraising the degree and dimension of students' achievements. 'Evaluation of educational practice' is a process of estimating and appraising the proficiency level of the particular educational practice which is being conducted. It is a way of appraising the application of educational theory in practice.

Scope for evaluation of educational practices

Educational practices and the activities related to them can be classified under three main headings:

1. Curriculum activities related to the subjects of instruction, organized with a view to achieving the scholastic objectives.
2. Co-curriculum activities related to other school programmes and practices. These provide a background for the curriculum activities. The purpose of organizing them is to promote certain aspects of pupils' growth which, although important ideals of the instructional programme, cannot be achieved through the teaching and learning of subjects alone.
3. Activities related to prognosis, diagnosis, review, motivation, guidance and evaluation.

Purpose of evaluating educational practices

In a school programme there may be several purposes or functions for which the evaluation of educational practices is considered necesseary. To illustrate, here are three of them:

1. To discover the extent of competence which the student has developed in initiating, organizing and improving his day-to-day work, and to diagnose his strengths and weaknesses with a view to further guidance.
2. To predict the educational practices which a particular student-teacher can best participate in or organize.
3. At the end of a course, to certify the student's degree of proficiency in a particular educational practice.

Procedure

By way of an example, let us take co-curricular activities in the schools as the subject of evaluation. The main areas of evaluation for co-curricular

activities are: (*a*) cultural activities; (*b*) literary activities; (*c*) games and sports; and (*d*) excursions. Suppose that their respective marking weights out of 100 in the programme of a particular school are 25, 25, 40 and 10 respectively. To focus upon 'games and sports' as the area of evaluation for one or more student teachers, we may find that it has two main aspects: (i) organization of games and sports; and (ii) participation in these activities. Then the evaluative criteria for aspect (ii) could be: co-operation with other players and with referees or judges; observance of punctuality; respect for rules and their observance; sportsmanlike behaviour.

Given these areas, aspects and criteria of evaluation, the evidence for making our judgement about a student's participation in games and sports could be collected by:

1. Observation of students: before taking part in games or sports events; in the course of the events; and after the events.
2. Anecdotal records of some noteworthy examples of behaviour in operational situations.

The evidence collected may then be summarized. Qualitative summarization could be done through descriptive statements; and quantitative summarization through rating scales which in turn are used to derive the Prep Index in regard to each aspect of evaluation.

DERIVATION OF THE 'PREP INDEX'

Let us assume that, for the evaluation of participation in games and sports, we have already collected evidence through observation and some anecdotal records. To simplify the example further, let us consider the third criterion: 'respect for rules and their observance'. Here, a rating scale probably will be the most suitable evaluation device.

If we construct a nine-point scale (with five points defined) for evaluating the degree of respect for rules and their observance by a student, it may look something like Table 6.

Usually, the evaluation designer constructs rating scales for each of the criteria (in our example, four). If so, the sum of the ratings from each of these scales will have to be divided by the number of rating scales prepared. The quotient represents the final rating of an individual student on a particular aspect of evaluation.

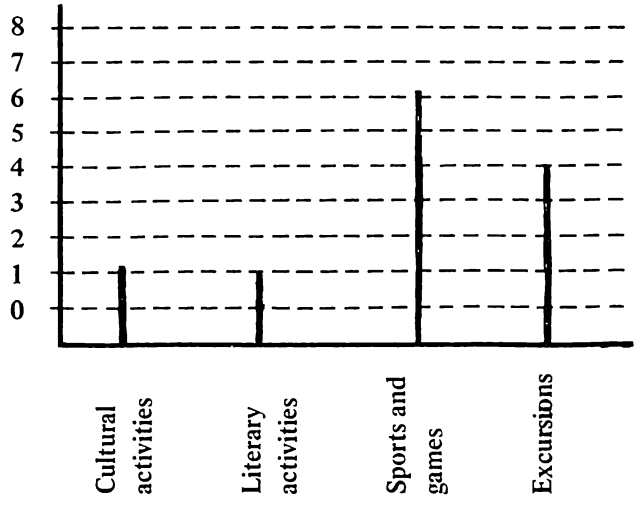
In the example so far, the evaluation, by four criteria, of one of the two aspects of 'games and sports' has been indicated. However, in our example there are three other main areas of evaluation. For convenience, we will

TABLE 6. A nine-point rating scale for evaluating 'respect for rules and their observance' among students in games and sports

8	— Always displays respect for rules and abides by them.
7	—
6	— Seldom displays disrespect for rules or fails to abide by them.
5	—
4	— Normally displays respect for rules and abides by them.
3	—
2	— On most occasions, displays disrespect for rules and seldom abides by them.
1	—
0	— Always displays disrespect for rules and never abides by them.

assume that, for each main area, the criterion scale ratings have been summarized (in the way just described) and each main area's aspect ratings merged—although, in principle and practice, they could remain separate so as to provide a more detailed analysis. Whatever method is used makes it possible, now, to prepare a visual profile of the evaluated student, such as Figure 3.

FIGURE 3. Visual profile of an evaluated student.



The corresponding 'Prep Index' (index of proficiency in co-curricular activities) of this student could be calculated as shown in Table 7.

TABLE 7. The Prep Index for a particular student.

	Co-curriculum activities	*Weightings*	*Score on the scale*	*Weighted score*
1.	Cultural activities	25	2	50
2.	Literary activities	25	2	50
3.	Games and sports	40	6	240
4.	Excursions	10	4	40
	Total	100	14	380

A 'perfect' or maximum weighted score would be 800.

$$\text{Prep Index} = \frac{380}{800} \times 100 = 47.5$$

USE OF EVALUATION DATA

We can now continue, as it were, from the right-hand end of Figure 4.

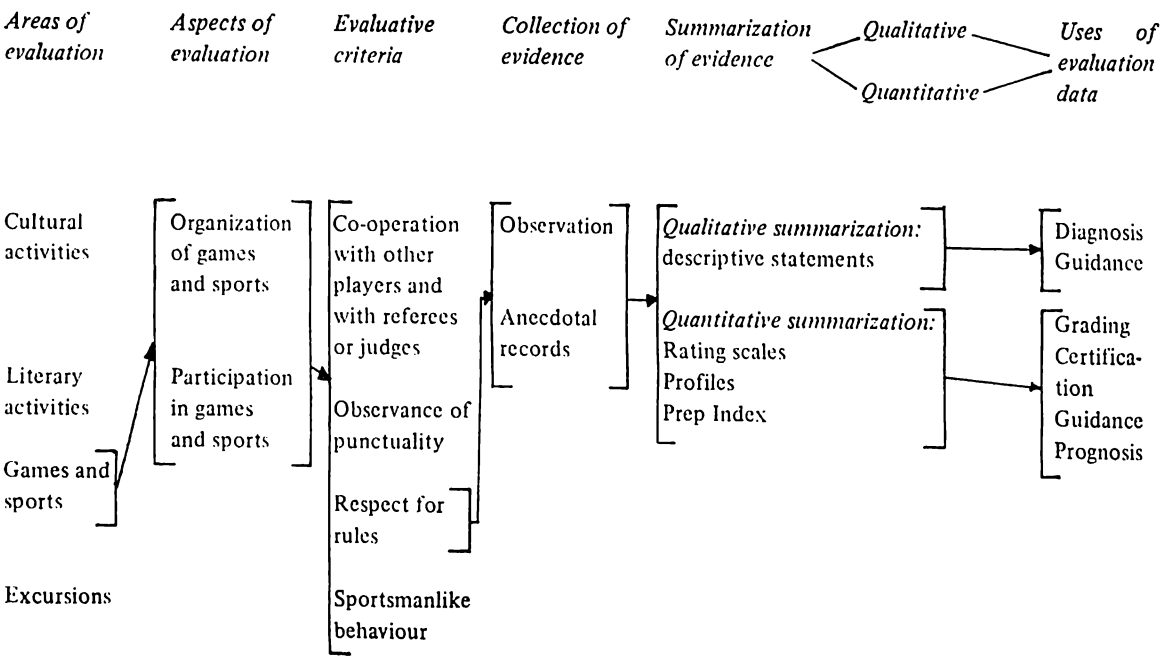
Diagnosis

Educational practices should be incorporated in a school programme with a view to achieving some well-defined educational objectives. The achievement of these objectives leads to student growth in desirable directions. For instance, in the case of student teachers, growth comes about as the student organizes the various school programmes and conducts educational practices so as, in turn, to ensure developments in pupils as enunciated through the learning objectives which apply to them. The extent to which a student teacher is currently successful needs to be evaluated. The primary purpose of the entire endeavour is to identify the individual's strengths and weaknesses, in preparation for guiding him towards making better personal progress and achieving better success with pupils.

Self evaluation and guidance

External evaluation of an individual's educational practices—particularly throught the development of profiles and Prep Indexes at periodic intervals—

FIGURE 4. Methodology of evaluating educational practices.



is an aid to his *self*-evaluation and *self*-guidance. Being under evaluation is a spur to motivation for achieving better success on subsequent occasions.

The evaluator also finds himself on a better footing to assess a student on the basis of the kind of evaluation data that have been described. The better he knows a particular student's development requirements, the more precise he can be and the more effective in giving him guidance.

Certification

Certification of the student teacher, in regard to the degree of competence achieved by him in the respective areas evaluated, is a most important function that requires well-founded data. The Prep Index will prove to be a more valid indicator of proficiency than intuitive assessment which is sometimes capricious or prejudiced. Certification on the basis of a number of pertinent and carefully evaluated dimensions will also be more meaningful to a person's employer.

Prognosis

Meaningfulness to the employer, in the above sense, implies that evaluation data could and would be used for predictive purposes, that is, concerning what a particular student is likely to accomplish when he takes up a job.

CONCLUSION

As undertaken in the past, evaluation of educational practices tended to be arbitrary and unreliable. The development of a consistent methodology of evaluating educational practices was therefore necessary; particularly for the rating and guidance of student teachers at a crucial stage in their careers. Prep Index is one such methodology which could be applied to all educational practices. Evaluation done on the basis of this methodology will, it is hoped, yield data which will be more accurate, specific and meaningful for decision making than the non-objective impressions, vague memories and emotional impulses that underlie snap judgements about an individual.

VII. Towards school autonomy

The dissatisfaction and disillusionment with the traditional system of external examinations have led educational thinkers to search seriously for some viable alternatives. Even a layman today looks at the present system with suspicion.

In one case where ninety experienced examiners were required to mark some ten history answer books, one of the answer books was considered the best of the ten by one experienced examiner, and the worst by another [8]. In the same investigation the only answer book which one examiner considered worthy of a distinction was failed by seven others; eight gave it a 'first class'; and the examiners' marks ranged between 22 per cent and 79 per cent. The number of 'first classes' awarded by some examiners was larger than the number passed by others.

So whether a candidate fails or gets a distinction may often be due as much to 'luck' (i.e. which examiner marks his paper) as to 'merit'. Of course, this kind of controlled variability, so unjust to candidates, is one of the conditions which a reform of the external examination system aims to remedy through improvements such as those mentioned in Section III. Even so, external examinations are able to address the aptitudes, abilities and learnings of students only partially. Some educationists argue that it is not justifiable to pass judgement upon an individual on the basis of such a small sample of the level of his growth. Accordingly, they contemplate measures for giving greater autonomy to each school in assessing its own students.

'INTERNAL ASSESSMENT': THE FIRST ATTEMPT

The Bhopal Seminar on Examinations adopted this argument when it resolved that the teacher of an individual student must be a party to the assessment of that student. A suggestion from the seminar was that 20 per

cent of the marks in each subject might be allotted to internal assessment by the teachers.

The idea found favour with several Boards of Secondary Education. Those of Bihar, Madhya Pradesh, Punjab and Vidarbha introduced internal assessment in their examinations. Under this scheme, if the total weighting of a subject was 100 marks and the proportion allotted for internal assessment was 20 per cent, the question papers for the external examination were set for eighty marks only. The examination subject teachers would award marks to their students out of the amount allotted to internal assessment. These subject-by-subject marks were forwarded to the board by the school concerned, so as to be arithmetically added to the score obtained by the student in the external examinations.

This scheme soon started being misused by some unscrupulous schools, who saw 'internal assessment' as a device for boosting their students' marks. A number of schools did this because of external pressures and out of fear. These outcomes led to the scheme being hastily withdrawn by the boards concerned. Each of these Boards of Secondary Education had taken a fairly long time in reaching its decision to introduce internal assessment; but the 'drop it' decision resembled the sequence of a chain reaction [74].

Setback to the movement

These successive decision of the boards to withdraw the scheme of internal assessment came as a great setback to the movement for giving autonomy to schools. The very term 'internal assessment' came to be regarded as synonymous with educational dishonesty.

Well-meaning educationists all around the country started having second thoughts about this movement. They lost hope in the possibility of practical success for the internal assessment concept, and their courage to defend it was dampened.

Even more tragically, a great many honest individuals pursuing the noble profession of teaching also lost prestige because of the actions of a few. Their traditional reputation of honesty and integrity was put in question.

A RENEWED APPROACH

In spite of this setback, India's educationists could still not come to terms with the increasingly evident defects of examinations. The Examination Reform Unit of NCERT was also very disturbed by the situation [101, 103].

The topic again came up for discussion when the Sixth Conference of the Chairmen and Secretaries of the Boards of Secondary Education convened at Poona in November 1964. As could be expected, by now there were genuine and wide differences of opinion among the delegates. Nonetheless, some general ideas which have since taken root emerged.

A school, it was stated, is capable of assessing much more about a particular student than external examinations ever can. External examinations are standardized (and statistically amenable) by means of testing scholastic aspects of a pupil's current understandings; albeit with only partial coverage. Evaluation *within* the school and *by* the school can, on the other hand, cover both the scholastic *and* non-scholastic aspects of a pupil's personality. Using suitable methods and proper controls, internal assessment can undertake this function quite effectively. Despite the initial mistakes, its potential, therefore, ought not to be left unexplored.

From this revised standpoint a comprehensive scheme of internal assessment was developed by the Central Examination Unit. The Rajasthan Board of Secondary Education, Ajmer, as usual, volunteered to try it out. A manual of instructions for the scheme was also developed, suited to the specific needs of Rajasthan. The officials of the state board participated in the development and finalization of the scheme [10], which after a small-scale try-out for two years was then introduced in all of the more than 2,000 secondary schools of the state in 1969. At present, Tamil Nadu is also trying out the scheme in five hundred of its secondary schools, and proposed to double the number during 1977 in a phased programme for all schools.

OUTLINE OF THE COMPREHENSIVE SCHEME

1. *Scholastic aspects*

(a) Curricular areas	*Techniques of assessment* Written examination Oral examination Practical examination *Tools of assessment* Question papers Diagnostic tests Unit tests Standardized achievement tests

	Periodicity of assessment Periodical tests Terminal tests Special tests *Coverage* For all students
(*b*) Intelligence	*Techniques of assessment* Pencil and paper tests Performance tests *Tools of assessment* Standardized tests of intelligence and abilities *Periodicity of assessment* Once a year, preferably at the beginning of the school year. *Coverage* For all students in the schools where facilities are available.
2. *Non-scholastic aspects*	
(*a*) *Personal and social qualities* Regularity Punctuality Discipline Habits of cleanliness Emotional stability Initiative Co-operation Sense of responsibility Industry Civic consciousness Spirit of social service	*Techniques of assessment* Observation *Tools of assessment* Anecdotal records Rating scales *Periodicity of assessment* Once every term, based on observation of classroom behaviour; behaviour in co-curricular activities; and other incidental behaviours. *Coverage* The first four personal and social qualities are to be assessed for all students. The remaining personal and social qualities, interests, and attitudes are to be considered for evaluation only in respect of those students in whose cases evidence is available.
(*b*) *Interests* Literary Scientific Musical Artistic Social service	

(*c*) *Attitudes*

Towards teachers
Towards studies
Towards schoolmates
Towards school programmes
Towards school property

(*d*) *Physical health*

Height
Weight
Ratio of height to weight
Chest expansion
Physical defects, if any
Eyesight
Hearing
Adenoids
Teeth
History of diseases, if any

Techniques of assessment

Medical check-up
Observation by the teacher

Tools of assessment

Rating scales
Doctor's own instruments

Periodicity of assessment

Half-yearly

Coverage

For all students

3. *Activities*

(*a*) *Literary and scientific*

Library reading
Debate
Recitation
Creative writing
Speech-making
Science club

[The school may organize any other subject club and the necessary rating scales may be prepared accordingly.]

(*b*) *Cultural*

Drama
Music
Dance
Drawing and painting
Sculpture
Artistic embroidery

Techniques of assessment

Observation

Tools of assessment

Anecdotal records
Rating scales

Periodicity of assessment

At least once every term.

Coverage

Library reading for all students; and at least one of the remaining literary, scientific and cultural activities for each student.

(c) *Outdoor* Games Sports Gymnastics Swimming Scouting National Cadet Corps First Aid Junior Red Cross Community service Gardening Craft	*Techniques of assessment* Observation *Tools of assessment* Anecdotal records Rating scales *Periodicity of assessment* At least once every term. *Coverage* Games and sports for all students; and at least one of the remaining activities for each student.

Operation of the scheme

As a part of the scheme, the tools of assessment (rating scales, checklists, inventories, etc.) are prepared and supplied to the teachers along with the manual of instructions.

With the introduction of a wide variety of pupil activities in the schools, opportunities are provided for the students to display the levels of their proficiency as indices of growth in several concurrent dimensions. Likewise, teachers have at least as many opportunities for collecting evidence regarding them. Each teacher collects such evidence on anecdotal record forms. These are discussed every term regarding each student in meetings of the school faculty. The requirement for obtaining collective opinion wards off the possibilities of invidious favour or disfavour by individual teachers. The final collective verdict of the faculty determines the rating of a particular student in regard to the aspect of personality under reference.

These ratings and results of tests in the dimensions of academic achievement, intelligence, and physical progress and impediments, are recorded in the Cumulative Record Card which has been very comprehensively developed.

It may be mentioned that, to ensure the scheme is functional and realistic, it is not compulsory for a student to be rated on all interests or attitudes, or personal and social qualities. He is rated only in respect of those areas in which he shows special promise or specific deficiency as supported by the evidence collected.

Besides the Cumulative Record Card there is also a Progress Report. While the former remains the property of one or more schools as a confidential document, the latter is the vehicle to communicate the levels of performance and proficiency to the students and parents, as feedback to induce further

improvement. The Progress Report is given to the student every term, but a Cumulative Record Card either remains with the school or is transferred to another institution where the student may go to study at the request of that school.

There is yet another document called the Personal Data Sheet which contains every possible type of individual or family information about a student which could have a bearing on his education. The information for this document is collected from the parents and is not available to the student or any other person. It is used for purposes of diagnosis and remedial/enrichment instruction.

On the basis of the information and evidence collected, a student is also given a final Certificate of Internal Assessment. This certificate is in addition to the one given for a student's level of performance in external examinations. It is given by the school and authenticated under the seal of the Board of Secondary Education. A special thing about this certificate is that while it gives the average scores of a student in a subject during the past two-to-three years, it also gives ratings on personality traits, interests, attitudes and so on, only in respect of those areas where the student has some positive qualities. Any negative ratings are deliberately not given in the Internal Assessment Certificate so that the student may carry this certificate as an asset.

The introduction of this scheme has had a very laudible influence on the tone of the schools and has also helped bring out hidden talents in numerous students. The institutions of higher education—as, also, the employers—are beginning to give due recognition to this certificate.

INTERNAL ASSESSMENT IN SPECIAL SUBJECTS

One of the comparatively recent progressive steps is to leave out of the scheme of external examinations one or two special subjects. These subjects are exclusively assigned for internal assessment. One of the reasons for this is to take a concrete step in the direction of autonomy. The second reason is that achievement in these subjects is most difficult, if not impossible, to evaluate through external examinations. The main examples of such curriculum areas are work experience, health education, and physical education.

Evaluation in work experience

The main purpose of introducing this subject into the curriculum is to bridge a gap between the individual, the school, the society and work. In a

subject of this kind, therefore, it is desirable to assess progress towards the following objectives:

1. Knowledge and understanding of pertinent facts, concepts, materials and processes.
2. Skills related to both the product and process of performance. These include: planning and maintenance of sequences in operations; proficiency in manipulating tools; ingenuity in the use of tools and materials; economy in regard to time, labour and cost; adherence to safety rules; correct selection of tools; creativity and originality. In regard to a specific product, its utility and value, from the point of view of the money spent on it, as well as its market prospects, could count among the criteria.
3. Among interests and attitudes to be evaluated are consciousness of the dignity of labour; self-reliance; social commitment; initiative; regularity and punctuality.

Evidently, the last-mentioned categories, as well as many of the others, cannot be evaluated through external evaluations. Instead, there has to be oral and practical evaluation, as well as recorded observation. Among these types, we may select methods and apportion relative evaluation weightings according to our specific situations. The development of adequate tools of evaluation like rating scales, checklists, observation schedules and their appropriate use by teachers will, of course, be the most important prerequisite for effective evaluation.

Evaluation in physical education

This programme would cover athletics, team games, and other activities like gymnastics, and exercises and attitudes associated with yoga.

While various abilities and skills in this area are to be evaluated through display or demonstration, as also for the ease and grace of performance, it will be desirable to incorporate in the evaluation scheme such qualities as self-discipline, sportsmanship, team spirit and leadership. In this area, as in others, the evaluation processes will be spread over the entire school session, and observation will be the main technique of evaluation.

Evaluation in health education

This is a comparatively new area for evaluation. Its aspects include: health knowledge; health habits; health skills; health interests; and health projects. Observation again is the main technique of evaluation for any such dimension. As is true of the other special areas, evaluation tools are

developed to ensure that evaluation is undertaken continuously, performed accurately, and recorded periodically.

AUTONOMOUS SCHOOLS

The most important development in this movement is the official designation of some excellent schools as autonomous in the real sense of the term. Again, Rajasthan was in the vanguard, where in 1976 Vidya Shawan School at Udaipur and Banasthali School in Jaipur were declared completely autonomous. These two schools have the freedom of developing their own curriculum, choosing their own textbooks, using their own instructional strategies and issuing their own certificates. The board only exercises a superficial kind of control by nominating one member to the academic committees of the schools. This it deems necessary to merit giving its seal to the certificate issued by the school.

It is to be hoped that the movement to identify fully competent schools and then declare them autonomous under due safeguards will spread to other parts of the country as well. The movement gives real direction to a purposeful programme of examination reform for our country.

VIII. Reforms in the mechanics of conducting examinations

This section discusses changes in the ways of conducting examinations which have already been introduced. These are improvements which have become common to several of the Boards of Secondary Education and state Departments of Education conducting external examinations at the school stage.

SOME IMPORTANT INNOVATIONS

In the traditional pattern, question papers used to be set by a single individual and were referred to a moderator afterwards. The latter looked through the question paper mainly to ascertain the correctness of the questions, appropriateness of the level of difficulty for the particular standard, relevance of questions to the syllabus and the prescribed textbooks, and the range of content matter covered by the question paper. Both the paper-setter and the moderator were subject experts, but the moderator had a final say in the matter. The paper-setter was rarely present at the time the paper was moderated; one reason for this was the requirement of secrecy.

In the new pattern, question papers are set by teams rather than one individual, and the institution of moderatorship has been abolished in several subjects and states. The agencies that have adopted this system normally have three people on the paper-setting panel. One of these is a university person (particularly for the secondary school examinations) who is there to ensure accuracy of the questions in relation to the subject matter. The second is a training college person who keeps a check on the accuracy of the techniques and tools of testing and ensures that each question follows the rules for framing that specific kind of question. The third person is a teacher who keeps watch on the level of the difficulty of the questions and their relevance to the syllabus textbooks and instructional methodology,

as well as looking for their concurrence with the learning situations in the schools. In fact, when this three-member team jointly sets a question paper, their interaction does away with the need for a moderator.

This team of three is normally provided with the design of a question paper (see the description given in Section III). To begin with, working alone, each individual draws up his own blueprint on the basis of the design, and prepares a question paper. Then, all three bring their question papers to a central meeting place where they discuss, improve and eventually confirm the three separate question papers—there is no attempt to merge these into a single paper. At this meeting not only are the individual questions verified and confirmed, but also the marking scheme, which gives the expected outlines of answers and the marking weights provided for each aspect of the answers. The 'Directions for examinees' to be printed in the question paper, as well as the 'question-wise analysis' (which is a check on the paper's calibration to the design and blueprint) are completed at the same session.

Thus, at the conclusion of the meeting, three sets of questions are ready; each set complete with its blueprint, marking scheme and question-wise analysis. The sets are sealed separately and the board uses one of them for the final examination, another for the supplementary, and holds the third in reserve for an emergency situation. The main advantage of having three sets prepared and confirmed simultaneously is that they emerge as parallel tests at the design level. Then one of them can be substituted for either of the other two without significant loss or gain.

Scoring of scripts

In the traditional pattern, the examining agencies used to send to the examination centres a list of examiners (by subjects and papers), to whom the superintendent of the respective centre was required to despatch the answer scripts assigned to each. Under this procedure it was easy for examinees and other interested parties to get to know who the examiner was, and to approach him. Some examiners did give in to the blandishments, threats and temptations they underwent.

An attempt to curb such abuses was made by the examining agencies requiring all answer scripts to be sent to a central location where they were then sorted for despatch to individual examiners. Even this procedure left scope for malpractices.

A further improvement, which is now practised by several boards of secondary education, is to collect all the answer books in all subjects and to give them fictitious code numbers before sending them to the concerned

examiners. A fresh formula for giving code numbers is devised every year, and the work of putting code numbers on answer books and, after the return of examined and marked scripts, of reconverting these numbers to the real candidate numbers, is normally entrusted to very senior people of high integrity.

More recently, another method of scoring scripts has been developed, and a growing number of examining agencies are using it. This procedure is called 'centralized scoring'. The examining agency collects all the answer scripts at a few central locations, to which the examiners are summoned. At the particular centre, bundles of thirty to forty answer scripts have been made up, and these are handed to the individual examiners, who have to examine them under administrative supervision and hand them back before they leave. Until their responsibilities have been completed, the examiners are not permitted to leave the premises, nor even remove the answer books from their desks. This practice has found particular favour with the examining agencies because it consumes less time than the other methods do, and also because quite often the total of travelling and daily allowance paid to the examiners turns out to be much less than the administrative and clerical costs, postage and freight incurred in preparation for the exercise itself, followed by the sorting, coding, and despatching of scripts and receiving them back from the examiners, and so on. Several agencies make on-the-spot payments to the examiners for their work, and this is a practical motivation for them.

Use of machines

The problems of a growing number of examinees, and of unwieldy administrative set-ups, have induced several Boards of Secondary Education to use computers [50]. Some boards now own their computers, while others hire computer time for their work. Most boards at least have their own machines for key-punching and card sorting. The staggering figure of twelve million candidates at the March 1976 High School Examination of the Uttar Pradesh Board indicates the need to use machines in examination operations. Electrical data processing (EDP) equipment also impresses the boards by its accuracy; speed in the processing of results; convenience; economy in respect of money and manpower; and the scope it provides for more effective management. Machines are being used for processing of applications, recording of scores, analysis of results, and issue of certificates; besides the conduct of several studies and investigations which EDP makes possible and easy.

Scaling

Some of the Boards of Secondary Education have started scaling the results of individual examinees through various statistical formulae, particularly with a view to normalizing the wide variation in the ranges of marks obtained by students in different subjects—for example, the range of marks obtained in English is much narrower than the range of marks in mathematics [64]. But, even now, several of the Boards of Secondary Education, instead of scaling the results and despite all criticism, are still giving 'grace marks' according to arbitrary formulae which they develop more or less every year.

Change-over to grades

Traditionally the examination system in India has used a 101-point scale (0 to 100) for evaluating students' levels of achievement in different subjects. Precise cut-off points for divisions, as also for failure and distinctions, were arbitrarily decided in advance; after which they continued unmodified year after year for that particular examination.

A serious shortcoming of the traditional procedure was that the smallest variabilities of examiners' judgement, in respect of one mark this way or that, changed the division and the fate of the students affected—for these judgements were irreversible. Furthermore, high marks could be scored in some subjects while not in others. This made choice of subject an important criterion governing the range of marks within which a student could aspire to achieve.

In 1975, NCERT brought out the *Framework of curriculum for the ten-year school.* This document embodied the national consensus on several issues, including this one. In summarized form, the recommendations regarding declaration of examination results went as follows:

1. In a final certificate, the levels of achievement of students in different subjects may be given in terms of 'grades' instead of 'marks'.
2. Grades for different subjects may be indicated separately.
3. No over-all grades or divisions should be given.
4. The institution of merely declaring that a student has passed or failed should be abolished.
5. Any requirement that students must pass all of a number of subjects at the same time (or fail them all) should be abolished.
6. Students should be given the opportunity to improve upon their grades by subsequently sitting one or more subjects again; if desired, separately.

These suggestions have far-reaching implications. When implemented they will have the effect of disconnecting examinations at the secondary level from a traditional yet distorted function: that of being a 'go/no-go' gauge for admission to jobs and to courses of higher education. In future, the agencies, institutions and organizations concerned will have to develop their own admission criteria and devise their own procedure for selection. They may even be stimulated to design selection tests suited to their specific needs. Thus the omnipotent position which the traditional external examinations have been enjoying since 1857, and the multi-purpose role that they have been made to play, will at least shrink and might eventually disappear. So this sector of reform indeed represents a positive move in the direction of finally abolishing external examinations.

Curbing malpractices

Malpractices have a natural knack of creeping into all situations of profit and loss. The traditional external examinations, therefore, could not possibly be free from these, particularly because of their inflated social and economic value [105].

Though, on the national scale, there are relatively few instances of malpractices before and after the external examinations, recently these had begun to assume unprecedented dimensions. The problems in a few notorious examination centres became so serious as to become problems of law and order beyond educational solutions. As such, they evoked the following rather rigorous measures to curb them:

1. Promulgation of movement restrictions within a range of one mile of an examination centre.
2. Endowing the superintendents of examination centres with first-class magisterial powers to pass summary sentences on offenders.
3. Institution of flying squads for surprise checks on examination centres.
4. Transfer of teachers from their own schools to others for purposes of invigilating there rather than 'at home'.
5. Transfer of students from their own to other schools for taking the examination.
6. Prohibition of teachers from invigilating examinations in their own subject fields.

The Examination Reform Unit nowadays considers these counter-tractics irrelevant, particularly in the context of its mission to help provide greater

autonomy to the schools in assessing the levels of achievement of their students. The anti-malpractice measures unfortunately display a blanket mistrust of all teachers, which is neither justified nor desirable. As the tension subsides, greater confidence will be reposed in the teacher and his ability to assess his student validly, reliably and objectively. It is our hope that the time will soon come when only he who teaches shall test.

INSTITUTION OF CORRESPONDENCE COURSES

Poor examination pass percentages, particularly among private candidates, have led some of the examining agencies to institute correspondence courses. These courses have been made compulsory for all candidates who are unable or who do not find it convenient to attend regular schools.

In the Madhya Pradesh Board of Secondary Education, Bhopal, a separate division of correspondence courses has been established to look after the operation of the whole scheme.

The board began this endeavour by organizing a correspondence course for the Intermediate Examination (class VII). The course content of each subject was sub-divided into sixteen units. Experienced teachers prepared sequential lessons over each unit, and the resultant courses were vetted by a committee.

For all subjects taught, the sixteen lessons are forwarded to the candidates in fortnightly succession. Every other one (that is, eight in all) has a test at the end of it which has to be carried out and scored by the student himself. The other eight lessons have exercises and tests which the candidate completes and sends in for correction and advice to the tutor to whom he is attached. This tutor corrects the scripts and sends them back to the student with his comments and suggestions for improvement. The student can also get in touch with the tutor for help with any difficulty he may have.

Under this system, then, students who used to lack the opportunity or could not afford the time to go to a formal school have been getting educational guidance. The first cohort recently appeared at the same examination as the regular students who attend schools. The most remarkable outcome of this venture was a significant rise in the pass percentage of the private candidates, who in years past could have sat the examination without any guidance from teachers or without having seen a textbook.

These results have attracted the attention of advocates of mass education; and an expansion of such correspondence course programmes can be anticipated.

To conclude: the attempt in this section has been, not to describe exhaustively all measures and innovations that have been introduced, but to highlight those improvements in the mechanics of conducting examinations which have the closest relationship to the qualitative improvement of the educational process and its outcomes.

XI. Future outlook

INTRODUCTION

Even though the programmes of examination reform in India have made considerable progress, so that significant improvements in the practices and procedures of conducting examinations are visible, we have still a long way to go. With the solution of each longstanding problem, new ones invariably crop up. Meanwhile, too, with each review that we make, we raise our sights. An example of this can be seen in the objectives we have set for our future programmes in examination reform. They are stated in the following two documents recently published by NCERT: *The curriculum for the ten-year school* [83]; and *Higher secondary education and its vocationalisation (classes XI & XII)* [84].

As the problems of evaluation in the ten-year school and in classes XI and XII are slightly different, we will look at them separately. Also, since an evaluation scheme can only be understood properly in the context of the curriculum design and content, both these aspects will be described as well.

CURRICULUM AND EVALUATION IN THE TEN-YEAR SCHOOL

Curriculum

An integrated approach to the teaching and learning of different subjects has been adopted which envisages no optional subjects until class X.

1. *Areas of school work*

(*a*) Classes I and II: first language; mathematics; environmental studies (social studies and general science); work experience and the arts; health education and games.

(*b*) Classes III, IV and V: first language; mathematics; environmental studies I (social studies); environmental studies II (general science); work experience and the arts; health education and games.

(*c*) Classes VI, VII and VIII: the first language continues and a second is added (Hindi or English); mathematics (including algebra and geometry); social sciences (elements of history, geography, civics, economics); science (elements of physical science and life sciences); the arts; work experience; physical education, health education and games.

(*d*) Classes IX and X: the first and second languages continue and a third is added (English or any other Indian language); mathematics (including algebra and geometry); social sciences (history, geography, civics, economics, psychology); science (the physical sciences and the life sciences); the arts; work experience; physical education, health education and games.

A word of explanation should be added here. The scheme presented above is illustrative of school work. But one may get an impression that there are too many subjects, *if* one counts each area of curriculum mentioned as a subject. Actually, the arts, work experience, physical education, health education and games should not be considered as subjects.

2. *Instruction time in school.* There should be a minimum of 240 working days in the school year, out of which 220 days are for instruction and 20 days for school camps, community services and so on. Instructional time in the lower primary classes may be from three to four hours per day. In the upper primary or middle classes and the lower secondary classes, instructional time should not be less than five hours. In addition to the instructional time, each school is expected to devote an extra hour per day in the primary classes for assembly, routine activities and one or two recesses. In the upper primary and lower secondary classes, 50 minutes may be devoted to the morning assembly and one recess.

3. *Allocation of time in classes I-V.* There should not be a rigid allocation of time in these classes, because certain projects and group activities which cut across subject boundaries need flexible scheduling. However, a broad indication of the time allotment may be given here. This is indicated below in terms of the percentage of total time to be allotted to each area of school work.

(*a*) Classes I-II: first language, 25 per cent; mathematics, 10 per cent; environmental studies (social studies and general sciences), 15 per cent; work experience and the arts, 25 per cent; health education and games, 25 per cent.

(*b*) Classes III-V: first language, 25 per cent; mathematics, 15 per cent; environmental studies I (social studies), 10 per cent; environmental studies II (general science), 10 per cent; work experience and the arts, 20 per cent; health education and games, 20 per cent.

It should be noted that the first language will also be learned during environmental studies and games. Comparably, mathematics also will be learned in part through work experience and the arts as well as through games. Hence, work experience, arts and games have been given a 40 per cent share of time. If they had not, a change away from bookish education and rote learning would be difficult to accomplish.

4. *Allocation of time in classes VI-X.* Upper primary and lower secondary schools should work for six days in the week. Assuming that there would be 48 periods per week, each of 30-40 minutes' duration, the instructional periods may be distributed as shown below. However, schools may make suitable modifications, wherever necessary, since what is indicated here is notional:

(*a*) Classes VI-VIII: first language, 8 periods per week; second language, 5; mathematics, 7; sciences (life sciences and physical sciences), 7; social sciences (history, geography, civics and economics), 6; arts, 4; work experience, 5; physical education, health education and games, 6.

(*b*) Classes IX and X: first language, 6 periods per week; second language, 5; third language, 2; mathematics, 7; sciences (life sciences and physical sciences), 7; social sciences (history, geography, civics and economics), 7; arts, 3; work experience, 5; physical education, health education and games, 6.

It may be noted that the proportion of time for languages is slightly less than the 25 per cent shown earlier for the primary stage. All the same, it is intended that the proportion should remain the same in the secondary stage, although the number of languages increases to three. Language is learned through the life, physical and social sciences as well; and since the medium of instruction is usually the first language, the proportion of time for specific instruction in the first language in the secondary classes goes down further. The effective time for language learning is much more because it will continue to be learned through the sciences. The proportion of time for work experience, the arts and physical education is slightly less than a third. It is reduced compared to earlier years. This is because the sciences, the social sciences and mathematics take a larger share of the time—a little less than half, in fact.

Evaluation and feedback

The main purpose of evaluation is to see how far the set objectives have been achieved through the curriculum. This process is naturally related to the learning experiences and methods of teaching that must have been used. Evaluation, in order to be useful, should have the following characteristics:

1. It should give reliable and concrete evidence of the attainment of specific objectives.
2. It should gradually cover a number of objectives and the entire course of studies.
3. It should be done with a variety of tools and techniques (written tests, practical and oral tests, observation, rating scales, etc.) to measure different objectives and content.
4. Evaluation should be at several points in time. It should not be a one-shot affair at the end of six months or one year, because its purpose is to give immediate feedback to pupils and teachers. The pupils should have a knowledge of the results of their learning as soon after that learning as possible. They should know clearly what they have learned, how much they have learned and how well they have learned it. The teacher should know from evaluation what his instruction has done, where his instruction has failed and where his instruction needs change, so that all the pupils are able to master the subject he teaches, or develop the qualities intended to be developed by the learning experiences. Hence, evaluation should be done by the teacher himself.

It is important that students do not develop wrong attitudes to evaluation, but take it in the right spirit as a means of improving their own achievement. Insistence on passing in all the subjects of a course at one time, and the consequent fear of failure, puts many a student out of gear with the true purposes of studies, and impedes further growth. Such a situation has to be changed. There should be flexibility. The mode of evaluation has to be such that students are discouraged from memorization and become competent to apply their knowledge in handling new situations and problems. Children will not work for higher types of learning, like critical thinking, creativity and evaluative judgement, unless such learning is developed through suitable experiences and is followed by proper evaluation. Where the only learning experiences provided in school are of the drill type and where the mode of evaluation encourages cramming, all that we have discussed so far about education becomes useless.

At the primary stage, children are young and tender. No rigid system of evaluation should be imposed on them at this stage. Evaluation should be integrated with the process of learning. A system of continuous recording of the progress and development of each child, on the basis of observation and oral tests, should be prepared. Promotion should not be based on the annual examination at the end of each year, but on the record of progress as registered over the session. Normally, all the children should be promoted. However, special attention should be given to those who do not show adequate progress, and particularly to children from backward sections of society.

Continuous evaluation of the development of the pupils in all aspects should be a regular procedure. From the middle stage onwards, the written examination should have a place in evaluating the achievement of students in subject aeras. But there should be a variety of ways of testing, and not just essay tests. Practical tests should be introduced. Observation, checklists, oral examination and evaluation of pupil products should also be used as tools and techniques of evaluation. Annual examinations may also be held, if considered necessary, but these should not be given weight that is unduly greater than the other assessments made during the year. The emphasis should not be on formal tests for 'pass or fail in the aggregate', it should be on the assessment of pupil growth, and the guidance of all concerned. In fact, there should not be any pass or fail in any examination. Letter grading on a five/seven point scale (A, B, C, D, E...) may be conveniently used. What is important is to use evaluation for the furtherance of learning. This can be done by giving back the corrected answer-books to the students, discussing with them the mistakes and showing them how they could do better. Afterwards, if any student wishes to improve his grade in any one evaluation, he should be given another chance to sit the examination in that subject only.

The school's cumulative assessment in each subject/unit should be placed on record and given to each student. A record of such assessment should cover both scholastic and non-scholastic areas, and be without any aggregate. Thus, there should be no pass or fail in the final school-leaving certificate. This certificate should give only the letter grades (A, B, C, D, E...) of each student in the school. Gradually, as the system of internal assessment takes root and a system of checking any biases (which lower standards) is evolved, the external public examination at the end of class X will become redundant and can be abolished. It would be necessary for each board/state to evolve a phased programme in order to accomplish this.

School complexes may be established throughout a state. The teachers of the school in any one complex can then form a committee which may,

from time to time, call for answer-scripts and question papers from the schools in their jurisdiction; re-examine samples to check biases; and then discuss the matter openly with the teachers concerned.

District education officers, and inspectors and senior teachers in a district, may set up a committee to do such sample checking and discuss results with the school complexes concerned. At the state level, there may be similar committees. This will be one way of ensuring that evaluation is properly performed and standards maintained. Every school should hold community meetings from time to time, not only to involve the community in the school programme, but also to let the community know how evaluation is done and used for the improvement of pupil growth and learning as well as for the improvement of instruction by the teachers.

CURRICULUM AND EVALUATION FOR THE HIGHER SECONDARY STAGE

Pattern of courses for academic and vocational streams [83, p. 42-4]

With regard to the framework of vocational education, as well as that of academic education, and the need for providing bridges between the two, the following pattern of courses and divisions of time for the academic and the vocational streams have been suggested in the report, *Higher secondary education and its vocationalisation* [84, p. 11-13].

Stream	*Time*
(*a*) Language General studies (social economic, scientific, etc.);	25 per cent all for streams.
(*b*) Science, social science and humanities, including literature;	75 per cent for the academic stream. Students may follow courses from (*c*) also.
(*c*) Science, social science and humanities courses designed to understand the basis and scope of various vocations;	25 per cent of the vocational stream.
(*d*) Vocational and practical work;	50 per cent of the vocational stream.

Time is allotted for (*a*) in such a way that there may be some flexibility in apportioning it between language and general studies. It is suggested that language may be taught to develop facility in reading, writing and speaking

fluently, and in taking part in communicating ideas with clarity and precision. It is recommended that none of the two components of category (*a*) should be apportioned less than 10 per cent of the time available. Students in the academic stream would be able to study courses from category (*b*) or (*c*) in accordance with a few rules of combination and with the help of a course adviser. This is to ensure that students do not make meaningless choices.

As far as the nature of courses in categories (*b*) and (*c*) are concerned, there would only be difference in emphasis. For example, when directed towards a group of agricultural vocations, category (*c*) may include soil or fertilizer chemistry or the chemistry of pesticides, fungicides, etc. It may have courses on biology emphasizing plant pathology and growth stimulators, or courses in agricultural economics, or land use, or even agricultural law concerning ownership. Such courses should naturally be given credit as 'academic' courses when students of the academic stream are allowed to take them, and they should likewise be given full credit on the academic side when a student of the vocational stream takes them and is allowed to enter the academic stream. Thus, roughly 50 per cent of the courses are 'common' with transferable credits. Courses in category (*d*) should be mostly of a practical nature—here, theory should be at a minimum. The laboratory, the workshop, or field work should be the main bases for these courses, rather than the classroom.

Courses are to be designed as semester courses in each subject, and they may have a 'modular' or unit character. That is, in each subject there may eventually be a few core courses of semester length in category (*b*); then there may be one or two advanced courses in category (*b*) which students wishing to go on to the tertiary level may take. There will also be one or two 'applied' courses in the same subject falling in category (*c*) to be taken generally by the vocational stream students.

In the matter of language, the schools should provide for at least two languages, although a student need only take one. If a student speaks the regional language and has also studied in a school where the regional language was the medium of instruction, there does not seem to be any advantage in forcing the student to learn that language further. If he wishes to, he can still study it as an optional category under (*b*). He may benefit from learning another language and, in particular, learning the language which may be the medium of instruction where he is studying or where he is likely to study. The option of studying an official Indian language other than the regional language should be available. If possible, too, the schools should provide additional courses for learning English, so that the deficiencies which a student has at the high school level may be

remedied, and that he may become proficient in using this language for further learning, particularly at the tertiary stage. Some schools would find it possible to provide facilities for learning a foreign language other than English. The stress should be on developing language and communication skills, and using modern methods of teaching.

General studies are meant to be a series of courses from which a student may receive the equivalent of about 15 per cent of his total education. For example, if he has to complete 140 credits in two years, he may gain about 20 credits in the sphere of general studies. The purpose is to enlarge the awareness of the students regarding national culture and heritage, national history, and the problem of growth and development of society. The studies up to class X already include some of these elements, but the two years which a student (from 16+) spends at an institution of higher secondary education should be used for a mature discussion of them. It is not foreseen that lectures on these subjects are obligatory. In fact, well-conceived discussions and seminars, with suggested readings for students (and, of course, provision of the books on these subjects in the library) would suffice if these are accompanied by suitable internal assessment and terminal examinations.

In the report of the Education Commission, there is emphasis on work experience at this stage of education. It has been included as a subject in the scheme presented above. Emphasis on work experience should be compulsory for students in the academic stream, preferably in the form of direct involvement in actual productive activity. It should be possible to arrange for these students to spend at least a month every year on farms, in factories, workshops and offices as student apprentices. Working in an actual employment situation provides experience, particularly through interaction with other working people, of the problems of social and individual life which cannot be obtained from books alone; that is why it is strongly recommended.

In the vocational sector, it is necessary to learn the basic sciences concerned with a vocation, since the intention is not to produce a man with only manual skills. If the vocational course is enriched by science subjects, it would become attractive for many intelligent students. Therefore, biology (or chemistry or physics or mathematics or economics) concerning the vocation has to be taken up through appropriate courses which are to be developed. Of course, if a student transfers from the vocational to the academic stream, he will carry the credits for this study as well as his credits for language and general study. The purpose is that, while 50 per cent of a student's time on the course is spent directly on learning the skills, operations and technology of the vocation, he should spend some time on understanding the broad social and scientific framework in which that particular vocation

operates. It is hoped that he will be able to take responsibility in his vocation more intelligently if he has such a knowledge base.

Work-experience activities are not being proposed as a separate element in the vocational sphere because already 50 per cent of a student's time will involve considerable practical/laboratory/field work and apprenticeship in relevant enterprises. On-the-job training is a 'must' in most of the vocations and the school timetables would have to be designed to meet that situation.

Evaluation at the higher secondary stage [84, p. 17-18]

One of the major issues engaging the serious attention and thought of educators is the system of examination we are using at the higher secondary level. A bold attempt should be made to dispense with the public examination system and to adopt a system of continuous evaluation. Full-time teachers should be encouraged to evaluate their own students. This would involve some training for staff working with students in factories, on farms, in hospitals, etc., so that confidence can be placed on their judgement and evaluation. A system of checking and supervision (perhaps joint examiners) will have to be developed to ensure that high standards of performance are maintained. Administrative difficulties may arise during the implementation, but these have to be solved with imagination, persuasion and firmness.

The form of examination being suggested would lead to a result card showing the various semester courses/training received by the student and the grade—on a seven-point scale—obtained in each case. Breaking courses down into self-contained units and creating opportunities to improve grades later on are part and parcel of this system. It may be emphasized that such a result, which is dictated by various practical considerations, requires either that tertiary institutions should conduct their own admission tests, or that the state should hold an entrance test for them. In medicine and engineering this is already a wide-spread practice, but in other faculties, whenever the number of students desiring admission exceeds the number of places available, the practice of holding an admission test should be considered. Even pedagogically, this should be a welcome change, since the aptitude and the academic background required by each faculty—for example, among science, arts, and commerce—are different.

Another issue to be grappled with at this stage is that of establishing equivalence among vocational diplomas and certificates issued by various agencies and of recognizing institutions for the purpose of training and employment. This is crucial, especially when several agencies—old and new —will be awarding diplomas and certificates. New diploma or certificate

holders should have equal opportunities of selection with those coming from polytechnics, etc. This is an appropriate sphere of work for the National Council of Vocational Education.

We have emphasized elsewhere that considerable flexibility would be built into the system in regard to the duration of education and training. Some of the upper secondary courses might be of two semesters' duration, some of three or four semesters, and others even of five or six semesters. Therefore, there will not be one rigid system, and students who have been educated and trained over different intervals of time will have to be assessed differently and appropriate equivalence of courses should be established among the ones of nearly equal duration offered in all the vocational institutions. For example, a student who undergoes a course of six semesters should have no difficulty in comparing his diploma with that of the diploma issued by the polytechnic. It is only a question of the competence that the student has to reach before a certificate is awarded. It cannot be over-emphasized that, by and large, employment opportunities dictate the choice of the type of education, especially at the higher secondary stage. The present tendency to acquire university degrees, without regard to employment conditions, is chiefly due to the prevalent practice of stipulating university degrees as minimum qualification for a variety of jobs which really do not need the services of graduates. On the other hand, the diploma or certificate holders with adequate skill and competence can very well fit into a large range of jobs. This aspect will have to be given due and urgent consideration, and steps will have to be devised to impress this upon all appointing agencies. If this principle is explicitly accepted, it will be possible to attract a large section of youth to vocational courses. This incentive can be further advanced if a policy decision at the highest level is taken to offer salaries to the diploma or certificate holders that are equal or comparable to those of university graduates, when skills in which the former have been trained are the basis of selection. A step in this direction has already been taken by adopting a resolution to this effect, in a meeting of the State Education Secretaries held on 6 and 7 June 1975. It is hoped that the resolution will soon be implemented.

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