

**EVOLVING SYSTEMS  
FOR THE  
INTRODUCTION AND DIFFUSION  
OF EDUCATIONAL INNOVATIONS**

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MICRO-LEVEL EXPERIMENTS TO MACRO-LEVEL ACTION

a proposal for the creation of  
an autonomous, state-level, decentralized  
INSTITUTE FOR EDUCATIONAL RESEARCH AND INNOVATIVE ACTION  
in Madhya Pradesh

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Submitted by  
THE 'INSTITUTE' FOUNDING GROUP  
in collaboration with  
THE KISHORE BHARATI GROUP

FEBRUARY 1982

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## ABSTRACT

1. It is proposed to set up an autonomous, decentralized, State-level Institute for Educational Research and Innovative Action in Madhya Pradesh.

### 2. FOUNDING GROUP

The Founding Group of this Institute consists of persons who have been involved either in formulating and administering policies for education in Madhya Pradesh or as resource persons in the Hoshangabad Science Teaching Programme (HSTP). The need for such an Institute has emerged out of the collective perception gained by the Founding Group while implementing educational innovations in the school network in Madhya Pradesh. Kishore Bharati, a voluntary agency that was a partner in pioneering the HSTP, is collaborating in setting up this Institute.

### 3. OBJECTIVES

- i) To carry out research and field testing of innovations in both formal and non-formal education at a micro level and also to assimilate and further develop existing innovations, such as the environment-based inquiry approach of the HSTP.
- ii) To explore new directions in both formal and non-formal education to relate their content and pedagogy to social change.
- iii) To develop problem solving skills, a spirit of inquiry and scientific temper.
- iv) To evolve an educational methodology for building up a scientific-historical understanding of the structure of society and its development.
- v) To identify and create mechanisms and structures for translating micro-level innovations into macro-level action programmes.

#### 4. DIRECTIONS OF INNOVATION

##### a) Formal Education

- i) Development of workbooks and curriculum for schools related to the local environment, needs and culture.
- ii) Introduction of the 'inquiry method' and similar innovations to the study of all subjects and at all levels within the school system.

##### b) Non-formal Education

- i) Development of content and pedagogy for the non-formal sector on the basis of educational need, environment and local perception.
- ii) Conducting research and experiments in the field of non-formal education in order to enrich the content of formal education

#### 5. GUIDING PRINCIPLES

- i) Decentralization.
- ii) Maximum teacher involvement.
- iii) People's participation.
- iv) Catalytic role in educational change.

#### 6. INITIAL PROGRAMMES

- i) Consolidation of the Hoshangabad Science Teaching Programme.
- ii) Conducting research into the social and physical environment in order to develop meaningful curriculum, based on environmental, ethnic and regional diversities.
- iii) Conducting research to evaluate the basic educational needs of those deprived of the benefits of formal education.
- iv) Preparation of a historical review and critique on education in Madhya Pradesh in the national perspective and a detailed project proposal for the Institute's future programmes.
- v) Search for motivated individuals from universities, Colleges of Education, teacher-training institutes and schools who can participate in the Institute's programmes.
- vi) Initiation of field-level trial programmes through the medium of school complexes in different regions of Madhya Pradesh by organizing centres of innovation around Col-

leges of Education and teacher-training institutes.

- vii) Initiation of programmes to build up a People's Science Movement in the State.

#### 7. STRUCTURE

A decentralized structure with autonomy, consisting of field-level resource centres to carry out innovative work, and a Coordination and Planning Centre for liaison and administration.

#### 8. FINANCING

From both Government and non-Government sources. One-third each from the State Government, Central Governmental agencies and private sources. The 3-year budget (1982-85) is as follows:

First year-	-Rs. 7. 42 lakhs
Second year	-Rs. 10. 34 lakhs
Third year	-Rs. 11. 10 lakhs

#### 9. PERSONNEL

Persons from universities, colleges, teacher-training institutes, schools and elsewhere with motivation to work for educational change at the field level would be recruited on deputation, fellowships or as full-time faculty. Special efforts would be made to identify such people in the educational set-up of Madhya Pradesh.

## 1.0 INTRODUCTION

It is under British rule that the systematic development of an educational system in India can be discerned. The quality of education offered through this system was governed by the aim of furthering colonial interests, which was essentially to produce a cadre of administrative personnel for lower echelons of bureaucracy who would faithfully carry out orders and uncritically implement policies. The gradual but steady growth of the docile 'babu culture' in the country was probably the pre-planned consequence of the educational processes which the British so carefully initiated and nurtured in India. The use of education to develop capabilities for self-expression and creative thinking and qualities like scientific temper, a critical understanding of socio-economic processes or, in general, a spirit of inquiry, was deliberately suppressed as it would have constituted a threat to the very existence of the Raj. One may, therefore, contend that the British effectively put into practice the maxim 'education should be need-based', having taken care to define these needs to suit their own interests.

India's emergence as an independent nation raised expectations amongst the people that self-rule would lead to a redefinition of socio-economic needs to fulfil national, rather than colonial, goals. It was also expected that from the new social reality of Independent India would evolve a more relevant educational system. Post-independence trends in education, however, indicate at best an effort towards quantitative growth, with little, if any, consciousness of the need for qualitative change to transform education into a powerful tool for resolving nation-wide contradictions such as extreme disparities, exploitation and social injustice. There seems to have been only a token effort to fulfil the constitutional directive which states:

"The State shall promote with special care the educational and economic interests of the weaker section of the people. "

Despite repeated assertions in our Constitution regarding the priority of directing national policies for solving the problems of the masses, the policies since independence have been mainly characterized by qualitative changes further buttressing the elitist character of the educational system and an adhoc quantitative growth of educational institutions from primary schools to universities. This aimless effort has meant the continuation and spread of the decadent and irrelevant educational processes inherited from the Raj.

The post-independence history of education in India is marked by frequent expressions of concern for the consistent

failure to relate educational programmes with constitutional directives. Ironically, this concern is expressed from the highest levels of political leadership, policy-makers and bureaucracy. The Radhakrishnan and Kothari Commission reports, NCEPT documents, frequent national-level educational conferences and Parliamentary exhortations are prominent reflections of this concern. Yet one sees little impact of such repeated expressions in either the formulation or implementation of educational policies. As recently as 1976, our Parliament found it necessary to incorporate into the Constitution, through the Forty-second amendment<sup>2</sup>, the fundamental duty exhorting every citizen of India

"to develop the scientific temper, humanism, the spirit of inquiry and reform. "

This belated expression by the Parliament further underlines what our educational policies have failed to fulfil. What concerns us here is this ever-widening gap between the repeated recommendations on education and the policies which continue to guide and distort India's educational system.

The problem of overcoming the stagnation in Indian education has broadly two aspects. The first is concerned with the creation of meaningful innovation to initiate a process of change, and the second is the identification of structures through which one can diffuse such innovations from micro-level experiments to macro-level action programmes.

1.1 Meaningful Innovations : The inadequacy and irrelevance in the context of social needs of the curriculum, examination system and teaching methods in school education have been voiced so often that one need not argue the issue afresh. In fact one can strongly argue that the educational methodology at the school and higher levels inhibits the development of qualities which the Constitution has listed. The development of curriculum in an adhoc and unscientific manner, without field-testing or an analysis of already known facts, and an archaic examination system have resulted in an educational process that systematically kills the natural curiosity of the child and stifles questioning, thereby inhibiting critical thinking. This is supplemented by a total disregard for environmental differences while creating curricula and teaching methods, an urban bias being the marked feature in this respect.

Whatever little has been done in the form of innovations in education has failed to produce any significant change. At different times, Government or semi-Government agencies, often with guidance from developed countries, have attempted to introduce innovations at various levels of education. Such efforts have, however, proved irrelevant



because they were implemented exactly as imported without any study of their feasibility or relevance to our society. This aspect is, perhaps, true not only in the context of India, but of the whole Third World.

1.2 Micro to Macro : Perhaps the only meaningful innovations have been the ones tried by certain voluntary groups from time to time. For obvious reasons, these groups have the ability to attract motivated and creative persons and provide them with adequate freedom to experiment and innovate. However, the failure of these voluntary attempts to create a significant dent in the system illustrates the second aspect of the problem, i. e. the identification of structures and processes that can diffuse micro-level innovations, while sustaining quality, into macro-level action programmes. In the absence of such structures, all high quality micro-level innovations remain scattered and unconnected. Voluntary agencies have often tried to duplicate existing structures only to discover the limits of this approach. Creating a few model schools and universities, Sevagram and Shantiniketan come to mind easily, is in the wider context quite meaningless as the beneficiary populace is not even a countable fraction. Hence, the utilisation of wider existing structures and networks for the purpose of diffusion becomes critical.

## 2.0 THE HOSHANGABAD SCIENCE TEACHING PROGRAMME

In this section we wish to describe an innovative experiment in school education started in 1972 by two voluntary agencies, Kishore Bharati and Friends Rural Centre Rasulia, with the permission and support of the Government of Madhya Pradesh, in sixteen rural middle schools in Hoshangabad District.

The chief objective of the Hoshangabad Science Teaching Programme (HSTP) was to explore the extent to which innovative changes can be introduced within the framework of the Government school network to replace the unscientific and irrelevant educational system. The programme undertook to investigate the feasibility of the 'inquiry method' in the learning of science at the village level. In the course of time, the concept of environment-based education was also included as an integral part of science education and subjected to testing under field conditions. 3, 4, 5, 6

In retrospect, it would seem that this experiment pre-empted a lament echoed in the Sixth Plan (1980 - 85) documents of the Planning Commission on Science and Technology in the following quotations:

"Despite the tremendous growth of science, very few scientists have taken upon themselves the

responsibility of creating a scientific ethos . The task of creating a scientific temper is a vital necessity for the growth of science and its utilisation in the development process. "7

and also,

"There is an urgent need for writing books in different Indian languages for teaching and popularization of science. The emphasis in these books should be on developing an understanding of science as a value system, and as a social movement, and not merely to communicate facts." 8

HSTP has been a significant experiment in science teaching which has seen the involvement of University and College-based scientists in school education and the production of science workbooks in Hindi that have been designed in accordance with the 'inquiry approach' and hence do not merely communicate facts.

A basic assumption in this effort has been that learning by the 'inquiry method' helps in building up a questioning and analytical attitude amongst children. Combined with the programme's emphasis on learning directly from the village environment, it is hoped that critical thinking thus developed shall constitute a significant input for building up processes of social change.

2.1 District Level Expansion : The programme was extended in 1978 from the initial sixteen middle schools to all the middle schools (about 220) of Boshangabad District. This expansion to us is a confirmation of the belief that it is possible to implement educational innovations at macro-level, if planned and executed by combining relevant experiences with an objective understanding of existing conditions. 9 . The chief elements of such a combination are:

- i) field experience in testing innovations and utilising support structures,
- ii) an objective assessment of the operative conditions in a Government system, and
- iii) a firm commitment to implement innovations.

2.2 Resource Personnel : This expansion has resulted in the training of nearly 600 school teachers with the assistance of a large number of resource personnel. The programme has been academically guided through the active involvement of scientists, educators and research students from many institutions which include Delhi University, Tata Institute of Fundamental Research, IIT's, National Physical

Laboratory and various Post-Graduate Colleges of Madhya Pradesh. The Delhi University Group received support from the UGC to participate in the Programme. A Post-Graduate College teacher was deputed by the Government of Madhya Pradesh to work in HSTP on a UGC Teachers' Fellowship. These arrangements have set a precedent in recognizing the validity of the role which can be played by the university community in the improvement of school education, a factor realized and recommended by the Kothari Commission but, perhaps, never implemented before in this formal manner.

**2.3 Methodology of Learning :** The methodology consists of learning through experiments and analysis and not through memorized lectures delivered by a teacher. The observations and the data collected are recorded by the children and later analysed with the help of the teacher. The classroom experiments are interspersed with field trips to agricultural fields, forests, rivers and the village to learn directly from the environment. The teacher's role is hence transformed from that of being an imposing fountainhead of all knowledge to acting as a guide and helper in learning through experience and the environment.

**2.4 Follow-up and Feedback :** An important innovative aspect of the programme has been its system of follow-up and feedback. Training teachers without a substantial follow-up component is inadequate. Hence regular monthly follow-up meetings are organized to strengthen and continue the training process through visits by trained follow-up persons to the schools at regular intervals. A cadre of such follow-up persons, composed of Higher Secondary school teachers and Middle school Headmasters has been created and trained. This is also, perhaps, the first instance where such a recommendation contained in the Radhakrishnan Commission report has been implemented. During these follow-up visits, useful feedback on material and methodology is collected directly from the classroom.

**2.5 Workbooks :** It is a contention of the programme that material for schools can be prepared only through direct interaction with teachers, students and the village environment. Most material prepared from urban headquarters, irrespective of the quality of scholarship behind it, turns out to be not only impractical but also irrelevant. With this in mind, all the material prepared under HSTP has been tested in the orientation courses with teachers and further modified on the basis of feedback gathered through follow-up meetings and visits, plus a study of the local environment. Workbooks are designed to give instructions to students on performing experiments, along with a set of questions to help them analyse their observations and data.

2.6 Examination : The traditional examination pattern is seen to be incompatible with the objective of an environment-based discovery approach to the learning of science. Traditional examinations chiefly test a student's capacity to memorise and recall facts from books or dictated notes. In contrast, HSTP emphasizes qualities of independent observation, data collection, free-thinking, logical deduction and, above all, conceptual understanding through an open-book examination.

2.7 Teacher Training : The training of teachers has been conducted through orientation courses held at regular intervals. In these courses, new chapters of the workbook are introduced. Teachers perform all the necessary experiments under the guidance of resource personnel. An intense discussion follows regarding the necessary modifications needed in a chapter. The feedback is collected and the chapters are modified in accordance with the criticism of the teachers. Only then is a chapter accepted and prepared for school trials. This process of teacher interaction is sometimes repeated in different courses for the same chapter and the material is continuously modified. Through such training programmes, the active participation of the teachers has been ensured in academic matters. In addition, teachers are equipped to handle their students with added confidence and are also oriented in the philosophy of the 'inquiry method'. The entire training process has been marked by a basic respect for the teacher's ability to effectively contribute in a growing programme of this nature. This principle has helped create an atmosphere of mutual exchange of ideas, information, experiences and criticism.

2.8 Bulletin : Since June 1980, a bulletin titled 'Hoshangabad Vigyan' is being brought out. Till now, five issues have been released. This bulletin is envisaged as a communication channel between resource personnel, teachers and students. It is expected to help in creating a teachers' forum in which views can be expressed and exchanged in an open and free atmosphere.

### 3.0 STATE LEVEL EXPANSION OF THE PROGRAMME :

3.1 Our Experience : It is now a decade since the HSTP was begun. In this decade, it has been expanded once in 1978 (as mentioned before) from a field tested sixteen school experiment to a district level programme. This expansion was made possible by exploring and creating various structures and cadres. Now that conditions, structures and cadres exist at the district level we feel it is time to analyze achievements, limitations and unfinished tasks. Guidelines for the future course of action can be derived from such an analysis. We believe that the following conclusions can be deduced from our experiences:

- i) It is feasible to introduce meaningful innovations in Government educational structures.
- ii) Joint ventures involving voluntary agencies and the Government are suitable set-ups for introducing such innovations. Such combined set-ups provide the academic freedom and flexibility normally absent in rigid Governmental systems, without which it is virtually impossible to create and test innovations. On the other hand, the availability of Government structures and administrative machinery ensures the implementation of such ideas so that they do not remain as mere laboratory endeavours.
- iii) The participation of MP Colleges personnel, TIFR scientists and the UGC/Delhi University arrangement highlights the feasibility of involving, in a formal manner, resource personnel of high quality in village level school education, thereby fulfilling the concept of a school complex envisaged by the Kothari Commission.
- iv) Environment-based learning through the 'inquiry method' is an implementable innovation and is expandable to a macro level. Its implementation has the potential of fulfilling the objective of creating a scientific temper in society.
- v) It is possible to create a motivated cadre of school teachers. By a process of continued interaction they can be made to realize their own potential, thereby increasing their confidence. The stagnation inherited through a methodology demanding routine lectures can thus be replaced through their dynamic and creative participation in the educational process.

**3.2 Limitations :** The main limitation we have experienced concerns the attitude of the Government. There seems to be a marked insensitivity in the Government to the needs and aspirations of teachers and students. Barring some motivated Government officials at senior and junior levels, the general Government attitude has been of apathy and concern. The rigidity of administrative structures tends to reduce creative efforts to naught and considerable inputs are required to overcome such barriers. It is clear that voluntary groups need to understand these aspects fully in order to create matching capabilities to neutralize these constraints. HSTP has made some dents into this rigid structure, the formation of an academic cell called 'Vigyan Ikai' at the district level by the Department of Education being an example. This cell has been specially created to

expedite matters regarding this programme. Some changes in the rules regarding the purchase of kit material have also been made at various times. But these are not indicative of an evolutionary change in the bureaucracy. Hence, many more such dents will be required to infuse more dynamism and vitality into the programme.

**3.3 Unfinished Tasks :** Although the training of all the concerned teachers and follow-up personnel has ended and the last workbook has just been printed, we are aware of many shortcomings. For example, a teachers' guide that should have appeared by now is yet to be finalized. The follow-up programme and kit distribution system, both involving Higher Secondary school teachers, has not been functioning satisfactorily. Monthly meetings require greater involvement of resource personnel, but manpower limitations are the constraining factor. Another requirement, particularly for the purpose of transferring the programme to other regions, is a comprehensive manual in which our experiences, methodology, working methods, examination method, etc. are distilled. Uptil now we have had to rely on word-of-mouth techniques to inform others about our programme.

#### **4.0 PROPOSAL FOR A DECENTRALIZED INSTITUTE**

**4.1 The Concept :** Our future plans are based on the conclusions of the previous section. Whereas we recognize the need for further inputs to tie up unfinished tasks, we have already begun exploring avenues for expansion. Our ultimate objective is to help implement the ideas and innovations of HSTP and similar innovations throughout the State of Madhya Pradesh in all subjects and at all levels in the formal school system. In addition, a study of the non-formal sector for the purpose of introducing similar ideas is also our aim. It will be our endeavour to encourage and associate with the Governments, individuals and groups from other States as well to start similar programmes.

Over the last ten years, and particularly in the last few years, Kishore Bharati has been the main base for the resource group to start from. Nearly the whole resource group has worked on a voluntary basis while in employment at various institutions throughout the country. For the proposed State-level expansion we envisage a mechanism for spreading vertically and horizontally by forming field centres at selected places managed by one or two resource persons but otherwise involving local cadres and resources. Initially, we propose to start five such centres by March 1982 of which there will be four field centres respectively at Piparia, Hoshangabad, Seoni-Malwa and Harda in Hoshangabad District and a Coordination and Planning Centre at Bhopal. A field centre is visualized as a catalytic unit for initiating, testing and diffusing innovative ideas in

both school and non-formal education. These centres would also act as field laboratories for exposing personnel from different parts of the State to the entire culture and pedagogy of educational innovation (for details see Appendix I). At a later stage these centres may be shifted to other regions of the State.

We are, therefore, proposing an Institute that will function in a decentralized manner from a growing number of field centres and a Coordination and Planning Centre at Bhopal. We stress that we shall ensure the distribution of manpower and resources in these centres rather than create a centralized monolith at Bhopal. The Bhopal centre is necessary for liaison with Government departments and also for academic work that may require an urban infrastructure of libraries, equipment etc. For a State-level expansion, it is obvious that the number of such field centres will ultimately become very large, requiring heavy resources, financial and otherwise. We recognize the fact and to counter this, our aim is to involve existing Colleges of Education and Basic Training Institutes (BTI's).

We prefer to look at Madhya Pradesh in terms of its several ethnic and geographical units where the initiative for educational innovation for each such region would be assumed by one or more field centres operating from the base of either a College of Education or a teacher-training institute through a large number of school complexes as proposed by the Kothari Commission. The Institute resource persons would play an effective collaborative and catalytic role in activating and crystallizing this process. In this way we hope to diffuse meaningful innovations through the existing school network without attempting to set up a parallel structure. We wish to emphasize here that we can only outline the process and structure of diffusion at this stage. During the next couple of years the specific role of the Institute resource personnel and their relationship with the Government structure would have to be explored. Also, the role which institutions such as the State Institute of Education (SIE), State Institute of Science Education (SISE) and the Regional College of Education (RCE- NCERT) could play remains to be defined.

**4.2 Objectives :** The work of the Institute shall chiefly focus on:

- i) Building up curricula and educational material on the basis of the local environment.
- ii) Extending the 'inquiry method' to the study of all subjects at all levels of school education as a necessary step for building up scientific temper amongst children.

- iii) Exploring new directions in both formal and non-formal education to relate their content and pedagogy to social change.
- iv) Consolidating and further creating structures within and outside the Government to facilitate the spread of the process of educational change.

The third point needs some elaboration. There is a major contradiction between the objective of educating large masses and working in the school system. The dropout rate in our country averages to about 70 per cent of the total school going population and, of the rest, a very small percentage remains in school beyond class eight. Exploring innovations, methodologies and structures for such a large deprived community cannot be ignored. It has been our experience that such non-formal work not only has the potential of benefitting dropouts but also contributes to the enrichment of an environment-based school curriculum and teaching methodology. The knowledge gained through non-formal activities has continuously been utilized in improving and enriching the curriculum of the HSTP. We consider this process an integral part of future development of curriculum, particularly in languages and social sciences.

4.3 Coordination and Planning Centre : Though the entire effort of the Institute would be to involve itself in intense field activity, for practical considerations, a Coordination and Planning Centre is proposed to be set up at the State capital i. e. Bhopal. The main work of this Centre would be to coordinate the activities of the field centres spread gradually throughout the State, by becoming an effective clearing house and communication medium. It would also deal with administrative matters common to all centres and do the necessary liaison with the Government. Being a joint venture with Government, as has been our experience with HSTP, an enormous amount of time and energy will be required to activate the necessary administrative channels within the Government. Since it will be our endeavour to free the field centres of administrative tasks, in order that they may engage in full-time academic work, the Bhopal centre would assume most of the administrative responsibilities.

Innovative work in new fields at an experimental level, requiring essentially an urban infrastructure of libraries, laboratories, workshops and easy availability of support material, may also be initiated at this centre. However, all such experiments would be tested through the field centres to evaluate their feasibility.

In the first year two workers at this centre would be involved in writing a comprehensive project proposal for the



Institute. The work is envisaged more on the lines of a critique on education in the country, with particular emphasis on Madhya Pradesh.

4.4 Personnel : The Founding Group (Appendix II) of this Institute consists of people who have been involved either in formulating and administering educational policies in Madhya Pradesh or in HSTP as field level resource persons. Since the focus in the initial phase would be on the 'inquiry method' and environment-based education, attempts would be made to attract as many experienced HSTP resource persons as possible.

Those interested in the application of the inquiry approach or other innovative approaches to social sciences, languages and other subjects would be spotted and invited to join the Institute.

It has been the experience of many connected with the educational scene in Madhya Pradesh that there is considerable wealth of hidden talent, both within and outside the teaching community, waiting for an opportunity to express their ideas and skills. The Institute would make an effort to attract such talented people who are spread over the State and are doing good work in their own way in remote areas by supporting them with fellowships. Faculty of this kind would enrich the Institute through its varied field experience.

The general policy would be to distribute faculty members to the field centres and to vigorously discourage the concentration of staff at the Bhopal centre.

We do not propose having a large permanent faculty since we believe in continuously attracting creative people for dynamic interaction, thereby reducing the dangers of stagnation. It is, therefore, envisaged to appoint only a nucleus faculty on a permanent basis. The bulk of the faculty would be on a temporary basis, tied to the duration of specific projects. An arrangement similar to HSTP is envisaged, where a large number of resource personnel were available at all times on a voluntary basis.

4.5 Structure : In order to be an effective and creative venture, such an Institute would require the same academic and administrative freedom that has been available all these years through Kishore Bharati. For this reason, we are seeking an autonomous status for the Institute with freedom to interact with various agencies and institutions of the Government of Madhya Pradesh. We feel that the above legal and administrative structure of the Institute would be appropriately reflected in a financial base of which one third each is derived respectively from the State Govern-

ment, Central Governmental agencies (such as DST, NCEET, UEC, CSIR, ICSSR and the Planning Commission) and private sources (like educational trusts, industrial houses and individuals). Possible support from UNICEF and UNESCO would also be explored. A budget for the first three years (1982-85) is appended (Appendix III).

4.6 Support Required for the Institute : There are three basic requirements for such an Institute:

- i) An autonomous status.
- ii) Availability of Government structures to implement its work.
- iii) Funds from both Government and private sources.

In this quest we are heartened by the recent policy decisions contained in the Report of the Working Group on Science and Technology<sup>10</sup> for the Sixth Plan:

"For fulfilling the social obligations of science there is need for considerable commitment and efforts on the part of scientists, for their efforts to be effective, significant resources and commitment on the part of Government will be required. "

and

"Voluntary agencies in the movement of science should be supported. "

We interpret the word 'science' in its wider sense in the above quotations to mean any activity aimed at spreading scientific temper. Private agencies like the Tata Trust have repeatedly shown their willingness to support fundamental work in various spheres. We hope to receive similar support from such agencies. An important participant in this venture is the Government of Madhya Pradesh. Without its permission and support it would be impossible to think of starting an Institute working for radical change in the school and non-school areas of the State. But we expect the same vision and willingness to pioneer State-level educational changes that existed when the initial permission to work in sixteen schools was given in 1972.

4.7 Initial Steps Already Taken : The following steps have already been taken in the process of setting up the Institute:

- i) The Hoshangabad centre has already started functioning from January 1982 with the arrival of an experienced HSTP field worker, Rex D'Rozario,

who has resigned his job at UPASI, Coonoor (Tamil Nadu) to join the Institute.

- ii) Kishore Bharati's Executive Committee has decided to provide support, including financial, for the Institute in the interim until it is formally registered and starts receiving its own funds. This period is, however, not expected to exceed one year.
- iii) An initial proposal to set up the Institute has already been submitted to the Chief Minister of Madhya Pradesh. He has also been requested to authorize the deputations to the Institute of the following persons for a period of five years each:
  - a) Shri S C Behar-Commissioner, Ujjain Division.  
(former Education Secretary,  
Government of Madhya Pradesh)
  - b) Dr. A P Gupte -Assistant Professor, Government  
Narmada Post-Graduate College,  
Hoshangabad. (An experienced  
HSTP resource person)
- iv) Applications have been submitted to the Chairman, University Grants Commission, for the deputation on Teacher's Fellowships of the following persons:
  - a) Dr. Goutam Department of Geography,  
Bhattacharya -Kumaon University, Nainital.
  - b) Dr. A P Gupte -Department of Zoology,  
Government Narmada Post-Graduate  
College, Hoshangabad.
  - c) Dr. Vinod Computer Centre,  
Raina -Delhi University, Delhi.
- v) The Chief Minister of Uttar Pradesh and the Vice-Chancellor, Kumaon University, have been formally approached to release Dr. Goutam Bhattacharya to the Institute on deputation for five years.
- vi) Preliminary discussions regarding the Institute have been held at an informal level with Dr. M S Swaminathan (Planning Commission), Dr. S K Mitra (NCERT), Dr. G S Sidhu and Dr. A Rahman (CSIR), Dr. (Smt) Madhuriben Shah (UGC), Prof. B M

Udgaonkar (TIFR, Bombay), Dr. P J Lavakare (DST), Shri K K Chakravorty (Director of Public Instruction, Bhopal), Shri N R Krishnan (Secretary, Department of Science and Technology, Government of Madhya Pradesh), Prof. R D Choksi (Tata Trust) and others. Generally encouraging responses have been received from these people.

## REFERENCES

- 1 The Constitution of India, Part IV, Article 46.
- 2 Ibid, Part IV, Clause 51A.
- 3 "Science Teaching in Rural India", Fulcrum, January 1976.
- 4 "The Doshangabad Vigyan", Science Today, December 1977.
- 5 "A Review of HSTP", Kishore Dharati Report, July 1977.
- 6 "A New Approach to Teaching Science", The Illustrated Weekly of India, March 4-10, 1979.
- 7 Sixth Five Year Plan (1980-85) document , 19. 9
- 8 Report of the Working Group on Science and Technology for the Sixth Plan, Planning Commission, Section 8. 2 (v).
- 9 "Evolving Systems for Introducing Innovations in School Education -A Proposal for the District-Level Testing of HSTP", a report by the Regional College of Education (RCE-NCERT), Bhopal, February 1978.
- 10 Opcit, Section 8. 1 and 3. 2 (vii).

Note : Some of these references can be made available on request.

## APPENDIX I

### DETAILED PROGRAMME OF THE PROPOSED FIELD CENTRES

This proposal for the establishment of four educational resource centres in Hoshangabad District is being presented in the context of the proposal for the Institute for Educational Research and Innovative Action. We envisage these centres as field-level units for exploring the methodologies for diffusion of innovative ideas in education. They constitute an experimental structure aimed at translating micro-level innovative efforts into macro-level action programmes in collaboration with the Government. In the process, it is visualized that their innovative work will provide the basis for the spread of a scientific temper in society through the development of educational methodologies structured around the 'inquiry method' and environment-based learning. The need for such field centres has emerged out of a number of considerations.

The most immediate of these is the necessity to consolidate an already existing innovation in science education at the middle school level in the formal education network - the Hoshangabad Science Teaching Programme (HSTP). This involves monitoring the feedback and follow-up of classroom teaching to reinforce the knowledge and training received by school teachers and to analyze the effectiveness of the orientation courses.

However, beyond plans to consolidate the existing HSTP, an immense need is felt to extend its scope and make education in all subjects within the formal system environment-based and relevant to local needs. Apart from this, considering the fact that, statistically, a minority of school going children enter or continue within the formal education system, a major aspect of the functioning of the centres will revolve around research into the methodologies and structures needed for involving the vast majority of dropouts, leftouts, youth and adults in a meaningful educational process. With this in view, the locale of the proposed centres has been selected to place them within easy accessibility of village schools and rural surroundings suitable for studying and analyzing local conditions. Close proximity to a large number of village schools will allow the centres to develop and maintain organic relationships with them, thereby providing the set-up for testing new teaching methods as well as trying out new learning materials such as workbooks, kits etc. in suitable surroundings. Thus, in contrast to an urban-based centralized institute, the proposed decentralized structure consisting of coordinated field centres will help in the dissemination of the

HSTP methodology by unifying micro-level activities.

Another important task of the centres is to identify and orient motivated individuals, particularly local school teachers, in the 'inquiry method' and environment-based learning, not only to begin and carry out HSTP programmes and to evolve curricula, workbooks and kits for other subjects but to generally act as catalysts in the process of educational change.

More specifically, the following activities are planned as part of the work to be carried out through the four field centres to be set up in Hoshangabad District at Piparia, Hoshangabad, Seoni-Malwa and Harda.

a) Additional Inputs for Stabilizing HSTP

- i) Training and monitoring the Operational Group, consisting of selected teachers from Higher Secondary schools and Headmasters of Middle schools, for collecting feedback and conducting follow-up of classroom teaching at the school level;
- ii) Organizing regular block-level teachers' meetings to discuss academic problems with the participation of some Resource or Operational Group members;
- iii) Monitoring the timely supply of kits and replacing damaged kits in schools through interaction with the Divisional Superintendent of Education's office at Hoshangabad;
- iv) Preparing teachers' guides containing background information on each chapter for the teachers' self study and preparing supplementary materials for teachers and students.

b) State-Level Expansion of Educational Activities

- i) Preparing an HSTP Manual incorporating the total HSTP methodology, a Kit Manual with all relevant data about development and use of experimental kits and an Examination Manual describing the nature of question papers and evaluation methods. These manuals would unify the basic information necessary for the projected expansion of the HSTP methodology to other regions of Madhya Pradesh as well as other Hindi speaking regions of the country. They would put together and abstract the wealth of information gathered during the collective experience of a decade of HSTP work;

- ii) Preparing and testing science curricula and work-books for the expansion of HSTP to the Higher Secondary and Primary school levels;
- iii) Preparing and testing curricula and workbooks in mathematics, languages and social sciences i. e. extension of the inquiry approach and environment-based education to subjects other than science;
- iv) Identifying and training school teachers for forming a Resource Group and Operational Group for carrying out teacher-training programmes. The trained teachers would also obtain feedback from classrooms for revising learning materials and teaching strategies. The training of these teachers would be carried out through workshops and training sessions organized periodically by the centres.

All the activities listed in section b) assume the active help and growing involvement of scientists, social scientists, linguists and educationists from institutions and universities all over the country, as has been the mainstay of HSTP in the past. The growth of a decentralized Institute envisages a core pool of talented manpower for organizing and carrying out the programmes of section b) which would be tested and implemented through the individual centres.

c) Exploring Innovations in Non-Formal Education

- i) Developing content and pedagogy for the non-formal sector on the basis of educational need, environment and local perception;
- ii) Experimenting with the possibilities of reaching out to non-school going children, school drop-outs, youth and adults with a view to developing scientific temper and social consciousness amongst them;
- iii) Organizing science clubs to initiate collective group activity in order to study scientific issues of popular interest and social relevance - a process that would ultimately lead to the demystification of science;
- iv) Conducting research and experiments in the non-formal sector in order to enrich formal education through the application of relevant experiences and knowledge gained from such research;



- v) Extending the scope of the 'Hoshangabad Vigyan', the monthly science bulletin of the HSTP programme in order to provide this forum to a larger number of teachers and students so as to evolve more meaningful academic interaction.

APPENDIX II

MEMBERS OF THE "FOUNDING GROUP"

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Name	Present Position
1) Shri S C Behar	-Commissioner, Ujjain Division, Ujjain, Madhya Pradesh (former Education Secretary, Government of Madhya Pradesh)
2) Dr. A P Gupte	-Department of Zoology, Government Narmada Post-Graduate College, Hoshangabad, Madhya Pradesh 461001
3) Dr. Vinod Raina	-Computer Centre, Delhi University, Delhi 110007
4) Shri H K Diwan	-Department of Physics, Kirorimal College, Delhi University, Delhi 110007
5) Dr. Goutam Bhattacharya	-Department of Geography, Kumaon University, DSB Campus, Nainital, Uttar Pradesh 263001
6) Dr. Anwar Jafri	-National Centre for Software Develop- ment and Computing Techniques (NCSICT) Tata Institute of Fundamental Research Homi Bhabha Marg, Bombay 400005
7) Rex D'Rozario	-c/o Nehru Yuvak Kendra, Sadar Bazar, Hoshangabad, M.P. 461001 (formerly of UPASI, Conoor, Tamil Nadu)

APPENDIX III

THREE YEAR (1982 - 85) BUDGET FOR THE PROPOSED  
INSTITUTE FOR EDUCATIONAL RESEARCH AND INNOVATIVE ACTION

A SUMMARY

(All figures in rupees)

S.NO.	PARTICULARS	FIRST YEAR (1982-83)	SECOND YEAR (1983-84)	THIRD YEAR (1984-85)	TOTAL
1.0.0	<u>FOUR FIELD CENTRES</u>				26,600.00
1.1.0	Non-recurring expenditure	26,600.00	-	-	26,600.00
1.2.0	Recurring expenditure	2,77,600.00	2,77,600.00	2,77,600.00	8,32,800.00
2.0.0	<u>COMMON FOR FOUR FIELD CENTRES</u>				16,500.00
2.1.0	Non-recurring expenditure	14,500.00	1,000.00	1,000.00	16,500.00
2.2.0	Recurring expenditure	25,000.00	25,000.00	25,000.00	75,000.00
3.0.0	<u>COORDINATION AND PLANNING CENTRE</u>				1,63,100.00
3.1.0	Non-recurring expenditure	33,100.00	1,25,000.00	5,000.00	1,63,100.00
3.2.0	Recurring expenditure	3,64,800.00	6,05,000.00	8,01,400.00	17,71,200.00
<b>T O T A L</b>		<b>7,41,600.00</b>	<b>10,33,600.00</b>	<b>11,10,000.00</b>	<b>28,85,200.00</b>

FIRST YEAR (1982-83)

1.0.0 FOUR FIELD CENTRES

(All figures in rupees)

TOTAL FOR EACH CENTRE      GRAND TOTAL FOR 4 CENTRES

S.NO.	PARTICULARS	TOTAL FOR EACH CENTRE	GRAND TOTAL FOR 4 CENTRES
1.1.0	<u>NON-RECURRING EXPENDITURE</u>	5,000.00	26,600.00
1.1.1	Establishment (furniture etc.)	<u>1,650.00</u>	
1.1.2	Bicycles (3x550.00)		2,77,600.00
1.2.0	<u>RECURRING EXPENDITURE</u>	53,400.00	
1.2.1	Salaries <sup>1</sup>		
	a) Fellow (senior scale) 1x2,100x12 = 25,200.00		
	b) Fellow (Junior scale) 1x1,600x12 = 19,200.00		
	c) Volunteer 1 x 750 x 12 = <u>9,000.00</u>		
1.2.2	Establishment (House rent etc.)	5,000.00	
1.2.3	Books and periodicals	2,500.00	
1.2.4	Stationery and postage	1,000.00	
1.2.5	Travel	5,000.00	
1.2.6	Miscellaneous	<u>2,500.00</u>	
		76,050.00	3,04,200.00

T O T A L: (1.0.0.)

FIRST YEAR (1982-83)

2.0.0 COMMON FOR FOUR FIELD CENTRES<sup>2</sup>

(All figures in rupees)

S.NO.	PARTICULARS	TOTAL
2.1.0	<u>NON-RECURRING EXPENDITURE</u>	14,500.00
2.1.1	Educational materials	2,500.00
2.1.2	Office equipment	<u>12,000.00</u>
	a) Typewriter 1 x 5,000	= 5,000.00
	b) Cyclostyling machine 1 x 7,000	= <u>7,000.00</u>
2.2.0	<u>RECURRING EXPENDITURE</u>	25,000.00
2.2.1	Teacher training courses, workshops, etc.	10,000.00
2.2.2	Extension and science popularization	5,000.00
2.2.3	Cyclostyling and printing	<u>10,000.00</u>
TOTAL: (2.0.0)		39,500.00

FIRST YEAR (1982-83)

(All figures in rupees)

3.0.0 COORDINATION AND PLANNING CENTRE

S.NO.	PARTICULARS	TOTAL
3.1.0	<u>NON-RECURRING EXPENDITURE</u>	33,100.00
3.1.1	Establishment (furniture etc.)	10,000.00
3.1.2	Office equipment	17,000.00
	a) Typewriter 2 x 5,000	= 10,000.00
	b) Cyclostyling machine 1 x 7,000	= 7,000.00
3.1.3	Telephone	5,000.00
3.1.4	Bicycles (2 x 550)	<u>1,100.00</u>
3.2.0	<u>RECURRING EXPENDITURE</u>	1,93,200.00
3.2.1	Salaries	
	a) Director 1 x 4,000 x 12	= 48,000.00
	b) Fellow (senior scale) 2 x 2,100 x 12	= 50,400.00
	c) Fellow (junior scale) 1 x 1,600 x 12	= 19,200.00
	d) Research Associate 2 x 1,000 x 12	= 24,000.00
	e) Accountant 1 x 1,500 x 12	= 18,000.00
	f) Clerk/Stenotypist 2 x 1,000 x 12	= 24,000.00
	g) Administrative assistant 1 x 800 x 12	= <u>9,600.00</u>

2,26,300.00

T O T A L c/f

3,97,900.00

FIRST YEAR (1982-83)

3.0.0 COORDINATION AND PLANNING CENTRE (CONTINUED)

(All figures in rupees)

S.NO.	PARTICULARS	TOTAL
	TOTAL b/f:	2,26,300.00
3.2.2	Establishment (House rent etc.)	25,000.00
3.2.3	Stationery and postage	5,000.00
3.2.4	Travel	12,000.00
3.2.5	Extension and meetings	5,000.00
3.2.6	Cyclostyling and printing	10,000.00
3.2.7	Miscellaneous	5,000.00
3.2.8	Floating fellowships <sup>3</sup>	99,600.00
	a) Visiting research fellow 1 x 1,800 x 12	= 21,600.00
	b) Senior teacher fellow 2 x 1,500 x 12	= 36,000.00
	c) Junior teacher fellow 2 x 1,000 x 12	= 24,000.00
	d) Research assistant 2 x 750 x 12	= 18,000.00
3.2.9	Special allowances for staff <sup>4</sup>	<u>10,000.00</u>
	T O T A L: (3.0.0)	3,97,900.00

SECOND YEAR (1983-84)

1.0.0 FOUR FIELD CENTRES

(All figures in rupees)

S. NO.	PARTICULARS	FOR EACH CENTRE	TOTAL FOR 4 CENTRES
1.1.0	NON-RECURRING EXPENDITURE	-	-
1.2.0	RECURRING EXPENDITURE (Details as in 1982-83)	69,400.00	2,77,600.00
T O T A L: (1.0.0)		69,400.00	2,77,600.00

2.0.0 COMMON FOR FOUR FIELD CENTRES

S. NO.	PARTICULARS	TOTAL
2.1.0	NON-RECURRING EXPENDITURE	1,000.00
2.1.1	Educational materials	1,000.00
2.2.0	RECURRING EXPENDITURE (Details as in 1982-83)	25,000.00
T O T A L: (2.0.0)		26,000.00



SECOND YEAR (1983-84)

3.0.0 COORDINATION AND PLANNING CENTRE

(All figures in rupees)

S.NO.	PARTICULARS	TOTAL
3.1.0	NON-RECURRING EXPENDITURE	1,25,000.00
3.1.1	Establishment (furniture etc.)	5,000.00
3.1.2	Diesel jeep with trailer	<u>1,20,000.00</u>
3.2.0	RECURRING EXPENDITURE	6,05,000.00
3.2.1	Salaries	2,59,200.00
	i) Details as in 1982-83	= 1,93,200.00
	plus ii) Fellow (senior scale) 5 1x2,100x12	= 25,200.00
	iii) Fellow (junior scale) 1x1,600x12	= 19,200.00
	iv) Research associate 1x1,000x12	= 12,000.00
	v) Driver 1x800x12	= <u>9,600.00</u>
3.2.2	} -Details as in 1982-83	42,000.00
3.2.3		
3.2.4		
3.2.5	Extension and meetings	10,000.00
3.2.6	Cyclostyling and printing	12,000.00
3.2.7	Miscellaneous	5,000.00
T O T A L c/f:		7,30,000.00

SECOND YEAR (1983-84)

3.0.0 COORDINATION AND PLANNING CENTRE (CONTINUED)

(All figures in rupees)

S.NO.	PARTICULARS	TOTAL
	TOTAL b/f:	4,53,200.00
3.2.8	Floating fellowships	2,59,800.00
	i) Details as in 1982-83	= 99,600.00
	plus ii) Visiting research fellow 2x1,800x12	= 43,200.00
	iii) Senior teacher fellow 3x1,500x12	= 54,000.00
	iv) Junior teacher fellow 3x1,000x12	= 36,000.00
	v) Research assistant 3x750x12	= 27,000.00
3.2.9	Special allowances for staff	12,000.00
3.2.10	Fuel and maintenance of jeep	<u>5,000.00</u>
	T O T A L: (3.0.0)	7,30,000.00

THIRD YEAR (1984-85)

1.0.0 FOUR FIELD CENTRES

(All figures in rupees)

S.NO.	PARTICULARS	FOR EACH CENTRE	TOTAL FOR 4 CENTRES
1.1.0	NON-RECURRING EXPENDITURE	-	-
1.2.0	RECURRING EXPENDITURE (Details as in 1983-84)	69,400.00	2,77,600.00
T O T A L: (1.0.0)		69,400.00	2,77,600.00

2.0.0 COMMON FOR FOUR FIELD CENTRES

S.NO.	PARTICULARS	TOTAL
2.1.0	NON-RECURRING EXPENDITURE	1,000.00
2.2.0	RECURRING EXPENDITURE (Details as in 1983-84)	25,000.00
T O T A L: (2.0.0)		26,000.00

THIRD YEAR (1984-85)

Z.C.O COORDINATION AND PLANNING CENTRE

(All figures in rupees)

S.NO.	PARTICULARS	TOTAL
3.1.0	NON-RECURRING EXPENDITURE	5,000.00
3.1.1	Establishment - (Details as in 1983-84)	<u>5,000.00</u>
3.2.0	RECURRING EXPENDITURE	8,01,400.00
3.2.1	Salaries	2,90,400.00
	i) Details as in 1983-84 = 2,59,200.00	
	plus ii) Fellow (junior scale) 1x1,600x12 = 19,200.00	
	iii) Research associate 1x1,000x12 = <u>12,000.00</u>	
3.2.2	} Details as in 1983-84	42,000.00
3.2.3		
3.2.4		
3.2.5	Extension and meetings	12,000.00
3.2.6	Cyclostyling and printing	15,000.00
3.2.7	Miscellaneous	<u>5,000.00</u>
	TOTAL c/f:	3,69,400.00
		8,06,400.00



Explanatory notes:

- 1 The salaries of the faculty members will be roughly equivalent to the UGC pay scales.
- 2 Several functions and equipment will remain common for the four field centres to prevent duplication and waste of resources.
- 3 Though budgeted under the Coordination and Planning Centre for convenience, the personnel selected for such fellowships would normally work in any one of the field centres or in other parts of the State on special projects. These fellowships will generally be made available to motivated school teachers and College or University lecturers. Staff/students from Basic Training Institutes and Colleges of Education would also be eligible for these fellowships. The number of fellowships available in the three-year budget are:

	1982-83	1983-84	1984-85
Visiting research fellow	1	3	5
Senior teacher fellow	2	5	8
Junior teacher fellow	2	5	8
Research assistants	2	5	8

- 4 Since many of the potential staff members of the Institute would come on deputation, there is provision for a displacement allowance.
- 5 Additional faculty members though budgeted under the Coordination and Planning Centre would normally work through field centres or be posted on special projects in different parts of the state.