

***UGC's Policy and Programme for  
Improvement of Research in the  
Universities***

UNIVERSITY GRANTS COMMISSION  
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1984

## UGC's POLICY AND PROGRAMME FOR IMPROVEMENT OF RESEARCH IN THE UNIVERSITIES

### **Commission's role and activities in regard to standards of education and research**

Coordination and maintenance of standards in teaching and research is the statutory responsibility of the University Grants Commission and in this connection the Commission consults the universities as well as the experts on its various Panels. The policy thus evolved is circulated to the universities to enable them to frame their own statutes and ordinances with due regard to the guidelines provided as also to flexibility which may be desirable. The Act of the Commission empowers it to frame Regulations in some of these matters and a violation of the Regulations by any institution could cause suspension or withdrawal of the grants provided by the Commission. Since the universities and the Commission are equally keen to maintain and raise standards of education and research there has always been cooperation in this sphere.

During the last couple of years, the Commission has taken a variety of decisions to foster better standards of education—for example by framing the Regulation regarding the qualification of teachers at the time of recruitment, or providing guidelines for minimum examination reform, or advice to the universities for striving to raise the number of days on which classes or laboratories are held to a figure of above 180 in a year etc. The Commission has also been pressing for modernization and relevance of syllabi and, methods of teaching which require students to do assignments, tutorials, projects or field work etc.—exercising their own initiative and creativity. A number of journals are being started or being strengthened (for example journals of Education in Physics, Chemistry, Mathematics and Biology etc.) particularly to help teachers to improve their professional per-

formance. Journals in social sciences and humanities are also being strengthened.

In research, the Commission has taken a number of policy decisions to make more money available to expand the base—for example in minor and major research projects, and to improve the infrastructure in selected institutions in order to enable them to raise standards of postgraduate education and attract projects from many national agencies in relation to areas of national importance. A cadre of Research Scientists in all subjects in the Lecturers', Readers' and Professors' grade has also been created so as to make research and excellence-oriented careers an attractive proposition for talented young men and women. The National Policy Resolution of the Government of India approved by Parliament in 1968 required that research institutions should function within the fold of the universities or in close association with them. In pursuance of this policy, the Commission is creating major research facilities in the university system with cooperative and autonomous management and use of such facilities. The Commission is also trying to strengthen or create links with other institutions and laboratories to have more national centres of research function in close collaboration of the universities.

The universities have a proud record in research—in fact, practically all famous scientists and scholars whom we remember were university people. The strength of the university system which makes it so effective in research is its free atmosphere and constant induction of fresh minds who work with dedication to solve problems within severe limitations of time. In order to maintain the position of pre-eminence in research, however, the universities have to be selfcritical and show readiness to improve their performance in research. There is, of course, the danger that the very factors of advantage may not recoil to adversely affect the quality of research—for example, freedom may not be misused to undermine disciplined hardwork, or limitations of time may not produce unimaginative and inconsequential research.

The various Panels of experts advising the Commission have expressed concern over the quality of research, particularly in

the context of its great expansion in the universities, and during the last year several meetings were held to discuss the problem. Finally, a two-day discussion of university\* scientists and those from other leading institutions and agencies was held in November, 1983 in which all aspects of improving research were thoroughly examined and a series of recommendations made to the University Grants Commission. It is gratifying that the Commission has accepted all the recommendations and is prepared to take those steps to improve university research which lie within its powers. An Implementation Committee has been set up to free this effort from routine delays and to persuade the universities and the senior academics, as also the younger supervisors, to make their specific contribution in the same direction. The latter is crucial since the willingness of supervisors to improve interaction with scholars, to strain every effort to provide them the "environment" for work, and to promote amongst the scholars a sense of academic values and integrity can make a difference in the quality of work produced by the team.

Some of the major observations and recommendations now accepted by the UGC are as follows:

## **1. Larger Research Base Needed**

- 1.1 The data on research enrolment and the award of Ph.D. degrees has been examined, and the view taken is that there has been no over-production of Ph.D.s, although in some subjects, particularly in languages, the enrolment is quite large often without scholarships. The needs, both of providing trained research personnel to the agencies and of manning institutions, where postgraduate education is conducted, are so large that we should not shrink from expanding the base of research *provided excellence can be maintained*. With insistence on excellence, the enrolment should be curtailed without hesitation wherever quality cannot be maintained. The UGC's insistence on research qualifications for teachers in the universities was considered to be proper and timely.

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\*Name given in Appendix.

## 2. Improving the Quality of Postgraduate Education

- 2.1 The foremost step in improving the quality of research is the improvement of the educational foundation of the scholars. The present undergraduate and postgraduate education and corresponding examinations generally do not present an intellectual challenge to students, and provide them no opportunity for creative work. Instead of relying entirely on straight lectures and set experiments, problem-solving exercises should be provided through tutorials, both on the theoretical and experimental side project should occupy at least sometime of every undergraduate and more time of every postgraduate student. The projects can be of varying degrees of simplicity or complexity requiring reflection, planning, designing, execution and critical evaluation of the results of the work. They are widely in practice even in schools of the developed countries, and they are an excellent means of giving research opportunities to students. Term papers and seminars are other devices to broaden the base of knowledge, oblige students to read many books, listen to invited talks, and in postgraduate classes, to read original publications in journals, and to present and discuss ideas with teachers and other students. It should be possible to include some of these activities in undergraduate and postgraduate classes, and to reduce the number of lectures. Such inter-active learning would prepare a student much better for every activity or job they might take up later and especially so for research. The attention of Boards of Studies in the universities is invited to this modification and it is hoped that these changes will be widely adopted as a matter of urgency.
- 2.2 Evaluation of performance in the above activities, which are more related to problem-solving, creativity and communication abilities can only be done by teachers who are involved in the conduct of these activities over a period of time that the student spends in the Department. Thus, it constitutes continuous internal assessment of abilities which cannot be properly measured by a test

at the end of the course, much less by an external examination, and hence, it is a natural corollary of the new programme.

2.3 The University Grants Commission may provide incentives to the departments which are prepared to modify their programmes in the above-mentioned direction. The incentives could be in the form of special book-grants, audio-visual aids, reprographic facilities and the strengthening of other infrastructure. It is suggested that if for some reason all the departments in a university are unable to adopt the educational and evaluation programmes suggested above, those which are willing to do so may be provided a measure of autonomy by the university.

2.4 These concepts are very important for improving the research preparation of students, and they would strengthen the effect of the recent decision of the Commission to select a large number of talented students for admission to undergraduate and postgraduate courses with suitable scholarships. Special summer schools for talented students will be arranged with suitable audio-visual support.

2.5 The universities are urged to examine these recommendations through their Boards, Faculties and Academic Councils. The dynamism of departments in a university and their readiness to adopt new strategies of learning will be given importance by the Commission in evaluating the performance of a university or department, particularly when they are considered for participation in special assistance programmes.

### **3. The Need for a National Test for Admission to Research**

3.1 It is essential to carefully select those who would be awarded Fellowships for undertaking research in the university system, through a national examination or test. In the absence of such a test, it has been found that a number of scholars, not suitably equipped for under-

taking research, get admitted into the system, and thereafter need prolongation of the period required for research and produce work of a quality which often leaves much to be desired. The Commission has already notified that these tests will be held in a number of Science and Social Science subjects starting from 1984, and universities have been advised that no Junior Research Fellowships in the specified fields may be awarded to those who have not qualified through the National Test. Similarly, persons engaged in Junior Research Fellowships in schemes and projects would also have to qualify through the test. When qualified persons are available, the universities may use other devices for selecting the best research workers—for example through a viva.

- 3.2 Once the educational programmes are modified and they are accompanied by internal assessment as suggested above, with proper checks and control in order that it may not become arbitrary or overly subjective, the record of internal assessment could also have weightage in the selection of JRFs, provided they have qualified in the test.
- 3.3 The Commission is aware that some other agencies such as the CSIR and the Atomic Energy Commission are already using Tests or fairly rigorous oral examinations for the same purpose. It is not the intention to subject an aspiring scholar to a multiplicity of tests, and hence some tests conducted by the agencies may be recognised to be equal to the National Test conducted under the auspices of the UGC. If in a few cases, because of the nature of the research project or its location, it is not possible to get a scholar who has qualified in the National Test, special relaxation could be requested from the Commission. In certain cases in the projects, if a scholar is not readily available, the contingent grant could be released to the Principal Investigator.

#### **4. Appropriate Emoluments and Amenities**

- 4.1 Being aware that the present Junior Research Fellowships at Rs. 600 per month would not attract bright and talen-

ted scholars to a research career, the Commission has decided to raise it to Rs. 1,000 per month. The argument generally is that at present a student with a high division in the Master's degrees could get employed under the Central or State Governments or agencies, in a grade of Rs. 550-900, with various kinds of allowances. In research, a student would improve his qualifications and thus raise his prospects in future life, so we may not give him exactly the kind of take-home-salary which an employed person gets, but we have to give him 70 or 80 per cent of it. There should be an evaluation of a rigorous kind at the end of about two years and if the work of a Fellow is found to be of adequate merit, the Fellowship should be raised to Rs. 1200 per month for another one or two years in which the research should be completed. This also implies that in accordance with the present practice, M.Tech. holders who undertake research will have a Fellowship at Rs. 1200 per month.

- 4.2 In the evaluation mentioned above, which should be rigorous and involve external evaluators, on finding a student to be below par in his performance, the Fellowship should be terminated. Unless the weeding out of the unfit is done, the quality of those who complete research and their future careers cannot be ensured.
- 4.3 It is realised that the amount of the Fellowship is not the only important factor in attracting people of high merit to research. Some provision for proper accommodation is essential which is also equally important in facilitating the work of a scholar. It is recommended that single-seated flat type accommodation with some cooking facilities should be provided for at least 25-30 per cent of the research scholars, and the others should be provided House Rent Allowance at the same rate as the Lecturers at the initial salary in the place of work. It may be noted that university hostel accommodation is primarily for new-comers and for younger students, and hence it would be proper to provide separate accommodation or separate hostels for research scholars.



- 4.4 It is also recommended that health facilities should be provided to the research scholars on the same basis as to other students of the universities.
- 4.5 On the question of the contingency grant, the recommendation is that it should be available for all kinds of incidental expenditure related to research such as purchase of books, chemicals or other consumables, typing, postage and travel to conferences, as also minor repair of equipment. *But it should be ensured that the contingency amount is not handed over to the student as a subsidy to him.* Books and equipment should be accessioned on proper registers. Books can then be issued to students and be returned to the library. The universities should be extremely careful that the funds are not misutilised and that proper records are kept.
- 4.6 The amount of the contingency grant is now raised to Rs. 5,000 per year, and whatever is not spent in one year, can be carried to the next. It cannot be carried into the third year. The contingency grant for those in the faculties of Social Sciences and Humanities is Rs. 3,000 but in special cases with full justification it may be raised to Rs. 5,000 per year.
- 4.7 Since every scholar leads to enhanced expenditure on the part of the laboratory or the department, and if this expenditure is left uncovered, the departments either starve the research workers of proper support or they draw away money which is provided to undergraduate and postgraduate laboratories for their day to day running. Hence, it is now the policy that each research fellow would be supported by a contribution of Rs. 3,000 per year to the department concerned for providing the necessary infrastructural facilities. With this provision, there should be no complaint that the research work suffers because of lack of typing facility or storage, furniture or other services in the department. Departments would have to maintain a separate record of the utilization of such funds.

## 5. The Quality of Supervision and Conditions of Work

- 5.1 In the view of the Commission, quality of supervision and creating a suitable atmosphere for work are crucial to the whole exercise of improving the quality of research. It is observed that, with some exceptions here and there, supervision is generally lax and it leads to frustration and unhappiness on the part of both the supervisor and the scholar. The following steps are strongly recommended to improve the situation.
- 5.1(a) Each university should compile a handbook giving the main research interests of its faculty and their important publications in the last few years. A short paragraph for each supervisor could provide adequate information to research scholars intending to register under them. Such a compendium should be brought out and updated every year to facilitate registration, particularly of scholars from other universities. The Commission notes with concern that the vast majority of research scholars in the universities are the products of their own postgraduate courses. Every effort should be made to change this situation.
- 5.1(b) M.Phil. programmes or course work preparatory to research are necessary in order to induct scholars into the undertaking of specific research. The courses for the above programmes could provide training in the methodology of research, which could include courses in Mathematics or Instrumentation or other cognate subjects which are considered important for the research to be undertaken. The courses could also provide a broad-based understanding of the subject so that a scholar does not end up knowing less and less of everything other than his narrow specialisation. This has been found to be a great weakness of those who get the degree and appear at interviews for various jobs. It may be proper that at the time of admission to a M.Phil. programme, only a general field of research may be specified, which may be made definite by the end of the M.Phil. programme. The

M.Phil. programme could consist of exploratory reading, preliminary field or experimental work, making a bibliography and defining the research problem more specifically. It could also consist of a long project or a dissertation based on the above. The evaluation of the M.Phil. performance should involve external examiners in order to ensure parity of standards with other institutions and the examination should be strict. The supervisor and the Head of the Department or another senior supervisor could be internal examiners.

5.1(c) It is recommended that wherever a research problem of a broad or of inter-disciplinary nature is taken up, there should be co-supervisors representing the related areas. In the sciences, a research scholar may not be entrusted entirely to one supervisor because it is becoming increasingly difficult for one supervisor to provide guidance in all aspects of a particular research. Joint supervision, therefore, sometimes of experts from different departments or even different institutions, should be made available to scholars whenever found necessary.

5.1(d) It has been strongly suggested to the Commission that every scholar towards the end of his work should write what may be called a subsidiary thesis or submit a project for research in a field different from his specialisation. This would compel a scholar to look beyond the narrow confines of the area in which he has carried out his investigations, and apply his systematic knowledge and approach to the solution of other problems in other areas. It is possible that in this connection a research scholar would have to interact with other scholars in the department or elsewhere to arrive at a suitable project for which some reading would have to be done before a short paper is written.

5.1(e) There is a strong feeling that viva voce examinations are becoming practically useless because degrees are awarded on the basis of reports on the theses; a poor performance at the viva voce does not seem to matter.

It is known that the reports of examiners on the theses, even when they are considered favourable, include an element of criticism, doubt or need for clarification. Therefore, the viva voce examination should in all cases be very important and *it should be made quite rigorous and open to other scholars in the university*. It is recommended that the viva should take into account the general understanding of the subject, it should relate to the subsidiary thesis or project, and it should involve a brief presentation of the main thesis so that questions could be asked about the various procedures or results, and their application or implication. At least two examiners, other than the supervisor, should be present at the viva. University rules should be modified, where necessary, to give the oral examination, the new character and more significance in the final result.

5.2 It is strongly recommended that supervisors should pay greater attention and maintain better record of their interaction with the research scholars.

5.2(a) An Attendance Register of research scholars should be maintained so that one knows that every scholar is present for work and attending to his or her research. This is all the more important because it is proposed to raise the emoluments while there are many complaints about research scholars spending a good part of the tenure in preparing for competitive examinations and appearing in interviews for jobs. They are also reported to be on leave off and on without due permission and proper record of the same. This situation should change.

5.2(b) The supervisor often does not allocate time each week, or every other week, to a discussion with his scholars, and this leads to waste of energy and sometimes recrimination. The supervisors complain of scholars not showing up for discussions, and the scholars complain of the supervisors being occupied in many other activities. It is recommended that the supervisor should display in his time-table the day and the time allotted to discussion

with his various research scholars. At least an average of two hours per week per scholar should be shown in the supervisor's time-table as a part of departmental load.

- 5.2(c) In view of the above and other practical reasons, it would be necessary to limit the number of scholars registered with a supervisor. It is strongly recommended that the number may vary from one to four, depending on seniority or maturity of a supervisor and only in the case of very senior supervisors it may go to five or six at any one time. The limit of six should be exceeded only with a special permission from the Board of Research Studies or a comparable body.
- 5.2(d) There is a practice in many Western Universities of each scholar maintaining a "Journal" in which all the observations are recorded and all discussions with the supervisor are entered. This practice needs to be adopted immediately because instructions given to scholars from week to week are then not lost, and, in fact, the journal, as a property of the department, would preserve the record of observations even if the scholar leaves the department. Tampering with results or manipulating them in any way, of which we now hear complaints, would then also be less probable. It is noted that good supervisory practices are having to be underscored even in the Western countries, whereas in India we pay very little conscious attention to them.
- 5.2(e) It is considered a matter of great importance that the results of experimental and of field work are reported and analysed with the utmost integrity. Similarly, and data or views of other persons should be fully acknowledged, leaving no room to doubt the reliability of the data or to leave it open to charges of plagiarism. The scholars as well as supervisors have to show great care in this respect because the reputation of both is likely to suffer otherwise. Plagiarism in research is the counterpart of "copying" in examinations and should be dealt with in a similar manner.

- 5.2(f) It need not be re-emphasised that the theses should be presented in internationally accepted form and it should be ensured that the language and literary style are proper.
- 5.2(g) It is noted that results of research are sometimes reported in unknown or non-descript or unREFERRED journals. It may be realised by scholars and supervisors that no value is attached to such publication. The supervisors ought to know in their own and in their scholars' interest that mere number of publications does not count for much. They must publish with great care and strive to publish only in well-known Indian or foreign journals.
- 5.2(h) It has been felt that the choice of problems to be researched is extremely important, but that there are tendencies to pick up problems which require a compilation of facts and figures and data of various kinds involving no innovation in methodology or no original thinking and analysis. Supervisors have to direct the attention of fresh entrants to research on the more profound or more significant themes. It would be in the interest of the disciplines and of professional reputation of the supervisors to show great care in this regard. Superficial and trivial problems may be quickly tackled, sometimes to fetch even a publication or a degree, but they have little significance in the development of the career of a scientist or an academic. It is equally important for supervisors to be responsive to the R & D needs of the research agencies as well as of the development departments of the government. Linkages with industry and agriculture and administration would also specify significant areas of research.
- 5.2(i) Research, amongst other things, requires deep interest and dedication, independent creative thinking and initiative on the part of a scholar. There will always be those whose pre-occupations are different but who have strayed into research. They would not be able to contribute to research and may, in fact, distract others from their

work. It would be necessary, therefore, to evaluate the work of a research scholar quite early in the tenure to determine whether or not he or she should be allowed to continue. In extreme cases of lack of motivation or indiscipline, the supervisor in consultation with the Head of the Department should take steps to terminate the tenure of a scholar and cancel the Fellowship within six months or a year. As a common practice, a rigorous evaluation should be made at the end of one year or the M.Phil. programme or the pre-Ph.D. course work. In such an evaluation, external examiners must be included.

5.3 It is strongly recommended that the universities should examine the rules, regulations and procedures which affect research performance and relationships. Many of these rules e.g. of obtaining sanctions for purchase of spares of equipment, or for getting something repaired, or inviting someone to address a Seminar etc. were framed when research was not at all an important activity in the universities. Now the heads of the departments complain about their lack of power to streamline and expedite research activities, and principal investigators in various schemes similarly, complain against heads of departments and the rest of the university. The funding agencies have noted that research grants cannot be quickly utilised for the purpose for which they were meant because the rules are so complicated or highly centralised that they do not give any freedom to the concerned researchers. It would, therefore, be useful to set up committees in individual universities to look into possible decentralisation of decision-making and of spending funds particularly in relation to research.

5.4 It has also been noticed that although research is interdisciplinary in most cases, there is no university body which oversees the progress of research, coordinates any part of it, or strives to create linkages between research in the various departments or that in research institutions or in industry. The atmosphere or environ-

ment of research which can be easily vitiated by personal whims and fancies of a few people is also never carefully examined for its improvement. It is, therefore, recommended that large departments should have each a Research Committee for continuously improving the potential for research, and there should be Faculty level research committees to ensure quality, coordination, linkages, and facilitation of research.

- 5.5 It is recommended that the universities should set up special committees either Faculty-wise or in some other way to examine the recommendations which have been made here and to incorporate them in their Statutes/ Ordinances/Regulations as the case may be, after due consideration in the university bodies. The Commission would like to be informed in this regard.

## **6. Role of the UGC**

- 6.1 In view of its responsibility for maintaining standards of research, the Commission accepts a role in monitoring the procedures and processes in research in the universities and in suggesting guidelines for the purpose.
- 6.1(a) In the previous Sections, observations have been made in regard to improving the quality of postgraduate education and provision of proper living and working conditions of the Research Fellows as also in respect of improving supervision and discipline of work. The necessity of modifying university procedures of decision-making in regard to research expenditure and management has also been pointed out. These are areas where the universities have to play a major role in improving the situation. The Commission urges the universities to have these issues examined by suitable academic bodies and to take decisions generally in line with the recommendations made here. It may be noted that the Commission's recommendations made here have indeed been based on the advice of a very large number of university professors and academics outside the universities.



- 6.1(b) The Commission may draw up a list of experts in various branches of learning with the help of university professors and others who could possibly be appointed as examiners for theses submitted in the concerned subjects. The list would be made available to the universities so that while appointing examiners, the universities could make sure that examiners are appointed on the basis of their expertise alone and not because of considerations of personal friendship etc.
- 6.1(c) The UGC has already asked the universities to have a summary of the theses prepared whenever the theses are submitted. These summaries should as a rule be cyclostyled and circulated to other departments and institutions in the country, with five copies supplied to the UGC. A copy of each of the examiners' reports on the theses should also be sent to the University Grants Commission when the work is completed. In case of divergence of opinion and the appointment of further examiners, all the reports and the names of the examiners should be sent to the Commission.
- 6.1(d) The Commission would be setting up a suitable system to review the summaries and the examiner's reports so as to prepare, for its own information, a report on the quality of research being done in the universities. Any anomalies observed would be confidentially fed back to the concerned institution.
- 6.1(e) The Commission would develop in consultation with some of the universities a format for progress reports to be submitted by the supervisors. It would be necessary for the supervisors to fill all the entries in these reports, which would also be kept under observation since it is widely observed that progress reports have become nominal because they are not given due importance by the professors.
- 6.1(f) The Commission would set up a suitable mechanism, where necessary, with the help of the universities, to

conduct studies based on the data which would be available on research awards, schemes and projects etc. It would also collect information on the prevailing statutes, ordinances and regulations in the universities for the award of the Ph.D. degree. This would allow the Commission to analyse the data with regard to various aspects such as duration for the Ph.D. degree, time lapse between submission of thesis and award of degrees, cost of research in various subjects, the quality and relevance of research, employment position of researchers and the like. It may, thus, be possible to study the role of university research in national development, the impact of this research, and the need of resources to strengthen it.

## **7. Assured Employment or Research Career for Ph.Ds.**

7.1 The Commission is of the opinion that those who obtain the Ph.D. degrees and have themselves worked hard for it, and for which the country has also spent a great deal of money should ultimately be assured useful employment in the various concerned institutions and productive activities. It is expected that people with the best minds would be selected for research, they will be carefully supervised and nurtured, and all facilities for their work will be provided, furthermore they would be examined on a rigorous basis, hence there is all the more reason to believe that the Ph.D's produced would be of excellent quality and their talents should not be wasted through a chancy process of employment. They should either be given further research opportunities or provided employment. In both these respects, the University Grants Commission and at least some of the research agencies requiring staff, should come together to evolve a system of readily utilising the services of the fresh Ph.Ds. It is felt that such steps might reduce the brain-drain which is presently a serious problem for the country. Some certainty about post-Ph.D. employment will also make research careers more attractive, and may draw more talented people into the research stream.

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## UGC's POLICY AND PROGRAMME FOR IMPROVEMENT OF RESEARCH IN THE UNIVERSITIES

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During the last couple of years, the Commission has taken a variety of decisions to foster better standards of education—for example by framing the Regulation regarding the qualification of teachers at the time of recruitment, or providing guidelines for minimum examination reform, or advice to the universities for striving to raise the number of days on which classes or laboratories are held to a figure of above 180 in a year etc. The Commission has also been pressing for modernization and relevance of syllabi and, methods of teaching which require students to do assignments, tutorials, projects or field work etc.—exercising their own initiative and creativity. A number of journals are being started or being strengthened (for example journals of Education in Physics, Chemistry, Mathematics and Biology etc.) particularly to help teachers to improve their professional per-

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\*Name given in Appendix.

## 2. Improving the Quality of Postgraduate Education

- 2.1 The foremost step in improving the quality of research is the improvement of the educational foundation of the scholars. The present undergraduate and postgraduate education and corresponding examinations generally do not present an intellectual challenge to students, and provide them no opportunity for creative work. Instead of relying entirely on straight lectures and set experiments, problem-solving exercises should be provided through tutorials, both on the theoretical and experimental side project should occupy at least sometime of every undergraduate and more time of every postgraduate student. The projects can be of varying degrees of simplicity or complexity requiring reflection, planning, designing, execution and critical evaluation of the results of the work. They are widely in practice even in schools of the developed countries, and they are an excellent means of giving research opportunities to students. Term papers and seminars are other devices to broaden the base of knowledge, oblige students to read many books, listen to invited talks, and in postgraduate classes, to read original publications in journals, and to present and discuss ideas with teachers and other students. It should be possible to include some of these activities in undergraduate and postgraduate classes, and to reduce the number of lectures. Such inter-active learning would prepare a student much better for every activity or job they might take up later and especially so for research. The attention of Boards of Studies in the universities is invited to this modification and it is hoped that these changes will be widely adopted as a matter of urgency.
- 2.2 Evaluation of performance in the above activities, which are more related to problem-solving, creativity and communication abilities can only be done by teachers who are involved in the conduct of these activities over a period of time that the student spends in the Department. Thus, it constitutes continuous internal assessment of abilities which cannot be properly measured by a test

at the end of the course, much less by an external examination, and hence, it is a natural corollary of the new programme.

2.3 The University Grants Commission may provide incentives to the departments which are prepared to modify their programmes in the above-mentioned direction. The incentives could be in the form of special book-grants, audio-visual aids, reprographic facilities and the strengthening of other infrastructure. It is suggested that if for some reason all the departments in a university are unable to adopt the educational and evaluation programmes suggested above, those which are willing to do so may be provided a measure of autonomy by the university.

2.4 These concepts are very important for improving the research preparation of students, and they would strengthen the effect of the recent decision of the Commission to select a large number of talented students for admission to undergraduate and postgraduate courses with suitable scholarships. Special summer schools for talented students will be arranged with suitable audio-visual support.

2.5 The universities are urged to examine these recommendations through their Boards, Faculties and Academic Councils. The dynamism of departments in a university and their readiness to adopt new strategies of learning will be given importance by the Commission in evaluating the performance of a university or department, particularly when they are considered for participation in special assistance programmes.

### **3. The Need for a National Test for Admission to Research**

3.1 It is essential to carefully select those who would be awarded Fellowships for undertaking research in the university system, through a national examination or test. In the absence of such a test, it has been found that a number of scholars, not suitably equipped for under-



taking research, get admitted into the system, and thereafter need prolongation of the period required for research and produce work of a quality which often leaves much to be desired. The Commission has already notified that these tests will be held in a number of Science and Social Science subjects starting from 1984, and universities have been advised that no Junior Research Fellowships in the specified fields may be awarded to those who have not qualified through the National Test. Similarly, persons engaged in Junior Research Fellowships in schemes and projects would also have to qualify through the test. When qualified persons are available, the universities may use other devices for selecting the best research workers—for example through a viva.

- 3.2 Once the educational programmes are modified and they are accompanied by internal assessment as suggested above, with proper checks and control in order that it may not become arbitrary or overly subjective, the record of internal assessment could also have weightage in the selection of JRFs, provided they have qualified in the test.
- 3.3 The Commission is aware that some other agencies such as the CSIR and the Atomic Energy Commission are already using Tests or fairly rigorous oral examinations for the same purpose. It is not the intention to subject an aspiring scholar to a multiplicity of tests, and hence some tests conducted by the agencies may be recognised to be equal to the National Test conducted under the auspices of the UGC. If in a few cases, because of the nature of the research project or its location, it is not possible to get a scholar who has qualified in the National Test, special relaxation could be requested from the Commission. In certain cases in the projects, if a scholar is not readily available, the contingent grant could be released to the Principal Investigator.

#### **4. Appropriate Emoluments and Amenities**

- 4.1 Being aware that the present Junior Research Fellowships at Rs. 600 per month would not attract bright and talen-

ted scholars to a research career, the Commission has decided to raise it to Rs. 1,000 per month. The argument generally is that at present a student with a high division in the Master's degrees could get employed under the Central or State Governments or agencies, in a grade of Rs. 550-900, with various kinds of allowances. In research, a student would improve his qualifications and thus raise his prospects in future life, so we may not give him exactly the kind of take-home-salary which an employed person gets, but we have to give him 70 or 80 per cent of it. There should be an evaluation of a rigorous kind at the end of about two years and if the work of a Fellow is found to be of adequate merit, the Fellowship should be raised to Rs. 1200 per month for another one or two years in which the research should be completed. This also implies that in accordance with the present practice, M.Tech. holders who undertake research will have a Fellowship at Rs. 1200 per month.

- 4.2 In the evaluation mentioned above, which should be rigorous and involve external evaluators, on finding a student to be below par in his performance, the Fellowship should be terminated. Unless the weeding out of the unfit is done, the quality of those who complete research and their future careers cannot be ensured.
- 4.3 It is realised that the amount of the Fellowship is not the only important factor in attracting people of high merit to research. Some provision for proper accommodation is essential which is also equally important in facilitating the work of a scholar. It is recommended that single-seated flat type accommodation with some cooking facilities should be provided for at least 25-30 per cent of the research scholars, and the others should be provided House Rent Allowance at the same rate as the Lecturers at the initial salary in the place of work. It may be noted that university hostel accommodation is primarily for new-comers and for younger students, and hence it would be proper to provide separate accommodation or separate hostels for research scholars.

- 4.4 It is also recommended that health facilities should be provided to the research scholars on the same basis as to other students of the universities.
- 4.5 On the question of the contingency grant, the recommendation is that it should be available for all kinds of incidental expenditure related to research such as purchase of books, chemicals or other consumables, typing, postage and travel to conferences, as also minor repair of equipment. *But it should be ensured that the contingency amount is not handed over to the student as a subsidy to him.* Books and equipment should be accessioned on proper registers. Books can then be issued to students and be returned to the library. The universities should be extremely careful that the funds are not misutilised and that proper records are kept.
- 4.6 The amount of the contingency grant is now raised to Rs. 5,000 per year, and whatever is not spent in one year, can be carried to the next. It cannot be carried into the third year. The contingency grant for those in the faculties of Social Sciences and Humanities is Rs. 3,000 but in special cases with full justification it may be raised to Rs. 5,000 per year.
- 4.7 Since every scholar leads to enhanced expenditure on the part of the laboratory or the department, and if this expenditure is left uncovered, the departments either starve the research workers of proper support or they draw away money which is provided to undergraduate and postgraduate laboratories for their day to day running. Hence, it is now the policy that each research fellow would be supported by a contribution of Rs. 3,000 per year to the department concerned for providing the necessary infrastructural facilities. With this provision, there should be no complaint that the research work suffers because of lack of typing facility or storage, furniture or other services in the department. Departments would have to maintain a separate record of the utilization of such funds.

## 5. The Quality of Supervision and Conditions of Work

- 5.1 In the view of the Commission, quality of supervision and creating a suitable atmosphere for work are crucial to the whole exercise of improving the quality of research. It is observed that, with some exceptions here and there, supervision is generally lax and it leads to frustration and unhappiness on the part of both the supervisor and the scholar. The following steps are strongly recommended to improve the situation.
- 5.1(a) Each university should compile a handbook giving the main research interests of its faculty and their important publications in the last few years. A short paragraph for each supervisor could provide adequate information to research scholars intending to register under them. Such a compendium should be brought out and updated every year to facilitate registration, particularly of scholars from other universities. The Commission notes with concern that the vast majority of research scholars in the universities are the products of their own postgraduate courses. Every effort should be made to change this situation.
- 5.1(b) M.Phil. programmes or course work preparatory to research are necessary in order to induct scholars into the undertaking of specific research. The courses for the above programmes could provide training in the methodology of research, which could include courses in Mathematics or Instrumentation or other cognate subjects which are considered important for the research to be undertaken. The courses could also provide a broad-based understanding of the subject so that a scholar does not end up knowing less and less of everything other than his narrow specialisation. This has been found to be a great weakness of those who get the degree and appear at interviews for various jobs. It may be proper that at the time of admission to a M.Phil. programme, only a general field of research may be specified, which may be made definite by the end of the M.Phil. programme. The

M.Phil. programme could consist of exploratory reading, preliminary field or experimental work, making a bibliography and defining the research problem more specifically. It could also consist of a long project or a dissertation based on the above. The evaluation of the M.Phil. performance should involve external examiners in order to ensure parity of standards with other institutions and the examination should be strict. The supervisor and the Head of the Department or another senior supervisor could be internal examiners.

- 5.1(c) It is recommended that wherever a research problem of a broad or of inter-disciplinary nature is taken up, there should be co-supervisors representing the related areas. In the sciences, a research scholar may not be entrusted entirely to one supervisor because it is becoming increasingly difficult for one supervisor to provide guidance in all aspects of a particular research. Joint supervision, therefore, sometimes of experts from different departments or even different institutions, should be made available to scholars whenever found necessary.
- 5.1(d) It has been strongly suggested to the Commission that every scholar towards the end of his work should write what may be called a subsidiary thesis or submit a project for research in a field different from his specialisation. This would compel a scholar to look beyond the narrow confines of the area in which he has carried out his investigations, and apply his systematic knowledge and approach to the solution of other problems in other areas. It is possible that in this connection a research scholar would have to interact with other scholars in the department or elsewhere to arrive at a suitable project for which some reading would have to be done before a short paper is written.
- 5.1(e) There is a strong feeling that viva voce examinations are becoming practically useless because degrees are awarded on the basis of reports on the theses; a poor performance at the viva voce does not seem to matter.

It is known that the reports of examiners on the theses, even when they are considered favourable, include an element of criticism, doubt or need for clarification. Therefore, the viva voce examination should in all cases be very important and *it should be made quite rigorous and open to other scholars in the university*. It is recommended that the viva should take into account the general understanding of the subject, it should relate to the subsidiary thesis or project, and it should involve a brief presentation of the main thesis so that questions could be asked about the various procedures or results, and their application or implication. At least two examiners, other than the supervisor, should be present at the viva. University rules should be modified, where necessary, to give the oral examination, the new character and more significance in the final result.

5.2 It is strongly recommended that supervisors should pay greater attention and maintain better record of their interaction with the research scholars.

5.2(a) An Attendance Register of research scholars should be maintained so that one knows that every scholar is present for work and attending to his or her research. This is all the more important because it is proposed to raise the emoluments while there are many complaints about research scholars spending a good part of the tenure in preparing for competitive examinations and appearing in interviews for jobs. They are also reported to be on leave off and on without due permission and proper record of the same. This situation should change.

5.2(b) The supervisor often does not allocate time each week, or every other week, to a discussion with his scholars, and this leads to waste of energy and sometimes recrimination. The supervisors complain of scholars not showing up for discussions, and the scholars complain of the supervisors being occupied in many other activities. It is recommended that the supervisor should display in his time-table the day and the time allotted to discussion

with his various research scholars. At least an average of two hours per week per scholar should be shown in the supervisor's time-table as a part of departmental load.

- 5.2(c) In view of the above and other practical reasons, it would be necessary to limit the number of scholars registered with a supervisor. It is strongly recommended that the number may vary from one to four, depending on seniority or maturity of a supervisor and only in the case of very senior supervisors it may go to five or six at any one time. The limit of six should be exceeded only with a special permission from the Board of Research Studies or a comparable body.
- 5.2(d) There is a practice in many Western Universities of each scholar maintaining a "Journal" in which all the observations are recorded and all discussions with the supervisor are entered. This practice needs to be adopted immediately because instructions given to scholars from week to week are then not lost, and, in fact, the journal, as a property of the department, would preserve the record of observations even if the scholar leaves the department. Tampering with results or manipulating them in any way, of which we now hear complaints, would then also be less probable. It is noted that good supervisory practices are having to be underscored even in the Western countries, whereas in India we pay very little conscious attention to them.
- 5.2(e) It is considered a matter of great importance that the results of experimental and of field work are reported and analysed with the utmost integrity. Similarly, and data or views of other persons should be fully acknowledged, leaving no room to doubt the reliability of the data or to leave it open to charges of plagiarism. The scholars as well as supervisors have to show great care in this respect because the reputation of both is likely to suffer otherwise. Plagiarism in research is the counterpart of "copying" in examinations and should be dealt with in a similar manner.

- 5.2(f) It need not be re-emphasised that the theses should be presented in internationally accepted form and it should be ensured that the language and literary style are proper.
- 5.2(g) It is noted that results of research are sometimes reported in unknown or non-descript or unREFERRED journals. It may be realised by scholars and supervisors that no value is attached to such publication. The supervisors ought to know in their own and in their scholars' interest that mere number of publications does not count for much. They must publish with great care and strive to publish only in well-known Indian or foreign journals.
- 5.2(h) It has been felt that the choice of problems to be researched is extremely important, but that there are tendencies to pick up problems which require a compilation of facts and figures and data of various kinds involving no innovation in methodology or no original thinking and analysis. Supervisors have to direct the attention of fresh entrants to research on the more profound or more significant themes. It would be in the interest of the disciplines and of professional reputation of the supervisors to show great care in this regard. Superficial and trivial problems may be quickly tackled, sometimes to fetch even a publication or a degree, but they have little significance in the development of the career of a scientist or an academic. It is equally important for supervisors to be responsive to the R & D needs of the research agencies as well as of the development departments of the government. Linkages with industry and agriculture and administration would also specify significant areas of research.
- 5.2(i) Research, amongst other things, requires deep interest and dedication, independent creative thinking and initiative on the part of a scholar. There will always be those whose pre-occupations are different but who have strayed into research. They would not be able to contribute to research and may, in fact, distract others from their



work. It would be necessary, therefore, to evaluate the work of a research scholar quite early in the tenure to determine whether or not he or she should be allowed to continue. In extreme cases of lack of motivation or indiscipline, the supervisor in consultation with the Head of the Department should take steps to terminate the tenure of a scholar and cancel the Fellowship within six months or a year. As a common practice, a rigorous evaluation should be made at the end of one year or the M.Phil. programme or the pre-Ph.D. course work. In such an evaluation, external examiners must be included.

5.3 It is strongly recommended that the universities should examine the rules, regulations and procedures which affect research performance and relationships. Many of these rules e.g. of obtaining sanctions for purchase of spares of equipment, or for getting something repaired, or inviting someone to address a Seminar etc. were framed when research was not at all an important activity in the universities. Now the heads of the departments complain about their lack of power to streamline and expedite research activities, and principal investigators in various schemes similarly, complain against heads of departments and the rest of the university. The funding agencies have noted that research grants cannot be quickly utilised for the purpose for which they were meant because the rules are so complicated or highly centralised that they do not give any freedom to the concerned researchers. It would, therefore, be useful to set up committees in individual universities to look into possible decentralisation of decision-making and of spending funds particularly in relation to research.

5.4 It has also been noticed that although research is interdisciplinary in most cases, there is no university body which oversees the progress of research, coordinates any part of it, or strives to create linkages between research in the various departments or that in research institutions or in industry. The atmosphere or environ-

ment of research which can be easily vitiated by personal whims and fancies of a few people is also never carefully examined for its improvement. It is, therefore, recommended that large departments should have each a Research Committee for continuously improving the potential for research, and there should be Faculty level research committees to ensure quality, coordination, linkages, and facilitation of research.

- 5.5 It is recommended that the universities should set up special committees either Faculty-wise or in some other way to examine the recommendations which have been made here and to incorporate them in their Statutes/ Ordinances/Regulations as the case may be, after due consideration in the university bodies. The Commission would like to be informed in this regard.

## **6. Role of the UGC**

- 6.1 In view of its responsibility for maintaining standards of research, the Commission accepts a role in monitoring the procedures and processes in research in the universities and in suggesting guidelines for the purpose.

- 6.1(a) In the previous Sections, observations have been made in regard to improving the quality of postgraduate education and provision of proper living and working conditions of the Research Fellows as also in respect of improving supervision and discipline of work. The necessity of modifying university procedures of decision-making in regard to research expenditure and management has also been pointed out. These are areas where the universities have to play a major role in improving the situation. The Commission urges the universities to have these issues examined by suitable academic bodies and to take decisions generally in line with the recommendations made here. It may be noted that the Commission's recommendations made here have indeed been based on the advice of a very large number of university professors and academics outside the universities.

- 6.1(b) The Commission may draw up a list of experts in various branches of learning with the help of university professors and others who could possibly be appointed as examiners for theses submitted in the concerned subjects. The list would be made available to the universities so that while appointing examiners, the universities could make sure that examiners are appointed on the basis of their expertise alone and not because of considerations of personal friendship etc.
- 6.1(c) The UGC has already asked the universities to have a summary of the theses prepared whenever the theses are submitted. These summaries should as a rule be cyclostyled and circulated to other departments and institutions in the country, with five copies supplied to the UGC. A copy of each of the examiners' reports on the theses should also be sent to the University Grants Commission when the work is completed. In case of divergence of opinion and the appointment of further examiners, all the reports and the names of the examiners should be sent to the Commission.
- 6.1(d) The Commission would be setting up a suitable system to review the summaries and the examiner's reports so as to prepare, for its own information, a report on the quality of research being done in the universities. Any anomalies observed would be confidentially fed back to the concerned institution.
- 6.1(e) The Commission would develop in consultation with some of the universities a format for progress reports to be submitted by the supervisors. It would be necessary for the supervisors to fill all the entries in these reports, which would also be kept under observation since it is widely observed that progress reports have become nominal because they are not given due importance by the professors.
- 6.1(f) The Commission would set up a suitable mechanism, where necessary, with the help of the universities, to

conduct studies based on the data which would be available on research awards, schemes and projects etc. It would also collect information on the prevailing statutes, ordinances and regulations in the universities for the award of the Ph.D. degree. This would allow the Commission to analyse the data with regard to various aspects such as duration for the Ph.D. degree, time lapse between submission of thesis and award of degrees, cost of research in various subjects, the quality and relevance of research, employment position of researchers and the like. It may, thus, be possible to study the role of university research in national development, the impact of this research, and the need of resources to strengthen it.

## **7. Assured Employment or Research Career for Ph.Ds.**

- 7.1 The Commission is of the opinion that those who obtain the Ph.D. degrees and have themselves worked hard for it, and for which the country has also spent a great deal of money should ultimately be assured useful employment in the various concerned institutions and productive activities. It is expected that people with the best minds would be selected for research, they will be carefully supervised and nurtured, and all facilities for their work will be provided, furthermore they would be examined on a rigorous basis, hence there is all the more reason to believe that the Ph.D's produced would be of excellent quality and their talents should not be wasted through a chancy process of employment. They should either be given further research opportunities or provided employment. In both these respects, the University Grants Commission and at least some of the research agencies requiring staff, should come together to evolve a system of readily utilising the services of the fresh Ph.Ds. It is felt that such steps might reduce the brain-drain which is presently a serious problem for the country. Some certainty about post-Ph.D. employment will also make research careers more attractive, and may draw more talented people into the research stream.

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