

REPORT
OF THE
EXTERNAL PEER REVIEW COMMITTEE
FOR
IIT BHUBANESWAR



October 1 , 2014

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1.0 PREAMBLE

In pursuance to the decision taken at the 47th meeting of the Council of IITs held on 16 September 2013, the Ministry of Human Resource Development (MHRD), Government of India constituted an External Peer Review Committee (EPRC) for the Indian Institute of Technology Bhubaneswar. The composition of the Committee was as follows:

1. Dr Srikumar Banerjee
DAE Homi Bhabha Chair Professor, BARC
2. Prof Mustansir Barma
Director, Tata Institute of Fundamental Research
3. Mr Ravi Kant
Ex-Vice Chairman, Tata Motors Ltd
4. Prof Goverdhan Mehta
National Research Professor, School of Chemistry, University of Hyderabad
5. Prof S P Sukhatme
Professor Emeritus, IIT Bombay

As stated in the terms of reference, it was envisaged that the review would principally focus on the core activities of teaching, research and interaction with industry. However, it was suggested that due importance should also be given in the review to matters that influence academic performance, such as governance, management structure, support systems and institutional culture.

The Committee visited the Institute on August 4 & 5, 2014 and carried out a detailed review. Prior to its visit, the EPRC finalized the detailed program for the review in consultation with the Director of the Institute. This was adhered to with minor modifications. The actual program followed is given in Annexure – 1.

2.0 BACKGROUND

IIT Bhubaneswar was established as a society on July 22, 2008, within a week of the Union Cabinet resolving to open eight new IITs. It was mentored by IIT Kharagpur and was the first among the new IITs to start its academic session in July 2008 on the IIT Kharagpur campus. It moved to its temporary campus located in different parts of Bhubaneswar in the summer of 2009. The present review was conducted at the temporary campus sites from which the Institute still operates, but included a visit to the site of the permanent campus.

3.0 PROCESS

Prior to visiting Bhubaneswar, the members of the Review Committee received a detailed report specially prepared for the peer review. The report contained information on the vision and mission of the Institute, the governance structure, the academic programs, etc and helped to provide an appropriate background for the visit.

On the first day of the review, detailed presentations were made by the Deputy Director and Deans of the Institute on various aspects pertaining to general administration, faculty planning, academic activities, sponsored research & industrial consultancy, continuing education programme and students' affairs, etc. The presentations also covered the various infrastructure facilities set up by the Institute including those on the permanent campus. The presentations provided an overview of the functioning of the Institute and its growth over the last six years.

In the afternoon, the Committee visited laboratories and facilities of a few Schools and interacted with individual faculty members, students and staff. Later, the Committee members also interacted with various stake-holders – students, faculty members, officers and staff of the Institute in separate group meetings.

The Committee began the second day by first visiting the site of the permanent campus at Arugul where it noted the status of construction of various facilities.

Returning to the temporary campus, it heard presentations by the respective Heads on the activities of individual Schools. It also heard presentations by a few individual faculty members on their research activities. The members of the Committee also interacted with an alumnus of the 2013 graduating batch, who had collated ideas from many alumni for making a presentation.

At the end of each day, the Committee members deliberated amongst each other and analyzed the inputs presented on various issues. They also had detailed discussions with the Director and Deputy Director and obtained clarifications from them before arriving at their recommendations.

4.0 PROGRAMS AND ACTIVITIES OF THE INSTITUTE

4.1 Profile of the Institute

IIT Bhubaneswar started operating from Bhubaneswar from May 2009 when Prof. M. Chakraborty joined as the Director. The uphill task of creating adequate infrastructure and facilities befitting the standard of an IIT, appointment of a few faculty and staff members and providing accommodation for students and staff within a time period of only two months was accomplished. In this endeavor, the Institute received invaluable support from some sister Institutes in Bhubaneswar. In particular, the Institute of Minerals and Materials Technology (IMMT) and the Central Tool Room & Training Centre (CTTC) made their laboratory and workshop facilities available for running the academic program. The Institute presently operates from several locations in Bhubaneswar and will have to continue to do so until it shifts to its permanent campus in a year or two.

The Institute believes in and actively promotes a borderless interdisciplinary academic environment through the concept of Schools rather than individual departments. Each School has a number of disciplines within its purview.

At present, the Institute has the following Schools:

- School of Basic Sciences (Physics, Chemistry, Biosciences, Mathematics)
- School of Humanities, Social Sciences and Management (Economics, English, Psychology)
- School of Mechanical Sciences (Mechanical Engineering, Manufacturing & Industrial Engineering, Aerospace Engineering)
- School of Infrastructure (Civil Engineering, Architecture)
- School of Electrical Sciences (Electrical Engineering, Electronics and Communication Engineering, Computer Science and Engineering)
- School of Minerals, Metallurgical and Materials Engineering (Metallurgy, Minerals and Materials Engineering)
- School of Earth, Ocean and Climate Sciences (Atmospheric Sciences, Ocean Sciences, Climate Sciences)

The last two Schools in the above list were started keeping in mind the following factors. (i) The region in and around Odisha is rich in natural resources. Mining is one of the major industrial activities and there are a significant number of existing or upcoming metallurgical industries. (ii) The eastern region of India and in particular the states of Odisha, Andhra Pradesh and West Bengal are affected from time to time by various types of natural disasters. The region also has a vast coastline with a rich biodiversity.

In addition, the Institute proposes to set up a School of Chemical and Biochemical Engineering and a School of Design & Creative Arts at a later date during the next phase of expansion.

The Institute is also setting up an Innovation Centre for Climate Change on the Puri-Konark coast line for which the Government of Odisha has agreed in principle to provide 75 acres of land. As part of this activity, the Institute is also setting up the Bay of Bengal Coastal Ocean Observatory jointly with the Ministry of Earth Sciences, Government of India.

The Institute has also established a Central Instrumentation Facility for optimum and cost effective utilization of sophisticated precision equipment and instruments needed by faculty members and researchers belonging to various Schools. The CIF consists of several laboratories: Materials Preparation Laboratory, Surface Characterization Laboratory, Laser Raman Spectroscopy Laboratory and Transport Analysis Laboratory

4.2 Academic Programs

The Institute offers the following academic programs :

- BTech (Hons.) in Civil Engineering , Electrical Engineering, Mechanical Engineering from 2008, Computer Science & Engineering from 2013 and Metallurgical and Materials Engineering from 2014.
- Joint MTech – PhD in Applied Geoscience, Civil Engineering, Mechanical Engineering, Electronics and Communication Engineering, and Materials Science and Engineering from 2012 and subsequently Mechanical Systems Design, Thermal Science and Engineering, Power Systems Engineering from 2014.
- Joint MSc – PhD in Chemistry, Earth Sciences, Mathematics and Physics from 2012 and Atmospheric & Ocean Sciences from 2014.
- PhD program in the Sciences, Engineering and Humanities & Social Sciences from 2009.

Presently, the student enrolment at various levels is : BTech – 536 ; Joint MTech-PhD – 116 ; Joint MSc-PhD – 122 and PhD - 138. The total enrolment is 917. The Institute has 95 full time faculty and 7 Guest Faculty. Besides this, there are 53 supporting staff including officers.

4.3 Research Activities

As stated in Section 4.2, the Institute started admitting students to the doctoral program from 2009. Thus far, three students have received PhD degrees and eight more will be awarded in the next Convocation. A post-doctoral program was also initiated in 2011 and a small beginning has been made with two Research Associates engaged in their research with faculty mentors.

Till date, the Institute has received funds for 67 sponsored projects from 22 national and international sponsoring agencies amounting to Rs. 21.30 crores. The major funding agencies are: Department of Science & Technology (DST), Department of Agriculture & Cooperation (DAC), National Informatics Center (NIC), Indian National Centre for Ocean Information Service (INCOIS), Indian Space Research Organization (ISRO), Council of Scientific and Industrial Research (CSIR), Information Technology Research Academy (ITRA), Defence Research &

Development Organization (DRDO), Board of Research in Fusion Science & Technology (BRFST) and UK-India Education and Research Initiative (UKIERI).

The Institute has identified the following as its thrust areas of research & development: Alternate Energy, Biosciences & Bioengineering, Environment & Climate Sciences, Minerals and Materials studies. It has already attracted approximately Rs.2 crore, Rs. 1.4 crore, Rs.7.3 crore and Rs. 2.2 crore, respectively in the above-mentioned areas.

A compilation of the publications of the faculty and their research students yields a total of 387 papers over the last six years. The break-up is as follows : Engineering disciplines – 190 , Sciences – 140 and Humanities & Social Sciences – 57.

The following are some of the subjects in which useful contributions have been made :

1. Studies on the effect on monsoon rainfall over Central India by dust-induced heating of the atmosphere over North Africa and West Asia
2. Development of (i) Improved maize-sheller, (ii) Silicon carbide X-Ray detector, (iii) Multifunctional mobile autonomous vehicles, (iv) Carbon free polymer concrete from industrial by-products
3. MRI guided laser treatment of brain tumours
4. Structure-function studies of various sHSPs related to human diseases
5. Development of nano-displacement sensor
6. Development of plasmonics based devices
7. Development of graphene-based fiber sensors for aqueous and gaseous detection

4.4 Interaction with Industry, Outreach and Collaborations

Consultancy :

From its inception, the Institute has a Sponsored Research and Industrial Consultancy Cell. All sponsored research and consultancy projects are coordinated by this Cell. SRIC activities are growing at a satisfactory rate. The number of sponsored research projects funded and the funding agencies supporting them have been given earlier in Section 4.3. Consultancy work is also being done. Fifteen projects having a total value of Rs 67 lakhs have been executed and eight patent applications have been filed for products and processes developed in the Institute.

Endowments :

The Institute has received the following major endowments from industry and individuals:

1. An endowment of Rs. 300 lakhs created by the MGM Minerals Group, Bhubaneswar to establish a perpetual “MGM Chair Professor” for the School of Minerals, Metallurgical

and Materials Engineering. An MoU has also been signed with the MGM Minerals Group to work in areas of common interest.

2. Shri S. K. Dash of Dr. Dash Foundation, USA has created an endowment of Rs. 300 Lakhs for a Chair Professorship in Biosciences and Bioengineering and has donated Rs. 250 lakhs for creating a Centre of Excellence in Biosciences and Bioengineering within the ambit of the School of Basic Sciences.

Societal Commitments :

The Institute is conscious of its societal commitments and the need for orienting its objectives in line with national developments and goals. Two examples are listed below:

1. The School of Infrastructure has been appointed the State Technical Agency for the states of Jharkhand and Odisha by National Rural Roads Development Agency, Govt. of India. In this role, it provides technical support for the development of rural roads under the rural connectivity programme.
2. Faculty members in the School of Mechanical Sciences have re-engineered a Maize Sheller to help maize-growing farmers of Odisha. This project was sponsored by Directorate of Agriculture & Food Processing, Odisha. The new maize sheller developed is highly efficient, light weight and user-friendly. After successful completion of the Maize Sheller project, a project for “Re-engineering of a reaper-cum-binder” has been sanctioned.

Collaborations :

Realizing that a premier institute in the making has to reach out globally, the Institute has started collaborative activities with a few Universities abroad. Faculty members are regularly visiting the University of Massachusetts and the University of Warwick for the purpose of joint teaching and research. Students are also visiting these universities for summer internships. In addition, the Institute has signed MOUs for faculty and student exchange, joint supervision and research collaboration with University of North Texas, State University of New York at Buffalo, University of Edinburgh and University of Western Ontario.

Further in order to improve links and exchange of information, scientists and technologists of international repute have been appointed as Distinguished Visiting Professors of the Institute. The eminent persons appointed so far are Professor Lord S. Kumar Bhattacharyya of the Warwick Manufacturing Group of the University of Warwick, Professor Asit K Biswas, President of the Third World Centre for Water Management and Dr. B. B. Rath, Associate Director of Research at the Naval Research Laboratory in Washington DC.

4.5 Governance

Structure :

The Director is the principal academic and executive officer of the Institute and is responsible for the proper administration of the Institute and for the imparting of instructions and maintenance of discipline therein. He is the ex-officio Chairman of the Senate and the Building and Works Committee and ex-officio member of the Board of Governors and Finance Committee.

The Deputy Director assists the Director in all academic and administrative work and in maintaining liaison with institutions of higher learning and research and industrial undertakings. He also exercises independent responsibility as assigned by the Director and the Board.

In addition, there are six Deans looking after specific areas of academics and administration:

- Dean (Faculty & Planning)
- Dean (Academic Affairs)
- Dean (Sponsored Research and Industrial Consultancy)
- Dean (Alumni Affairs & International Relations)
- Dean (Students' Affairs)
- Dean (Continuing Education)

Each of the seven Schools is administered by a Head appointed by the Director.

As far as academic governance is concerned, the Senate is the highest academic body of the Institute. It exercises academic supervision and control through three standing committees, the Undergraduate Program Evaluation Committee (UGPEC), the Post-Graduate Program Evaluation Committee (PGPEC) and the Research Program Evaluation Committee (RPEC).

Accountability :

Academics

1. Students' Performance Evaluation is completely open. All tests and examination scripts are shown to and discussed with the students for feedback and cross-check.
2. There is a feedback system for evaluating teaching. At the end of the semester, students submit a web-based teaching evaluation to the Dean (Academic Affairs), who collates the information for appropriate feedback and advice to the faculty member, as necessary. A summary is submitted to the Director.

3. Research Scholars periodically report their activities to a Doctoral Scrutiny Committee. Each scholar also makes an open presentation of his/her activities annually on the Research Scholars' Day.
4. Every faculty member submits an annual self-assessment report on all aspects of academics, R&D and administration carried out by him/her to the Director through Dean (Faculty).

Administration

1. A well-structured reporting system exists from the lowest to the highest Level of employees. Reporting authority keeps track of the activities of the respective charges in terms of assigned works.
2. A systematic annual assessment of performance is carried out. Reporting authority makes a formatted assessment report on his/her respective charges and submits the same to the reviewing authority for appropriate advice and action.

Stores & Purchase and Finance & Accounts

1. All S&P and F&A Activities are pre-audited by the Internal Audit Section.
2. Activities of all sections are subject to regular external audit under CAG.

Institutional Transparency:

1. The Institute hosts a website, where all general information concerning the Institute is available.
2. All tender notices, openings and hiring information for staff and faculty members, recruitment of research scholars are posted on the Website.
3. As required by the RTI act, the names of the Public Information Officers and Appellate Authorities have been notified on the website.

4.6 Students and their Activities

The Institute has three hostels situated in Kesura, Samantapuri, and Madanpur for accommodating students. The students commute to various academic units through buses engaged by the Institute.

All-round Growth & Development of Leadership :

The Students' Gymkhana is the umbrella body under the auspices of which all students' co- and extra-curricular activities are carried out. The Institute ascribes great importance to students' opinion and it is through the Gymkhana that the voice of the students is heard. Since its inception in 2010, the Gymkhana has been playing a crucial role in students' all round development and in nurturing leadership qualities. It provides scope for the students to excel in

various activities which are socio-cultural in nature or concerned with science and technology. Sports and games also come under the ambit of the Gymkhana. The Gymkhana is financed by the students themselves and a matching grant is provided by the Institute. It may be mentioned that two major events organized by students are Alma Fiesta – the socio cultural fest of IIT Bhubaneswar and Wissenaire – the techno-management fest. The funding for these events is arranged through sponsorship from various companies.

Student Career Counselling and Placement :

Students' overall well-being, both physical and psychological, is given top priority by IIT Bhubaneswar. The Institute also has the responsibility of providing effective career counselling and quality placement facilities to its students.

The Institute has a well-structured Career Counselling Cell. For counselling, the students may approach the Cell individually or in a group. The Cell in its turn arranges seminars and group discussion on career issues.

The Cell also coordinates the Placement Process for passing out students. Numerous companies visit the Institute for this purpose. Some of them are: Samsung Electronics, Cognisant, Infosys Ltd, Tata Consultancy Services, Flipkart, Altair Engineering, BPCL, L&T Construction, Finisar Malaysia, Tata Steel, Texas Instruments, Tata Consulting Engineers, IOCL, HPCL, ONGC, DRDO and Bank of India.

4.7 Alumni

The Institute has an Alumni Cell which maintains a database of the three batches of students who have graduated so far. All the students admitted to the Institute in the 1st year are allotted lifelong personal email IDs, which they can use even after graduation. Also a group email ID is assigned to each batch.

5.0 ANALYSIS AND COMMENTS

We now proceed to analyze and comment on certain aspects of the information provided to the Committee through the reports, presentations, interactions and visits.

5.1 Vision and Mission

The Committee has noted the vision and mission statements of the Institute. It has also noted that there are separate vision and mission statements for each School. This does not seem to be appropriate. The Committee suggests that there should be only one vision and one mission statement for the Institute as a whole and that this should apply to all schools. It also feels that the current vision and mission statements of the Institute need to be edited. They should be crisp statements of intent which incorporate the long term ideals of the Institute.

5.2 Schools of the Institute

The Committee has taken note of the profile and growth of the Institute over the years. In particular, it has noted that the activities are organized under a number of schools and that at present there are seven schools. It appears that the schools may not be split into departments for the specific disciplines which come within its ambit. This would be a departure from normal practice. The Committee feels that this experiment is worth trying and could be successful if the schools and the disciplines coming under each of them are carefully selected and organized.

The Committee has noted with satisfaction that two Schools, viz. School of Minerals, Metallurgical and Materials Engineering and School of Earth, Ocean and Climate Sciences, have been started keeping the regional context in mind. It commends the Institute for this decision.

Some specific comments on the names given to some other Schools and their functions may be in order.

School of Infrastructure: At present, the School of Infrastructure is oriented towards Civil Engineering only. It has been indicated that the School would eventually add on Architecture as a discipline. The pros and cons of this addition need to be debated. However, the School should consider expanding into other areas. For example, disciplines like Urban Planning or Regional Planning could be considered. In that case, it may be necessary to modify the existing name of the School.

School of Humanities, Social Sciences and Management: There are currently six faculty members in Humanities and Social Sciences (two each in English, Economics and Psychology) and no one in the area of management. The overall number in H & SS needs to be increased so that all subjects in H & SS are adequately covered from the point of view of teaching the core and elective courses in H & SS in the BTech curriculum. Apart from teaching, the concerned faculty need to be encouraged to guide students for PhD degrees and to get sponsored research projects. It has been indicated that the School is considering starting Master's degree programs in areas like Financial Economics / English / Psychology. The case for starting such programs is weak. They are not likely to be viable and there may never be enough faculty. The School needs to be focussed because constraints will always be there. It has to learn to operate and become well known within those constraints. This remark is applicable to some extent to all Schools.

Similarly the case for expanding into the area of management at a later date needs to be carefully weighed. Based on the experience of the older IITs, it can be seen that the establishment of Schools or Departments of Management has not been particularly noteworthy. The management programs at the older IITs have done reasonably well, but are nowhere near some of the engineering departments at these IITs in terms of the quality of the faculty and the academic programs offered. The Committee would like to suggest that for the foreseeable time being, IIT Bhubaneswar should not venture into the area of management. This suggestion is important because an Indian Institute of Management is coming up in the state. If

this suggestion is accepted, the school at IIT Bhubaneswar should be renamed as the School of Humanities and Social Sciences.

5.3 Academic Programs

In spite of difficulties of space, the Institute has managed to establish classrooms and laboratories in a number of locations. Thus although there is a cluster of temporary accommodations, the Institute has organized itself well in an effective manner. It has carefully calibrated the growth of its academic programs and expanded them in a systematic manner. This has been achieved by thoughtful planning and by keeping national and regional interests in mind, and is indeed praiseworthy.

Comments:

BTech Programs

- (i) The Committee has noted that currently five BTech degree programs are operational and that there are plans to start new programs in the future. It would like to recommend that any new proposal should be carefully examined. In particular, its attention was drawn to a proposal to start academic programs in Aerospace Engineering in the School of Mechanical Sciences. While specialized MTech programs and a PhD program in Aerospace Engineering can certainly be started after a certain minimum number of faculty are in position, there is no case for starting a BTech program in Aerospace Engineering. The existing BTech programs in India at four of the older IITs and a few other engineering colleges are generally running at sub-critical levels. Thus, there is no need to start another BTech program in that discipline.
- (ii) The data on admissions shows that sanctioned seats have remained unfilled in some BTech programs. This aspect is difficult to accept insofar as the BTech program is concerned. The issue needs to be examined and corrective measures taken.
- (iii) While it is recognized that each IIT is an independent university in its own right with its own identity and character, some comparisons between the IITs are inevitable. This is particularly true for the eight new IITs of which IIT Bhubaneswar is a part. One comparison which is often made by outsiders after the admissions to the BTech program through JEE are over every year is the all India rank of the first student opting for a discipline at an IIT. An analysis of the available data shows that in Mechanical Engineering and Electrical Engineering, IIT Bhubaneswar is placed 3rd, 4th or 5th out of the eight new IITs for the period from 2008 to 2013. Thus there is scope for improvement.
- (iv) It was surprising to note that the issue of teaching pedagogy was hardly mentioned during the meeting at Bhubaneswar. Innovations in presenting lectures, assessing students in courses, or in designing laboratory experiments were never mentioned. Similarly, on-line learning and the possibility of blending it for teaching large-sized courses was not discussed. The issue of attendance in classes (or rather the lack of it) also did not figure. Quite frankly, this was a little surprising. Young faculty should normally be bristling with new ideas and an IIT is the place where such experiments

should be welcomed. The Committee would like to suggest that the Institute needs to introspect on this matter seriously and let the 'winds of change' flow more freely.

Joint MSc-PhD and MTech-PhD Programs

- (v) The Committee was informed that students admitted to the joint programs are initially in the MSc or MTech programs and are permitted to move to the PhD program if they wish to do so and their CGPA was above a specified value. The number is restricted to 20% in the joint MSc-PhD program and 30% in the joint MTech-PhD program. The Committee feels that the criteria for transfer to a PhD program should be based only on academic performance and need not be restricted to a certain percentage of students. It also feels that the CGPA specified should be sufficiently high. Thus it suggests that for both programs, transfer to the PhD program should be permitted if the CGPA exceeds 8.5.

PhD Program

An important issue faced by all Institutes and Universities in India is the need to attract quality students into the PhD programs. IIT Bhubaneswar should make special efforts for achieving this goal. It is necessary to make the quality of the faculty and the facilities available at the Institute known in the surrounding colleges of the region and Odisha in particular. This should be done by delivering lectures in the region and by sending out brochures. The Institute should also offer good facilities to PhD students and make them feel welcome. For example, every PhD student should have a desk in his/her laboratory. The scholar should also have easy access at all times to the place of work.

5.4 Research Activities

The Committee noted that the overall research profile of the Institute was impressive both in terms of quality and quantity. It felt that a reasonable amount had been achieved and that the Institute was on a good trajectory. It also noted that certain areas had been identified for research and development and that these were consistent with the geographical location of the Institute.

The fact that 67 sponsored projects had been funded so far and that many more proposals were in the pipeline indicated a reasonably satisfactory state of affairs and a good beginning. The publication record of the faculty based on sponsored and unsponsored research was also satisfactory. However, there is scope for improvement because many faculty members are not yet actively involved in research or in writing proposals for sponsored research. It was also noted that the thinking of many of the faculty was essentially along classical lines and in some cases, somewhat old-fashioned research is being conducted. It is important for the faculty to develop new mind sets and to explore new areas. For this to happen, there has to be internal discussion as well as external inputs from experts. Encouragement is also needed from the senior faculty. The administration on its part needs to set aside more funds every year from the

Institute's grant in order to establish specific research facilities and buy sophisticated equipment. The creation of such a research base will encourage government and other agencies to sponsor more projects at the Institute. The Committee would also like to suggest that even though there is a shortage of faculty, every year some young faculty members should be allowed to spend a year or two in good research institutions as visiting research staff.

5.5 Interaction with Industry, Outreach and Collaborations

The Committee noted that activities related to industrial consultancy are slowly gathering momentum. Most of the consultancy work has been in Civil Engineering and some of it is rather routine in nature. This is to be expected in the early years. The challenge for the faculty in the coming years is to expand consultancy to activities other than Civil Engineering and to undertake projects which involve design, research and hard core industry interaction.

Insofar as outreach is concerned, the Committee has noted with satisfaction that a Centre of Excellence in Biosciences and Bioengineering is proposed and that significant support amounting to Rs 5.5 crores will support both a Chair Professorship and the creation of research facilities. It was also noted that an endowment of Rs 3 crores has been created by the MGM Minerals Group. The Institute is involved with the states of Odisha and Jharkand on rural road development projects. It has also undertaken projects on re-engineering of agricultural and food processing machinery for the state of Odisha. These are welcome developments for a young Institute.

Good collaborations have been initiated with the Warwick Manufacturing Group in UK and with the University of Massachusetts at Dartmouth for faculty exchanges and student internships. The appointment of Distinguished Visiting Professors is also a very welcome step.

Although the Institute has done good work by attracting outside funds, the Committee feels that it should leverage its approach of having a School system to garner more funds in the future.

5.6 Governance

The formal governing structure of the Institute is along established lines and appears to be working well. Issues concerning accountability and transparency are also being addressed.

As stated earlier, the Committee had three interaction meetings with the faculty, students, officers and supporting staff. These meetings were well attended. A number of issues were raised which need to be discussed directly with the administration and do not fall within the purview of this Committee. However, some of them are listed in Sections 5.7 and 5.8. The Committee noted that nothing adverse was said at the interaction meetings.

Based on the tenor of discussion at the meeting with faculty, the Committee felt that the level of communication with the faculty (particularly younger faculty) as well as the level of

participation of the younger faculty in planning and decision making should be improved. The Committee would also like to suggest that an Institute Faculty Meeting should be conducted every semester. This should be a formal meeting open to all faculty at which the Director/Deans could report on the progress of certain activities and faculty members could raise academic matters and related issues for discussion. Notes of these meetings should be kept by a faculty member who would serve as the Secretary of the Institute Faculty Meeting and important issues raised should be addressed or converted into agenda items for consideration of the Senate and/or the Board. A feedback on the action taken should be given at subsequent Institute Faculty Meetings.

5.7 Faculty, Officers and Supporting Staff

The strength of the faculty is 95 and it is reported that very few persons have left after joining. The Committee felt that this is certainly creditable, although all the hired persons are probably not of as high a standard as desirable. It also observed that there is a significant dearth of faculty at the level of Associate professor and Professor.

The Committee would like to emphasize that there should be no compromise in quality while selecting faculty. Selection of outstanding faculty is critical to the growth and future of the Institute. In order to encourage this process, suitable incentives could be given for attracting young people and for moving senior people. A fair and transparent procedure should be used for this purpose. The Committee would also like to point out that although there are properly constituted Selection Committees for selecting faculty, the quality is largely determined by the pro-active measures taken by the Institute to encourage outstanding faculty to apply and by adopting strict screening procedures for applications. It is necessary that the Institute should appoint a Faculty Search Committee (FSC) for this purpose. While the Dean (Faculty) could be the Chairman of FSC, its members should be from all the Schools. These persons need not necessarily be the Heads of Schools. In fact it would be desirable to involve young faculty in this process. Specific guidelines should be drawn up for dealing with all applications in a fair and expeditious manner. Since Selection Committees cannot meet frequently, FSC could recommend suitable faculty candidates to the Board for immediate temporary appointments. These temporary appointments can be regularized later.

It is also suggested that a few selected scientists and technologists from other institutions from within the country and outside, be appointed as Adjunct Faculty. These persons should be associated with particular schools of IIT Bhubaneswar and would be expected to spend a few weeks every year with the respective school. Such associations would enliven the research activities and add to the academic ambience.

During the interaction with faculty, two interesting points were made and need to be noted.

- (i) It was pointed out that the difference in salary for contract faculty at the Assistant professor's level and regular faculty at the same level was excessive even though there was only a difference of three years experience between the two positions. Of course, this is an issue which affects faculty at all IITs and is only recorded here.

- (ii) It was suggested that the faculty should be more cosmopolitan in nature. Already there are indications that the faculty at IIT Bhubaneswar are essentially from three or four states. This may not be desirable in the long run.

Apart from the meeting with the faculty, the Committee had a useful interaction with officers and supporting staff. Some of the issues raised during the interaction were as follows :

- (i) Guidelines are needed in the form of manuals for purchase procedures, admission policies, methods for staff selection, etc. At present, manuals developed in IIT Kharagpur are being used. These need to be suitably modified and adapted for use in IIT Bhubaneswar.
- (ii) Being a new IIT, IIT Bhubaneswar is not a part of the consortium of e-subscribers of journals. Some action is needed at a higher level to resolve this problem.
- (iii) Staff need encouragement if they wish to pursue studies for obtaining higher qualifications.

5.8 Students and Alumni

Interaction with Students :

A number of issues were raised by students during the interaction meeting with them. These are recorded here.

- (i) Undergraduate students in Electrical Engineering felt that the degree awarded to them should indicate the fact that they had studied a lot of courses in Electronics and Communication Engineering. They felt that re-naming would improve the prospects of graduating students.
- (ii) Undergraduate students in Computer Science and Engineering stated that their curriculum had essentially no course in Computer Science and Engineering till the second year second semester.
- (iii) Some undergraduate students felt that though they filled in course evaluation forms every semester, they received no feedback on what was done with the information.
- (iv) A PhD research scholar pointed out that examiners' reports on PhD theses were sometimes delayed a lot. As a result, after a certain period, the student received no scholarship.
- (v) Undergraduate students suggested that student based projects needed more funding.

Almost all these issues need the attention of the administration of the Institute and are listed here so that necessary action can be taken.

Based on these inputs, the Committee suggests that there should be discussion sessions student groups and the concerned Deans. These should be scheduled in advance and held once every semester so that meaningful issues are raised and discussed.

Interaction with Alumni :

Although only one alumnus showed up for the interaction, she came prepared and had many comments and suggestions to offer based on her prior discussions with other alumni of the Institute. When asked at the beginning, how her four year stay at IIT Bhubaneswar had helped her, she said it had developed in her the ability to think for herself without inhibitions. She went on to say that the professors were generally helpful. However, there was a shortage of faculty. Because of this, in some courses there was a mismatch between the area of specialization/interest of the faculty member and the course he/she had to teach.

The following are some suggestions made based on the inputs she had received from some alumni.

- (i) Curriculum. Courses on the environment and on biosciences could perhaps come later rather than in the first or second year. On the other hand, some courses of direct relevance to a discipline (e.g. Wireless Communication for Electrical Engineering students) need to come earlier than the final year.
- (ii) Interaction with industry. The Institute should make concerted efforts to increase its association with industry. Some courses in the curriculum could be tailor made for industry and parts of these courses could be taught by persons from industry. Industries should be persuaded to offer more projects to students.
- (iii) Placement. The companies which come can be categorized into core companies (i.e. companies doing work of relevance in the discipline in which the student has obtained his/her degree) and non-core companies (e.g. many IT companies). At present, during placement, job offers made by non-core companies dominate. This needs to be noted.
Also, since the MTech program at IIT Bhubaneswar is new and the numbers passing out are small, very few job offers are made to such students.
- (iv) Branding the Institute. The Institute is now six years old and it is necessary to begin the process of branding the Institute by publicizing features which make it stand out already and will enhance its image in the future.
- (v) Alumni. It is necessary to take concrete steps to enhance and maintain links with alumni. Apart from maintaining a database of alumni and their addresses which is continuously updated, it would be useful to start immediately an Institute newsletter which is sent to all alumni and well wishers of the Institute. To begin with, this newsletter could be a quarterly.
- (vi) Mentorship by alumni. Having passed through the Institute, some alumni would certainly be interested and willing to mentor current students. Such mentorship should be encouraged.

The Committee feels that most of the above suggestions are well thought out and need careful consideration.

5.9 The Permanent Campus

The permanent campus is located at a beautiful site on the outskirts of Bhubaneswar with gentle hills in the background. During its visit, the Committee observed that the main roads have been laid out and that some buildings (two hostels, the guest house, etc) were ready for occupation. However, most of the other buildings (Main Building and buildings for various schools) are far from being ready. In an overall sense, the construction is proceeding well and it was noted that a green agenda is being pursued vigorously. However the general impression was that there was a serious mismatch between the rate of construction in the residential area and in the academic area. This fact will hamper early movement to the campus.

The Committee also observed that the buildings on the campus are dispersed over a large area with considerable distances between them. This will certainly inhibit interaction between the faculty and students of different schools and make the task of promoting interdisciplinary activities difficult.

Building a new institute presents both challenges and opportunities. There is a wonderful opportunity to build an educational institution in which the architecture and landscaping blends with the setting, couples with regional trends of construction and thereby infuses a spirit of learning and discovery in the students and faculty. The Committee noted with dismay that this opportunity appears to have been lost in the present case. This is indeed a pity. It recommends that even now the advice of a group of master planners and architects of standing should be sought to suggest modifications and remedy matters to some extent.

6.0 RECOMMENDATIONS FOR ACTION

The main recommendations made in Section 5 are compiled in this section.

Vision and Mission

There should be only one vision statement and one mission statement for the Institute as a whole. The present statements need editing. Separate vision and mission statements should not be prepared for each School.

Schools

- (i) The School of Infrastructure should be renamed and the disciplines coming under its purview should be carefully delineated.
- (ii) The Institute should not venture into the area of management. Hence the School of Humanities, Social Sciences & Management should be renamed as the School of Humanities and Social Sciences.

- (iii) All the Schools need to be focused. They should only start degree programs which are viable and in the long term interests of the nation and the region.

Academic Programs

- (i) Care must be taken to ensure that sanctioned seats in the BTech degree program in any discipline do not remain vacant after the admission process is complete.
- (ii) New BTech and MTech degree programs need to be started after due diligence. The proposal to start academic programs in Aerospace Engineering under the School of Mechanical Sciences may be acceptable only at the MTech and PhD levels. A new BTech degree program in Aerospace Engineering should not be started because an unfilled capacity exists at the national level.
- (iii) Teaching pedagogy has not received attention at the Institute. Faculty need to introspect on this aspect and take external advice, if necessary.
- (iv) High academic performance should be the only criterion for deciding if a student is eligible to transfer to the PhD program in the joint MTech-PhD program and the joint MSc-PhD program. This criterion should be set at 8.5 CGPA for both programs,
- (v) The PhD program needs special attention and nurturing so that more students of superior ability are attracted. The program should be given more publicity through brochures, advertisements and talks in various colleges in the region. At the same time, the Institute must offer better facilities to research scholars.

Research Activities

- (i) The Institute must set aside more funds from the Institute's grants every year in order to establish better research facilities in certain identified areas and thereby attract more sponsored research projects.
- (ii) In spite of a shortage of faculty, a few young faculty members must be permitted to spend a year or two in reputed research institutes (either in India or abroad) if they receive appointments as visiting staff. Only then, will new research ideas flow into the Institute.

Governance

There should be an Institute Faculty Meeting at least once every semester. Important academic matters and related issues raised at the meeting should be addressed. Some issues may be converted into agenda items for consideration by the Senate or the Board of Governors.

Faculty

- (i) The Institute should set up a Faculty Search Committee to help in the task of screening and assessing the applications of candidates who are to be considered for faculty positions by duly constituted Selection Committees. The Faculty Search Committee should also be entrusted with the task of recommending faculty candidates for temporary appointments.

- (ii) The Institute should appoint a few selected scientists and technologists from other institutions as Adjunct Faculty. These persons should be associated with particular schools and be expected to spend a few weeks every year with the respective school.

Students and Alumni

- (i) The suggestion made that the BTech degree in Electrical Engineering should be renamed to reflect the Electronics and Communication Engineering content needs to be seriously considered if it is seen to be affecting the future careers of the students. It is recommended that a Senate Committee consider the matter and make appropriate recommendations to the Board.
- (ii) Concrete steps should be taken to enhance links with alumni. It is recommended the database of alumni and their addresses is continuously updated and that the Institute publish a Newsletter which is sent to alumni and well-wishers.

The Permanent Campus

The permanent campus of IIT Bhubaneswar needs to be built with a grand vision. The Committee recommends that the advice of a group of master planners and architects be sought to suggest modifications even at this late stage when some construction work is complete.

7.0 LOOKING FORWARD

Setting up a new IIT in a new environment is a difficult and challenging task. From a practical point of view, one needs to get the academic programs going as soon as possible and maintain a steady growth. One also needs to encourage research activities right from the beginning. At the same time, one needs to create an atmosphere in which excellence in teaching and research is encouraged. Keeping all these aspects in mind, the Committee feels that IIT Bhubaneswar, its leadership and its faculty are to be commended for having done a good job so far. In this effort, it would be appropriate to acknowledge the initial assistance received from IIT Kharagpur, the mentor Institute.

In the long run, the quality of an Institute is determined, not by bricks and mortar, but by the quality of its faculty and the quality of its students. The Expert Peer Review Committee has been essentially guided by this principle in making its recommendations. It hopes that the recommendations and suggestions made by it are viewed in the right spirit and that the changes suggested are implemented. A new mind set needs to be summoned for defining and attaining future goals of excellence. For this to happen, the Institute should have continual churning and seek external inputs whenever necessary. The Committee feels that this spirit should guide IIT Bhubaneswar so that it is eventually recognized as one of the best Institutes of Technology in the country.

PROGRAM OF PEER REVIEW COMMITTEE AT IIT BHUBANESWAR
August 4-5, 2014

MONDAY - August 4, 2014		
Time	Program	Venue / Remark
1000-1030 hrs	Meeting with Director and other Institute Functionaries	Board Room Toshali Bhavan
1030 -1100 hrs	Presentation by Deputy Director	-do-
1100-1110 hrs	Presentation by Dean (F&P)	-do-
1110-1120 hrs	Presentation by Dean (Academic Affairs)	-do-
1120-1130 hrs	Presentation by Dean (SRIC)	-do-
1130-1140 hrs	Presentation by Dean (Students Affairs)	-do-
1140-1150 hrs	Presentation by Dean (Alumni Affairs & International Relations)	-do-
1150-1200 hrs	Presentation by Dean (Continuing Education)	-do-
1200-1300 hrs	Visit of Toshali Bhavan Campus	
1300-1400 hrs	Lunch Break	Lunch
1400-1530 hrs	Visit to Samantapuri Campus including Workshop and Lab complex and A. N. Khosla Hall of Residence	
1530-1615 hrs	Meeting with Students	Institute Auditorium
1615-1645 hrs	Tea Break	
1645-1730 hrs	Meeting with Faculty Members	Institute Auditorium
1730-1815 hrs	Meeting with Officers and other Supporting Staff	-do-
1815-1915 hrs	Internal Meeting of Committee Members	Virtual Class Room, Samantapuri
2000 hrs.	Dinner	Hotel
TUESDAY -5th August 2014		
Time	Program	Venue / Remark
0845-1145 hrs	Visit to permanent campus at Arugul	
1145-1155 hrs	Presentation by HOS, Basic Sciences	Virtual Class Room, Samantapuri
1155-1205 hrs	Presentation by HOS, School of Earth, Ocean and Climate Sciences	-do-
1205-1220 hrs	Presentation by HOS, School of Electrical Sciences	-do-
1220-1230 hrs	Presentation by HOS, School of Infrastructure	-do-
1230-1240hrs	Presentation by HOS, School of Mechanical Sciences	-do-
1240-1250 hrs	Presentation by HOS, School of MMME	-do-
1250-1300 hrs	Presentation by HOS, School of HSM	-do-

1300-1330 hrs	Presentation by faculty member- Dr A. Biswas	-do-
1330-1500 hrs	Lunch	Hotel
1500-1630 hrs	Presentations by faculty members (contd)- Dr R Jha, Dr V L N Murthy, Dr. D. Pasala and Dr. S. N. Panigrahi	Virtual Class Room, Samantapuri
1530-1700 hrs	Internal Meeting of Committee Members	Virtual Class Room, Samantapuri
1700-1715 hrs	Tea	-do-
1715-1800 hrs	Meeting with Alumni	Institute Auditorium
1800-1900	Final Discussion with Director and Deputy Director	
1915 hrs	Departure for Hotel	
2000 hrs	Dinner	Hotel

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