Criterion VII.

Innovation and Best Practices

7.1. Environment Consciousness

Environment plays a pivotal role in quality of human life. Jiwaji University takes pledge to raise an environment conscious community of educated fraternity. The green policies of the University are clearly documented in 'Environmental policy' and are being implemented.

7.1.1 Doesthe University conduct Green Audit Policy?

The University is planning to initiate 'green audit' of the campus soon.

7.1.1 What are the initiatives taken by the University to make the campuseco-feriendly?

a. Energy Conservation:

The University has set up solar energy panels in Boy's hostel.

The wind energy system is displayed at guest house.

b. Use of renewable energy

Promotion of solar and wind energies is included for implementation in a phased manner. The University has set up 'Vermicompost' centre and plans are underway to use human waster for generation of biogas.

c. Water harvesting

Terrace water harvesting systems made with every building on the campus.

d. Check dam construction

There are no major rivers nearby.

Efforts for carbon neutrality: Attempts are to be made for carbon neutrality.

e. Plantation:

The campus is covered by nice greenery including lush green lawns, avenue trees, departmental and residential gardens. University administration, engineering section, teaching & nonteaching faculty of Physical Education, Botany, Zoology, Earth Science, Environmental Science, Pharmacy, Neuroscience and others deserve all appreciation for plantation and caring for them. Vermicompost produced by Vermicomposting Center of the University is used in lawns and plants. In addition of "Botanical Garden", "Environmental Garden", a "Medicinal Garden - cum Biodiversity Park" named as "CHARAK UDYAN" has also been established in the campus. Approximately 400 species of plants of economic and medicinal importance are available over here. Many of them are rare, threatened and endangered. It is spread in an area of 14 hectares and it is divided into different theme based sectors like Panchwati Vatika, Nakshatra Vatika, Nav-Grah Vatika, Gyan-drusti Vatika, Aushadi Vatika, cactus hillock, vermicomposting center, Palm (Green) House, Bonsai (Green) House, Hanuman Mandir. A small water pond with blooming purple and yellow lotus flowers is enhancing beauty of the garden. In Charak Udyan, animal biodiversity is closely integrated with botanical biodiversity with different types of mammals, birds, reptiles, frogs and toads, insects and other invertebrates. A mud pod is made as a model for both waste water remediation and rain water harvesting system. The large amount plantation waste, generated from here is recycled in Vermicomposting Center located in one of the sectors and excellent quality of biocompost (vermicompost) is produced. Charak Udyan is recognized is by International body of United Kingdom, "Botanical Garden Conservation International" due to its rich of botanical diversity, excellent maintenance and conservation activities. This is a big achievement to the University.

Hazardous waste management

The University is practcing appropriate norms for disposal and management of hazardous waste of chemical and biological laboratories.

e-waste management

The University is making efforts to develop appropriate measures for e-waste management.

Any other : Specify

* any other (please specify)

(A) **Model of Organic Waste Management:** For about 15 years we are working on organic waste management through vermicomposting. A Vermicomposting Center has been established in 2005 for this purpose. The plantation waste from Charak Udyan and University campus is mixed with cattle dung and is recycled into high quality bio (vermi) compost through culture of epigeic earthworms. A number of students carry out their project work on vermicomposting of variety of waste biomass including food and kitchen, paper, temple, animal house etc. Training to student of different levels and farmers is also imparted. Research work on earthworms, vermicomposting and medicinal properties of earthworms has been carried out over here and 3 Ph.D. and 8 M.Phil. candidates have been produced so far. Significant studies on vermicomposting of food and kitchen waste, paper waste, sewage sludge, pea waste and pharmaceutical properties of earthworms have been conducted. It was demonstrated that inoculation of some microorganisms enhances the vermicomposting of high cellulose containing waste. Development of portable home vermicomposting unit for recycling of household (food and kitchen) waste is also noteworthy. Vermicompost, vermiwash and live earthworms are sold from here so that Vermicomposting Center works as "Self-Sustaining (No Profit No Loss) System". Inspired by us, more than 20 vermicomposting units have been established at Schools, UTDs, Nurseries, Colleges, dairy farms, temples, general public. We are collaborating with Central Reserve Police Camp, Shivpuri Road, Gwalior for management of their waste. Similarly we are also handling the waste from famous "

(C) Establishment of Bio-toilets: In order to promote pollution free waste management efforts are underway to install bio-toilets at student hostels and residential blocks in a phased manner.

(D) Green Technology consumer products like bio-compostable plastic, bio-pesticides, insect (stored grain, mosquito) traps will be promoted

7.2. Innovations

Universities are the seats of higher learning and the prime objectives of the University include creation and dissemination of knowledge. Innovation is the greatest driver of multidimentional growth in academic Institutions. The University has developed policies and are being implemented for promotion of Research and improvement of teaching-learning processes.

7.2.1 Give details of innovations introduced during the last four years which have created a positive impact on the functioning of the University.

7.3 Best Practices

7.3.1 Give details of any two best practices which have contributed to better academic and administrative functioning of the university.

The University has developed excellent practices and are being implemented in the following two areas:

a) Promotion of Research activities and
b) Teaching-learning processes.

1. Title of the Practice

Innovations and best practices in promotion of research on the campus:

2. Objectives and intended outcomes of this practice and the underlying principles/concepts of this practice:

Research is a scholarly and creative activity that supports one of the major academic missions of the University i.e., creation of Knowledge. The Jiwaji University is exploring and practicing innovations in generation of knowledge by promoting research activities on the campus.
The following innovative approaches for promotion of research are being implemented:

Research & Innovation policy of Jiwaji University

The Jiwaji University developed a document on 'Vision 2025' that delineates the immediate goals, short term goals, long term goals action pathways to be implemented in phased manner, and intiatives taken to fullfill the future vision. One of the missions of the University is conduction of applied and quality research on the campus. In order to promote the research on the campus the University worked out a 'Research & Innovation Policy' document which delineates research mission, measures to be taken to ensure research excellence, innovations to be adopted to become the leader in advancing the frontiers of scientific research. The document gives the mission and framework for best practice processes and solutions that offer a strategic roadmap for quality research. Thrust areas of focus have been identified in faculties of Physical Sciences, Life Sciences, Social Sciences, arts and other faculties. The document envisages the strategies to be followed to accomplish the research goals and commitments of faculty members. Creation of good research work culture on the campus by addressing organizational and procedural barriers within the system are envisaged.

3. The Context

What were the contextual features or challenging issues that needed to be addressed in designing and implementing this practice (in about 150 words)?

The basic prerequisites for achieviang high standards in academic research, as identified by the University, are as follows:

1. Strategic planning and ensure research excellence
2. Integration of graduate and post graduate curricula with research
3. Focus on regional and national based issues
4. Preference for product oriented research
5. Interdisciplinary approaches in research
6. Availability of good infrastractural and advanced scientific instrumentation facilities.

The innovations and practices being followed to meet the challenges of the rapid advances in scientific research are detailed below:

a. Strategic planning, excellence in academic research

Jiwaji University has a reputation for excellence in scientific research and innovation. The Jiwaji University identified the thrust areas of research in various disciplines keeping in view the academic expertise of the faculty, natural resources of the region, demands of the country, resources and facilities available.

i. **Faculty Excellence:** The University has faculty members specialized in diverse fields and areactively involved in research. The following best practices are followed to promote research excelence of the faculty members.

   a. To keep abreast with the advances in their areas of research specialization, the faculty are encouraged to attend conferences organized by Professional Societies, Institutions; workshops on frontiers of science, individual training in National laboratories and premier research organizations. The University provides partial and full partial support to faculty for attending conferences not only in India but also abroad. Budgetary provisions are made specifically for this purpose.
   b. In order to broaden the horizons and to promote interdisciplinery and inter-instituional research, the University encourages faculty members to spend time in laboratories outside India. Several faculty members suceeded in securing fellowships from National and International agencies for their postdoctoral studies outside India. The University provides academic leave with full salary payment.
   c. The University encourages teachers to submit major research projects to National and International public funding agencies. The following best practices are underway in this regard:

ii. **Simplified application procedure:** Applications procedures are highly simplified.
iii. **Setting up of Directorate of Research**: A research cell was constituted to inform the faculty on research annoucements/notifications of different National and International

funding agencies from time to time. The research cell of the University is now upgraded to ‘ Directorate of Research’. The main function of the ‘Directorate of Research’ is to promote academic research on the campus and to address the administrative issues of researchers of theUniversity.

iv. **Recognition of research contributions of the faculty:** The University developed a mechanism to encourage faculty by rewarding their prime research contributions. The University duly acknowledges the research contributions of the faculty and are duly rewarded with the support of Madhya Pradesh Council of Science & Technology. ‘Best researcher of the year’ announced in every academic year and felicitated.

v. **Research fellowships to Students:** Jiwaji University made budgetary provisions for award of monthly research fellowships to bright students in every faculty. A total of --- student fellowships are given in a year. Besides University fellowships, the students are also awarded research fellowships under SAP programs of various departments. These are in addition to those provided directly by ICMR, CSIR, and adhoc research projects sanctioned to faculty members.

vi. **Student training:** The research students of SOS as well as those of affiliated colleges (private & public) are encouraged to attend national and International conferences, workshops to enhance their research skills.

vii. **Promotion of research excellence of faculty of affiliated colleges:** The University organizes ‘Workshops’ for the benefit of teachers working in colleges inorder to promote academic expertise in specialized areas.

viii. **Starter grants:** The research policy advocates a provision for **seed money as ‘**Starter grant’ to newly recruited faculty in order to facilitate initiation of research in their areas of specialization. The University also proposes to increase the number of Ph.D fellowships to non-NET qualified students. Efforts are being made for promotion of product/ patent oriented research.

ix. **Patent Cell** has recently been created in that direction. A Patent cell has just been created in this direction. ‘Advanced Scientific Equipment Facility’ which caters to the requirements not only of Jiwaji University but also of other educational Institutes of the region has strongly been advocated.

x. **Financial support:** The University provides partial/complete support to faculty members for organization of Seminars and Conferences at National and International level. Five to 8 such conferences are organized in every academic year.

The University has plans to establish a research funding facility preferably for newly recruited faculty to initiate research in their areas of specialization. Also, the University plans to increase the number of research fellowships for students.

Integration of graduate and Postgraduate curricula with research

In order to inculcate research culture, the curricula of both graduate and postgraduate courses are tagged with Project works of 2-4 months duration. Every student will have to take up research project under the supervision of a teacher either with in the School or outside. The student learns how to identify research problem, planning of experimental strategies, their execution, compilation data and their analysis, interpretation and logical conclusions. The University devised means by which the Postgraduate students of the University would get exposed to good research laboratories.

Development of MoUs with National laboratories:

One of the major initiatives of the University to promote quality human resource in research is development of collaborations with various National laboratories. The University had Memoranda of Understanding with five National laboratories beloging to ICMR, CSIR, DRDO. Viz., The MoUs facilitated students to take up their research projects in those laboratories. This practice promoted research aptitude among the students.

Development of MoUs with Universities abroad:

The University initiated development of collaborations with two of the European Universities. The executive representatives of those Universities visited the campus, interacted with faculty and agreed in principle for collaborative researches and teaching.

Development of infrastructural and advanced Scientific facilities

The University has laid down clear strategies for development and growth of infrastructural facilities on the campus.

Promotion of Infrastructural facilities: In order to promote infrastructural growth, the following measures are practiced by the University:

i. **Special budget provisions:** As per the demand of the School, the University considers liberally allocation of special budget for development of infrastural facilities needed for research without any specified limit on budget allocation.

ii. **Allocation of 100% overhead budget of research projects:** The University sanctions 100% of the fund available under 'Over heads' of externally funded research projects without any deduction to Principal Investigators for improvement of Infrastructaral development.

iii. **Advancing funds for sanctioned projects**: The University had taken decision to meet expenditures from University budget on advt. of project fellows/student fellowships and other essential expenditure till the fund is received by the Principal Investigator, provided the sanctioned letter from funding agency is available.

Infrastructural fund under FIST: The University specifically encourages each and every Science department. Recognizing the research contributions of thefaculty of Science departments, lager funds worth several crores were sanctioned to various Schools of Studies viz., Zoology, Botany, Chemistry and Biochemistry.

Infrastructural fund under SAP: Similary, the University encourages faculty to secure grants under SAP –UGC program. The SoS in Zoology has secured funds under Phases I, II & III. The applications of various other departments is under process.

B. Setting up of Sophisticated Instrumentation facility:

In order to provide the advanced instrumentation facilities on the campus, the University is planning to set up 'Central instrumentation facility' housing major equipment. The

University has already initiated efforts in this direction. Application is proposed under RUSA program of Human Resource Ministry which is under active consideration.

C: **Faculty Excellence** :

The University proposed two of the departments for recognition as 'Departments of excellence' on the basis of research contributions to State Higher education department. These applications are under active consideration and likely to be successful. The funds sanctioned under this program would totally be dedicated for promotion of excellence in research on the campus.

IV**: Information resources:**

Academic journals and tpublications are good sources of information researchers of all categories. The University has taken advantage of IT resources. The University suceede d in securing UGC-Infonet facility for the benefit of researchers. A total of about 7500 international journals are made available with full access to the researchers on campus. The facility is extended to the desk top of each and everyfaculty member through optic fibre cabling.
A central facility with Infonet facility is made available in all departments active in research.

V. Impact of best practices adopted by the University

1. Resulted in high quality publications in international journals

2. Resulted in securing major research projects.

3. Resulted in securing major infrastructural grants and recognition of 'Departments of excellence'.

4. The research contributions of the faculty of duly recognized and awarded in the form of fellowships of Professional Societies such as Royal Society of London and Prestigeous Indian academies and awards to faculty and students in various conferences.

VII. Challenges of research innovation faced by the University:

The major impediments faced by the University in promoting excellence in research include:

1. Lack of sufficient fund for development of advanced infrastructural facilities for research
2. The current policy of State Govt. does not permit recruitment of new faculty.

Second best practice

Title:

II. Innovations and best practices in teaching –learning process

Teaching-learning process plays a critical role in dissemination of knowledge, the second aim of the University. The main stake holders in this process are students and teachers. One of the key issues in Institutions is to ensure that the quality of teaching and learning is as good as it can be.

Admission processes are made online: Jiwaji University is the first one in Madhya Pradesh State which made admission processes online.

Teaching-Learning Process

Academic calender: The University announces academic calendar annually which provides date of commencement of the academic session, duration of semester, period of internal assessment tests, final semester examinations etc. Striking features of the academic calender highlight teaching days, and State Govt and local holidays.

University provides course structure and examination schemes prior to the commencement of the academic session

The University provides, at the beginning of academic session, Course structure, detailed Unit wise topics, number of teaching classes allocated for each Unit, to each and every student

admitted to a given program. In order to ensure that detailed curriculum is available to students not only of Schools of Studies but also of affiliated colleges, the whole curriculum as approved by the Academic council is uploaded on Jiwaji University website.

Teaching is made student-centric:

Students are given representation in curriculum development, seminars, group discussions and they are prepared to develop the leadership qualities by giving representation on the basis of the best performance in their results.

Also, the University is planning to initiate student-centered classrooms and the elimination of traditional teaching practices. The student-centered classroom operates on collaboration, project-based learning, technology integration, and plenty of conversation between students and teachers about learning. The following steps to build a remarkable student-centered learning processes on the campus:

Smart Class Rooms:

The University initiated exploiting information technology by setting up smart class rooms in various Schools of studies with web connection. The smart class rooms are open to students in their free time which provide excellent platforms for presenting, interacting and sharing information with each other. When students have an array of exciting web tools at their disposal, they become eager to participate in learning process outside of their class. Availability of smart class rooms breeds learning for the sake of learning—one of the best parts of the student-centered classroom.

Weekly seminars conducted by students:

Many Schools on the campus practice 'Journal clubs' on specified day of every week. The class representative takes the responsibility of collecting seminar topics from students, fixation of dates in consultation with student colleagues, announcement of topics and dates in advance in School notice board, organization of seminars every week.

Participation of students in evaluation process:

Each and every student is asked to evaluate the seminar delivered as per the evaluation markers viz., quality of matter presented, organization of the matter, expression, performance in discussion etc. The average of each evaluation is taken into consideration.Involving students in conversations and evluations about their learning not only builds trust, but also helps them become critics of their own work, which is a remarkable part of the amazing student-centered classroom.

Visiting faculty

The University has reasonably well qualified pool of human resource to meet the teahcing and learning processes of students. In self financing courses, where there is a resource crunch duly qualified faculty from local and Institutions outside Gwalior are invited on regular basis.

Visiting faculty from National laboratories and Central Universities deliver lectures to students in addition to regular faculty.

The University signed MoUs with National laboratories of ICMR, CSIR etc which facilitates Scientists to come down to Jiwaji University and participate in teaching program.

A separate fund is earmarked under unassigned head of UGC development grant for invitin experts from outside.

e-learning resources

The University provided funds to almost all departments running regular courses to develop e-learning resources: Both non-technical and technical facilities are available for effective teaching and learning practices. This facility is being extended to other courses as well in phased manner. All most all faculty members follow advanced lecture methods besides conventional teaching and learning process.

UGC-Infonet facility is extended to each every School on the campus through Optic fibre system and is in best use on regular basis.

Wi-fi campus:

Plans are under way to make the campus Wi-fi process has been initiated in that direction.

Mobile learning:

Field work is a necessary activity of the curriculum for some departments like Archaelogy, Tourism, Geology and few other departments.

Every year these departments organize departmental field study tours. Very often local sites are selected and surveying, data collection, specimen collection, analysis and report writing are taught systematically and students are made efficient so as to prepare and submit a field report independently. On site experience of the field is proving more beneficial than the theoretical and class room teaching.

Every deparment is provided with a digital Xerox machine in the deparmental libraries and smart classrooms.

Quality monitoring:

The University has 'Quality monitoring Unit' monitor the issues regarding teaching-learning processes. This Cell extends its functions to Open Source Community in order to integrate its' benefits in the University's educational processes.

Innovations in teaching learning process – outline:

1. **Establishment of Smart class rooms:**

   Smart class rooms were set up in almost all Schools running regular courses. These class rooms are in regular use by teachers. Use of such facility is assisting teachers in practicing the best possible innovative approaches in teaching methodology.

   Web service to Smart class rooms:

The smart class rooms are further strengthened by providing internet facility. **Availability of internet in the class room has taken the teaching-learning processes to newer heights.** The students make best use of this facility in out of class times for downloadig the latest informations/ power point study matters/ you tube lectures. Thus this facility made students listen to lectures of eminent teachers and Nobel laurets across the globe.

2. LCD & Overhead projectors:

In courses where smart class room facility is not available, LCD projectors are in regular use for power point presentations by teachers. This approach facilitated completion of course completion on time with ample time for revision.

The Overhead projectors are also used simultaneously by teachers in routine class room teaching as per the requirement.

3. **Seminars and discussion:**

A number of departments viz.Biochemistry, Biotechnology, Botany, Chemistry, Physics, Mathematics, Zoology, and considerable departments in humanities, arts regularly organizes weekend departmental seminars. The students are encouraged to conduct such seminars which facilitated their active participation in discussion and interaction.

4. Group discussion with Report presentation:

In departments of Commerce, Management, and Education group wise discussions are organized from time to time to improve the debating and discussion skills of students. The group discussions are monitored by a panel of teachers and suggestions and guidance are provided for improvement.

The students are divided into some groups, a relevant topic is given for discussion and asked to note down the main points by the group leader. After a few minutes of discussion the group leaders are asked to present their report one by one. After presentation of their report the concerned teacher summarises the main important points and explains them briefly.

5. **Project works:**

Excursion and project works are part of the learning process in subjects like Tourism, Social work, Management, commerce and courses of Science streams.
Major projects of durations ranging from 1 to 4 months form part of almost all courses running on campus.

6. **Field Studes**: A number of departments viz. Tourism, Social work, Management, commerce and few courses of Science stream organize field studies for their students. The students submit the report on that study.

Informal feed backs from students revealed that these practices made a profound impact on teaching-learning process on the campus. Although, formal incentives are not provided, the teachers taking active part in such practices are duly recognized and appreciated by the ViceChancellor personally.

Generation of creative aptitude:

The University created a culture of instilling and nurturing creativity and scientific temper among the learners through different clubs like Journal club, science club, cultural and literary club, commerce and management club, sports, writing articles, organizing science exhibitions independently or in collaborations with the governmental and professional agencies. To nurture creativity and scientific temper students are made to participate in the workshops, group discussions, debates, field visits, science

exhibitions etc.,

Feed back from students:

The University has recently introduced feed mechanism from students and alumni on teaching abilities and processes being practiced on the campus. A separate heighlighted i-con is created in the University website for feed back from current and past students.

Placement Cell:

The University Placement cell to look after the placements of students. Efforts are beingmade to develop MoUs with Industrial houses.

Entrepreneure development cell:

The University has recently set up entrepreneureship cell to inculcate entrepreneurial skills among students.

Quality Teaching:

The University is making extra efforts to provide quality teaching to students. The faculty with high distinctions are available. Several teachers were abroad on various fellowships.

Few teachers are fellows of reputed National and International academies.

Every faculty member in every department is provided with net worked computer (UGC-Infonet) to keep abreast with latest developments in the subject.

Impact of innovative approaches in teaching-learning process:

The innotive approaches and best practices followed resulted in:

1. High percentage of students clearing NET examination
2. The placement record is also improved significantly.

Challenges in Teaching – Learning Process:

The major challenge being State Govt.'s apathy towards higher education. Sanctioning of regular faculty positions is currently suspended. The University is making extraordinary efforts to recruit faculty from its own resources.

Any other information regarding innovations and best practices which the University would like to include:

The Jiwaji University is making sincere efforts to set up high standards in academic research and teaching & learning process to make the University one of the top most in India with in 5 yrs period.