

Government Institute of Science, Aurangabad
AQAR 2017-18
Best Practice 1

1. Title of the Practice

Experiential Training and Mentoring for overall development of the students.

2. Goal

The subjects taught in the Institute, viz. Life/Bio-sciences and Earth science (Geology) are highly interdisciplinary in nature. It is necessary to nurture the students in these interdisciplinary areas to broaden the scope of their knowledge and to develop professional approach. First and foremost, the Institute aims to introduce to the students, the knowledge resources available in the Central Library that span across various disciplines and types of resources. In order to make the students understand the interdisciplinary nature of the programmes being taught, the Institute has the objective of organizing visits of the students to the various departments and laboratories in the Institute and encourage the students to interact with faculty of other departments. Moreover, the Institute also aims to provide opportunity for students to take up interdisciplinary research projects. In addition to their classroom and laboratory training in the concerned subjects, the students must be exposed to real world/on-site scenarios to develop integrative approach/strategy and imbibe application oriented approach. Hence, the major goal of the Institute is to encourage experiential training through arranging various activities, viz. summer projects, industrial trainings, independent handling of research projects, self-designed seminars, participation in National and International conferences, field visits, mine training, hospital demonstrations, industry/institute visits, etc. Moreover, considering the need to qualify various competitive examinations for future prospects, it is necessary to take up competitive exam training and skill development initiatives. Further, since all PG programs have laboratory component, the Institute also aims to inculcate analytical, interpretative ability, aptitude, ability to design laboratory experiments and solve problems. Lastly, an important goal of the Institute is to bridge the gaps in practical and numerical skills and orient students for integrative approaches to understand concepts.

3. The Context

The students admitted in the Institute are mostly from economically and educationally under privileged Marathwada region. Although meritorious students seek admission to the programmes offered by the Institute, they are unaware of their own in-built talent and skills. Due to the lack of academic exposure and career prospects, they cannot decide about their career goals and the utility of the subject in which they are trained. Moreover, the students are reluctant in opting the academic career through National/Global level competitive examinations. The Institute has developed extensive pre-admission counseling mechanism to reduce/remove the fear and phobia about higher studies and assist in choice of subject at M.Sc. level. Mere classroom teaching is not effective for the career honing of students. Therefore the Institute has seriously addressed this problem by designing multi-directional approach that caters self-learning, developing interest, using interdisciplinary, integrative and object-oriented strategy in learning; broadening of knowledge grasp; analyzing situations and inculcating problem solving/solution finding attitude.

4. The Practice

- At the beginning of every academic year, a visit to the central library is arranged under the aegis of the IQAC for M.Sc. Part I students. Here, students are exposed to the knowledge resources available in the Central Library, i.e. reference books, text books, collection of rare books and volumes, abstracts, reviews, science magazines, journals and periodicals, etc.
- Students are encouraged to put forth questions on a topic in the class and then find out the answers on their own prior to start of teaching of the topic. The adopted method of cross evaluation of internal exam answer papers by student peers encourage setting up of appropriate high rubric level ultimately conveying students the ideal way of answering papers. This has resulted in students becoming very honest in evaluating themselves. In Department of Geology, post evaluation of internal exams, the answer sheets of good performers are displayed openly in the class and discussed.
- Explaining concepts orally to audience facilitates a deeper understanding of the subject. Knowledge dissemination always catalyzes the knowledge grasp. Keeping this in mind, the Institute motivates the students to design and deliver information/concept-based seminars during their curriculum. Students are given the flexibility to deliver seminars based on topics from within the prescribed syllabus, allied areas of prescribed syllabus, or research papers. The display of synopsis, presentation skeleton, overall organization of the seminar events, evaluative feedback/interactive discussion is completely managed by the students which self-mentors their leadership qualities. Faculty members guide the students for improvisations.
- Students as “Student Mentors” are encouraged to explain concepts or short topics in the class to enhance their own understanding of the particular topic and boost the interest and understanding of other students in the class.
- Faculty members of other departments in the Institute are invited to engage 1-2 lectures on topics of their expertise. This increases collaborative teaching in the Institute and also offers in-depth knowledge to the students on particular topic/s. The students are encouraged to interact with faculty of the various departments in order to gain knowledge from various disciplines/subjects to get better insights of their own subject.
- Students are oriented for developing problem-solving abilities by providing them an opportunity to design the laboratory practical, keeping in mind the various possible outcomes, interpretations and fulfilment of the goal/s.
- The linkage between classroom learning and field-experience is established through regular visits to industries, research institutes, hospitals, mines, field visits, etc. Here, the students explore new dimensions in the practical application of the subject knowledge. Exhaustive interactions on varied queries by the students with field experts stimulate thirst for learning.

- The Institute strongly believes in enrichment of teaching-learning process using research based approach in concerned subjects. As a consequence the students are allotted with mini-research projects as a part of academic curriculum. Students develop research aptitude by familiarizing with research methodology, analytical tools, data analysis, interpretation skills, numerical skills and presentation skills while implementing these projects independently.
- Students are motivated to undertake summer projects/in-plant training in various organizations/industries/research laboratories outside the Institute, to give them first-hand experience of the organizational settings. They get familiarized with latest trends, quality principles, processing techniques, instrumentation, need for documentation and documentation procedures.
- Students are given the opportunity to observe/participate in certain consultancy projects undertaken by faculty members, wherever possible., under close supervision of concerned faculty. For example, M.Sc. Part II students of Geology Department carry out certain tasks assigned by faculty in the ground water analyses under strict supervision. Students of Biophysics Department are demonstrated the procedure of Genetic Purity Testing by Gamma-irradiation which is a part of consultancy work. Spare samples available from the consultancy provided by Department of Botany to Regional Forensic Laboratories (Nasik and Aurangabad) are used to demonstrate techniques of identifying plant samples to the students.
- As an initiative to motivate students and honour them for the performance in final year of PG, the Department of Botany under the aegis of the alumni awards Prin. S. P. Nanir Gold Medal to the M.Sc. Part II Department Topper in the subject of Botany.
- Students are encouraged to participate in sports and cultural activities organized by the Institute and competitions organized by other institutions and agencies such as quiz, essay, debate, poster competitions, etc. for all-round development.
- Students participate enthusiastically in National and International conferences, present research papers/posters, interact with the scientific community and develop contacts that may be useful in their future endeavors. This helps in building up their confidence, will-power and morale.
- Real life/on-site experiences shared by the invited experts, faculties, scientists, entrepreneurs, industry personnel and our alumni with our students culminate in imbining ethical values and personality traits viz. pride towards the Institute, down-to-earth analytical approach, methodologically buffered strategy, descriptive & illustrative approach.
- Exam skill and experience sharing by alumni who have successfully qualified the competitive examinations developed a positive attitude amongst the students. "Walk-the-talk", organized by Biotechnology Department is one such student-centric activity aimed at enhancing the interaction between the current students with the alumni. Students have since then opted enthusiastically to appear in the NET/SET/GATE and other competitive examinations. The faculty members also provide in-house guidance to the students for competitive examination preparations. This has elevated and strengthened the confidence in successful tackling of the examinations.

5. Evidence of Success

- As a result of the devotion and sincere efforts of faculty members towards teaching-learning-research, the Institute attracts meritorious students to take admission in the various PG programmes of the Institute. This is evident from the fact that top ranking students in the PG CET conducted by the affiliating University secured their seats in the Institute in 2017-18.
- Display of internal examination answer sheets of good performers helped students to measure their own deviation from the expected performance.
- Seminars and poster presentations have enriched the qualities within the students, viz. gathering information, designing talk/presentation, preparing the display slides using computers, co-assisting the presentations with animations, simulating examples, boldness, confidence, clarity of thoughts, integrating information and logic of bridging the concepts, communication skills, analyzing the questions raised and giving appropriate answers, effective use of audio-visual devices and white-board. As a result students could confidently present oral and poster papers in conferences and interact with scientific community.
- The knowledge acquired through field exposures, summer projects and research projects could successfully amalgamate the theoretical concepts with practical utility which further assisted them in diagnosing and curing the problems/challenges faced in actual work environment. As a result students had a chance to be in vicinity with National and Global experts in research laboratories/industries from whom they could build their personality and contribute significantly to the growth of their organizations. The coveted positions held by alumni highlight the result of these efforts.
- Moral boosting lectures by alumni/invited experts sharing real life/on-job experiences has thoroughly revolutionized the students' mind with strong will to undertake/handle tough challenging situations. The students visualize and follow these mentors as their Role Models and as a result there is boost in the placement percentage within last couple of years. A total of 39 students received placements in the on-campus and off-campus programs due to efforts of the placement cell.
- The Award of Prin. S. P. Nanir Gold Medal to the Institute Topper in the subject of Botany, resulted in providing inspiration to the students to prepare and perform well in the examinations and the award creates a sense of pride for the awardee. One awardee of Prin. S. P. Nanir Gold Medal published a Reference Book based on the class notes and discussions with the faculty members.
- The in-house coaching for competitive examinations has elevated and strengthened the confidence in successful tackling of the National level competitive examinations. A total of 44 successful attempts were recorded in the National Level competitive exams such as NET, SET, GATE, etc. Seven students received awards for presentations in conferences/symposia. A total of 06 PG students of the Institute were selected for research leading to Doctoral Degree in other renowned Institutions, 01 student was selected as a research fellow and 01 student was selected for M.Phil. Degree in another Institution. A total of 08 research students were awarded Ph.D. Degree from the affiliating University. A total of 01 student of Biophysics Department was selected for Advanced Diploma in Medical Fusion Imaging Technology at Radiation Medicine Center, Tata Memorial Radiation Center,

Mumbai, though National Level Entrance Test. “Walk-the-talk”, organized by Biotechnology Department, for enhancing the interaction between the current students and alumni resulted in students opting enthusiastically to appear in the NET/SET/GATE and other competitive examinations. In-house guidance for competitive examination preparations has elevated and strengthened the confidence in successful tackling of the examinations.

6. Problems Encountered and Resources Required

- The weak academic background and fear within the students poses challenge for the mentoring process. The challenge is further enhanced in case of the economically weaker sections of the students. Personal counseling with little financial assistance at the personal level circumvents these difficulties to certain extent favoring the mentoring process.
- The weak communication abilities consequently leading to shyness within the students was another hurdle in the teaching-learning. The faculty members devoted extra time in building up the communication ability and curb the shyness. The family-like and congenial atmosphere maintained within the Institute further catalyzes the mentoring process.
- Owing to low budgetary provisions, the Institute cannot support economically weaker students for participating in out-station co- and extra-curricular activities. Separate provisions of finances would certainly boost the participation.
- Student-centric activities enlisted in the “Goals” above, if supported with additional financial assistance, can capture momentum and can be extended to needy students from other Institutions as well.
- The students need to be trained in computing skills, especially with regard to latest communication technologies such as on-line meetings, webinars, etc. The institute needs to improve infrastructural facilities for the same.

7. Notes (Optional) Nil

8. Contact Details

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Government Institute of Science, Aurangabad
AQAR 2017-18
Best Practice 2

1. Title of the Practice

Nurturing value-based education, social responsibilities and good citizenry

2. Goal

The students admitted in the Government Institute of Science, Aurangabad come from lower socio-economic and educationally underprivileged Marathwada region. Hence, it is necessary to help students overcome the language barriers, especially communication english. The students must be given enough time to cope up with the English Communication and develop rapport with the faculty members. Moreover, the subjects taught in the Institute, viz. Life/Bio-sciences and Earth science (Geology), being highly interdisciplinary in nature, it is necessary to nurture the students to develop professional approach.

3. The Context

The Institute being a Post Graduate and Research Organization caters the academic needs of the region. In addition to academics, the societal components also expect creation of sensible human resource with high human values and sensitivity towards social climate as well as science-based extension services. In order to bridge the gap between academic training and the societal expectations, the Institute has structured multi-faceted programs that cater socio-sensitivity, environmental awareness and ethical values. In addition, the Institute takes the responsibility to extend the available facilities and expertise to community welfare and nurture scientific temper amongst the community through science popularization programs and initiatives for carving value based education and social awareness amongst the students, facility extension and information dissemination to the community.

4. The Practice

- Students were encouraged to participate in Open Day function on 14th Aug. 2017 and interact with visiting school and college students. They made use of the opportunity to sharpen their own explanation skills without any language “phobia”. This was also seen as an opportunity by the visiting students to learn communication skills from the Institute students.
- The number of value-added courses under “Service Course” provided opportunity to the students to opt for subjects that would help in their own development. Students opted for Archaeology, Personality Development and other technical subjects.

- Special sessions on soft-skills are organized under the “Placement Cell” to boost the student potential and allow them to understand the importance of effective communication in the “Job Scenario”. Additionally, participation of students in seminar presentations, poster presentations and paper presentations and various co- and extra-curricular activities also give necessary impetus for their all-round development.
- The interactive lecture and practical on “International Yog Day” had active participation of the students and it provided necessary catalyst for the elimination of mental and physical stress”.
- Green areas of the Institute campus were preserved through the “50 Crore Mega Tree Plantation Campaign” of the Department of Forestry. One of the aims of this programs was to preserve and protect the large number of bird and animal species while ensuring neat, clean and green environment.
- The Bio-waste composting initiative undertaken with Aurangabad Municipal Corporation and “Swachhata Survey” helped to ignite the sensitivity towards nature and environment protection amongst the students.
- The social responsibility of the students to create and increase awareness about a “Health Conscious Society” was imbibed by organizing Health Camp in the Institute campus in association with Aurangabad Municipal Corporation and Minority Girls’ Hostels.
- In order to develop good citizenry and increase sensitivity of students for the society, environment and cleanliness, a number of Cleanliness Campaigns were organized in and around Aurangabad City and Aurangabad District. Students participated in these activities whole heartedly.
- The Institute provides extension services to the community for routine analysis of water to ensure a healthy community and environment.
- Under the umbrella of the NSS, Institute carries out various environment related activities such as Tree Plantation within and out of the Institute campus, street plays, construction of check dam for water conservation, etc. The Institute has adopted several practices for energy conservation such as use of power saving devices, solar equipment, etc. The Institute organizes guest lectures and poster presentations to stress the important environmental issues and the need to conserve energy, biodiversity and the environment.
- In order to pay tributes to National personalities and inculcate the feeling of National Pride and social responsibility, special day programs are organized.
- The Institute extends some facilities and scientific expertise to community. These facilities include soil analysis, ground water exploration and testing, gamma irradiation and supply of microbial cultures to college teachers, researchers and industry.
- The Institute being scientific avenue, dissemination of scientific information to the masses is practiced through mass communication media (radio talks), newspaper articles and organizing National Science Day programs and contribution of faculties as resource persons.
- The Institute actively participates in launching Voter Awareness Campaign at the time of general elections.

5. Evidence of Success

- Students gained the confidence of showcasing their own knowledge gained in the Institute. They could effectively explain the salient features of the Institute and PG Programs to the visiting students. The response of the visiting students indicated their interest in taking admissions to this Institute in the future.
- Students got necessary motivation from the value-added courses such as Personality-development, Archaeology, Nanotechnology, Plant Tissue Culture, etc. They also performed well in the examinations since the selection of subjects was as per their choice.
- Programs under “Placement Cell” yielded success in terms of both, learning effective communication as well as a good number of on- and off-campus placements.
- The overall environmental awareness and a strong ecofriendly attitude were imbibed amongst the students. Students could learn composting method, solid waste disposal, and conservation practices for keeping the environment clean and green. The campus was made “Greener” and promised of increased biodiversity due to initiatives of the students. Sensitivity of students towards pollution-free and clean-city increased and they whole heartedly participated in “Clean City” initiatives.
- The Health Camp served to spread the word of Health Security and a number of students and local residents derived benefit from the awareness camp.
- The students successfully spread the messages of “Preventing Female Foeticide”, “Preventing Drug Addiction”, “Energy and Power Conservation”, “Voters awareness campaign”, “Gender equality, support and respect for women”, “National pride, social rights and responsibility”. etc. The community was benefitted through the extension services such as awareness programs,
- Paying tributes to National personalities inculcated the feeling of National Pride and social responsibility.
- The research papers published and presented in scientific congregations have provided additional information content in terms of environmental remediation. Students were equipped with the tools and techniques to develop sustainable and eco-friendly processes and products.

- Tree plantation, check dam construction and CCT activities in the adopted village, Georai Kuber created awareness about soil and water conservation and resulted in increase in the water table in the village.
- The Institute successfully conveyed the importance of avoiding pesticides, use of organic manure and rain water harvesting to the villagers under village adoption program.
- The Institute has profoundly contributed in popularization of science through various activities and expert lectures benefitting the schools, colleges and general public.

6. Problems Encountered and Resources Required

- The students and faculty members being engaged full-time in lectures, practical, projects, mentoring for research, and a number of Government assigned duties, the major limitation to the implementation of these extra-curricular activities is time availability.
- Lack of financial aid for village adoption and other community services was another major obstacle in implementation of these programs.

7. Notes (Optional)

Nil

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