7.2.1 Best Practices – Social Relevant Research

Title- Research for Societal Benefits

Objectives of the Practice (Objectives/intended outcomes, underlying principles or concepts of practice- 100 words) - In tune with the philosophy of the Revered Founder Chancellor- *Knowledge that is not translated into skills that are used for helping the society is useless*; from the very inception of the institute, research is always aligned with the apex objective of it being beneficial to the society. Research topics are chosen with great diligence leading to translational or directed basic research. Hence the institute constantly endevours to develop a strong base for research which, to a great extent, is relevant to local needs and simultaneously explores avenues of basic work crucial to our national development.

Context (Contextual features or challenging issues in designing and implementing this practice- 150 words)- In the context of thrust on 'Make in India' by the Government of India, and the research becoming interdisciplinary in nature, there has been a need to undertake research to find solutions indigenously and with an interdisciplinary approach. There is also a growing need to integrated values in work and personal life. Sri Sathya Sai Institute of Higher Learning (Deemed-to-be-University) associated with the following contextual features was taken up the issues that are of immediate relevance to the society.

- Revered Founder Chancellor's philosophy of practicing Values in Daily life
- Rural set up
- Drought prone area of Rayalseema
- Local issues of ill health and malnutrition and excess fluoride in water
- Close association with two super specialty and general hospitals providing vast opportunity for research in addressing the issues faced in the hospitals in a cost effective way.
- Anantapur District where the institute is located is one with abundance of solar power with lot of potential of harnessing it effectively.

Hence the thrust areas of research have been Health, Energy and Environment at SSSIHL for sciences and Man Management & Ethics in Management for department of Management and Commerce.

Practice (Describe the practice, uniqueness in the context of Indian Higher Education, Constraints/Limitations- 400 words)-

Uniqueness of research at SSSIHL has the following points:

- Socially relevant
- Integrating human values, ethics capital in work and personal life
- Addressing local issues
- Cost effective health diagnostics
- Waste to wealth
- Harnessing abundant solar energy available in the region

- **Sciences**- The research activities of faculty and students at SSSIHL envision exploration and promotion of socially relevant, rural-friendly, translational research encompassing three domains - **Health, Environment and Energy**. In the area of **Health**, the focus has been on Understanding disease states, detection and healing of disease states and their remedy, Medical imaging, study of functional materials for health applications, alleviating macronutrient malnutrition, micronutrient malnutrition and chronic lifestyle diseases. In the area of **Environment**, research is being pursued in Water quality monitoring, water purification and integrated watershed management. In the area of **Energy**, research is being undertaken in Microbial fuel cells, Thermo-electric materials, Perovskite solar cells, Super capacitors, Piezo-electric materials for energy harvesting and Green building technologies.
- **Management**- Focus on research on the importance of human values and ethical capital in business. There is also promotion on building case studies with local relevance. The work done includes theoretical and empirical studies on Values-centred Leadership, Corporate Governance and the Impact of Ethical values on Economic development. A doctoral research at the institute strives to accomplish a holistic understanding of leadership for social entrepreneurship. Areas that help in social upliftment, work on sustainability and financial inclusion have been in continuous focus. The research in these aspects include work that has been done on the Green Practices in Supply chain Management, financial microfinance in India and inclusive business practices.

- **Economics**- In the broad area of Macroeconomic Policy Modelling research topics where work is being done are modelling India's external sector, Public debt management and modelling India's Food inflation. Under Financial Econometrics, work is being undertaken in Financial Economics with an emphasis on Analysis and Modelling of Capital Markets and Economic Growth in Emerging Economies. In Development Economics the emphasis has been on analyzing the growth of various sectors of the economy such as agriculture, industry, services and trade, in promoting economic development.
- **Education**- Research focus is on Values development through different pedagogies in school education
- **Central Research Instrument Facility (CRIF)**- It was strongly felt that the research work can be accelerated, if basic infrastructure facilities are strengthened by providing state-of-the-art facilities under one roof. This has resulted in setting up of CRIF which provides the latest and advanced characterization/analytical tools to carry out translational research in physical, biological, chemical, materials science, food and also computational and interdisciplinary areas.

Constraints/Limitations- Teaching faculty and to some extent research scholars are custodians of the unique Sathya Sai system of integral education which moulds the students into human beings of good character who are self-reliant, contented and enterprising heroes of action and self-sacrifice for the purpose of serving humanity.
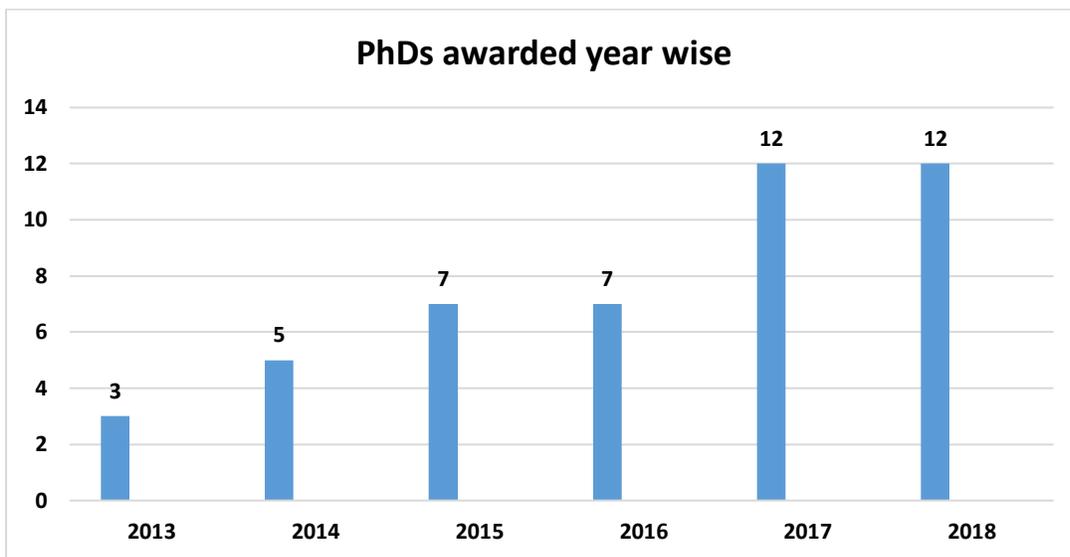
Our faculty members across various departments are actively involved in pursuing high quality research besides their regular testing assignments in various areas by their interest, keeping societal needs in view. The quality of research investigations/findings is reflected on their publications in scientific journals of high impact. This attracts more and more talented students for pursuing their Ph.Ds. For instance, for our Institute of this magnitude, we have 120 researchers pursuing their Ph.Ds in cutting edge areas of Scientific and Technology.

Evidence of Success (Performance against targets and benchmarks, review results, what do the results indicate-200 words)
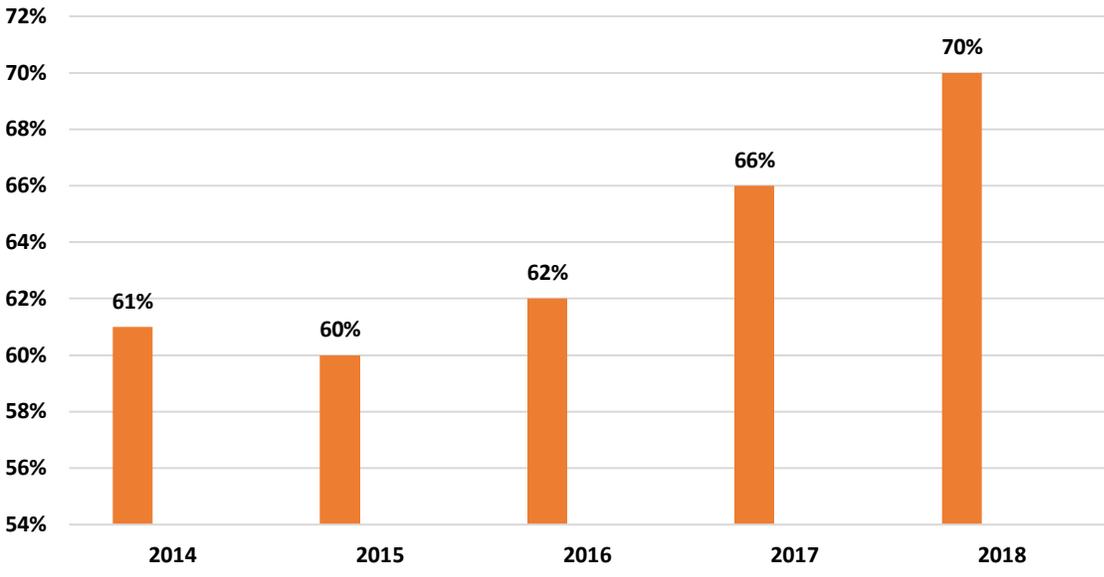
Research projects

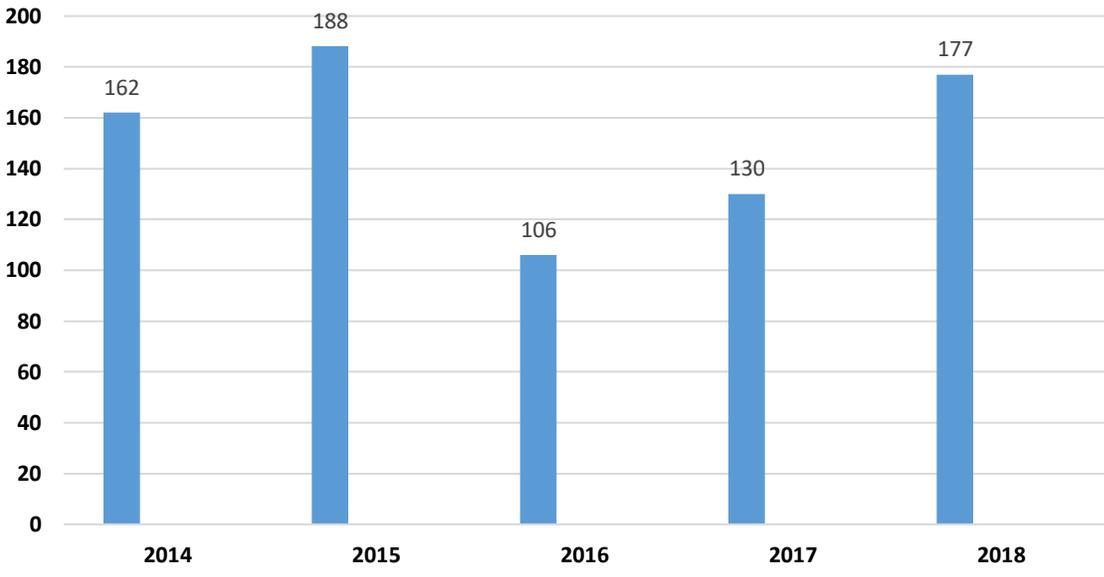Highlights of breakthroughs achieved:

- Institute has two patents awarded and many are filed in the last five years
- Development of Small organ imaging gamma camera system
- Development of multi modal microscope
- Defluoridation of water by polymer metal ion nano composites
- Knee replacements using Chrondocyte cell culture
- Researchers developed an implementable model to enfranchise communities by means of inclusion in their firm's value chains for higher and stable income for the poor.
- Spirit at work (S@W) drew insights from Karma Yoga principles, an Indian psycho-philosophical equivalent of S@W. Unlike other studies, this study indicates that organizational culture and philosophy too have an explicit role to play in integration of S@W through 'Engagement at workplace' and 'Trans organizational work orientation'
- Tropical microgreens- A viable answer to malnutrition in Rural India
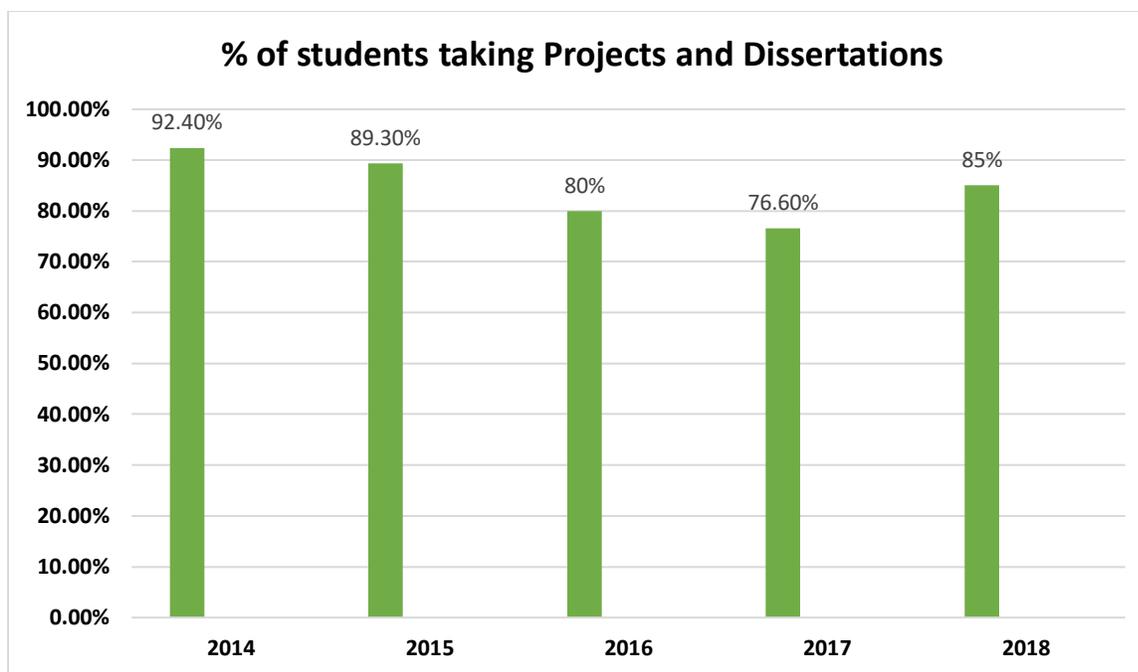
PhDs awarded year wise

Year	PhDs awarded
2013	3
2014	5
2015	7
2016	7
2017	12
2018	12

% Teaching Faculty with PhDs

Year	%
2014	61%
2015	60%
2016	62%
2017	66%
2018	70%

Visiting Faculty who contribute with their Research Inputs

Year	Count
2014	162
2015	188
2016	106
2017	130
2018	177

% of students taking Projects and Dissertations

Year	Percentage
2014	92.40%
2015	89.30%
2016	80%
2017	76.60%
2018	85%

To enhance the research output of the university**, MoUs** have been signed with organizations viz. Tata trust, Food and Drug Administration (FDA) USA, Herald Logic (Pvt.) Ltd., OMiX Technologies, Twastrix, MAESTRO Inc., Labby Inc. USA, Madras Diabetic Research Foundation etc.

Problems Encountered Resources Required (150 words)- Though the research work in different disciplines/areas that is being carried out has been satisfactory, it was unanimously felt by the scientific community at SSSIHL that the research work can be accelerated, if the existing basic infrastructure facilities are strengthened by providing state-of-the-art infrastructural facilities under one roof. To address this issue, the SSSIHL Central Research Instruments Facility (CRIF) was created. CRIF is customized to provide latest and advanced characterization/analytical tools to carry out translational research in various areas of Science and Technology. Full time technical assistants with specific expertise operate and maintain the instruments. This enables researchers to keep pace with the developments taking place globally and to publish their research findings in peer reviewed high impact journals; and contribute to the society at large.

Notes (Optional-150 words)

<u>Any other information regarding Institutional Values and Best Practices which the university would like to include</u>- The enhance the research culture at campus, the institute has envisaged the introduction of Final year dissertations at Under graduate level. This has already been implemented in the department of Physics with sound results. It is being implemented at the other departments also. This helps the students to take up a problem which needs a research focus. As the institute has a provision of B.Sc.(Hons.) and integrated M.Sc., subject to a minimum CGPA, the students can crystallize and understand the problem well in advance and can take it up later as a research topic to have more insights into the problems of his/her interest.

7.2.1. Best Parctices - TQF

Title- Teaching Quality Feedback (TQF)

Objectives of the Practice- According to the Revered Founder Chancellor Bhagawan Sri Sathya Sai Baba, a teacher should be an '*acharya*' who teaches students by his *acharana-*conduct (practice). Teachers should not only have knowledge of the subject but the skills to impart the same to the students. He/she should have the spirit of being a student for life to never stop learning and kindle the same spirit in the students. Objective feedback from the 'taught' about the teaching process goes a long way in providing the necessary inputs to the teacher to assess his/her teaching vis-à-vis the benchmarks of an ideal teacher and bring about the necessary improvements.

Context- The rigour of the present day workplace like corporates, research institutions, entrepreneurship etc., requires the students to be thorough in their basics, also acquire additional knowledge in their specific fields of study and also be innovative in their approach. Due to this, the teaching process is witnessing a paradigm shift from the traditional chalk and talk method to the interactive and participative type of teaching enhanced by the modern teaching aids available to the teachers. In this context, to undertake effective teaching, the feedback from students about the teaching process becomes very important. For the feedback to be effective, following points had to be addressed:

- Has to be confidential so that students can give candid and constructive inputs about the teaching process.
- The questionnaire should be designed in such a way that it captures information about all the aspects of teaching learning process.
- The analysis of the feedback to be presented to the faculty in a way so that they can take steps to improve/modify (if required) their teaching process

Practice-

A committee was constituted to do an in-depth review of the teaching learning process and it arrived at the six broad dimensions of **Core Teaching, Pedagogy, Class Interaction, Conduct of CIE, Student Centric Teaching, Discipline & Values** and 3 to 4 questions in each dimension. A Likert scale of Strongly Disagree- Strongly Agree was

employed for scaling the responses of the students. Different set of questionnaires were designed for Theory, Experiment based Practicals and Software Lab. The questionnaires are coded in PHP and administered through a specially dedicated server. The feedback sessions in the respective computer labs of the campuses were kept completely anonymous to elicit candid responses from the students.

Feedback is recorded at the end of every semester from the students about the teaching process of the semester. The responses received are automatically compiled through a computer programme and are made available to the faculty and the HoDs at the beginning of the next semester. The HoDs receive the feedback of the faculty members of the whole department and they counsel/advise wherever necessary after going through the reports of the individual faculty. Following are the set of questions for a theory subject:

CONFIDENTIAL FEEDBACK ON TEACHING QUALITY

The purpose of this feedback/assessment is to help improve the overall quality of teaching.

❧ *Kindly respond to the following questions **in relation to the quality of teaching of this course**.*

❧ *Your **honest opinion** is solicited and your feedback will **not** have any influence on your grade.*

Indicate the response to the following questions on a scale of 1 to 6 where **1 is Strongly Disagree and 6 is Strongly Agree.**

CORE TEACHING

1   The course was covered effectively in an organized manner (includes uniform spacing of course lectures and assignments).

2   Lectures were communicated effectively (i.e. clarity of expression, reinforcement of key ideas).

3   Passion in teaching the subject was evident.

PEDAGOGY

4   Appropriate teaching aids (includes blackboard/slides/videos/demos), when necessary, were used effectively.

5   A variety of questioning techniques were employed to enhance learning.

6   A broad perspective of the subject was given to stimulate learning.

CLASS INTERACTION

7   Class participation/discussion was encouraged.

8   Accessibility for clarifying doubts/queries (inside and outside the class) was adequate.

9   Doubts/queries on the subject were answered convincingly.

CONDUCT OF CIE

10   Syllabus was taught comprehensively.

11   Learning was enhanced by the effective use of assignments and tests.

12   Grading of assignments/answer scripts was impartial.

13   Students were given timely feedback on their performance.

STUDENT-CENTRIC TEACHING

14   Classes kept the students interested and focused.

15   Students' point of view in class discussions was considered.

16   Openness to accept errors & omissions was shown.

DISCIPLINE AND VALUES

17   Discipline was maintained in class.

18   Values and the teachings of Bhagawan were seamlessly integrated into the teaching process.

OVERALL RATING

19   How would you rate the overall quality of teaching?

Teaching Quality Feedback

Questionnaire for Experiment based Practicals:

P1: Effective theoretical guidance related to practicals was given.

P2: Planning and execution of practicals were explained.

P3: Appropriate methodology to carry out the practicals was explained.

P4: Practicals were supervised effectively.

P5: Doubts and questions raised during the practicals were clarified effectively.

P6: Helpful comments/suggestions were given on lab records for improvement.

P7: Time given for practicals was adequate.

P8: Equipment for practicals were in working condition.

P9: Prescribed minimum number of practicals were completed and performed.

P10: Evaluation of practicals was fair and impartial.

P11: Any other suggestions and improvements. (Descriptive question with word limit of 50 words)

Teaching Quality Feedback

Questionnaire for Software Laboratory:

P1: Effective theoretical foundation related to programming exercises was given.

P2: Planning and execution of programming or mini-project related exercises were explained.

P3: Appropriate methodology to implement the software solution was explained.

P4: Software lab sessions were supervised effectively.

P5: Doubts and questions raised during the programming sessions were clarified effectively.

P6: Assignments were corrected on time.

P7: Constructive comments/suggestions were given on assignment/ lab exercises.

P8: Time given for exercises/assignments was adequate.

P9: Computing equipment were in working condition and of capability needed to perform the tasks.

P10: Any other suggestions and improvements. (Descriptive question with word limit of 50 words)

Evidence of Success- The feedback of students helps the teachers to ascertain the areas where improvement is needed (if any). This helps them in planning for the classes in a better way for the subsequent semester. The HoDs study the feedback reports of the individual faculty and use it as an effective tool to allocate subjects to the teachers in the subsequent semesters. The subjects where the feedback from the students is poor, the HoDs initiate corrective action. They also identify the strong areas of a faculty based on the feedback and give them subjects in those areas while deciding the workload in the following semesters. The feedback is also taken into consideration as one of the components in selecting the best teacher for Sai Krishna Best Teacher award from each campus once in two years. Radar chart of winter semester 2017-18-theory for the Undergraduate, Postgraduate and Professional Programmes are attached for reference.

Winter Semester 2017-18- PG

Winter Semester 2017-18- Professional

Winter Semester 2017-18- UG
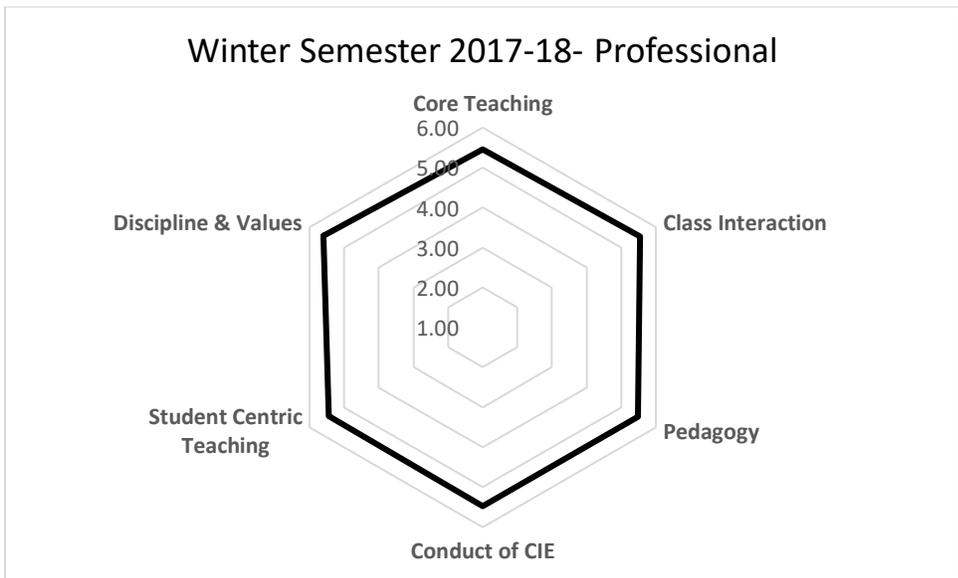
Problems Encountered and Resources Required- Few issues were encountered regarding administering the feedback to the whole student community at the end of the semester through the campus intranet. This was initially addressed by dedicating the net connectivity only to the computer labs during feedback time. After the installation of dedicated lease lines from the individual campuses to the main campus this problem also has been effectively addressed.

Notes (Optional)