Achieving Excellence in Teaching – Learning Through Innovative Practices - A Case Study of Rajarambapu Institute of Technology, Rajaramnagar

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Abstract

Technical Education system in India is heading for a sea change. The biggest challenge for the technical institutions is to adopt the change and design, deliver academic program to prepare the students for employment at the global level. In this paper attempt is made to present the best practices at Rajarambapu Institute of Technology, Rajaramnagar which has helped to get accreditation by National Board of Accreditation (NBA) New Delhi, Selection as a network institute under TEQIP, a world bank funded project of MHRD, Govt. of India and also achieved a status of preferred institute to study and work with.

Preamble

Teaching-learning process is a critical success factor for any educational programme and technical education system is not an exception to this. The positioning of the educational institute is determined by the capability of the institutional programmes to prepare quality engineering graduates acceptable for employment and also to attract the students of high merit and attract the competent faculty. Teaching learning thus is a heart of technical education and it is the process which transform the students in to employable graduates with competencies and skills to practice their engineering profession in a most efficient and effective way. In this paper attempt is being made to present the selected best practices to achieve success in terms of getting its programmes accredited by National Board of Accreditation (NBA), Selection as a Network institute under Technical Education Quality Improvement Project (TEQIP) recognition at National and International level for excellence in practicing Quality Circles and earned the distinction of providing a quality technical education in the Maharashtra.

Best Practices at R.I.T.

The success of any educational institute depends on many factors which include – the management and administrative infrastructure and laboratories, faculty and staff, training and placement services, interaction with industries, networking with other institutions of higher learning and research, and many more. RIT since its inception has a very clear vision and focused on the three important aspects i.e. teaching – learning process, faculty and staff development and innovative practices for enhancement of educational quality. The RIT model for achieving excellence is represented in Fig. (1)

1. Faculty And Staff Development

Faculty and Staff is believed to be the back bone of the technical education and it is the

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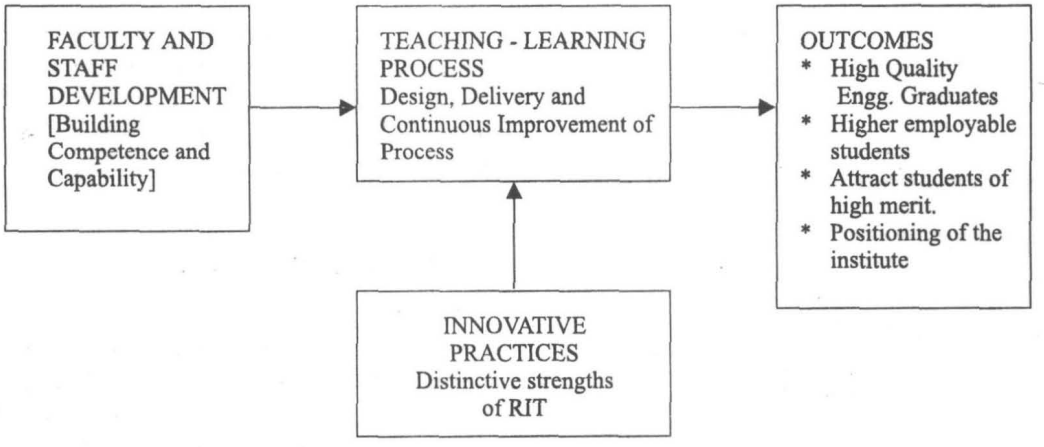


Fig. (1) : Model of RIT Best Practices

critical success factor in delivering the quality education to the aspirants to meet the expectations of employers. Unfortunately, in the majority of the self financed private institutions, there is an acute shortage of faculty both in terms of number and competency expected and specially it is more prevalent in institutions which are situated in the remote rural settings. Though the managements are trying to attract the talent and retain them with limited success.

For teaching – learning process to be effective, it is essential to have a right mix of faculty and it is this right mix which ensures and contributes to the success of the educational programme. The right mix here refers to both the quality; number and cadre of the faculty. Right mix is represented in table 1 Blessed are the institutions which posses the right mix. But in majority of the situations, the institutions are

Table No. 1 Right Faculty Mix

1. Number of Faculty	[Staff Student Ratio]
2. Faculty Cadre	[Ratio of P : AP : L]
3. Faculty competency and capabilities	[In specialized areas proficiency]
4. Right Attitude	[Flair for teaching and research]

Facing a lot of challenges in attracting and retaining the right mix specially those situated in rural settings

1.1 Major Challenges:

1. Failure to attract faculty (even at entry level) with the competency and attitude towards teaching.
2. Limited choice in selection of faculty.
3. Retaining and motivating the existing faculty.
4. Attraction towards cities.
5. Less reserve mobility to rural areas.

6. Financial constraints.
7. Provision of academic and social environment for faculty.
8. Scarcity of specific skills in the market itself for specific engineering disciplines.
9. Managing the faculty with alternative career option.
10. Asking for faculty loyalty, commitment for longer period of time (Senior faculty with a long standing experience)

1.2 Faculty Development Strategy:

Rajarambapu Institute of Technology, since inception is aware of the potential challenges in attracting retaining and developing faculty and developed faculty development strategy based on the realistic assumptions, taking into consideration the challenges. RIT developed its own model for faculty development which is working well in the present context.

1.3 The Faculty Development Policy of RIT:

Recruit the faculty (who fulfill the minimum requirements of AICTE) at entry level and build capabilities and competence in them to perform their job effectively and prepare them to take up responsible positions in the future. RIT believes in institutional development enroute industrial development.

This policy has worked well for the institution and majority of the key positions in the organizations are occupied by faculty who have joined as a lecturers to start their career. RIT Staff Development Model addresses the development at three levels.

Level 1 : The beginners

The faculty who are new entrants to technical teaching, having 1-5 years teaching or professional experience constitute this level.

Faculty development at this level is very much focused in terms of orienting them to technical teaching, building confidence to face students, class room effectiveness and also making them aware of the institutional culture and developing a sense of belongingness to the institution and preparing them for teaching as a career option.

Level 2 : Faculty with 5-10 years experience

This category forms the core implementation team of the institute. The faculty development at this level include need based training in identified areas of their specialization, exposure through participation in national / international seminars and conferences, initiations towards research and publications, upgradation of qualifications.

Level 3 : The Institutional leaders

This level senior faculty, Professors, Head of the Department and Deans, Different Cell Co-ordinators.

This development strategy at this level is to provide an excellent opportunities in terms of developing and enhancing their technical and managerial skills. The focus here is to equip the faculty with all the requisite facilities to perform and contribute to the institutional development. The focus of development here is – exposure to the new frontiers of technology, opportunities to organize national conferences, workshops, promotion of research and consultancy activities, encouraging to innovative practices in institutional building.

This three pronged faculty development has helped RIT to enhance its teaching learning process and improve it on continual basis. The model is represented in fig. (2)

2. Innovative Practices at RIT

2.1 Quality Circles

We at RIT believe strongly in team work and participatory concept. Hence we have

implemented concept of Q.C. for all the faculty members. It is a small group activity where in 8-10 people of same work area (i.e. department) come together once in a week to identify problems, collect data, analyze, using problem solving techniques, find solution and implement it for work related problems.

It has been implemented at department level with an organization structure. Principal is coordinator of Q.C. programmes with HOD's of each dept as facilitators for their group. Department faculty members are team members. Our Circles have participated at national & International level and won awards (Ref. Table – I.0 for details of Number of Circles, Problems undertaken and awards won) There are lot of tangible and intangible gains to the Institute through participation in Q.C. To mentions a few –

1. Circle members come together and discuss and identify their own work related problems and find solution & implement it too. This process has led to good interpersonal skills and communication skill.

2. This being a continuous activity there is involvement of faculty members which has generated sense of belongingness to RIT.

3. Many creative models, Teaching Techniques, Learning resources etc. have been developed through circles.

4. It has led to attitudinal change and HRD leading to knowledge enhancement and sense of pride and recognition, amongst faculty members .

2.2 5-S workplace management technique for Non-Teaching, Office, Library and Workshop staff.

5-S is a Japanese technique for work place management. 5-S is namely

1-S - Sorting

2-S - Systematic arrangement

3-S - Cleaning

4-S - Standardization

5-S - Self Discipline

All the non-teaching staff is divided in to zones and groups are formed with 5-10 people. Each group gives name to its zone and elected a leader and deputy leader. Each group carries out work-place management as per each S and makes presentation after 5-S is completed ,in front of management.

Outcomes

1) People learn to work as team & participatory, sharing culture has developed.

2) Groups thinks about improvement in work place and learns systematic way of doing work. Proper work place and self discipline has brought enjoyment in day to day work.

3) Management presentation gives them recognition and sense of achievement.

TABLE 1.0 Present status of QC & Achievements

Number of Circles: - 11

Membership in Circles:- 108

Participation Rate:- 80%

Number of Themes:- 11

Problems Undertaken

Department	Name of Circle	Name of the Theme
Automobile	Assure	Laboratory Development
Civil	Glory-2	Training to Non technical staff in civil engg. Laboratories.
Computer & IT	Smart Petals	Improvement of Technical Knowledge & appitude of students.
Computer & IT	The Legends	Software for Developmental Information System
Electrical	Brain	Energy Auditing
Electronics	Kalpana	Communication skill Improvement
Electronics	E-Solution	Lab Development
General Engg.	Pragati	To improve result of first year Engg. Students
Mechanical Engg.	Creative Group	Lab Development
Automobile	Assure	Laboratory Development
Automobile	Bullet	To convert study type experiment into Practical
Civil	Glory-4	Awaremess of Computers to teaching & Non teaching staff.
Computer & IT	Global Fighters	Software for Result Analysis.
Computer & IT	The Legends	Software for Departmental Information System
Electrical	Brain	Personality Development of Electrical engg. Students
Electronics	Resonance	Software Training
General Engg.	Catalyst	Improper study Habits Among First year Engineering students.
Mechanical Engg.	Solution	Lab Development. To convert study type experiment into Practical.
	Student Section	Student coordination
	Bloom	Identification & Development of scope for consultancy & testing.
	Chillers	Drinking water facility to Mechanical student.

Special Achievements of Quality Circles

Sr. No.	Name of The Circle	Department	Presentation	Award
1.	The Legend	Computer & IT	"National Convention for Quality Circles" at Mumbai NCQC-04.	Excellent Circle Award
2.	The Legend	Computer & IT	"International Convention - ICQCC-05", Chawgong, Korea	Appreciated. The Only presentation from education field at the International convention.
3.	Glory 2	Civil	"National Convention for Quality Circles" NCQC-05, Ernakulum, Kerala	Meritorious Circle Award.
4.	Glory 2	Civil	CCQC - 05 Bhosari, Pune	Excellent Circle Award.
5.	Global Fighters	Computer & IT	CCQC - 05, Bhosari, Pune	Meritorious Circle Award.
6.	Assure	Automobile	CCQC- 06, Bhosari, Pune	Bajaj Rolling Trophy Second Prize.
7.	Assure	Automobile	NCQC - Dec. 06, Kanpur	Par Excellence Award

2.3 Industry-Academy Interaction:

Talent pipeline project signed with Bharat Forge Ltd. Pune. This includes

- Short listing students through aptitude test, group discussions and personal interview.
- Student select the desired skill set (as developed and prescribed by Bharat Forge Ltd.) for e.g. CNC / (CAD / CAM) / PLC / Industrial Electronics / Project Management
- The training of students for desired skill set with three test planned along with 20 days inplant training.
- Final selection of students based on performance in test and personal interview.
- Stipend planned during inplant training.
- Interaction extended to association for annual technical paper presentation, competition at national level for students with key note speakers, judges etc from Bharat forge .
- Faculty visits/training to Bharat Forge Ltd. Pune.

Outcomes

- Exposure to faculty regarding latest

development and technological advancements.

- Students get an insight into processes, management skills, quality practices in industries i.e. orientation to Industry culture.
- Institute gets to understand requirements of industry and can modify curriculum accordingly.
- Will help in design of curriculum.

2.4 Strategic Business Planning done for RIT with the help of consultants from New Delhi.

1) We have carried out strategic planning for the Institute for three years after carrying out detailed study of SWOT analysis for RIT.

2) Key areas for focused development have been identified under four heads namely

- Learning & Growth - Faculty development, use of I.T. to get competitive advantage
- Processes – Internal
- Customers – Stake holders
- Organization growth – through growth in ability and resources of the Institute.

3) Under each head, key result area (KRA) have been assigned with target fixed for each year namely – 2006-07, 07-08, 08-09.

4) KRA has been assigned to HOD's, Vice-Principal and Principal as per interest indicated.

5) Each month, the performance of the faculty based on the KRA is filled in the designed software matrix, scores, weightages are assigned to each KRA and based on performance incentives are given.

Outcomes

- Strategic planning decides the direction of growth and development of Institute.
- Has given focused approach with proper division of work and clearly defined objectives and targets.
- Performance is measured and appreciated
- Leadership roles properly defined.
- Department performance index is defined for each department and is framed to evaluate the department performance.

Refer fig. 3.0 for strategic planning Map for RIT

We have discussed some of the significant innovative activities undertaken at RIT which has helped in Institution building.

3.0 Teaching Learning Process

The focus of the whole exercise is obiviously elevating the student's competencies which make them employable in the ever-changing industrial world. In addition to staff development and innovative practices, two more points are to be considered

a) Students development in other areas than core academics

b) Effectiveness of teaching learning process

3.1 Students development

At entry level institute has no choice to about quality of students to be admitted due to centralized admission process. It is highly heterogeneous mixture of slow and fast learner students. For developing teaching learning process as well as the strategies for student development model, average students are focused.

3.1.1 Students training

Training programs are offered to improve soft skills of the students like presentation skill, communication skill, group discussion, technical and analytical ability. Cutting edge technology programs are offered like CAD /CAM/ CAE, Projects Management Software, Structural analysis and design software, etc. are also offered.

3.1.2 Students counseling

Special regular counseling for "at risk students" through workshops are organized with external professional counselor

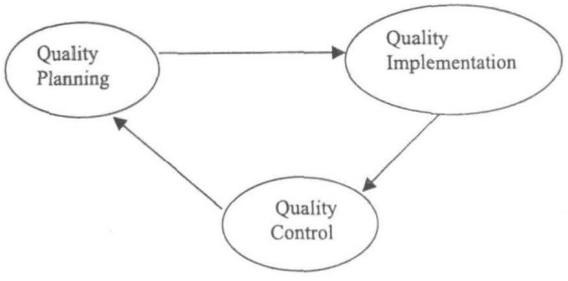
3.1.3 Effectiveness of teaching learning process

RIT has focused on teaching learning process considering the lack of coherence of teaching and learning which has been a common experience. This demands all efforts to be taken on faculty development aimed at effective learning. The efforts of RIT in this regards could be put in the form of the famous Juran's Model with three components

a) Process design (characterized by Quality Planning)

b) Delivery (characterized by Quality implementation)

c) Evaluation of process (characterized by Quality control)



Teaching Learning Process : Process Cycle

Process Design

The features of process design would throw light on the quality planning

1. Planning for preparation: - The subject syllabus is divided into no. of lectures available for the semester. Each lecture is planned properly with teaching aids and handouts.
2. Syllabus completion.
3. Attendance of students.
4. Other support services such as preparation for GATE, competitive examinations, personality development, technical /analytical skills training.
5. Faculty development and training:- Pedagogy, video recording and self evaluation by teachers for improvement with mentoring from senior faculty.
6. Al l activities are monitored by monitoring cell at institute level.

Delivery

The conduct of lectures and lab practical are monitored daily and report is generated at the end of every month to review classroom teaching process, percentage of syllabus completion, student attendance. Action will be proposed for deviation. Online report is generated which is also accessible to students. The student progress is communicated to parents every month.

Evaluation of Process

Evaluation of process is done in two parts

1. Students Evaluation
2. Faculty Evaluation

1. Students Evaluation:-

Formative assessment scheme is implemented to evaluate students performance,

monthly test conducted, assesed and discussed in the class. Quizzes, assignment and oral feedback is taken regularly in the class.

2. Faculty Evaluation:-

Staff appraisal is done annually by higher authority. Faculty evaluation is done by students in the semester. Video shooting is done during lecturing and same will be analyzed by expertise and communicated to concerned staff.

Conclusion

Institutional development has become the survival strategy because of the growth of technical institutions and fierce competition amongst institutions to attract both talented students and faculty members. Quality of teaching – learning process becomes a USP to achieve this. Faculty development, innovative practices and student development become important to contribute to the improvement of quality of teaching – learning process along with other inputs. RIT has developed its own model for achieving the success in institutional development in terms of faculty development, innovative practices and student development to improve teaching – learning process.

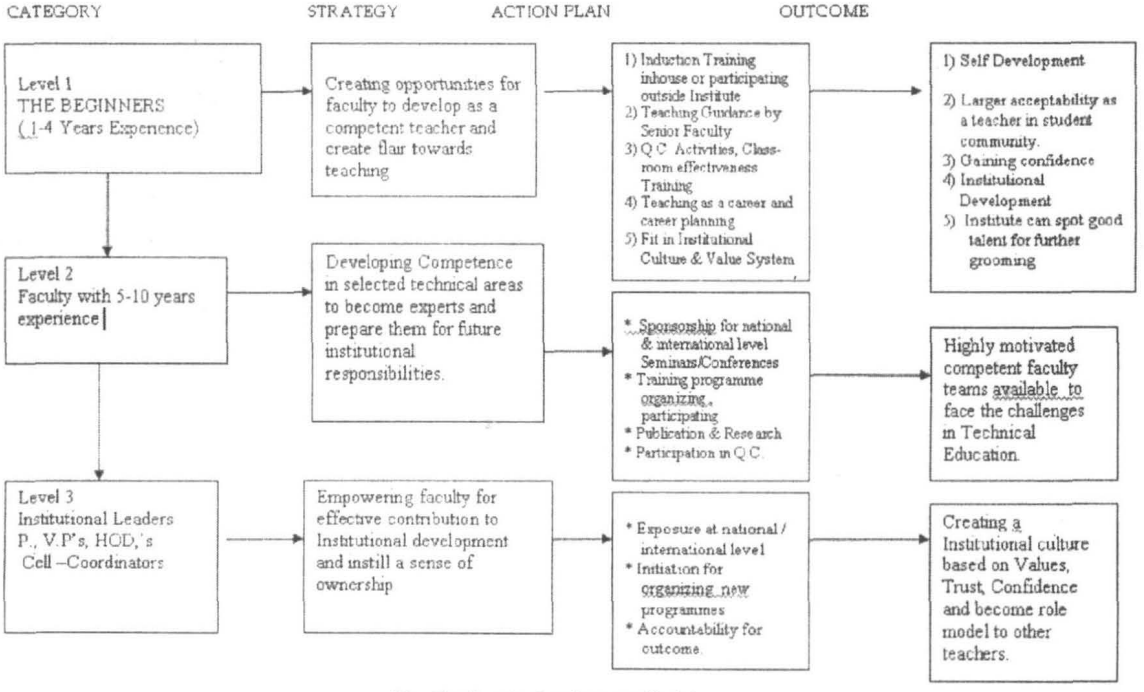


Fig. (2) : Faculty Development Model

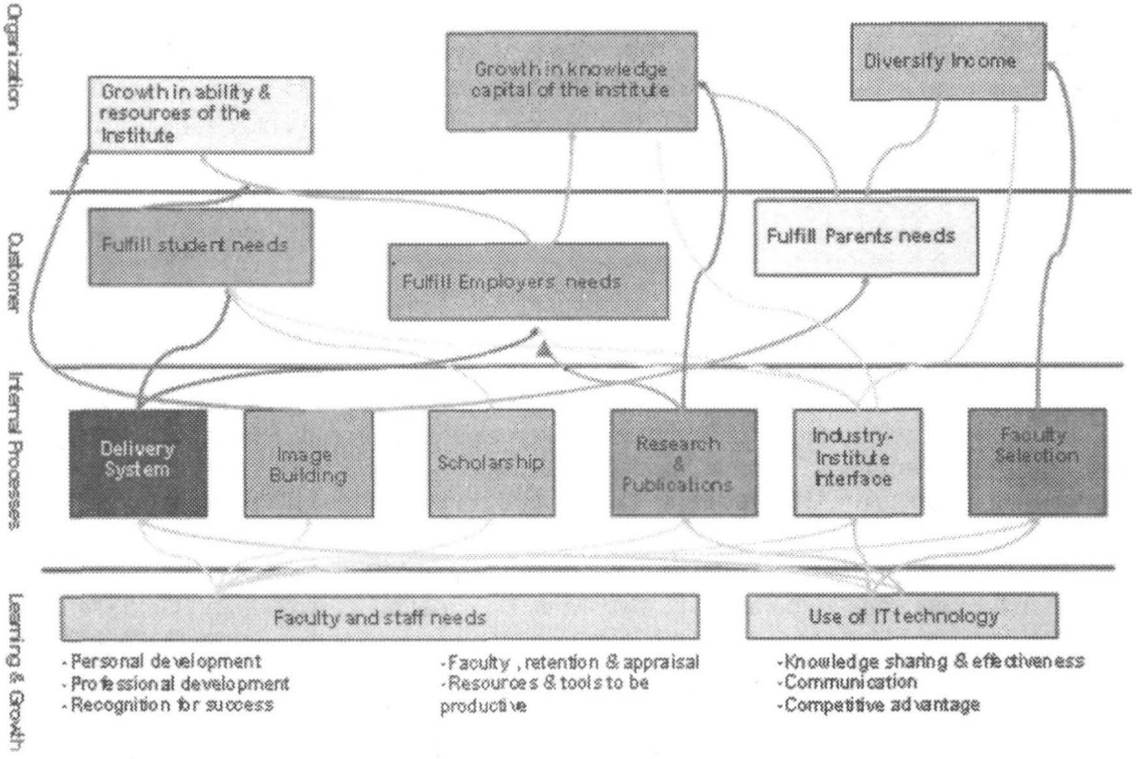


Fig.3.0 – Strategic Planning Map for RIT .