### Abstract

Teaching methods adopted with the objective to reach the students and making them spread their outreach to larger span and perimeters of knowledge level is always a successful method. Time proven and experimented methods ensure time bound results to any institution/college but unless innovativeness is included the students will not be motivated to aspire higher levels in their technical intellect to reach anchoring heights in their life. With this thought the team of Dr. B.R.Ambedkar Institute of Technology (BRAIT) did the SWOT (Strength, Weakness, Opportunity and Threats) analysis in 1996 (then known Dr. B.R.Ambedkar Govt. Polytechnic) and thought of structuring its teaching process under ISO (International Organisation for standardisation) standards. Probably ours was the first institute in Government system to go for ISO. With all support under the umbrella of Andaman & Nicobar Administration it acquired the ISO standards and then continuously improved it by adding more innovative practices, with better interaction and designing a system based teaching process, to inculcate the skill in students which will help them to apply the acquired Technical knowledge in their course of study. The institute also adopted its Environment Management System to bring about an environmental friendly culture amongst the staff and students. A Case Study was conducted by surveying the final year students with a tool Questionnaire AAGRAH (Aspiring and Analysing Goals to Reach Anchoring Heights) to analyse and its benefits. The reaffirmed that innovative practices have benefitted them with more than 70% of students submitting towards the positive inputs they reaped during their course of study in BRAIT.
1. Introduction

Dr. B. R Ambedkar Govt. Polytechnic was established in the year 1984 and Second Govt. Polytechnic was established in the year 1989 with the objective to fill up the gap between the demand and supply of technical manpower in these islands. In the year 2010, both the Institute was merged and it was renamed as Dr.B.R.Ambedkar Institute of Technology. The institute popularly known as BRAIT in Islands, offers four degree program, three B.Tech (Civil, Computer Science and Electronics & Communication Engineering) one in Nautical Science (Deck Cadet Course), seven Diploma program (Civil, Electrical, Mechanical, Electronics & Communication, Computer, Information Technology Engineering and Hotel Management) one Post Diploma program in Marine Engineering and three Certificate program which include two in Hotel management and one in Maritime studies. In addition to this non-formal courses for skill development in school drop outs or rural and urban unemployed youth was also offered under erstwhile Community Polytechnic scheme and thereafter continued under Technical Vocational Education Training (TVET) program.

The geographical isolation of Andaman & Nicobar Islands gives the teaching fraternity and the students both in school as well as in higher education the challenge of keeping themselves abreast with the latest happenings in the outside world. Being the only technical institute entrust greater responsibility on BRAIT to open windows of opportunities to the island students by adopting a vision which commits that- “We develop a competitive workforce.” In order to set a road map to achieve the same the team collectively went to a new venture of introducing ISO standards in teaching process. Thus the Institution established, documented, implemented, and maintained a Quality Management System (QMS) and Quality Management Instructions (QMI) in accordance with the requirements of all applicable standards and regulations and continually improves the effectiveness of its QMS.

2. Approach Followed

The team identified the following primary processes needed for its operations and their application throughout the organization. The processes identified were:

- Admission Process
- Teaching Process
- Appointment of Regular Faculty & Guest Faculty
- Checking and control of guest faculty selection
- Monitoring and Measurement Process including conduct of examinations as per the affiliated Board/University Guidelines, Director General of Shipping guidelines and All India Council for technical education (AICTE) Norms
- Assessment of board exam answer sheets as per affiliated Board guidelines under local assessment.
- Management responsibility
- Resource management
- Internal communication
- Continual Improvement
- Student feedback
- Placement service

Once these processes were identified then the sequence and interaction of these primary processes as per Process Interaction Map was implemented. This was followed by ensuring the criteria and...
methods for making both the operation and management of these processes effective. Thereafter the resource availability was ensured to support the process and then continual monitoring and measurement was carried out.

The Quality Management System and the Quality management Instructions were defined for each section which included Academic, Human Resource which covered Training & Placement Cell, Campus, Hostels, Purchase and Vehicle Sections. The departmental Quality assurance process was kept same for all the Engineering and Hotel Management department.

3. Innovative Methodology to build an Institutional System

The innovativeness is practised and identified under different focus area which ultimately converges into a larger scope for student empowerment and development so that they are best suited for industry and employability with inherent quality of commitment and conviction. The methodology adopted for innovative practice under various areas is as follows

3.1 Teaching Learning Process

The quality process included in Teaching Learning Process diverges to higher level of control involving all the stake holders in the process. This include the Management Information System (MIS) information from class room to higher levels and thereby continuous monitoring at all points for better productivity. This assures preventive measures for redundancies and removal of unproductive work wherever the process gets into its maturity level. The figure- 3.1 shows the flow and process adopted for monitoring followed in the system

The prevention of non-conformity is assured for both internal and external process as the performance analysis is carried out for grey subjects having results less than 55%. Feedback is taken from failures for assuring the reasons for process improvement and accordingly remedial measures are implemented. The trend is mostly observed in analytical subjects thereby suggests for more tutorials sessions and thereby gives idea for future correction. The process cycle is depicted in the following figure 3.2
3.2. Learner Centered Activities

Students entering into college have different perspective about technical studies and the role they need to play for industry. Therefore it becomes more so important for the system to succeed to introduce all those components which are asked by Employer. The feedback received from Industry/Employing organisation, after the students went for their Industrial attachment training, made the team realise that the geographical isolation of these Islands need to be filled up with some extra efforts on soft skill which covered –communication, presentation and oratory skills under Focus Group Activity (FGA) classes. The intake include students from vernacular medium with non-English background which was the biggest challenge for the faculty handling FGA classes with first year students. But soon it became the platform for effective teacher student interaction and moulding initiatives (as shown in Figure 3.3)

Figure 3.3 – Process followed for Learner Centric Activities
In addition to above the students are also motivated for philanthropic values and social obligations so that they become more responsible towards the social issues and help their fellow needy batch mates. This is done by giving them scope to participate in the following

a) **Benevolent Fund** - contribution which is used for economical poor students to meet their academic fees

b) **SoCh** –On the occasion of 30th Anniversary of establishment the BRAIT team identified activities to address the Social Challenges (SoCh) wherein various groups attempts to attend the selected problem and students voluntarily give their efforts and time under the guidance of the event manager (faculty) who owes the basic idea. The various groups under this concept are

i. AUO – Attending unattended ones where students identifies elderly, mentally challenged people who are discarded/unattended by their family.

ii. Pratidaan – contributing an amount of Rupees 1 Lakh to Lt. Governor’s Relief annually fund which is used at the time of need

iii. SWATCH – Saving water by cleaning habitats having drinking water wells wherein well water is tested for its portability and identifying the treatment required to make it safe and healthy for the users in the neighbourhood

iv. SABAS- Saving and attending Beaches which are spoiled due to tourist activities and sensitizing the local population to adopt safe disposal of plastics and other wastes to save marine life.

v. SANKALP- Socially attending not very known and Less Advantageous people where students interacts with inmates of orphanages and arrange programs to attend to their emotional and academic needs.

vi. Know your neighbourhood – where the students select the neighbourhood area which requires basic amenities and co-ordinate with the authorities to do the needful

vii. Awareness on Social Issues – Students perform Nukkad Natak (Street Play as shown in figure) and organise bike rally for drawing attention of general public on issues like importance of sanitation and related diseases due to mosquito breeding, traffic rules and road safety etc.

viii. ARPAN – Alternative Resource to Polythene to avoid Nuisance, in which students groups collects used papers and cotton cloths to make bags and distribute the same at crowded places where they are required the most.

Figure 3. - Arpan Bag Distribution and other SoCh Activities, Nukkad Natak,
c) **Disaster Preparedness** – Two hour weekly, students attend class on Disaster Preparedness which is a course prepared with the objective to prepare the students for situations of disasters. In addition to the theoretical part students have to undergo training on physical drills for keeping them physically and mentally fit for such situation.

d) **Involvement in National Day Celebrations** – Students are given different platform during National day celebrations (Independence Day, Republic Day etc.) wherein they are asked to depict the stories of unsung heroes to understand the motive behind such devotion and conviction for the nation. Meritorious staff and students are also awarded on these days for their exemplary work.

### 3.3 Feedback System

Any system becomes dysfunctional and non-productive if effective feedback system is not in place. In order to create more transparency and to uphold the practice of ethics and values the inbuilt feedback flow at various levels and stages is allowed which is depicted in figure 3.5 below.

![Feedback system for continuous improvement](image)

**Figure 3. 5 - Feedback system for continuous improvement**

### 3.4 Placement Initiatives

The quality management system considers the employer (industries/organisation) as customer and the passed outs are considered our products. Thus to get the best customer for our products the need analysis is carried out at regular interval and students are exposed to the corporate industrial culture through training. The initiatives are given below in figure 3.6.
3.4 Environmental Friendly Initiatives

The Environmental Management System (EMS) implemented in the campus covers the following process:

- Paper Recycling Plant – The used paper in the campus is recycled after segregating at disposal point
- Windrow Composting of Solid bio-degradable waste (food waste and other such wastes produced by Hostels and staff quarters) is collected and the compost produced is used for the large garden in the campus
- Effluent Treatment Plant (ETP) – first and only of its kind in the island to treat waste water
- Rain Water Harvesting – roof system and a mini Bund is used to tap the water
- Measures To Reduce Power Consumption by changing the conventional lamps
- Initiatives For Paperless Work - by introducing intra-portal facility wherein all circulars and entries are made online through various software designed by students as their academic projects

Figure 3.6 – Placement Initiatives for students

Figure 3.7- ETP, Windrow Compost and paper recycling plant functional in campus
3.5: E- Initiatives

The process involved in QMS is captured through various software indigenously prepared by students as their projects which helps in data maintenance, storage and thereafter analysis for improvement. One of the major breakthroughs in this initiative is the large databank provided by Students Information Software (SIS) wherein the personal information is registered at the entry level and thereafter monthly attendance, marks for both internal and external exams, skill map for soft skill development plan and details of participation in extracurricular and co-curricular activities is recorded. On the other hand faculty details are also entered to capture the performance of Lecturers/Faculty, result analysis, grey subject analysis, class average and yearly result comparison, as per the subjects handled by them. In addition to SIS, various other software fulfilling the requirement of QMS are depicted below:

Figure 3.8: Software implemented to assist QMS

4. Validation of Benefits

The students entering into the system from the far flung islands later indulge into bigger venture of employability and thereby attempting for brighter jobs in mainland as the only source for employability is the government sector in these islands which has become stagnant. In order to authenticate the expected benefit a survey was carried out amongst final year students who have undergone the process of QMS and EMS complimented with other initiatives. The survey questionnaire AAGREH (Aspiring and Analysing Goals to Reach Anchoring Heights) aimed to capture the objective derived for each and every initiative gave the following outcome;
After becoming a BRAITian, how do you feel

- Confident: 66%
- Scared: 32%
- Confused: 1%
- Glad I am here: 1%

How FGA helped you

- Enhanced Knowledge: 73%
- Confidence: 24%
- Oratory skill: 26%

How the academic Project helped you

- Gains Practical knowledge: 87%
- Learn advanced techniques: 33%
- Gives insight to research work: 79%
- Gives freedom to implement ideas: 12%

Why you feel empowered

- Students view is considered: 80%
- Not considered: 19%
- Open forum: 36%
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How the academic atmosphere of BRAIT is helping you?
- Enriching academically: 95%
- Not helpful: 4%
- will help in higher studies: 26%
- has become more responsible: 24%
- will give better job opportunities: 0%
- Became more disciplined: 12%

How do you feel the change as a person?
- Feels the importance of Moral Values: 90%
- Not felt much change: 15%
- Feel good factor with SoCh: 26%
- Feel more responsible: 15%
- feel more patriotic with Celebration of National days: 5%

What are the changes you have undergone after becoming a BRAITian?
- Changed for good: 80%
- No change: 31%
- Positivity in thoughts: 26%
- Environment friendly: 24%
- Became Socially responsible: 14%
- Learned Values: 5%
- Rise in Confidence: 1%

What you like the most about BRAIT?
- Environment: 50%
- Teaching: 30%
- Both: 24%
Your learning from EMS in the Campus

- Became Environment friendly: 36%
- No Change: 12%
- Cleanliness: 21%
- Recycle & reuse: 5%
- Join SoCh activities: 3%
- Tree plantation: 4%
- Use ink pen: 4%

How do you feel for your nation?

- Need to be a responsible citizen: 93%
- Need to fight corruption: 4%
- Should be socially responsible: 24%
- Respect Nation: 17%
- will join Defence force: 5%
- should avoid using foreign products: 4%
- Became Environment friendly: 12%

Figure 3.9- Survey Outcome of AAGREH

5. Conclusion

The system driven process has given the following benefits
- Prior planning of subjects and thereby identifying required resources (both manpower and material/equipment)
- Accessibility of all academic related information to students through a strong databank supported by Student Information System (SIS) software
- Use of e-data in daily academic activities to make the functional process effective and efficient
- More transparency in system for both accessibility and objectivity of maintaining quality
- Ease in change in process for continuous improvement
- Easy removal of redundancy due to close looped process making end to end connected with respect to delivery and measurement
- Timely identification of non-conforming performers both at teaching and student side for necessary preventive and corrective measures
- Effective feedback system at various levels
- Empowering students in system modification and improvement
- Scope for more innovativeness by continuous scaling of output derived from each change
Reference

[1] QMS (Quality Management System) and QMI (Quality Management Instructions) of ISO documents


BIOGRAPHIES

Corresponding author is a Civil Engineer and has done her Post graduation (M.E.) in construction Management & Technology. She is born and brought up in Andaman Islands and did her graduation from Gujrat University in the year 1993 and her Post graduation from NITTTR, Chandigarh with Punjab University. She is been in teaching profession for last 20 years and has been actively participated in all student centric activities for BRAIT. Her field of interest is Traffic Engineering.

The second author is also a Civil Engineer and has done her graduation from Tirunelveli, Tamil Nadu. She is born and brought up in Tamil Nadu and has been in teaching for last five years. She has been actively involved in student related activities in Civil Engineering department of BRAIT and looks after the Disaster Preparedness Activities for the entire institute. Her field of interest is Irrigation Engineering, Building Drawing and Structural Engineering.