This chapter highlights the industry outlook on the industry-academia-interface and the various issues under the domains of industrial training, student placement, curriculum development, student evaluation, resource sharing, seminars, research and development, adjunct faculty, collaboration and personality development programs through survey based analysis. Joint industry-academia deliberations on the industrial views thus congregated can be synthesized as a base for formation of strategies in transforming present technical institutions into institutions of excellence.

4.1 Introduction
In order to assess the present dynamics of industry-academia-interface and its impact on different skills of the students, a survey tool (questionnaire) was used as an instrument to obtain industrial feedback from various industries for making teaching learning process effective and to narrow down the prevalent gap between industrial expectations and available academia output. The survey tool was developed on the basis of industrial interaction, student interaction, literature review and personal experience and the same is enclosed an Annexure-A. Total 106 questions with parts and subparts were prepared on ten different industry-academia-interactions domains and the following domains were covered in the survey for getting industrial feedback.

• industrial training
• student placement
• curriculum development
• student evaluation
• resource sharing
• seminars
• research and development
• adjunct faculty
• collaboration
• personality development programs

These questionnaires were sent through post, e-mail and by hand to 110 industries located in different states and union territories of India such as Delhi, Haryana, Uttar Pradesh, Maharashtra, Himachal Pradesh and Chandigarh having diverse business processes with a view to get fair assessment of the study. Out of 110 approached industries 64 industries responded. Some of these industries answered questions partly and gave their own options as per their own understanding and judgment. The statements were carefully designed to cover the essential aspects. The respondents were asked to rate on a 5-point scale:
1 - to great extent
2 - to large extent
3 - to some extent
4 - to little extent
5 - not at all

The feedback generated through survey tool is an indication of the present industry-academia status, benefits of being together and the various issues which are on threshold to development of stronger linkages between industry and academia. The results obtained through survey tool is compiled, analyzed and presented below as such:

4.2 Assessment of Industry-Academia Interface through Industrial Training

Industrial training is one of the most predominant industry-academia-interface existing presently in Indian scenario as industrial training is an integral part of every graduate engineer’s academic program. Two most common types of industrial training which exists in student academic program are short and long training. Short training is most commonly adopted system of industrial training in student academic program and is usually of 6-8 weeks duration. This training is scheduled at the completion of 2nd and 3rd year of student academic program and the time slot for this industrial training falls in summer vacations.
Long industrial training is usually of 6 months duration and is generally aligned in last semester of student academic program. Long training programs are not commonly prevalent in all the technical institutions. The experience indicates that most of the industries barring few do not show much interest to accommodate students on industrial training. Almost all the training and placement officers of institutes face an uphill task to arrange an industrial training for their student. To understand industrial views on student industrial training, their interest in accommodating students on training with what maximum number on training, trainee selection procedure, structured or unstructured training, effective duration and academic slot of training, preference to rotational or non-rotational training, paid or unpaid training, student's seriousness on training, amount of stipend and its relation in generating student interest in training, institute training monitoring system and its effectiveness, industrial participation in students training evaluation, worthiness of trainees and reward to performer trainees, theory vs. practical/ workshop ratio in student's academic program, absorption of students after training and impact of industrial training on different attributes is studied through survey based questionnaire. The industrial feed back generated and compiled through survey reflects the following:

4.2.1 Assessment of Industrial Interest in Providing Training to Students
Industrial training is an essential component of student academic program. The interest of industries is studied in providing training to graduate engineering students. Survey reveals that 92.18% respondent industries are open to student's industrial training; where as the remaining industries have not shown any interest in accommodating student on training.

4.2.2 Assessment about Free/ Paid Training
With rise in demand for training due to mushrooming of technical institutions and non availability of training seats in an industry, study is made about availability of free or paid training to students. Survey indicates that 93.75% respondent industries provide free industrial training to student. One industry which happens to be a training house also provide free as well as paid training depending upon student's caliber. The remaining respondent industries remained silent on this issue.
4.2.3 Assessment about Number of Student, Industry Ready to Accommodate on Training

Different industries absorb different number of students on training depending upon their own requirements, government by-laws and local pressure. Survey reveals that large numbers of respondent industries prefer to accommodate maximum 05 students on industrial training. The status of percent respondent industries willingness to accommodate different number of students is explicit through Fig.4.1 (Refer Section-II, Question-2 under Industrial Training domain in Annexure-A).

![Fig.4. 1: Industry willingness to accommodate students on training](image)

4.2.4 Assessment about Industrial Stipend to Trainee Students

Some of the industries look for student trainees who extend helping hand to their staff in their industrial projects. The interest of industries was studied in providing stipend to trainees during industrial training. The feed back through survey indicates that 42.19% respondent industries offer stipend to trainees, where as 06.25% industries have not responded and the remaining respondent industries do not pay any stipend to the students during industrial training. The stipend in certain cases goes as high as Rs.12000/-P.M.

4.2.5 Assessment about Linkage of Trainees Interest with Stipend

Stipend is always a point of great interest amongst students during industrial training. Survey signifies that 65.63% respondent industries believe that stipend increases students interest in industrial training, where as 26.56% does not agree to this theory. 6.25% industries have not responded and 1.56% industries are not confident to comment about interest relation with stipend.
4.2.6 Assessment about Effective Duration of Industrial Training

Different institutions have different industrial training calendar as per their university curriculum. Large percentages of respondent industries believe that long industrial training is more consequential than short training. Certain respondent industries have given their own perception about effective duration of industrial training. Industries discernment about effective duration of training can be visualized through Fig.4.2 (Refer Section-II, Question-9 under Industrial Training domain in Annexure-A).

![Effective Duration of Training](image1)

Fig.4.2: Effective duration of Industrial Training

4.2.7 Assessment about Student Seriousness on Industrial Training

There is a question mark on seriousness of student’s during industrial training. 34.38% respondent industries are of the view that students are quite serious about their industrial training; where as the remaining respondent industries are not very happy on the issue of trainee’s seriousness. Views of respondent industries on student’s seriousness during industrial training are implicit in Fig.4.3

![Seriousness about Industrial Training](image2)

Fig.4.3: Seriousness about Industrial Training
4.2.8 Assessment about Institute Training Monitoring Status and its Effectiveness

For training to be more significant training monitoring system has to be quite effective. It provides confidence in young buddies that the institution faculty is at their back to extend helping hand to tackle various bottlenecks which come in their way during training. It also checks non serious students to put them on right track. It provides information to institutions about what new is going on in industrial arena so that institute can update themselves for necessary reforms in meeting industrial challenges. Survey indicates that 48.44% respondent industries believe that institutions do visit industries to monitor students training, where as 4.69% respondent industries remained silent on this issue. Out of the respondent industries 25.01% respondent industries are of the opinion that institutions do monitor training seriously, where as the response of the other respondent industries is not very encouraging. The industrial feed back about training monitoring effectiveness by institutional faculty can be understood through Fig.4.4

![Training Monitoring Effectiveness Graph](image)

Fig.4.4: Industrial Training Monitoring Effectiveness

4.2.9 Assessment about Trainees being an Asset for Industry

Students from all type of institutions, good, average or bad enter industrial arena for their industrial training. Assessment has been carried out to understand industrial views about trainees being an asset. The feed back reflects that 29.69% respondent industries believe that trainees who come for an industrial training are really an asset to them. The feed back from other respondent industries is not very encouraging. Overall respondent industries assessment is highlighted through Fig.4.5
4.2.10 Assessment about Reward to Trainees

Good performers are always an asset for an organization. Study reveals that 60.93% respondent industries consider good performers in terms of job, 9.38% each believes in terms of offering money and kind to the trainees, 3.12% industries are silent and 17.19% industries do not opt for any rewards to trainees. (Bansal V.K., and Kumar Ashok, 2007) has reported in a case study that 15% of mechanical engineering students received offers from those industries in which they underwent training.

4.2.11 Assessment about Industrial Participation in Trainees Evaluation

During academic industrial training student work under industrial supervisors or training manager and the student interaction with institute faculty about their project by and large remains minimal. Are such student’s really to be evaluated by institute faculty when they are doing project under industrial staff. The feed back divulges that those who are responsible in nurturing student’s during industrial training their participation in trainee’s evaluation is quite feeble.

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**Fig.4.5: Assessment about Trainees as an Asset**

**Fig.4.6: Industrial Participation in Training Evaluation**
4.2.12 Assessment about Practical/Workshop Exposure in Student Curriculum
Institutions have their own curriculum as per university norms, which appear to be more theoretical as per stakeholders. 98.43% industries recommend that for better perception and understanding students must have sufficient practical/workshop exposure before they are deputed to industry for industrial training.

4.2.13 Assessment about Theory vs. Practical/Workshop Ratio in Curriculum
Industries expect that students must have sound theoretical and practical knowledge and be productive from day one. The importance of workshop practice in student academic program has been well understood in the west and their belief is in learning through practice. Large number of Indian industries too feels the same way. 48.44% respondent industries suggest that 1:1 theory-practice ratio is more meaningful, where as 34.38% is of the same opinion with 1.5:1 theory-practice ratio. Some of the respondent industries have put forward their own views on institute theory-practice ratio. Respondent industries view on effective theory-practice ratio in student curriculum is shown in Fig.4.7 (Refer Section-II, Question-17 under Industrial Training domain in Annexure-A).

![Fig.4.7: Theory Vs Practical Ratio](image)

4.2.14 Assessment about Class Room Contact Program during Industrial Training
Structured training with class room contact program is gaining importance in enhancing trainee’s performance. Assessment was carried out to understand this aspect. The Feed back indicates that 35.94% respondent industries do take care of this aspect during industrial training and 6.25% industries are silent on this issue.
4.2.15 Assessment about Rotational vs. Non-Rotational Training and its Effectiveness
People have different perception about rotational and non-rotational industrial training. Both the systems are quite common in use and have relative merits and demerits in comparison to each other. Certain industries believe in providing exposure to students in various departments which help them to understand an overall working of an industry. Contrary to this certain industries are of the opinion that training in one department is more evocative. Industrial feed back indicates that 45.31% respondent industries believe that training in one department i.e. non-rotational training is more effectual. Views pertaining to effective training in different number of departments can be understood through Fig.4.8

![Effectiveness of Rotational Vs Non-Rotational Training](image)

Fig.4.8: Effectiveness of Rotational Vs Non-Rotational Training

4.2.16 Assessment about Effective Training Slot in Academic Curriculum
Different institutions follow different industrial training slots as per their university calendar. Which training slot is most suitable to students is a hot discussion amongst various researchers and people involved in managing technical education.

![Effective Training Slot](image)

Fig.4.9: Effective Training Slot
As per industrial feedback, the industrial training in the final semester seems to be the choice of most of the respondent industries. Industrial views about appropriate industrial training slot in student curriculum are depicted in Fig. 4.9.

4.2.17 Assessment about Absorption through Industrial Training

Industry always looks forward for talented staff. Training is a mode through which trainee interacts with the industrial staff. It provides an edge to superior's in the industry to understand the trainee’s talent, potential, interpersonal and attitude skills which help them to recruit the manpower best suited to them. Through training, industry is also able to generate data of the potential viable candidates to be absorbed at a later date as per the need of the industry. The survey indicates that a large number of industries absorb up to 2% of their trainees. Few respondent industries have provided their own option about this ratio. The trainee absorption status of respondent industries is shown in Fig. 4.10 (Refer Section-II, Question-26 under Industrial Training domain in Annexure-A).

![Absorption through Training](image)

Fig. 4.10: Absorption through Industrial Training

4.2.18 Assessment about Impact of Industrial Training on Student Attributes

Students acquire certain attributes at institute level while undergoing academic program. Once they move to industries for their industrial training, they find a different atmosphere, where punctuality, discipline, commitments, attitudes, team work etc. have different meaning for them. Most of the trainees work in a team, where specific task is assigned to them. A trainee learns how to handle work pressures, the various barriers and the art of completing project on time. This brings a qualitative change in student’s perception and behavior. Such an experience brings qualitative change in student various attributes. An attempt is made through industrial study to understand the impact of industrial training on various attributes.
i.e. technical knowledge, aptitude, communication skills, leadership quality, software knowledge, computer literacy, team work skills, discipline, attitude, self confidence, problem solving, value education and strategic thinking. Through industrial survey an assessment is carried out to understand the industries view about echelon of 13 different skills a student possesses before and after undergoing industrial training. This gives a fair idea about an impact of industrial training on student attributes.

4.2.18.1 Assessment about Improvement in Aptitude Skills
These days industries thrust is to recruit manpower that are good performers and have better aptitude skills. Survey indicates that number of respondent industries discernment about improvement in student aptitude skills changed on scale of large to great extent from 26.57% to 68.76% after undertaking industrial training. Overall percent respondent industries perception regarding student aptitude skills before and after training is highlighted in Fig.4.11

![Fig.4.11: Improvement in Aptitude Skills through Training](image)

4.2.18.2 Assessment about Improvement in Technical Knowledge
Institute tries to equip the student with the necessary technical input so that they are able to accomplish the challengeable task in a most comfortable manner in an industry. Grasping and understanding depends upon how fundamentally strong a student is and how faculty is able to correlate theory with application. Study reveals that number of respondent industries perception about improvement in student technical knowledge changed on scale of large to great extent from 9.38% to 90.62% after undertaking industrial training. Overall percent respondent industries perception regarding student technical knowledge before and after training is highlighted in Fig.4.12 (Refer Section-II, Question-28 (a) under Industrial Training domain in Annexure-A).
4.2.18.3 Assessment about Improvement in Communication Skills

With businesses growing global, interaction around the world has increased tremendously. These days communication is a front runner skill in the manpower recruitment and more so in the software industries. Students admitted to engineering colleges are not only from urban sector but many of them belong to rural area where good communication is one of the biggest barriers for them. During industrial training trainee students are to interact frequently with different people which help them in improvement of their communication skill. Survey indicates that number of respondent industries opinion about improvement in student communication skills changed on scale of large to great extent from 7.8% to 57.81% after undertaking industrial training. Overall percent respondent industries perception regarding student communication skills before and after training is highlighted in Fig.4.13

4.2.18.4 Assessment about Improvement in Leadership Qualities

Leadership quality is art of motivating group of people to act towards achieving a common goal. It is possible when the team leader is matured, visionary and able to understand the potential, constraints and difficulties of his fellow members and takes decision in the best interest of industry and his team member. Industries always look for such people who are
positive and able to carry masses along with them. Survey indicates that number of respondent industries judgment about improvement in student’s leadership skills changed on scale of large to great extent from 6.24% to 45.32% after undertaking industrial training. Overall percent respondent industries perception regarding student software knowledge before and after training is highlighted in Fig.4.14

![Leadership Qualities](image1)

**Fig.4.14: Improvement in Leadership Qualities through Training**

### 4.2.18.5 Assessment about Improvement in Software Knowledge

These days software usage is very extensive in an industry as it has made work quite simpler and at the same time enhanced performance, visualization and analyzing strength of an individual. Survey indicates that number of respondent industries opinion about improvement in student’s knowledge regarding software changed on scale of large to great extent from 9.37% to 46.87% after undertaking industrial training. Overall percent respondent industries perception regarding student software knowledge before and after training is highlighted in Fig.4.15

![Software Knowledge](image2)

**Fig.4.15: Improvement in Software Knowledge through Training**
4.2.18.6 Assessment about Improvement in Computer Literacy

Computer literacy is better known as the comfort level someone has in using computer programs and other applications. It is a veritable passport to success and holds the key to bright career prospects. Survey indicates that number of respondent industries outlook about improvement in computer literacy changed on scale of large to great extent from 42.18% to 71.88% after undertaking industrial training. Overall percent respondent industries perception regarding student computer literacy before and after training is highlighted in Fig.4.16

![Computer literacy Improvement Graph](image1)

**Fig.4.16: Improvement in Computer Literacy through Training**

4.2.18.7 Assessment about Improvement in Team Work Skill

Team spirit is the concept of working together and it is a very old concept. Its impact is well known through sports and it has gained momentum in almost all fields in last few years.

![Team Work Skill Improvement Graph](image2)

**Fig.4.17: Improvement in Team work Skills through Training**

The purpose to work together is to get more inputs to capture better ideas, to pool knowledge, resources and to have advantage of diversity of skill and experience in order to have better
results with quality. Study reveals that number of respondent industries perception about improvement in team work skills changed on scale of large to great extent from 6.25% to 71.88% after undertaking industrial training. Overall percent respondent industries perception regarding student team work skills before and after training is highlighted in Fig.4.17 (Refer Section-II, Question-28 (h) under Industrial Training domain in Annexure-A).

4.2.18.8 Assessment about Improvement in Student Discipline

College life is quite different than the professional life. During Industrial training student get exposed to industrial culture and understands the expected behavioral norms which develops self-control, character and keep them organized. Survey indicates that number of respondent industries perception about improvement in student discipline changed on scale of large to great extent from 10.97% to 73.44% after undertaking industrial training. Overall percent respondent industries perception regarding student discipline before and after training is highlighted in Fig.4.18

![Discipline Improvement through Training](image)

Fig.4.18: Improvement in Discipline through Training

4.2.18.9 Assessment about Improvement in Attitudes

Attitude is becoming extremely important and industries give high priority to attitude while selecting their man power. A positive mental attitude lead to positive changes and makes people more productive. Survey indicates that number of respondent industries opinion about improvement in student attitudes changed on scale of large to great extent from 14.08% to 73.45% after undertaking industrial training. Overall percent respondent industries...
perception regarding student attitudes before and after training is highlighted in Fig.4.19 (Refer Section-II, Question-28 (j) under Industrial Training domain in Annexure-A).

![Attitudes Diagram]

**Fig.4.19: Improvement in Attitudes through Training**

**4.2.18.10 Assessment about Improvement in Self Confidence**
Self-confidence breeds enthusiasm and allows people to perform more effectively. A self-confident person is often organized and able to stick to a schedule. Survey indicates that number of respondent industries opinion about improvement in student self confidence changed on scale of large to great extent from 10.93% to 71.88% after undertaking industrial training. Overall percent respondent industries perception regarding student self confidence before and after training is highlighted in Fig.4.20

![Self Confidence Diagram]

**Fig.4.20: Improvement in Self Confidence through Training**

**4.2.18.11 Assessment about Improvement in Problem Solving Skills**
Problem solving is a mental process. It is a subset of critical thinking and is a process of reasoning to solutions using more than simple application of previously learned procedures. Problem solving is of crucial importance in engineering industries and employer expect that
engineers who are back bone of their industry must be able to tackle their day to day problems in a most satisfactory way. Survey indicates that number of respondent industries perception about improvement in problem solving skills changed on scale of large to great extent from 10.93% to 64.06% after undertaking industrial training. Overall percent respondent industries perception regarding problem solving skills before and after training is highlighted in Fig.4.21 (Refer Section-II, Question-28 (1) under Industrial Training domain in Annexure-A).

![Fig.4.21: Improvement in Problem Solving Skills through Training](image1)

### 4.2.18.12 Assessment about Improvement in Strategic Thinking

Strategic thinking is an approach based on why instead of what. It is a synthesizing process utilizing intuition and creativity for integrated perspective of the enterprise. It is a step by step approach. Strategic thinking is a key attribute which an industry look in their employees. Survey indicates that number of respondent industries perception about improvement in strategic thinking skills changed on scale of large to great extent from 7.81% to 43.75% through industrial training. Overall percent respondent industries perception regarding strategic thinking skills before and after training is highlighted in Fig.4.22

![Fig.4.22: Improvement in Strategic Thinking through Training](image2)
4.2.18.13 Assessment about Improvement in Value Education

Value education inculcates a sense of humanism, a deep concern for well being of others and the nation. It cultivates essential values like honesty, simplicity, love, unity, peace happiness, humility, cooperation etc. so that the civilization that teaches us to manage complexities can be sustained and further developed. Survey indicates that number of respondent industries opinion about improvement in student’s value education changed on scale of large to great extent from 10.94% to 59.37% after undertaking industrial training. Overall percent respondent industries perception regarding value education in student before and after training is highlighted in Fig.4.23 (Refer Section-II, Question-28 (n) under Industrial Training domain in Annexure-A).

![Value Education]

**Fig.4.23: Improvement in Value Education through Training**

4.2.19 Survey Outcome on Industrial Training

Most of the industries are open to student industrial training, but with small in number at a time. Industry do not charge any money, rather majority of them offer stipend to attract best talent. Stipend augments student interest which is in better interest of an industry. Long academic industrial training up to 6 months duration is an ideal choice. Institute training monitoring system is in effective and needs quick readdress. Student seriousness during industrial training is an important issue, although around 30% students are quite serious and are an asset to industry. Most of the trainer industry rewards good students and offer placement to students after completion of training. Industrial participation in student’s training evaluation is quite stumpy although projects are assigned and completed under industrial guidance. There is a need for good practical/ workshop exposure with equal weight.
age to theory and practice. Both systems viz. rotational and non-rotational training systems are quite popular but non-rotational training system is more effective. Although industrial training slot is different in different universities but last semester industrial training slot is most effectual. Industrial training leaves high impact in refining student attributes viz. technical knowledge, practical skills, team work skills, discipline, self confidence, attitudes, problem solving skills and communication skills. Moderate improvements in student attributes are expected in value education, aptitude skills, leadership qualities, software knowledge, strategic thinking and computer literacy.

4.3 Assessment of Industry-Academia-Interface through campus Placement

Quality and placement are the two major parameters for growth and sustainability of any educational institute. Mindless expansion of technical education without concern for quality would only lead to ill educated technical workforce misfit in the present age of competition (Pandey, 2003). Lack of infrastructure and shortage of faculty in many institutions is putting an impact on student quality and their employability. Most of the industries often complain about a wide gap between skill sets required and skill sets imparted to students. Campus placement is a platform where industries and institutions meet together and interact. Industries understand the strengths of the institution and institutions get feedback about their shortcomings. In the present work through industrial survey an assessment is made about weightage to 15 different competencies which industries may look in students during their recruitment plan. The competencies which are covered under the survey for getting industrial feedback are technical knowledge, practical skills, aptitude, communication skills, leadership qualities, software knowledge, computer literacy, team work, discipline, attitudes, self confidence, retention, capacity to change, value education and cross cultural understanding. Apart from study on weightage to different competencies, feedback has also been collected on host of other factors such as industrial participation in campus selection, their placement preferences for governmental institution over private institution, student eligibility criterion, concessions to reserved category over unreserved category students, mode of selection, gap and extent of gap between available and required skill sets and feedback to institutes to bridge the gap. The industrial feedback collected and compiled through survey reflects the following:
4.3.1 Assessment about Industry Participation in Campus Selection
The information is gathered from the various industries about their manpower selection process. The thrust was to understand how many industries have the trust to take raw students from the institutes. The survey indicates that 64.06% respondent industries participate in campus selection process which seems to be a good industrial participation in campus recruitment plan.

4.3.2 Assessment about Number of Visiting Institutions on Industrial Panel
Industrial feedback was gathered about different number of institutions they visit for campus recruitment to understand whether the recruitment is limited to only small number of selected institutions or good number of institutions is under the industrial network. Survey reveals that 63.41% respondent industries conduct campus recruitment process in less than 5 different institutions and 7.32% respondent industries make recruitment in more than 15 institutions per year. The status of respondent industries visiting different number of institutions are shown in Fig.4.24

![Visit to Institutes](image)

Fig.4.24: No. of Institutions on Panel for Campus Recruitment

4.3.3 Assessment about Preference to Government over Private Institutions for Campus Recruitment
Till few years back number of technical institutions in India were quite less and most of them were either governmental or governmental aided institutions. Recently education sector is flooded with private players. Stake holders regularly keep on commenting on downfall of quality education. Through this survey an effort is made to analyze about which type of institute is most sought for campus recruitment process. Study reveals that majority of industries believe in business and are interested in quality students irrespective of from which
institute they are. Only 34.38% respondent industries prefer to visit government institutions for selection of their manpower which is a signal for governmental institutions that in the quality era government tag won’t work any more and institute have to train students as per industrial needs. Overall assessment about respondent industries preference for government institutions over non government institutions is depicted in Fig.4.25 (Refer Section-I, Question-4 under Placement domain in Annexure-A).

![Preference to Govt. over Pvt. Institutions](image)

**Fig. 4.25: Preference to Government over Private Institutes**

### 4.3.4 Assessment about Student Eligibility Criterion during Campus Selection

Most of the industries impose certain eligibility conditions for students to appear in their interview. The eligibility criterion differs from industry to industry as per industrial expectations. This is an indication for students to either perform or be out. Feed back through survey reveals that majority of the respondent industries look for students who have attained more than 60% marks which is usually a first class in an Indian academic system. Overall respondent industries feed back on student eligibility criterion for campus selection is depicted in Fig.4.26

![Eligibility Criterion](image)

**Fig.4.26: Eligibility Criteria for Campus Recruitment**

57
4.3.5 Assessment about Relaxation in Student Eligibility Criterion

All government bodies including governmental institutions follow state government reservation policy through which they give preference to reserved category people over general category people in order to provide opportunities to those who are either below the poverty line or have rendered service for the country defense etc. Through study, analysis is made whether such facility is existent in private sector or not. The Industrial response indicates that 95.13% respondent industries do not provide any relaxation in eligibility criterion. This is an indication in general for all, that private industry believes in business and there is no place for underperformers whether they are from general or reserved category. Respondent industries opinion about relaxation in eligibility criterion during placement interviews for reserved category students is presented through Fig.4.27

![Fig.4.27: Relaxation in Eligibility Criteria](image)

4.3.6 Assessment about Selection Mode for Campus Recruitment

Different industries follow different selection criterion during campus recruitment. Which selection mode is most commonly adopted during campus recruitment is analyzed through industrial feed back.

![Fig.4.28: Mode of Campus Selection](image)
Survey indicates that majority of industries prefer technical test followed by an interview. Selection criterion followed by various respondent industries during their permanent recruitment process is depicted in Fig.4.28

4.3.7 Assessment about Industrial Feed Back to Institute
Feedback is an important tool in bringing qualitative change. The purpose of assessment is to understand how many industries during their campus selection process provide feedback to academia so that institutions can understand what their strengths and weaknesses are and which areas need immediate attention. Survey indicates that very small percentage of industries make institutions abreast on student strengths and weaknesses. Overall percentile respondent industrial assessment on sharing of feedback with institutions is projected in Fig.4.29

![Fig.4.29: Feed Back to Institute](image)

4.3.8 Assessment of Gap between Industrial Expectations and Student's Skills
Quite often it is said that employers and institutions don't understand each other's language and there is a mismatch between the growing needs of an industry and the type of the knowledge/training being imparted in engineering institutions. Through survey the feedback is collected to understand industry opinion about any gap if persists. The analysis indicates that 96.88% respondent industries support the idea of a prevailing gap between industrial expectations and institute attained skills. The message from the feedback goes that something is seriously wrong with institute academic program and needs immediate reassessment. Overall respondent industries assessment about any gap between industry and academia is highlighted through Fig.4.30
4.3.9 Assessment about Extent of Gap between Industrial Expectations and Student's Attained Skills

After understanding industrial views on the academic gap, the feedback is collected about the extent of prevalent gap.

35.94% respondent industries believe that the gap exist on large to great extent on the earlier defined scale of 1:5. The gap figure reflects that institutions must look for ways and means to cut this gap. Overall respondent industries perception on the extent of industry-academic gap is represented through Fig.4.31 (Refer Section-I, Question-16 under Placement domain in Annexure-A).

4.3.10 Assessment of Industrial Weightage to Various Skills during Placement

The customer driven market expects minimum level of quality. Students acquire certain skills at institute level which has a mismatch with industrial expectations. Quality of technical education has become an important issue and institutions have to redefine and refine educational programs in better interest of stakeholders. Through this study an assessment is made about industrial weightage to 15 different skills which an employer look in a student at the time of recruitment. These skills have been graded on 5-point scale as defined earlier i.e. 1 (to great extent), 2 (to large extent), 3 (to some extent), 4 (to little extent), and 5 (not at all).
The 15 different skills assessed through industrial eye are technical knowledge, practical skills, aptitude, communication skills, leadership qualities, software knowledge, computer literacy, team work, discipline, attitudes, self confidence and retention, capacity to change value education and cross cultural understanding. The feedback about industrial weight age to different student skills at the time of recruitment reflects as such:

4.3.10.1 Assessment of Industrial Weight age to Technical Knowledge

Selection of proper manpower is quite a challenging task before human resource personnel. Student competency is analyzed through different skills during recruitment process. The survey was carried out to understand the industrial weight age to technical knowledge during recruitment process. The feedback reveals that 81.26% respondent industries give weight age to technical knowledge on scale of large to great extent under earlier defined 5 point scale. Overall respondent industries perception regarding weight age to student technical knowledge is highlighted in Fig.4.32

![Fig.4.32: Industrial weight age to Technical Knowledge](image)

4.3.10.2 Assessment of Industrial Weight age to Practical Skills

Strengthening theory through practice improves understanding and generates better self confidence in the students is a well known phenomenon. More and more interactions between institutes and industry will bridge the gaps and help students to acquire more practical approach (Sharma Yogesh, 2007). The feedback on weight age to student practical skills indicates that 65.62% respondent industries give weight age to practical skills on scale of large to great extent at the time of recruitment. Overall respondent industries perception regarding weight age to practical skills is presented through Fig.4.33

![Fig.4.33: Industrial weight age to Practical Skills](image)
4.3.10.3 Assessment of Industrial Weight age to Aptitude Skills

In recent years aptitude skill has gained tremendous importance. In some of the industries it is treated as a screening skill to eliminate students getting low score. The assessment about industrial weight age to aptitude skill during recruitment process indicates that 67.19% respondent industries give weight age to aptitude skill on scale of large to great extent. Overall respondent industries perception regarding weight age to aptitude skill is highlighted in Fig.4.34.

4.3.10.4 Assessment of Industrial Weight age to Communication Skills

With business becoming global importance of communication skills and language lab has risen considerably. Communication has become a front runner skill in the manpower recruitment and more so in the software industries.
The assessment about weight age to student communication skills indicates that 57.82% respondent industries give weight age to communication skills on scale of large to great extent during their recruitment process. Overall respondent industries perception regarding weight age to communication skills is explained through Fig.4.35

4.3.10.5 Assessment of Industrial Weight age to Student Leadership Skills

A real leader keeps his vision bigger than himself and empowers the people to accomplish their goals. He has the knack to understand weaknesses and potentials of his people and able to motivate them to deliver to their full capacity. The assessment about weight age to student leadership skills during recruitment process indicates that 46.88% respondent industries give weight age to leadership skills on scale of large to great extent. Overall respondent industries perception regarding weight age to student leadership skills is explained through Fig.4.36

4.3.10.6 Assessment of Industrial Weight age to Software Knowledge

Software industry has grown up by leaps and bounds in last few years. The knowledge cuts down an idle time, makes work simpler, and improves performance, visualization and
analyzing strength of an individual. The assessment about industrial weight age to software knowledge during recruitment process indicates that 32.81% respondent industries give weight age to understanding of software’s on scale of large to great extent. Overall respondent industries perception regarding weight age to student software knowledge is explained through Fig.4.37

Fig.4.37: Industrial weight age to Software Knowledge

4.3.10.7 Assessment of Industrial Weight age to Computer Knowledge
These days knowledge on to computers is a must. It is termed as a veritable passport to success and a bright career. The assessment about weight age to computer literacy during recruitment process signifies that 50% respondent industries give weight age to computer literacy on scale of large to great extent. Overall respondent industries perception regarding weight age to computer literacy during recruitment process is explained in Fig.4.38

Fig.4.38: Industrial weight age to Computer Knowledge

4.3.10.8 Assessment of Industrial Weight age to Team Work Skills
The output of an organization can be assessed through cohesion of the team members. The thrust of the corporate world is to go for manpower which is positive and can work
collectively. Study indicates that 70.32% respondent industries give weight age to team work skills on the scale of large to great extent, during their recruitment process. Overall respondent industries perception regarding weight age to team work skills during their recruitment process is clear through Fig.4.39

![Fig.4.39: Industrial weight age to Team Work Skills](image1)

4.3.10.9 Assessment of Industrial Weight age to Attitude

Although there is a little difference between people, but the little difference makes a big difference and this little difference is called an attitude. It is a state of mind which keeps people on the forefront and half the success will be achieved if a person has right attitude. The assessment about weight age to attitude during recruitment process indicates that 78.13% respondent industries give weight age to student attitude skills on scale of large to great extent. Overall respondent industries perception regarding weight age to student attitude skills during student recruitment process is explained in Fig.4.40 ((Refer Section-I, Question-19 (j) under Placement domain in Annexure-A).

![Fig.4.40: Industrial weight age to attitudes](image2)
4.3.10.10 Assessment of Industrial Weight age to Discipline

Discipline enjoys top priority and it is a vertebra to improve efficiency. Undisciplined organizations and people do not survive long in social and business relations. The assessment about weight age to team work skills during student recruitment process indicates that 92.19% respondent industries give weight age to team work skills on scale of large to great extent. Overall respondent industries perception regarding weight age to team work skills during student recruitment process is explained in Fig.4.41

![Fig.4.41: Industrial weight age to Discipline](image)

4.3.10.11 Assessment of Industrial Weight age to Employee Retention

In last few years with exponential growth in software business, employee retention has surfaced as one of the biggest challenge before an industry. Most affected are the small and medium enterprise, who invests money and time in training the fresher and ultimately loosing them to bigger whales? In this study, the survey was carried out to understand how much industrial weight age is given to student interest for long term relationship with an industry for which he is looking an employment.

![Fig.4.42: Industrial Weight age to Employee Retention](image)
The Study reveals that 62.5% respondent industries give weight age to employee retention during recruitment process on the scale of large to great extent. Overall respondent industries perception regarding weight age to student retention is explained in Fig.4.42

4.3.10.12 Assessment of Industrial Weight age to Self Confidence
Self-confidence promotes initiative and a person can do multifaceted tasks with greater level of commitment and concentration. The industrial assessment reveals that 82.82% respondent industries give weight age to student self confidence on scale of large to great extent. Overall respondent industries perception regarding weight age to student self confidence during recruitment process is explicit in Fig.4.43

![Fig.4.43: Industrial weight age to Self Confidence](image)

4.3.10.13 Assessment of Industrial Weight age to Capacity to Change Skill
Technology is changing very fast. As per industrial need and interest people are to work in different domains? Industries views are gathered about weight age to student capacity to change skill at the time of recruitment. The Study reveals that 50% respondent industries give weight age to capacity to change skill on the scale of large to great extent. Overall respondent industries perception regarding weight age to capacity to change skill during recruitment process is highlighted in Fig.4.44

![Fig.4.44: Industrial weight age to Capacity to Change](image)
4.3.10.14 Assessment of Industrial Weight age to Value Education

Value education such as honesty, simplicity, love, unity, peace happiness, humility and cooperation are the pillars of the society on which the civilization is sustained and developed. Industrialists look for such people who with their human values are able to push forward organizations to newer heights. The survey reveals that 65.62% respondent industries give weight age to value education on scale of large to great extent during their recruitment process. Overall respondent industries perception regarding weight age to value education during recruitment process is highlighted in Fig.4.45

![Value Education](image1)

Fig.4.45: Industrial weight age to Value Education

4.3.10.15 Assessment of Industrial Weight age to Cross Cultural Understanding

With businesses going global, importance of cross cultural understanding is gaining popularity.

![Cross Cultural Understanding](image2)

Fig.4.46: Industrial weight age to Cross Cultural Understanding
The survey reveals that 31.25% respondent industries give weight age to cross cultural understanding on scale of large to great extent during their recruitment process. Overall respondent industries perception regarding weight age to cross cultural understanding during recruitment process is explained in Fig.4.46

4.3.11 Survey Outcome on Student Placement
Industry prefers to recruit manpower through campus recruitment, but cover only small number of institutes, although there are few industries which do large recruitment through campus. Concept of recruitment only from government institute does not sustain any longer. Industrial thrust is to hire good students irrespective of to which institute they belong. Large numbers of industries impose first class as eligibility criteria for recruitment and relaxation in eligibility criterion does not exist to any particular caste and creed. Industries believe in business, underperformers have no place in today’s world. Mode of selection is normally based on technical test followed by an interview although aptitude is gaining popularity. Average salary growth of a fresh engineer lies between 10-20%. Feed back to institute on strengths and weaknesses is comparatively missing. Academic curriculums are not tuned to industrial needs and require considerable revamping. Huge gap persists between employer requirements and institute imparted skills. Industry provide different weight age to different skills during recruitment depending upon job requirements, but on an average industry provides top priority to discipline followed by self confidence, technical knowledge, attitude, team work skills, aptitude, practical skills, value education, retention, communication skills, computer literacy, capacity to change, leadership skills, software knowledge and cross cultural understanding.

4.4 Assessment of Industry-Academia- Interface through Curriculum Development
Curriculum is called the heart and soul of an education system and need proper synthesis during designing. With fast changing technology, curriculums need frequent up gradation. Wide-spread technical courses grew out of the impact of rapid changes of technological, economic and social development. Perhaps the greatest influence on curriculum is what an appropriate to teach. A focus on purely technical or absorptive skills can lead to a downgrading of the process of encouraging analytical capacities or creating questioning
attitudes and socially necessary dissidence (Patel Vibhuti, 2009). Curriculums are either designed to target the specific industrial needs or to prepare the students on broad based education. Solid and well based education is the remedy not only for social sickness in our society in our society, but also are more importantly, the engine behind growth, prosperity and stability (Ofek Guy I., 2007). Industry prefer curriculum as per current industrial needs, whereas the thrust of the institutions is towards broad based education. Curriculums can prove effective if it is industrial friendly, cover technological advancements and flexible to take care of student’s interest. Creating and maintaining relationships between industry and academia is a highly recognized mechanism to manage the changing demands of an industrial society. A bad curriculum can cast an eclipse on students, industry and institute future. In the present work through survey analysis feed back is collected on industrial participation in designing graduate engineer’s curriculum and its impact is studied on making academic programs more relevant to industrial needs. Feed back is also gathered about frequency to revise academic curriculums, improvement in student’s understanding on latest technologies and enhancement in student career opportunities through joint curricula designed by industry and academia. The industrial feed back thus collected and compiled for curricula development through industry-academia-interface reflects the following:

4.4.1 Assessment of Industrial Participation in Institute Curriculum Development
In most of the institutions curriculums are designed or updated by the academician and role of industry in designing or developing student curricula is minimal to nil. Amalgams of industry-academia in student curricula can possibly imbibe those competencies which industries look eagerly in students. Through industrial survey the assessment is made to understand industrial participation in institute curriculum. The feed back do not speak of encouraging results as only 6.25% respondent industries are found to be associated with institute for curriculum development.

4.4.2 Assessment of Industry Participation in Curriculum Development in Preceding 05 Years in the Same Institute
The study is made to understand that the industries which have given feed back about their involvement in designing student curricula, how much are they associated with the same
institute in curriculum development. The feedback reveals that in last 05 years 1.56% respondent industries each participated once and thrice respectively in the same institute for student curricula, where as 3.12% respondent industries participated twice during the same period. Overall respondent industries opinion about participation in the same institute regarding curriculum development is highlighted through Fig.4.47

![Participation in same Institute](image1)

**Fig.4.47: Participation in Curriculum Development in Same Institute**

### 4.4.3 Assessment of Industry Participation in Curriculum Development in Preceding 05 Years in the Different Institutes

The study is made to recognize that with how many institutions these participating industries are associated for curriculum development. The feedback reveals that in last 05 years 1.56% respondent industries each have participated once and twice respectively in different institutions. Overall respondent industry opinions about participation in different institutions in institute curriculum development programs are highlighted through Fig.4.48. The survey indicates poor industrial participation in institute curriculum designing.

![Participation in Different Institutions](image2)

**Fig.4.48: Participation in Curriculum Development in Different Institutes**
4.4.4 Assessment of Curriculum Relevance to Industrial Needs without Industry Participation

(Ahuja and Nanda, 2003) reported that rare attempts have been made to ascertain the needs of the society and most of the educational programs in the country are designed, developed and implemented very unsystematically and also some of the programs not need based. Curriculum once made remains unchanged for years and students keeps on learning outdated technologies. Through survey, assessment is made about relevance of student curriculum with industrial needs. The study is made when there is no industrial participation in designing student curriculum. Feed back indicates that majority of respondent industries are of the opinion that institute curriculum has only 50-60% relevance to their needs. Overall respondent industries opinion about curriculum relevance with industrial needs without their participation is highlighted in Fig.4.49

![Curriculum Relevance without Industry Participation](image)

**Fig.4.49: Curriculum Relevance without Industry Participation**

### 4.4.5 Assessment of Curriculum Relevance with Industrial Needs through Industrial Participation

The percentile institute academic program getting in tune to industrial needs with participation of their industrial partners in student academic planning is assessed through industrial survey. The feed back reflect that majority of respondent industries are of belief that student academic curriculum get 70-80% aligned with industrial needs. The comprehensive information about industrial views on curriculum relevance through industrial participation is highlighted in Fig.4.50
4.4.6 Assessment of Frequency to Revise Academic Curriculum in Core Engineering Subjects

In a university system, there is no fixed calendar to revise the syllabus. It is a need based upgradation as per the changing technology and industrial demands. Industrial feedback is collected on how frequently academic syllabi be revised in core engineering sector. Majority of the respondent industries recommend that after every 03 years the academic revision may be done to incorporate the latest changes in the technological field. The overall respondent views on frequency to revise academic syllabus in core engineering streams is highlighted through Fig.4.51

4.4.7 Assessment of Frequency to Revise Academic Curriculum in Computer/I.T Streams

In last 02 decades technology advanced exponentially. Immense change is seen everyday in computer and information technology. Frequency to revise syllabus in these fields has become a top priority. Industries views were gathered about how frequently institutions should think to revise their academic syllabus in computer and information technology streams. Mixed opinion has come through feedback. 50% respondent industries advocate for
revision after a year, where as 42.19% respondent industries recommend for revision after every 02 years. The overall respondent views on frequency to revise academic syllabus in computer and information technology streams is highlighted through Fig.4.52

Fig.4.52: Frequency of Curriculum Revision in Computer/I.T Streams

4.4.8 Improvement Assessment in Student Perception on Latest Technologies through Industrial Participation in Curriculum Development

The purpose of industrial participation in curriculum planning is to ensure that the current and future technologies are integrated in student academic program to meet the present and future industrial needs and to develop those attributes in students to which industry is providing top priority. Survey feedback reflects that majority of the respondent industries are of the opinion that industry-academia participation in designing student curricula improves student perception on latest technologies through 40-50%. The overall respondent views on improvement in student perception on latest technologies is highlighted through Fig.4.53 (Refer Section-II, Question-2 under Industrial Training domain in Annexure-A).

Fig.4.53: Improvement in Student Perception through Industrial Participation
4.4.9 Improvement Assessment in Student Career Opportunities through Industrial Participation in Curriculum Development

Industrial participation makes the academic programs more industry oriented. The study is conducted to understand improvement in student career opportunities through industrial participation in institute curriculum planning. Survey feedback indicates that 35.94% respondent industries believe that industry-academia participation in designing student curricula improves student career opportunities between 20-30%, whereas 32.81% respondent industries are of the opinion that improvement in career opportunities is greater than 30%. Some of the respondent industries have given their own option of improvement to the tune of 75% and even above. The overall respondent views on improvement in student career opportunities through industrial participation in student curriculum designing is highlighted through Fig.4.54

![Improvement in Career Opportunities](image)

Fig.4.54: Improvement in Career Opportunities through Industrial Participation

4.4.10 Survey Outcome on Curriculum Development

Industrial participation in developing academic curriculum is quite meager and wherever such participation exists it is minimal and limited to very small number of institutions. Institution curriculums without industrial participation are rated average industrial friendly, whereas through industrial participation these programs attain larger industrial acceptability. Core engineering curriculums need readdress after every 3 years, whereas computer and information related curriculums need revision after every 1-2 years. Through industrial participation the topics related to current and future technologies are expected to dominate
and student awareness on latest technologies is anticipated to improve significantly. Possibility of improvement in student career opportunities can be seen to small extent through industrial participation in student curriculum.

4.5 Assessment of Industry-Academia-Interface in Student Evaluation

Evaluation is a vital tool of quality education. Bi-annual semester system of study is generally prevalent in Indian graduate engineering programs. Two internal assessments and one university evaluation system based on subjective questions with around 35% choice is one of the most commonly adopted method of evaluation in India to award marks or grade to promote student to next semester. Good choice availability during examinations tempts students to skip few topics which they consider it tough and possibly they don’t attempt hard to learn these topics. Often evaluation to check creativity and comprehensive level of learning remains missing. By and large the student’s evaluation is being done by the institutional faculty and the industrial participation in student’s evaluation is either minimal or non-existent. The traditional evaluation system of education needs restructuring. Scope of joint evaluation through industry and academia has been premeditated through industrial survey. The study is carried out to understand the present status of industrial participation in student’s evaluation in terms of setting and evaluation of papers, evaluation of laboratory work, evaluation of workshop exercises and evaluation of projects and seminars. Industrial views are gathered on student's industrial exposure and feedback is taken on learner’s inventiveness, their strength to comprehend fundamentals, their visualization and analyzing power to carry forward research, their proficiency in managing man power, their knowledge on to software applications and to get along with different kinds of people effectively. The recruiter’s feedback is also studied on institutional weak areas, industry-academia ratio for joint evaluation and impact of industrial evaluation on student’s learning, employability and in getting live industrial projects. The assessment reflects the following:

4.5.1 Assessment about Propriety of Evaluation

Industries are the biggest stake holders of an academia and they expect certain competencies from students before employing them, but most of them land up with an opinion that students are to be retrained before they become an asset for an organization. Eventually evaluation is
dominated by an academia although students are trained for an industry. Through industrial survey, feedback is gathered about whether the evaluation should be the propriety of an institute faculty or it should have participation of industry being their major stake holder. The survey reveals that 81.25% respondent industries are of the opinion that the present system of student evaluation only through institute faculty is not appropriate. 1.56% industries were silent on this issue.

4.5.2 Assessment about Industrial Participation in Students Evaluation

The present status of industrial participation in student evaluation is studied in the areas of paper setting; evaluation of question papers, project viva, seminars, laboratory and workshop exams. The feedback through survey indicates that industrial participation in student evaluation on all the above mentioned domains is quite poor except in the field of seminar and in project viva. The assessment based on earlier defined 05 point scale reflects the following:

- The industrial participation in the field of student paper setting is very poor as only 1.56% respondent industries believe that it is good on the scale of large to great extent
- The industrial participation in the field of student answer sheet evaluation is very poor as none of the respondent industries believe that it is good on the scale of large to great extent
- The industrial participation in the field of student laboratory work evaluation is very poor as only 4.68% respondent industries believe that it is good on the scale of large to great extent
- The industrial participation in the field of student workshop evaluation is very poor as only 7.81% respondent industries believe that it is good on the scale of large to great extent
- The industrial participation in the field of student seminar evaluation is poor as only 14.07% respondent industries believe that it is good on the scale of large to great extent
• The industrial participation in the field of student project viva evaluation is poor as only 15.62% respondent industries believe that it is good on the scale of large to great extent.

• Overall respondent industries views on industrial participation in the field of paper setting, answer sheet evaluation, laboratory work evaluation, workshop evaluation, seminar and project viva evaluation is highlighted Table-4.1

<table>
<thead>
<tr>
<th>Activity</th>
<th>Participation Level in %age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To Great Extent</td>
</tr>
<tr>
<td>Paper Setting</td>
<td>0.00</td>
</tr>
<tr>
<td>Paper Evaluation</td>
<td>0.00</td>
</tr>
<tr>
<td>Lab Evaluation</td>
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</tr>
<tr>
<td>Workshop Evaluation</td>
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</tr>
<tr>
<td>Seminar Evaluation</td>
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</tr>
<tr>
<td>Project Evaluation</td>
<td>3.12</td>
</tr>
</tbody>
</table>

Table-4.1: Industrial Participation Status in Student Evaluation

4.5.3 Assessment of Student Strengths through Industrial Evaluation

In the academic and industrial fraternity the discussion is quite common about industry-academia gap. Much has been recommended and implemented from time to time to effectively improvise engineering education. The traditional structure of engineering education still prevails, even though the current exigencies require fundamental restructuring. The importance of industrial evaluation has been studied through industrial survey. The evaluation has been defined as the process of determining the merit, worth and value of things (Lee Chien Sing, 2008). The feed back collected about the industrial exposure and various skill sets which student acquire during study through industrial evaluation reflects as such:
4.5.3.1 Assessment about Basic Concepts

The thrust of industrial evaluation is to assess student fundamentals and the comprehension level of learning, but the present system of evaluation is dominated by institute faculty. The purpose of study is to understand that with industry as partner in evaluation, how much students gain strength on their basics. The study reveals that 15.63% respondent industries believe that students may acquire strong basics on scale of large to great extent. The overall respondent industrial views are highlighted in Fig.4.55

![Feed Back on Basic Concepts](image)

Fig.4.55: Feed back on Basic Concepts

4.5.3.2 Assessment about Practical Skills

Academic program of any institute is based on the syllabus approved by their affiliating university which is unarguable. Industries usually emphasize on practice based training as they believe that theoretical based learning is less receptive and practice based training improves visualization, develops better understanding and boost learner's confidence.

![Feed Back on Practical Skills](image)

Fig.4.56: Feed back on Practical Skills
The study reveals that 21.88% respondent industries are of the opinion that students may acquire good practical skills on the scale of large to great extent with industry becoming partner to an academia in student evaluation. The overall respondent industrial views are highlighted in Fig. 4.56

4.5.3.3 Assessment about Industrial Exposure

Industrial exposure update people on current technologies, strengthens concepts through visualization. The exposure is essential for people who are associated with academics. Murthy, 2002 has pointed that a teacher with industrial exposure can add significant value to technical education with live practical issues through his industrial experience. The industrial exposure can be strengthened through tours, visits or project training. It improves industry-academia relations, student’s placement and enhances opportunities in getting live projects during industrial training. The study reveals that 15.62% respondent industries believe that students may get good industrial exposure on the scale of large to great extent with industry becoming partner to an academia in student evaluation. The overall respondent industrial views are projected in Fig. 4.57

4.5.3.4 Assessment about Analytical Abilities

With industry as partner to academia in student evaluation, the assessment will be more towards student analytical strengths. Such an evaluation will make academia and students to concentrate more to develop these skills. The study through industrial survey point out that 25% respondent industries believe that students may acquire good analytical strengths on the scale of large to great extent with industry becoming partner to academia in student evaluation. The overall respondent industrial views about student analytical strengths are projected in Fig.4.58
4.5.3.5 Assessment about Managerial Skills

With the entire world as a market and national borders becoming increasingly irrelevant, the potential for organization to grow expands dramatically. There are considerable challenges in managing global as well as internal businesses. Managers have to deal with economic, political and cultural differences. The purpose here is to understand trainer’s role in preparing students equipped with these skills. The survey indicates that 15.62% respondent industries believe that students may acquire good managerial skills on the scale of large to great extent with industry becoming partner to academia in student evaluation. The overall respondent industrial views about student managerial skills are highlighted in Fig.4.59

4.5.3.6 Assessment about Research and Development Skills

Large industries have developed their own research and development centers. These industries look for people who can design, analyze and interpret so that a recognized and specific need for production of useful materials, devices, systems or improvement in prototypes and new processes can be met through development. The purpose here is to have assessment of student’s research and development skills. The survey indicates that 17.18%
respondent industries are of the belief that students may acquire good research and development skills on the scale of large to great extent with industry becoming partner to academia in student evaluation. The overall respondent industrial views about student research and development skills are highlighted in Fig.4.60

4.5.3.7 Assessment about Software Applications knowledge

The feedback on knowledge to software applications are gathered as software’s usage is the need of an hour and every engineer must possess sufficient proficiency to augment proficiency and to make work simple. The study point out that 39.06% respondent industries believe that students may acquire good knowledge of software applications on the scale of large to great extent with industry becoming partner to academia in student evaluation. The overall respondent industrial views about student knowledge of software applications is projected in Fig.4.61
4.5.3.8 Assessment about Soft Skills

With changing educational trends, versatility in educational courses, availability of masses of qualified personnel, the competition for job acquisition and job sustainability is becoming tougher. The soft skills have become important in today’s corporate scenario and it has taken an edge over hard skills. Most employers these days wants to hire, retain and promote persons who are dependable, resourceful, ethical, and self directed, having effective communication, willing to work and learn and have positive attitude. The study indicates that 17.19% respondent industries believe that students may acquire good soft skills on the scale of large to great extent with industry becoming partner to academia in student evaluation. The overall respondent industrial views about student soft skills is projected in Fig.4.62

![Feed Back on Soft Skills](image)

Fig.4.62: Feed back on Soft Skills

4.5.4 Assessment about Impact of Industrial Evaluation

The assessment about impact of joint evaluation through industry-academia interface is studied through industrial survey, in the areas of sharpening student knowledge, improving employability, enhancing live projects opportunities and in getting feed back on weak areas. The study indicates that on the scale of large to great extent 75% respondent industries believe that joint evaluation provides feed back on weak areas, 50% respondent industries believe that it sharpens student’s knowledge and improves learning quality, 34.37% respondent industries believe that it improves employability and 63.5% respondent industries is of the opinion that it enhances opportunities in getting live projects for industrial training. Overall respondent industrial views are projected in Table-4.2
### Table-4.2: Impact of Industrial Evaluation

<table>
<thead>
<tr>
<th>Activity</th>
<th>To Great Extent</th>
<th>To Large Extent</th>
<th>To Small Extent</th>
<th>To Little Extent</th>
<th>Not at All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed back on weak areas</td>
<td>12.50</td>
<td>62.50</td>
<td>20.31</td>
<td>1.56</td>
<td>0.0</td>
</tr>
<tr>
<td>Sharpens student’s knowledge and quality</td>
<td>1.56</td>
<td>48.44</td>
<td>45.31</td>
<td>1.56</td>
<td>0.0</td>
</tr>
<tr>
<td>Improves employability</td>
<td>7.81</td>
<td>26.56</td>
<td>59.38</td>
<td>3.12</td>
<td>0.0</td>
</tr>
<tr>
<td>Enhances opportunities for industrial live projects</td>
<td>6.25</td>
<td>56.25</td>
<td>32.81</td>
<td>1.56</td>
<td>0.0</td>
</tr>
</tbody>
</table>

#### 4.5.5 Assessment about Academia-Industry Ratio in Student Evaluation

For joint evaluation industries views were gathered about industry-academia ratio. Analysis indicates that many options came, but 2:1 is the most suggested ratio by majority of respondent industries. Fig.4.63 provides overall respondents industries views about institute-industry ratio in student’s evaluation.

![Fig.4.63: Academia-Industry Ratio in Evaluation](image)

#### 4.5.6 Survey Outcome on Student Evaluation

Student evaluation is dominated by institute faculty and industrial participation is fairly poor. Evaluations need not be an institutional propriety. Industrial participation in student’s seminar and project evaluation is somewhat better in comparison to paper setting; answer
sheets evaluation, laboratory evaluation and workshop evaluation. Industrial evaluation is extremely effective in getting information on weak areas. It is quite effective in managing student industrial projects, sharpening student’s knowledge and to some extent in improving employability. Feed back through evaluation is quite useful in improving student basic concepts, soft skills, managerial skills, research and development skills which otherwise are comparatively student weak areas. Students seem to be well versed with software applications and its use age. Most appropriate academia-industry ratio for student’s evaluation appears to be 2:1.

4.6 Assessment of Industry-Academia Interface through Resource Sharing

Industries and institutions are passing through highly competitive phase. Cut throat competition is predominant. Survival is of the fittest and financial constraints are looming large. No organization is able to satisfy all the needs of its clientele. It is slow but sure death if academia can’t raise resources and industry can’t innovate (Nanda Tarun and Singh T.P., 2008). The purpose of resource sharing is to have access to those resources which fall outside their scope. Resource sharing is not merely mutual sharing of infrastructure, but it is a concept which is developed to include many cooperative activities between industry and academia in meeting their needs. In the present work the assessment is made through industrial survey on the extent of sharing of resources in the field of software’s, in sharing of testing laboratories, in sharing of library, in sharing of training center and in sharing of recreation centre. The study is also made to understand the impact of resource sharing in improving industry-academia relations, in generating money, in improving research and development activities, in hunting potential viable candidates for employment and project training and to understand industry local standing. The status about donation of industrial equipment to academia, permission to visit industry and the effectiveness of industrial visits in student academic program is analyzed through this survey. The industrial feed back received and compiled through survey reflects the following:

4.6.1 Assessment about Software Sharing Status

Different industries use different software’s for the same work. All software’s may not be available with one institute. In most of the places utilization of software’s to its full capacity
is normally not happening. Sharing of software’s with academia will not only improve its utilization, but will help students to pick up the use of software’s which are very much locally in use. Through industrial survey an attempt is made to understand the extent of software sharing between industry and academia. The feed back reveals that only 1.59% respondent industries believe that sharing of software’s between industry and academia is good and which is on the scale of large to great extent. Most of the respondent industries believe that practically there is no sharing of software’s between industry and academia. Overall respondent industries perception about sharing of software’s between industry and academia is highlighted in Fig.4.64

4.6.2 Assessment about Testing Laboratories Sharing Status
Much attention has not been paid to the laboratories in most of the institutions and they are the most neglected one. In the name of laboratories, cheap and old equipments in the form of models are kept. High cost equipments involving simulations are rarely seen. Large industries employ hi-tech labs for highly specialized applications to combine the highest levels of accuracy and precision with design innovations. The development of these laboratories needs plenty of experience and finance. Such laboratories once made open to student under industry-academia guidance, the students are expected to become more technology driven professional. Through industrial survey a study is made to understand the extent of sharing of laboratories between industry and academia. The feed back reveals that only 1.59% respondent industries believe that sharing of laboratories between industry and academia exists on scale of large to great extent. Most of the respondent industries believe that practically there is no sharing on this front between industry and academia. Overall
respondent industries perception about sharing of laboratories between industry and academia is shown in Fig.4.65

4.6.3 Assessment about Library Sharing Status
Library is a source of information and industrial library mostly contains the books, catalogue related to industrial products. These books are written in simple and straight language. It usually contains cut section details and step by step information about various parts through assembly and disassembly. It strengthens conceptualization, improves understanding about technology and its applications. It helps to understand what current technologies are in use. The feedback through survey reveals that 6.35% respondent industries believe that sharing of industrial library between industry and academia exists on scale of large to great extent. Fig.4.66 projects the overall library sharing facilities available to students.

4.6.4 Assessment about Sharing of Training Centre
Indian technical education system lays more weight age to theory against practice. Technology innovative countries are opposite to this. Institutions in the name of workshop,
have kept just few old machines, where as industries are extensively making use of CNC based machines. Most of the foreign joint ventured training centers in India too have employed state of the art machines through which they not only impart best training to their students, but generate money for their organization by doing production jobs. This sort of training not only creates better placement opportunities for their students, but brings greater satisfaction to their stake holders. Sharing of such training centers by academia will definitely make students industrial friendly. Through industrial survey a study is made to understand the extent of sharing of training centre between industry and academia. The feedback reveals that 6.35% respondent industries believe that sharing of training centre between industry and academia exists on scale of large to great extent. Overall respondent industries perception about sharing of training centre between industry and academia is shown in Fig.4.67

![Sharing of Training Centers](image)

**Fig.4.67: Training Centre Sharing Status**

### 4.6.5 Assessment about Sharing of Recreation Centre

Sharing of recreation centre helps to develop intimate relations between industry and academia. This opens platform for further interactions which may bring qualitative changes and open up avenues in consultancy, industrial training, student projects, seminars, adjunct faculty, personality development and permanent recruitment. The assessment made about sharing of recreation centers between industry and academia reveals that 4.76% respondent industries believe that sharing of recreation centre exists on scale of large to great extent. Overall respondent industries perception about sharing of recreation centre between industry and academia is highlighted in Fig.4.68
4.6.6 Assessment about Donation Status of Industrial Equipment to Academia

Industries look to institutions for their manpower requirements. Industrial quality is based on the institutional input. Quality can be strengthened with better faculty and infrastructure. Industries keep on adding state of the art equipment to enhance product quality and reliability. Some of the industries prefer to donate their surplus/old equipments to academia instead of selling it in scrap, so that institutions can make use of these equipments to strengthen teaching learning process which ultimately is going to help them indirectly. Feed back through industrial survey indicates that 3.18% respondent industries donate equipment to academia free of cost and 4.76% respondent industries donate equipment on nominal cost.

4.6.7 Assessment about Permission to visit Industries

Industrial visits carry lot of significance. Learning in class rooms gets strengthened through industrial visits. Visualization gives boost to analyzing power and one is able to co-relate theory with application in much better way. Visits keep people abreast with what new is going on in an industrial sector. Many industries are positive to such visits and allow their men to interact with institute faculty and student. However some of the industries do not give permission, it may be on account of secrecy or some other reasons. Assessment made through industrial survey about what percentage of industries allows academia to interact through such visits reflects that 82.54% respondent industries are quite positive on this front.

4.6.8 Assessment about Effectiveness of Industrial Visits

Many years back practice of taking final year students on industrial tour was quite common. The purpose of this visit was to acquaint the students with the industrial atmosphere and to
make them aware about various technological practices being followed in different industries. This was also a platform to interact with industries about student’s industrial training and their final placement. Few years back this process some how discontinued, but many educational experts still advocate for such a system. Industrial views gathered about effectiveness of industrial visits in student academic program reveals that 50.79% respondent industries believe that industrial visits are quite effective in student academic program on scale of large to great extent. Overall respondent industries perception about industrial visits in student academic program is highlighted through Fig.4.69

4.6.9 Assessment about Resource Sharing Impact

The impact of resource sharing is studied through industrial survey in improving industry-academia-interface, in improving industrial research and development, in hunting best talent for recruitment and project training, in generation of money and in getting local recognition.

The results of study indicate the followings:

4.6.9.1 Assessment about Impact of Resource Sharing on Industry-Academia Interaction

Resource sharing is need based which requires lot of interaction initially to take a start. Interaction brings people more closely through frequent exchange of thoughts. Through industrial survey an improvement in industry-academia relations is studied with resource sharing. The feed back reflects that 58.73% respondent industries are of the opinion that resource sharing is quite effective in improving industry-academia-interface on the scale of large to great extent. Overall respondent industries perception about improvement in industry-academia-interface is highlighted through Fig.4.70
4.6.9.2 Assessment about Impact of Resource Sharing in Money Generation

The purpose of resource sharing is to make use of facilities which one do not have, but are available with someone else. This improves utilization capacity of the available resources and generates money for an organization. Industrial survey projects the feed back on money generation through sharing of resources. The study divulges that 7.94% respondent industries believe that resource sharing is quite effective in getting back the cost of equipment on scale of large to great extent. Overall respondent industries perception about money generation through resource sharing is projected through Fig.4.71

4.6.9.3 Assessment about Impact of Resource sharing in getting Local Recognition

Resource sharing brings people more closely and when resource sharing is between large numbers of organizations, the interaction becomes extensive and it makes the people or organizations more locally known. The feed back through survey reflects that 20.64% respondent industries are of the opinion that through resource sharing industries get good local recognition on the scale of large to great extent, where as 34.92% respondent industries
are of the opinion that they get local recognition to small extent Overall respondent industries perception about local recognition is highlighted through Fig.4.72

Fig.4.72: Impact of Resource Sharing in Local recognition

4.6.9.4 Assessment about Impact of Resource Sharing in Research and Development

Through resource sharing industrial people gets a chance to interact with various faculty members, through which they understand industrial strengths, faculty competencies and their areas of specialization. Through resource sharing improvement in industrial research and development activity is studied and the feed back indicates that 14.29% respondent industries are of the opinion that it improves research and development activities on the scale of large to great extent. Overall respondent industries perception about improvement in research and development activities is highlighted through Fig.4.73 (Refer Section-V, Question-5 (d) under Sharing of Resources domain in Annexure-A).

Fig.4.73: Impact of Resource Sharing in Research and Development
4.6.9.5 Assessment about Impact of Resource Sharing in Hunting Talent

Talent is natural abilities, qualities or unusual innate ability which a person possesses. Talent tracking is one of an important and difficult task before any human resource department. In order to effectively tap the best talent, large industries employ best human resource professionals, who are able to understand the psychology, needs, expectations and satisfaction levels of interested people, which play a very constructive role in organizational development. Industries and institutions during resource sharing come closer to each other and this interaction creates a platform for both of them to understand each other strengths and to look for more collaborative activities including student's industrial project training and manpower recruitment. Through industrial survey importance of resource sharing in hunting talent for industrial training and for permanent manpower is studied and the feedback indicates that 49.21% respondent industries are of the view that resource sharing improves talent tracking on the scale of large to great extent. Overall respondent industries perception about improvement in talent tracking through resource sharing is highlighted in Fig.4.74

![Impact of Resource Sharing in Hunting Talent](image)

4.6.10 Survey Outcome on Resource Sharing

The resource sharing is a cost cutting technique and it is possible through better capacity utilization of available resources. The industry-academia resource sharing status is quite ominous in the field of software's, use of laboratories, library, training centers and in recreation centers. Academia which is one of the largest manpower developers does not get any industrial support in terms of equipment donation to train people on technologies. Resource sharing is a great mode to produce better industry-academia relations and in
tracking best talent for placement as well as for industrial training. It improves industrial research and development activities to certain extent and gives a boost in local recognition.

4.7 Assessment of Industry-Academia Interface through Seminars
Interaction through seminars in Indian education system stands on better footing in comparison to other industry-academia-interaction modes. Expert lectures from industry and academia are in great need to share observations and to expose each other with newer technologies. The interaction expands relation in better understanding of each other environment and resources. Through industrial survey a study is made, on the status of industry-academia-interaction through seminars, average number of industrial seminars per semester per institute, number of institutions covered under seminars, mode of seminar arrangement, level of industrial staff involved in delivering seminar, specific areas of seminars, normal and effective duration of seminars. An assessment is also carried out on 05 point scale about seminar frequency in different areas, student-faculty participation and interaction during seminars, effectiveness of seminars, level of interaction during and post seminar, improvement in skills through seminars, information on present and future industrial needs. The data thus collected and compiled reflects the following:

4.7.1 Assessment of Industrial Participation in Student Seminars
Through industrial survey present industrial participation status in student seminars was studied. The feedback indicates that 36.50% respondent industries do interact with academia through seminars. Overall respondent views is presented in Fig.4.75
4.7.2 Assessment about Average Number of Seminar per Semester per Institute
To understand industrial participation in student seminars a feedback is collected about number of visits an industry make per semester to deliver seminars. The assessment reflects that 23.81% respondent industries visit once to an institute for making presentations. The overall respondent views on number of visits per semester for seminar purpose is presented through Fig.4.76

![Number of Seminars Visits to same Institute](image)

Fig.4.76: Participation in Seminars in Same Institute

4.7.3 Assessment about Number of Different Institutes covered under Seminars
To understand whether industrial participation in student seminars is a casual or a regular affair, a feedback is collected about in how many different number of institutes industry makes a visit for delivering seminars. The assessment reflects that majority of respondent industries visits maximum between 1-2 different institutes per semester for seminar presentations. The overall respondent views on number of different institutions an industry visit for delivering seminars is presented through Fig.4.77

![Number of Different Institutions](image)

Fig.4.77: Participation in Seminars in Different Institutes
4.7.4 Assessment about Arrangement Mode of Seminars
The purpose here is to assess academia stake holder’s interest in updating academia on various technological issues through seminars. The study is made whether industrial faculty come forward on its own or through academia request for delivering seminars in the institute. The role of any industry-academia tie up or any agreement between academia and local industrial associations is also studied for holding seminars. The feedback indicates that majority of seminars are arranged through academia request only. The overall respondent views on seminar arrangement is highlighted through Fig. 4.78

![Mode of Seminar Arrangement](image1)

Fig.4.78: Mode of Seminar Arrangement

4.7.5 Assessment about Level of Participating Industrial Faculty in Seminars
Level of industrial faculty involved in delivering seminars is assessed through industrial survey. Through this study an analysis is made whether the faculty involved in seminars is up to rank of manager, higher than the rank of manager but lower than the rank of general manager or they are the people who are either general manager or of rank higher than that.

![Level of Industrial Faculty](image2)

Fig.4.79: Level of Industrial Faculty involved in Seminars
The feedback indicates that 22.22% respondent industries are of the view that normally faculty involved in delivering seminars in institutes are of the rank higher than that of managers but lower than the rank of general managers. The overall respondent views on level of industrial participation in delivering seminars to academia is presented through Fig.4.79

4.7.6 Assessment about Seminars Frequency

Through industrial survey an assessment is made on 5-point scale: 1 (to great extent), 2 (to large extent), 3 (to some extent), 4 (to little extent), and 5 (not at all) about frequency of seminars being held, on issues related to current technologies, on issues related to research and development, on issues related to entrepreneurship development programs, on issues related to sales promotion and on issues related to personality development programs. The data collected through survey was compiled, analyzed and the feedback reflects the followings:

4.7.6.1 Assessment about Seminars Frequency on issues Related to Current Technologies

Assessment through industrial survey indicates that 34.92% respondent industries are of the view that issues related to current technologies are covered in student seminars on the scale of large to great extent. Over all respondent views about frequency of seminars on issues related to current technologies is presented in Fig.4.80

![Seminars Frequency on issues related to Current Technologies](image)

**Fig.4.80: Seminars Frequency Related to Current Technology**

4.7.6.2 Assessment on Seminars Frequency Related to Research and Development

Assessment reflects that 20.64% respondent industries are of the view that issues related to research and development are covered in student seminars on the scale of large to great extent.

97
extent. Over all respondent views about frequency of seminars on issues related to research and development is presented through Fig.4.81

**Fig.4.81: Seminars Frequency Related to Research and Development**

### 4.7.6.3 Assessment on Frequency Related to Entrepreneurship Development

Assessment points out that 9.53% respondent industry are of the view that issues related to entrepreneurship development are covered in student seminars on the scale of large to great extent. Over all respondent views about frequency of seminars on issues related to entrepreneurship development is presented in Fig.4.82

**Fig.4.82: Seminars Frequency Related to Entrepreneurship Development**

### 4.7.6.4 Assessment on Seminars Frequency Related to Sales Promotion

Assessment indicates that only 4.76% respondent industries are of the view that issues related to sales promotion are covered in student seminars on the scale of large to great extent. Over all respondent views about frequency of seminars on issues related to sales promotion is presented in Fig.4.83 (Refer Section-VI, Question No. 7 (d) under Seminars domain in Annexure-A).
4.7.6.5 Assessment on Seminars Frequency Related to Personality Development Programs

Assessment indicates that 12.7% respondent industries are of the opinion that issues related to personality development programs are covered in student seminars on the scale of large to great extent. Over all respondent views about frequency of seminars on issues related to personality development programs is presented through Fig.4.84

4.7.7 Information about other Seminar Areas

Apart from five different seminar areas which are covered above, the information was also gathered about other specific areas on which seminars are frequently delivered. The feedback indicates that small number of respondent industries have pointed out about some other seminar areas viz. new products, new technologies, future of technologies, knowledge sharing, corporate responsibility and HR employee development. Over all respondent views about other specific areas which are covered during seminars is highlighted through Fig.4.85
4.7.8 Assessment about Faculty Participation in Seminars

Certain institutions have earmarked certain free periods during which seminars are conducted so that the entire departmental faculty can participate in seminars along with students, but in number of other institutions such a system is non existent. Through industrial survey an assessment is made on earlier defined 05 point scale about level of faculty participation in student seminars. Assessment indicates that 19.05% respondent industries believe that institute faculty participation in student seminars is quite good on the scale of large to great extent. Over all respondent views about faculty participation in student seminars is highlighted through Fig.4.86.

![Faculty Participation in Seminars](image)

4.7.9 Assessment about Faculty Interaction during Seminars

In institute certain faculty members are always quite active, but few of them may be passive also. To understand active involvement of faculty members during seminars, an assessment is made through industrial survey about faculty interaction. Assessment indicates that 25.4%
respondent industries are of the opinion that faculty interaction during seminars is quite good on the scale of large to great extent. Over all respondent views about faculty interaction in seminars is highlighted through Fig.4.87

![Faculty Interaction Status in Seminars](image)

**Fig.4.87: Faculty Interaction in Seminars**

### 4.7.10 Assessment about student Interaction during Seminars

Active interaction depends on host of factors viz. the presentation mode, quality of content, student level etc. However an idea is gathered about level of student interaction in general. The feedback indicates that 30.15% respondent industries are quite positive on the scale of large to great extent about student interaction. Over all respondent views about student interaction level in seminars is highlighted through Fig.4.88

![Student Interaction Status in Seminars](image)

**Fig.4.88: Student Interaction in Seminars**

### 4.7.11 Assessment about Seminars Effectiveness

The seminar effectiveness in student academic program is studied through industrial survey. Feed back reflects that 31.74% respondent industries are of good belief that seminar enhances effectiveness of student academic programs. Around 54% industries were silent on
4.7.12 Assessment about Faculty Post Seminar Interaction Status

Certain queries may remain unanswered in the minds of participants after seminars. An assessment is made about post seminar interaction. The feedback indicates that 14.29% respondent industries are of the opinion that faculty post seminar interaction on earlier delivered seminars is quite good on the scale of large to great extent. Over all respondent views about faculty post seminar interaction is highlighted through Fig.4.90

![Fig.4.89: Seminars Effectiveness](image)

**Seminars Effectiveness**

- To Great Extent: 53.96%
- To Large Extent: 26.98%
- To Small Extent: 14.29%
- To Little Extent: 0.00%
- Not at All: 0.00%
- Not Responded: 0.00%

Industries: 102

4.7.13 Assessment about Student Post Seminar Interaction Status

Post seminar interaction status of student was studied through industrial survey. The feedback indicates that 17.46% respondent industries are of the opinion that student post seminar interaction on earlier delivered seminars is quite good on the scale of large to great extent. Over all respondent views about student post seminar interaction is highlighted through Fig.4.91

![Fig.4.90: Faculty Post Seminar Interaction Status](image)

**Faculty Post Seminar Interaction Status**

- To Great Extent: 53.96%
- To Large Extent: 26.98%
- To Small Extent: 14.29%
- To Little Extent: 0.00%
- Not at All: 0.00%
- Not Responded: 0.00%

Industries: 102
4.7.14 Assessment about Improvement in Student Attributes through Seminars

Through industrial survey the role of seminars in improving various student attributes was studied. The various attributes of study was taken as communication skills, technological upgradation, leadership skills, confidence level, inspiration to work in specific areas, information about opportunities in new fields and future needs of industry. The data collected through survey was compiled and analyzed and the feedback reflects the followings:

4.7.14.1 Assessment about Improvement in Communication Skills through Seminars

An assessment indicates that 25.39% respondent industries are of the opinion that seminars improve student communication skills on the scale of large to great extent. Overall respondent views about improvement in student communication skills is highlighted through Fig.4.92.
4.7.14.2 Assessment about Improvement in Technological Up-Gradation information

A study is made to understand improvement in information on technology up gradation through seminars. An assessment indicates that 52.39% respondent industries believe that seminars have strong potential to up date students on technologies on the scale of large to great extent. Over all respondent views about improvement in information on technology up gradation through seminars is highlighted through Fig.4.93

![Fig.4.93: Improvement in Information on Technology Up-gradation](image)

4.7.14.3 Assessment about Improvement in Leadership Skills through Seminars

An assessment indicates that 17.45% respondent industries are of the opinion that through seminars student’s leadership skills improves considerably on the scale of large to great extent. Over all respondent views about improvement in student leadership skills through seminars is highlighted in Fig.4.94 (Refer Section-V, Question-10 (c) under Sharing of Resources domain in Annexure-A).

![Fig.4.94: Improvement in Leadership Skills Skill through Seminars](image)
4.7.14.4 Assessment about Improvement in Confidence Level through Seminars

Assessment was carried out about improvement in student confidence level through seminars. Study indicates that 42.85% respondent industries believe that seminars are quite effective in improving student confidence level on the scale of large to great extent. Over all respondent views about improvement in student confidence level through seminars is highlighted through Fig.4.95 (Refer Section-VI, Question No. 10 (d) under Seminars domain in Annexure-A).

![Improvement in Confidence Level through Seminars](image)

4.7.14.5 Assessment about Improvement in Inspiration to Work in Specific Areas

Seminar provides information about possible work areas and opportunities to grow in those areas. This brings an inspiration in young students to look for specific areas in which they are more interested to work. An assessment indicates that 50.79% respondent industries are of the opinion that inspiration to work in specific areas through seminars improves greatly on the scale of large to great extent. Over all respondent views about improvement in student’s inspiration to work in specific areas through seminars is highlighted in Fig.4.96

![Improvement in Inspiration to Work in Specific Areas](image)

Fig4.96: Improvement in Inspiration to Work in Specific Areas
4.7.14.6 Assessment about Improvement in Information on Present and Future Industrial Needs through Seminars

Seminars are a good source of interaction to make people abreast with present and future industrial needs. An assessment indicates that 60.31% and 58.73% respondent industries believe that good improvement on the scale of large to great extent occurs in student understanding on present and future industrial needs through industrial seminars. An over all respondent views about improvement in student understanding on present and future industrial needs are highlighted through Fig.4.97 and Fig.4.98 respectively.

4.7.15 Assessment about Seminars Duration

Through this study an assessment about duration of seminar was made. The feed back reflects that majority of respondent industries are involved in delivering seminars for a maximum duration of 2 hours. Few respondent industries have given their own options. Over all respondent views about seminars duration is highlighted in Fig.4.99
4.7.16 Assessment about Effective Seminars Duration
An assessment was carried out to understand about an effective duration of seminar. The feedback reflects that majority of respondent industries recommend that 2 hours duration is an effective duration of seminar. Over all respondent views about effective seminar duration is highlighted through Fig.4.100

4.7.17 Survey Outcome on Student Seminars
Academia enjoys better interaction with industry through seminars. Industrial participation is limited to 1-2 institutes and normally once a semester. Staff involved in seminars is either managers or higher but normally below the rank of general managers. Common topic of discussions is issues related to current technologies and research and development. Issues related to entrepreneurship development, sales promotion and personality development programs are also high on heels. Off and on issues pertaining to new products, future of
technologies, corporate responsibility and human resource development also make a mark. Interaction during seminars remains quite effective. Post seminar interaction is comparatively weak. A seminar is a good source to have feedback about opportunities in new fields, present and future industrial needs and technology upgradation. It inspires people to work in specific areas and boosts their confidence level. Its low positive impact is also expected in student communication and leadership skills. The usual and effective duration of seminars is about 2 hours.

4.8 Assessment of Industry-Academia-Interface through Research and Development Projects

Research and development activity is the backbone of industry-academia relations and progress of any country is judged through its research and development activities. The research is mostly dominated by academicians, but the research conducted in the universities need to be transformed in an industry. (Jaidka Ravi, 2007) has pointed out importance of joint collaboration that advanced manufacturing countries have invested a lot of money in setting up better research and development centers through industry academia interface. To close the gap between engineering and industrial design there is a need to apply leading edge technology and use of simulation tools for product development (Kumar Pavan, 2007). Till few years back bigger industry believed in borrowing technologies from outside, but to day we are surrounded with fast emerging technological innovations and therefore without industry-academia-interaction research and development activities would be quite irrelevant. Strength of industry-academia relations can be assessed through number of successful completion of industrial projects jointly or singly by an academic faculty. Through industrial survey a study is made to understand academic participation status in industrial research, level of academia participation in industrial research, mode of participation, project completion life cycle, institute preference, research collaborating partners, institute selection criteria for research activities, status of own research and development activities and experience about research collaborations with academia. An assessment is also carried out on 05 point scale about various barriers in research and development collaborations. The data thus collected and compiled reflects the followings:
4.8.1 Assessment of Academia Participation in Industrial Research

(Sahrawat Rajdeep, 2007) has emphasized that to facilitate knowledge diffusion between student and research; the specialized educational institutes should be located close to research institutes involved in research and development. Through industrial survey an assessment was made about status of academia involvement in industrial research. The feed back indicates that 30.16% respondent industries involve academia in their research and development activities. Overall respondent views about academia participation in industrial research is highlighted through Fig.4.101

![Assessment about Academia Involvement in Industrial Research](image)

Fig.4.101: Academia involvement in Industrial Research

4.8.2 Assessment about Level of Academia Participation in Industrial Research

The level of academia involvement in handling industrial research and development projects is studied on 05 point scale through industrial survey. The feed back indicates that 6.35% respondent industries believe that academia is greatly involved on the scale of large to great extent in their research and development work. Overall respondent views about level of academia participation in industrial research is highlighted through Fig.4.102

![Assessment about Level of Academia Participation in Industrial Research](image)

Fig.4.102: Level of Academia Participation in Industrial Research
4.8.3 Assessment about Mode of Participation in Industrial Research
Through industrial survey an assessment is made about whether industrial projects are handled by academia singly or jointly. The feedback reflects that 17.46% respondent industries believe that academia handle these projects singly where as 22.22% respondent industries believe that these projects are done jointly. 60.32% respondent industries were silent on this issue.

4.8.4 Assessment about Project Completion Life Cycle
Assessment is made to understand about normal expected project completion life cycle. The feedback reflects that majority of respondent industries believe that these projects can be completed with in a span of 3-6 months. Overall respondent views about project completion life cycle is highlighted through Fig.4.103.

<table>
<thead>
<tr>
<th>Assessment about Project Completion Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 3 Months: 9.52%</td>
</tr>
<tr>
<td>3-6 Months: 30.16%</td>
</tr>
<tr>
<td>Up to 1 Year: 4.76%</td>
</tr>
<tr>
<td>Any Other: 0.00%</td>
</tr>
<tr>
<td>Not Responded: 55.56%</td>
</tr>
</tbody>
</table>

Fig.4.103: Assessment about Project Completion Life Cycle

4.8.5 Assessment about Preference of Institutions for Research Projects
Research is a highly intellectual work and requires subject expertise to handle industrial projects. An assessment is made through industrial survey to understand about industrial preference for an institute which can complete their research work with in a stipulated period as per industrial terms. The feedback reflects that majority of respondent industries prefer Indian Institute of Technologies to accomplish their research work. Many respondent industries have given multiple options. Overall respondent industrial views about preference of an institute for research work is highlighted through Fig.4.104 (Refer Section-VII, Question-6 under R&D Projects domain in Annexure-A).
4.8.6 Assessment about Collaborative Partners in Industrial Research

Through industrial survey an assessment is made about industrial research collaborative partners. The study is targeted to understand whether only institute faculty is involved, faculty and student are involved, industry and faculty is involved and industry-faculty-students are involved.

Fig. 4.104: Preference of Institutions for Research Work

Fig. 4.105: Industrial Research Collaborative Partners
The assessment is also made to understand about involvement of only students in industrial research as few industries may provide this information on account of student being attached to research and development department during their industrial project training. The feedback reflects that majority of respondent industries have given option where they have shown students as their collaborative partners in doing industrial research. Next to student collaborative partners, it is followed by joint research conducted by industry and academia together. Overall respondent industrial views about collaborative partners of industrial research is highlighted through Fig.4.105

4.8.7 Assessment about Institute Selection Criteria for Industrial Research

Through industrial survey an assessment is made about how industries decide on an institute to whom research work is to be given. The options to answer were number of projects a faculty has handled, previous industrial experience and level/qualification of faculty members. Many respondent industries have given their own options. The feedback indicates that 14.29% respondent industries decide on the basis of previous experience. Overall respondent industrial views about decision on institute for industrial research is highlighted through Fig.4.106

![Institute Selection Criteria for Research](image)

Fig.4.106: Institute Selection Criteria for Research

4.8.8 Assessment about Industry own Research and Development Activities

An assessment is made whether respondent industries carry their own research and development activities or not. The feedback indicates that 60.32% respondent industries have their own research and development centre. Overall respondent industrial views about their own research and development centre is highlighted through Fig.4.107
4.8.9 Assessment about Research and Development Collaborating Experience

Through industrial survey an assessment is made about industry collaboration experience with academia. The feedback indicates that 12.69% each respondent industry enjoyed fair to good research and development collaborating experience. Overall respondent industrial views about research and development collaborating experience with academia is highlighted through Fig.4.108

4.8.10 Assessment about Research and Development Collaborating Barriers

Through industrial survey a study has been made using 05 point scale: 1 (to great extent), 2 (to large extent), 3 (to some extent), 4 (to little extent), and 5 (not at all) to assess various barriers which come in the way of industry-academia collaborations viz. lack of communication, lack of committed individuals on either side, lack of commitment at the top, lack of recognition for collaborative work and lack of transparency and system openness, The data thus collected and compiled reflects the following:
4.8.10.1 Assessment about lack of Communication as a Barrier

Communication is a powerful tool in bringing people together. Through industrial survey an assessment is made how industry considers lack of communication as a barrier in the collaboration of research and development. The feedback indicates that 9.52% respondent industries believe that lack of communication play major role on the scale of large to great extent as a barrier in generating industry-academia collaboration in research and development. The overall assessment about lack of communication being a barrier in industry-academia collaboration is projected in Fig. 4.109.

![Lack of Communication as Barrier in R & D Collaboration](image1)

Fig. 4.109: Lack of Communication as Barrier in Collaboration

4.8.10.2 Assessment about lack of Committed Individuals as a Barrier

It is a common phrase that half the work is complete if people are committed. An assessment is made how industry considers lack of commitment as a barrier in the collaboration of research and development. The feedback indicates that 6.36% respondent industries believe that lack of committed people create strong barrier on the scale of large to great extent in producing industry-academia collaboration in research and development.

![Lack of Committed People as Barrier in R & D Collaboration](image2)

Fig. 4.110: Lack of Committed People as Barrier in Collaboration
The overall assessment about lack of committed people being barrier in industry-academia collaboration is projected in Fig. 4.110.

4.8.10.3 Assessment about lack of Top Commitment as a Barrier
The people who are managing the system, if they are not committed, what will be its impact on organizational development. One such case has been studied about the impact in building collaboration between industry and academia in the field of research and development due to lack of top commitment. The feedback reflects that 9.53% respondent industries believe that lack of commitment at the top is one of the strongest barriers on the scale of large to great extent in developing industry-academia collaboration in the field of research and development. The overall assessment about lack of commitment at the top being a barrier in industry-academia collaboration is highlighted through Fig. 4.111.

4.8.10.4 Assessment about lack of Recognition of Collaborative Work as a Barrier
Missing recognition for any useful work being done, a person gets disheartened and loses interest. Through industrial survey an assessment is made about the impact of lack of recognition in developing collaboration in the field of research and development.

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**Fig. 4.111: Lack of Top Commitment as Barrier in Collaboration**

**Fig. 4.112: Lack of Recognition as Barrier in Collaboration**
The feedback indicates that 12.7% respondent industries believe that lack of recognition of collaborative work is a great barrier on the scale of large to great extent in developing industry-academia collaboration in the field of research and development. The overall assessment about lack of recognition of collaborative work being a barrier in industry-academia collaboration is projected through Fig. 4.112.

4.8.10.5 Assessment about lack of Transparency and System Openness as a Barrier

Transparency is essential to create trust between two different organizations. The feedback indicates that 23.81% respondent industries believe that lack of transparency and system openness work as a great barrier on the scale of large to great extent in developing strong industry-academia collaboration in the field of research and development. The overall assessment about lack of transparency and system openness being a barrier in industry-academia collaboration is highlighted through Fig. 4.113.

Fig. 4.113: Lack of Transparency as Barrier in Collaboration

4.8.11 Survey Outcome on Research and Development

Average academia involvement exists in industrial research. The research is handled singly as well as jointly by an academia in which student also participate. Average project completion cycle varies between 3-6 months. Industry gives top preference to Indian Institute of Technologies and government institutes for research activity. Decision on institute for research work is normally based on previous industrial research experience. Large number of industries has their own research centers. Industrial experience about research collaboration with academia is fair to good. Lack of communication, top commitment, recognition of work,
committed individual are no great barriers in research collaboration, however people want more transparency and openness in research collaborations.

4.9 Assessment of Industry-Academia-Interface through Adjunct Faculty

An adjunct faculty is a part-time faculty who does not hold a permanent position at that particular academic institution. Hiring adjuncts is done primarily to fill in courses that would add to an academic department's offerings. Adjunct faculty is less costly than full-time faculty in both salaries and benefits. The concept of adjunct faculty initially appeared to slash higher faculty costs in absence of availability of funds from government/ funding bodies. With exponential growth of technical institutions, availability of regular faculty has been drastically affected and role of adjunct faculty has gained momentum. The concept of industry-academia-interface through adjunct faculty here is slightly different and its purpose is not to save few chunks of money by employing adjunct faculty, but to make best use of talent and well educated faculty having rich industrial experience to supplement the predominantly "theoretical" focus of traditional full-time academics with a more pragmatic "real world" perspective. The fruits through involvement of senior adjunct faculty in management programs are well known to everyone. (Verma Pawan Kumar, 2007) has stressed that technical institutes should follow the business schools in training and deployment of faculty, where a part of faculty is employed who have served in top management positions in the corporate sector for quite a long period. Through industrial survey a study was made, on the status of industrial participation as adjunct faculty, participation status at undergraduate and at postgraduate level, involvement in full or partial course, involvement in specialized or in general course and level of industrial faculty involved in teaching. An assessment is also carried out on 05 point scale about reasons of low industrial involvement and impact of adjunct faculty in student learning. The data thus collected and compiled reflects the followings:

4.9.1 Assessment about Industrial Participation as Adjunct Faculty

Through industrial survey an assessment was made about present status of industrial participation in institute academic program as adjunct faculty. The feedback indicates that industrial participation in student academic program as adjunct faculty is considerably poor. 95.24% respondent industries are in no way connected with academia through adjunct
faculty. Overall respondent views about industrial participation in student academic curriculum as adjunct faculty is highlighted through Fig.4.114

4.9.2 Assessment about Adjunct Faculty Participation at U.G/P.G Level
An assessment was made whether the respondent industries participate as adjunct faculty at undergraduate, postgraduate or at both levels. The feedback reflects that out of 4.76% participating industries only 1.59% respondent industry is participating at both the levels i.e. at undergraduate and at postgraduate level. Remaining 3.17% participating industries were silent on this issue.

4.9.3 Assessment about Adjunct Faculty Participation in Full or Part Subject
Through industrial survey an assessment was made whether adjunct faculty is engaged for the full or the part subject. The feedback indicates that all the 4.76% participating industries are involved to teach only a part of the subject.

4.9.4 Assessment about Percent Syllabi to be covered by Adjunct Faculty
An assessment was done to understand about average percent syllabi covered through adjunct faculty. The feedback indicates that 3.17% participating industries states that they cover 25% subject syllabi, where as 1.59% participating industries have given their own option of covering 35% syllabus. Overall respondent views about average academic syllabus covered through adjunct faculty are highlighted in Fig.4.115 on next page.

4.9.5 Assessment about Type of Subjects Taught by Adjunct Faculty
An assessment was done whether adjunct faculty is engaged for teaching general, specialized or both types of subjects. The feedback indicates that all the 4.76% participating industries are of the view that industrial faculty is hired only to teach specialized subjects.
4.9.6 Assessment about Level of Industrial Staff engaged as Adjunct Faculty
An assessment was made to understand the level of industrial staff involved in teaching as adjunct faculty. The feedback reflects that 9.52% respondent industries are of the belief that industrial staff up to the rank of manager is involved, 3.17% respondent industries believe that that staff higher than the rank of manager but below the rank of general manager is involved and 3.17% respondent industries believe that they are the persons either of the rank of general manager or of higher than that.

4.9.7 Assessment about Impact of Industrial Adjunct Faculty on Learning
The impact of learning opportunities through participatory activities has started making a mark in software industries (Kakodkar Anil, 2003). Through industrial survey an assessment was made on 5-point scale: 1 (to great extent), 2 (to large extent), 3 (to some extent), 4 (to little extent), and 5 (not at all) about impact of industrial adjunct faculty in improving student basic concepts, improving student managerial skills, improving student analyzing power and improving their ability to co-relate use of technology. The data collected through survey was compiled, analyzed and the feedback reflects the followings:

4.9.7.1 Assessment about Improvement in Basic Concepts
Industry put lot of thrust on fundamentals and it is presumed that if the same course is taught by an industrial faculty student might develop better understanding of a subject. An assessment through industrial survey indicates that 49.2% respondent industries are of the belief that industrial teaching through adjunct faculty improves student basic concepts considerably on the scale of large to great extent. Over all respondent views about improvement in student basic concepts through adjunct faculty is highlighted in Fig.4.116
4.9.7.2 Assessment about Improvement in Managerial Skills
Industry demands good managerial skills from graduate engineers. An assessment through industrial survey indicates that 20.63% respondent industries believe that through industrial teaching student managerial skills can be enhanced considerably on the scale of large to great extent. Overall respondent views about improvement in student managerial skills through adjunct faculty is highlighted in Fig.4.117

4.9.7.3 Assessment about Improvement in Analyzing Power
Through industrial survey an assessment is made about improvement in student analyzing power if industry is also involved with academia in teaching students. The feed back reflects that 47.62% respondent industries are of the belief that teaching through industrial faculty
improves student analyzing strength on the scale of large to great extent. Over all respondent views about improvement in student analyzing strength through industrial faculty is highlighted in Fig.4.118

4.9.7.4 Assessment about Improvement in Ability to Co-relate use of Technology

The present system of education lacks information on use of technology in real life situations. Through industrial survey an assessment is made about improvement in student ability to comprehend use of technology with involvement of industrial faculty in teaching students along with academia. The feedback reflects that 79.35% respondent industries are of the belief that teaching through industrial faculty improves student ability to comprehend use of technology on the scale of large to great extent. Over all respondent views about improvement in student ability to comprehend use of technology through industrial faculty is highlighted in Fig.4.119

4.9.8 Assessment about Adjunct Faculty Barriers

The results of industrial assessment strengthens that industry-academia-interaction through adjunct faculty is quite frail. Some of the barriers which can be viewed as a possible threat to
industry-academia-interaction through adjunct faculty are included in this study and the various study barriers are high industrial work pressures, non-recognition of institute teaching work in an industry, non-availability of employer permission, low remuneration, lack of academia interest in inviting industrial faculty and fear of loosing industrial secrets. The feedback has been collected using 05 point scale: 1 (to great extent), 2 (to large extent), 3 (to some extent), 4 (to little extent), and 5 (not at all) to assess these various barriers. The data thus collected and compiled reflects the following:

**4.9.8.1 Assessment about High Work Pressure as a Barrier**

Work pressure in industrial sector remains quite high. This is true particularly at higher positions. Many times all of a sudden a problem crops up which needs an urgent attention to avoid stoppage of work. The study is made to understand how industries treat it as a barrier to work as adjunct faculty. The feedback reflects that 66.66% respondent industries believe that high work pressure is a strong barrier on the scale of large to great extent to work as adjunct faculty. Overall respondent views about high work pressure being a barrier to work as adjunct faculty is highlighted in Fig.4.120

![High Work pressure as Barrier to Adjunct Faculty](image)

**Fig.4.120: High Work Pressure as Barrier to Adjunct Faculty**

**4.9.8.2 Assessment about Non-recognition of academia Work in Industry as a Barrier**

Many people in industry are of the view that they don’t get recognition of any academic work being done by them. An assessment in this regard is made to understand how people in the industry treat it as a barrier to work as adjunct faculty. The feedback reflects that 28.58% respondent industries believe that non-recognition of academic work in an industry is a barrier on the scale of large to great extent to work as adjunct faculty. Over all respondent
views about non-recognition of academic work in an industry being a barrier to work as adjunct faculty is highlighted in Fig.4.121

4.9.8.3 Assessment about Employer Non-Permission as a Barrier
Certain industries don’t spare their employees to go and work somewhere else. An assessment is made to understand how people in the industry treat it as a barrier to work as adjunct faculty. The feedback reflects that 31.75% respondent industries believe that non-permission from an employer is a great hindrance on the scale of large to great extent to work as adjunct faculty. Over all respondent views about non-permission from an employer being a barrier to work as adjunct faculty is highlighted in Fig.4.122

4.9.8.4 Assessment about Low Remuneration as a Barrier
Institute wants to exploit the best industrial talent to work as industrial faculty, but on the remuneration part they are one of the bad pay masters. This is particularly true in government institutes who are governed by government by-laws. Through industrial survey an assessment is made to understand how people in the industry treat it as a barrier to work as adjunct faculty. The feedback negates this idea to great extent as only 11.11% respondent industries...
are of the opinion that low remuneration is a hindrance on the scale of large to great extent to work as adjunct faculty. Over all respondent views about low remuneration being a barrier to work as adjunct faculty is highlighted in Fig.4.123

**4.9.8.5 Assessment about Lack of Academia Interest as a Barrier**

Academia frequently talks about importance of industrial participation in student academic program. How many times an academia had really prepared an academic schedule in which certain periods were earmarked for industrial interaction. Through industrial survey an assessment is made to understand how people in the industry treat lack of academia interest as a barrier to work as adjunct faculty. The feedback reflects that 17.45% respondent industries are of the opinion that academia don’t show great interest on the scale of large to great extent in inviting industrial staff to work as adjunct faculty. Over all respondent views about lack of academia interest in inviting industrial staff to work as adjunct faculty, being a barrier is highlighted in Fig.4.124

**Fig.4.124: Lack of Academia Interest in inviting Industrial Staff as Barrier**
4.9.8.6 Assessment about Strong Industrial Secrecy as a Barrier

Certain industries are very secretive. They are afraid that their staff may not share details with outside people which can harm them or favour their competitors. In the process they avoid interaction with all other organizations including academia. Through industrial survey an assessment is made to understand how people in the industry treat it as a barrier to work as adjunct faculty. The feedback reflects that 19.04% respondent industries believe that strong industrial secrecy is a barrier on the scale of large to great extent to work as adjunct faculty. Overall respondent views about strong industrial secrecy being a barrier to work as adjunct faculty is highlighted in Fig.4.125.

4.9.9 Survey Outcome on Adjunct Faculty

Industrial adjunct faculty status is practically non-existent in Indian academics. The greatest barrier to industry-academia collaboration in adjunct faculty is high industrial work pressure followed by non permission from employer and non recognition of this work in industrial sector. Industry doesn't consider low institute remuneration as potential barrier to industry-academia collaboration. The impact of adjunct faculty is very wide and student can co-relate academic applications to a great extent. It has strong potential to improve student basics and their analyzing strength. It is also useful to small extent to refine student managerial skills.

4.10 Assessment of Industry-Academia Interface through Collaboration

In globalize world competition is tremendous and unavoidable. Every customer has a wide choice of goods and services available to him. In present scenario one can not be taken for granted. To exist in this situation we need to work together and form clubs, or else we will perish (Chatterjee Amit, 2003). Collaboration expands opportunities for mutual benefits.
Institute rely on industry for student project training, for resource sharing, for seminars, for curriculum development, for project evaluation, for industrial consultancy, for research projects, for adjunct faculty, for faculty development and for final destination of their graduate students to an industry. On the other hand industries look to institutes for their manpower requirements, for technical solution, for innovations, for employee’s continuing education, skill up gradation and knowledge transfer. (Salem Al Agtash, and Amjed Al Fahoum, 2008) states that knowledge-technology transfer is the core driver for national prosperity and enhancement of intellectual capital. Through industrial survey a study is made on the status of industry-academia collaboration. An assessment on 05 point scale is made about role of joint projects, resource sharing, continuing education, faculty industrial exposure, student industrial training, joint conferences, student seminars, joint workshops and curriculum development in constituting industry-academia collaboration. Strategies for productive industry-academia relationships, number of industrial collaborations, benefits of collaboration and feed back on different collaborative partners has also been analyzed through this study. The feed back thus collected and compiled reflects the following:

4.10.1 Assessment of Industry-Academia Collaboration Status
To draw mutual benefits, the necessity for collaboration has been realized both by academia and industry. To understand present industrial status of collaboration with academia, the feed back has been collected from various industries. The feed back indicates that only 9.52% respondent industries are associated with academia through collaborations, which appears to be a quite low figure.

4.10.2 Assessment about Domains Relation in Industry-Academia Collaboration
The relation of different interaction domains such as joint projects, resource sharing, continuing education of industrial staff, exposure to institute faculty in an industry, student industrial training, participation in joint conferences and workshops, student seminars, and curriculum development is studied by using 5-point scale: 1 (to great extent), 2 (to large extent), 3 (to some extent), 4 (to little extent), and 5 (not at all), in promoting industry-academia collaboration. The industrial feed back received and compiled through survey reflects the following:
4.10.2.1 Assessment about Role of Joint Projects in promoting Collaboration

Many industries take the help of reputed institutions like Indian Institute of Technology, National Institute of Technology and few other good institutes for certain industrial projects which are jointly taken up by industry and academia. The importance of such projects in building industry-academia collaboration is studied through this industrial survey. The feedback reflects that 25.40% respondent industries are of the opinion that such joint projects are in a position to promote industry-academia collaboration on scale of large extent. Overall assessment of respondent industries on role of joint projects in promoting industry-academia-collaboration is projected in Fig.4.126

![Joint Projects Relation in Industry-Academia-Collaboration](image)

Fig.4.126: Role of Joint Projects in Promoting Collaborations

4.10.2.2 Assessment about Role of Resource sharing in promoting Collaboration

Industry-academia interdependence has been felt with changing time. In this competitive world the sharing of resources is one important area of industry-academia interaction through which the best use of resources can be made and one can look for reduction in their product cost.

![Resource Sharing Relation in Industry-Academia-Collaboration](image)

Fig.4.127: Role of Resource Sharing in Promoting Collaborations
Through industrial survey the assessment is made about role of resource sharing in promoting industry-academia collaboration. The feedback indicates that 15.87% respondent industries are of the opinion that resource sharing is in a position to promote industry-academia collaboration on scale of large extent. Overall assessment of respondent industries on role of resource sharing in promoting industry-academia-collaboration is projected in Fig.4.127

4.10.2.3 Assessment about Role of Industrial Staff Training in Promoting Collaboration
To day industry is fully aware that their strength is their own employees. A book on Employees First, Customers Second has already been published by Harvard Business Press. Now a days industry attach great importance to welfare of their employees and make arrangement to upgrade their knowledge on newer technologies so that they are able to contribute more in industrial and personal growth. Such trainings are normally being carried out either in good institutes or through special trainers. The impact of continuing education is studied through industrial survey and the feedback indicates that 15.88% respondent industries believe that continuing education of industrial staff is quite important in promoting industry-academia collaborations on scale of large to great extent. Overall assessment of respondent industries on role of continuing education in promoting industry-academia-collaboration is projected in Fig.4.128

Fig.4.128: Role of Continuing Education in Promoting Collaborations
4.10.2.4 Assessment about Role of Industrial Exposure to Faculty in promoting Collaboration

Faculty industrial exposure is a widely talked issue amongst various sections of the society. Its importance has been regularly emphasized on various quality education forums, workshops and through research papers. There is a need to form a policy on industrial experience during faculty recruitment process. Existing faculty is to be deputed to an industry for industrial exposure, but the expected outcome can only be possible if industry is serious on to this issue and involve these faculty members in their industrial projects to make use of their academic experience. Through such an interaction the possibility of improvement in industry-academia-collaboration is studied and the feed back reflects that 17.46% respondent industries are of the opinion that during industrial exposure faculty interaction with industry is in a position to promote industry-academia collaboration on scale of large to great extent. Overall assessment of respondent industries on role of faculty industrial exposure in promoting industry-academia-collaboration is projected in Fig.4.129

![Figure 4.129: Role of Faculty deputed for Industrial Exposure in Promoting Collaborations](image)

4.10.2.5 Assessment about Role of Industrial Training in promoting Collaboration

Numbers of industries plan their visit to institute for selection of academic trainees. This sort of system is normally seen in those institutes where long academic training programs are available. Such students are asked to handle live projects under the command of industrial supervisor. This training being an integral part of a student academic program is also supervised by an institute faculty which helps the student to handle these projects in most comfortable and superior way. Depending upon regular good performance of students many times trainer industries prefer to enter in to collaboration with those institutes to which these students belong. The feed back through industrial survey reflects that 63.48% respondent
industries are of the opinion that industrial training can promote industry-academia
collaboration on scale of large to great extent. Overall assessment of respondent industries on
role of industrial training in promoting industry-academia-collaboration is projected in
Fig.4.130

![Industrial Training Relation in Industry-Academia-Collaboration](image)

Fig.4.130: Role of Industrial Training in Promoting Collaborations

### 4.10.2.6 Assessment about Role of Joint Conferences in promoting Collaboration

Academia is deeply involved in publishing papers. Research activities are regularly presented
in various national and international conferences or published through journals. Many good
presentations are seen through industrial staff, but this area is mainly dominated by academia
and people from research laboratories. Confederation of industries can be approached for
holding joint conferences so that researchers can share their research activities with people
from industry and make them aware about what new is available to remain competitive.
Through such interactions research which remains dumped in journals can be transferred to
industry.

![Joint Conference Relation in Industry-Academia-Collaboration](image)

Fig.4.131: Role of Joint Conference in Promoting Collaborations
Through industrial survey an assessment is made about role of joint conferences in promoting industry-academia collaboration. The feedback indicates that 25.40% respondent industries are of the opinion that joint research can be useful in promoting industry-academia collaboration on scale of large to great extent. Overall assessment of respondent industries on role of joint conferences in promoting industry-academia-collaboration is projected in Fig.4.131

4.10.2.7 Assessment about Role of Seminar in Promoting Collaboration
Seminars are vital to remain abreast with future and current technologies. Industry and academia encourage such activities to strengthen their knowledge. Many times such interaction paves a way for cordial relations to work jointly for each other benefits. Through this study an analysis is made to recognize the role of seminars in promoting industry-academia collaboration. The feedback indicates that 44.44% respondent industries are of the opinion that seminars are good interaction modes to promote industry-academia collaboration on scale of large extent. Overall assessment of respondent industries on role of seminars in promoting industry-academia-collaboration is projected in Fig.4.132

![Seminars Relation in Industry-Academia-Collaboration](image)

Fig.4.132: Role of Seminars in Promoting Collaborations

4.10.2.8 Assessment about Role of Joint Workshops in promoting Collaboration
Workshop held jointly between industry and academia either for industrial or for academic cause is a boon to development. Such interactions reinforce relations between both of them and tend to improve academic working. The study through survey projects that 20.63% respondent industries are of the opinion that interaction through joint workshops is quite effective in promoting industry-academia collaboration on scale of large extent. Overall
assessment of respondent industries on role of joint workshops in promoting industry-academia-collaboration is projected in Fig. 4.133

4.10.2.9 Assessment about Role of Curriculum Development in promoting Collaboration
Curriculum development is a source of interaction through which industry highlights their requirements to modify the academic syllabus in order to train the students on the technology which are very much in demand in industry. The study through survey indicates that 15.87% respondent industries are of the opinion that interaction through curriculum development is quite helpful in promoting industry-academia collaboration on scale of large extent. Overall assessment of respondent industries on role of curriculum development in promotion of industry-academia-collaboration is projected in Fig. 4.134

4.10.3 Assessment about Barriers in Industry-Academia-Collaborations
There are certain inhibitors which come in the way of collaboration which are called impedances against the flux of benefits to the collaborating partners. Through industrial survey, respondent industries views on 5-point scale: 1 (to great extent), 2 (to large extent), 3
(to some extent), 4 (to little extent), and 5 (not at all) were gathered about various barriers in successful implementation of collaboration between industry and academia. The various barriers which has been studied through this survey are: lack of strong communication, lack of availability of committed people, lack of commitment at the top, lack of recognition of collaborative work, lack of institutional /logistic support, lack of coordination, lack of appreciation, lack of understanding of each other roles, lack of transparency and system openness, lack of balance in giving and receiving resources, lack of trust in collaborative relationship, lack of flexibility and visible organizational structure, fear of loosing control, fear of sacrificing an autonomy, lack of administrators active involvement and supportive attitude, rigid orientation of the institute towards broad based education and rigid orientation of the industry towards profit based product. 34.92% respondent industries remained silent on this issue. The respondent views were compiled and Table-4.3 presents the percent respondent industries opinion about the intensity of barriers in fruitful industry-academia-collaborations.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage Respondent Industries Opinion about Industry-Academia-Collaboration Barriers Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To Great Extent</td>
</tr>
<tr>
<td>Lack of Strong Communication</td>
<td>1.59</td>
</tr>
<tr>
<td>Lack of Committed Individuals</td>
<td>4.76</td>
</tr>
<tr>
<td>Lack of Commitment at the Top</td>
<td>4.76</td>
</tr>
<tr>
<td>Lack of Recognition of Collaborative Work</td>
<td>0.0</td>
</tr>
<tr>
<td>Lack of Institutional /Logistic Support</td>
<td>1.59</td>
</tr>
<tr>
<td>Lack of Coordination</td>
<td>1.59</td>
</tr>
<tr>
<td>Lack of Appreciation</td>
<td>3.18</td>
</tr>
<tr>
<td>Lack of Understanding of each other Roles</td>
<td>0.0</td>
</tr>
</tbody>
</table>

133
Lack of Transparency and System Openness  1.59  12.70  23.81  19.05  7.93  
Lack of Balance in Giving and Receiving Resources  1.59  17.46  26.98  12.70  6.35  
Lack of Trust in Collaborative Relationship  4.76  14.29  25.40  15.87  4.76  
Lack of Flexibility and Visible Organizational Structure  7.93  14.29  28.57  11.11  3.18  
Fear of Loosing Control  3.18  9.52  17.46  19.05  15.87  
Fear of Sacrificing an Autonomy  3.18  6.35  15.87  25.40  14.29  
Lack of Administrative involvement and Supportive Attitude  0.0  17.46  30.16  15.87  1.59  
Rigid Institute Orientation for Broad Based Education  1.59  31.75  22.22  9.52  0.00  
Rigid Industry Orientation for Profit Based Products  3.18  34.92  17.46  9.52  0.00  

Table-4.3: Barriers in Industry-Academia Collaboration

4.10.4 Assessment of Strategies for Productive Industry-Academia-Collaborations
Certain organizations in spite of having collaborations do not make headway to an expected level of achievements which they look through these relations and sometimes it leads to frustrations on both sides. The role of strategies like negotiations based on written agreement, establishment of monitoring and evaluation procedure, negotiations based on verbal discussions and making staff familiarized with collaborating agreement was studied on 5-point scale: 1 (to great extent), 2 (to large extent), 3 (to some extent), 4 (to little extent), and 5 (not at all) to understand the impact of these strategies in developing productive industry-academia collaboration/relationship. The study reflects the following:
4.10.4.1 Assessment of Productive Industry-Academia Collaboration through Negotiations Based on Written Agreement

Many people are unrealistic when it comes to creating contracts and one should not take it for granted that the threads of your relationship are strong enough to face any crisis. It states about the terms and conditions of collaboration and helps to avoid any misunderstanding that may arise in the absence of a written contract. Negotiations based on written agreement are a documented proof due to which people work with more trust and belief. The assessment is made about possible status of productive relations between industry and academia based on written agreement. The feed back indicates that 34.92% respondent industries are of the belief that collaboration through such agreements is quite productive on the scale of large to great extent. The overall respondent views on productive relations through written agreement is highlighted in Fig.4.135

![Assessment of Productive Relations through Written Agreements](image)

Fig.4.135: Role of Written Agreements in Productive Collaborations

4.10.4.2 Assessment of Productive Industry-Academia-Collaboration through Negotiations Based on Verbal Discussions

Negotiation is a common way for people to deal with problems and conflicts. The handshake is a long-standing way of doing business. Verbal agreements can be entered into quickly and work well for both the parties, but if a dispute arise it often comes down to “their word versus mine.” It becomes difficult to prove what the terms of the agreement were and the credibility of the parties becomes the deciding factor. Through industrial survey an assessment is made about role of negotiations based on verbal discussions in developing productive industry-academia collaborations. The feed back reflects that only 12.70% respondent industries are of the opinion that collaboration based on verbal discussions is
quite effective in generating productive industry-academia collaborations on the scale of large to great extent. The overall respondent views on productive relations through negotiations based on verbal discussions is highlighted in Fig.4.136

4.10.4.3 Assessment of Productive Industry-Academia-Collaboration through Proper Monitoring and Evaluation Procedure

To keep track of projects and programs, monitoring and evaluation is essential as monitoring is a systematic regular collection and analysis of information to measure changes. Through evaluation analysis is made about its impact and effectiveness. Without monitoring, practically there is no management. Through industrial survey an assessment is made about role of proper monitoring and evaluation in developing productive industry-academia collaborations. The feedback reflects that 50.79% respondent industries are of the opinion that collaboration based on principles of proper monitoring and evaluation is quite productive on the scale of large to great extent. The overall respondent views on productive relations through proper monitoring and evaluation is highlighted in Fig.4.137
4.10.4.4 Assessment of Productive Industry-Academia-Collaboration through Staff Familiarization with Collaborative Agreement

What is its impact on productive industry-academia collaboration by making staff familiarized with the collaborative agreement is studied through industrial survey. The assessment reflects that 39.68% respondent industries are quite positive that familiarization of staff with the collaborative agreement make collaboration more productive on scale of large to great extent. The overall respondent views on productive relations through familiarization of collaborative agreement with participating staff is highlighted in Fig.4.138

Fig.4.138: Role of Familiarizing Staff in Productive Collaborations

4.10.5 Assessment about Number of Industrial Collaborations with Academia

Through industrial survey the feed back was collected about number of collaborations the industry had with academia in last five years. The assessment about number of industrial collaborations with academia is highlighted through Fig.4.139

Fig.4.139: Number of Industry-Academia Collaborations
4.10.6 Assessment about Benefits of Collaborations

(Khedkar M.K., Dhole G.M., and Mujgelwar V.A., 2003) recommends that industry may provide sophisticated and costly equipment to institution for research. The benefits of industry-academia-interaction through collaborations is studied on 5-point scale: 1 (to great extent), 2 (to large extent), 3 (to some extent), 4 (to little extent), and 5 (not at all). in the areas of resource sharing, in fulfilling education mission, in providing top class education, in cost saving, in improving business growth, in improving research activities, in improving knowledge on emerging technologies, in improving problem solving skills and in getting information about the level of the institute. In this survey 3.18% respondent industries remained silent on this issue. The respondent views were compiled and the percent respondent industries opinion about the benefits of industry-academia-interaction through collaboration are tabulated in Table-4.4

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage Respondent Industries Opinion about Benefits of Industry-Academia-Interaction through Collaborations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To Great Extent</td>
</tr>
<tr>
<td>Resource Sharing</td>
<td>1.59</td>
</tr>
<tr>
<td>Fulfilling Education Mission</td>
<td>3.18</td>
</tr>
<tr>
<td>Provides Top Class Training</td>
<td>4.76</td>
</tr>
<tr>
<td>Cost Saving</td>
<td>1.59</td>
</tr>
<tr>
<td>Improves Business Growth</td>
<td>1.59</td>
</tr>
<tr>
<td>Improves Research Activities</td>
<td>4.76</td>
</tr>
<tr>
<td>Improves Knowledge on Emerging Technologies</td>
<td>4.76</td>
</tr>
<tr>
<td>Improves Problem Solving Skills</td>
<td>6.35</td>
</tr>
<tr>
<td>Provides Information about Level of Institute</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Table-4.4: Benefits of Industry-Academia Collaboration
4.10.7 Assessment about Level of Industrial Collaboration with Collaborating Partners
A study is made through 05 point scale about the level of industrial collaboration with various collaborating partners viz. with research and development laboratories, community organizations, governmental agencies, funding agencies, alumni, international agencies and with different industrial houses. The study reflects the followings:

4.10.7.1 Status of Industrial Collaborations with Research and Development Laboratories
The study indicates that 12.7% respondent industries possess good collaboration with research and development organizations on the scale of large to great extent. The overall assessment about collaborations with research and development organizations is projected in Fig.4.140

![Status of Industrial Collaboration with Research and Development Laboratories](image)

Fig.4.140: Status of Industrial Collaborations with Research and Development Laboratories

4.10.7.2 Level of Industrial Collaborations with Community Organizations
Industry can play an important role for the cause of community. Through this industrial survey an assessment is made about status of their collaborations with community organizations.

![Status of Industrial Collaboration with Community Organizations](image)

Fig.4.141: Status of Industrial Collaborations with Community Organizations

139
The feedback indicates that 6.35% respondent industries have good collaboration with community organizations on the scale of large to great extent. The overall assessment about industrial collaborations with community organizations is projected in Fig.4.141

4.10.7.3 Level of Industrial Collaborations with Government Agencies

Industrial collaboration with governmental agencies can be seen as creating better opportunities for entrepreneurs to enhance their growth and to build country higher G.D.P. Through these collaborations people can look for better employment opportunities and enhanced avenues of specialized training to make up for shortage of skills due to changing technology. An assessment reflects that 3.18% respondent industries have collaboration with governmental agencies on the scale of large to great extent. The overall assessment about industrial collaborations with governmental agencies is projected in Fig.4.142

![Status of Industrial Collaboration with Governmental Agencies]

Fig.4.142: Status of Industrial Collaborations with Governmental Agencies

4.10.7.4 Level of Industrial Collaborations with Funding Agencies

The collaborations between funding agencies and industry can provide an opportunity to funding agency to critically analyze the viability of new industrial projects and their return on the loan. At the same time it makes the work simpler for an industry and they are able to concentrate more on other productive works. Through this industrial survey an assessment is made about status of industrial collaborations with funding agencies. The feedback indicates that 11.11% respondent industries have good collaboration with funding agencies on the scale of large to great extent. The overall assessment about industrial collaborations with funding agencies is projected in Fig.4.143
4.10.7.5 Level of Industrial Collaborations with International Agencies
Status of respondent industries is studied in having collaboration with international agencies to make best use of latest technologies in order to compete globally. The assessment indicates 11.11% industries have international collaborations and overall assessment about industrial collaborations with international agencies is projected in Fig.4.144

4.10.8 Survey Outcome on Industry-Academia Collaboration
The present status of industry-academia collaboration is not encouraging, although industry does have certain collaboration with research laboratories; international agencies and funding agencies. Student industrial training, seminars, joint conferences and projects are the valuable modes of industry-academia collaboration. Rigid industry orientation for profit based products, rigid institute orientation for broad based education and lack of strong communication mechanism are some of the prime barriers in industry-academia collaboration. Productive industry-academia collaborations can be visualized through negotiations based on written agreements, making participating staff familiarized with
collaboration agreement and through establishment of strong monitoring and evaluation system. Major benefits of industry-academia collaborations can be seen in terms of getting top class industrial training, enhancement in knowledge on emerging technologies, boost to research activities, in getting industrial feed back, fulfilling education mission and understanding level of the institute.

4.11 Assessment of Industry-Academia Interface through Personality Development Programs

Our personality is what makes us unique. With businesses going global and competitions running high, personality has emerged as front runner skill. Large numbers of students in spite of having good technical knowledge and aptitude skills are unable to make up in the companies of their choice for want of attractive personality. To remain competitive, only hard skills these days won’t do, one has to acquire something extra which makes him different from others. Through industrial survey, an assessment is made to comprehend industrial participation in student’s personality development programs. Industrial views are gathered on introducing personality development program a mandatory subject in graduate engineering programs. Feed back is collected to understand the apposite semesters and the number of semesters in which personality programs may be introduced. Appropriate class strength for effective interaction and impact of personality development program on students various attributes like self confidence, communication skills, team work skills, discipline, attitudes, value education, and leadership quality is analyzed through this survey using 5-point scale: 1 (to great extent), 2 (to large extent), 3 (to some extent), 4 (to little extent), and 5 (not at all). The industrial feedback received and compiled through survey reflects the following:

4.11.1 Assessment of Industrial Participation in Student Personality Development Programs

Often it is said that if user and trainer joins hand in transforming the learner, the gaps between needs and expectations are reduced to a great extent and stake holders enjoy greater satisfaction. With the same idea in mind views were congregated about industrial participation in student’s personality development program as industries have battery of strong human personnel who are said to be real human developers. The study through industrial survey divulges very low industrial participation in student’s personality
development programs as 93.65% respondent industries seem to be in no way connected to this idea.

4.11.2 Assessment about Instituting Personality Development Course a Mandatory Subject

Keeping in mind the necessity of pleasing personality in globally competitive world, industries views were invited about introducing personality development course a mandatory subject in graduate engineering programs. The feedback received through industries highly support this idea as 98.41% respondent industries are in favor of it.

4.11.3 Assessment about Apposite Semesters for Personality Development Course

Through industrial survey an assessment is made about an appropriate semester in which the personality development course may be taken up. Industries responded to this question with great enthuse and many of them have given their own options. Around 45% respondent industries are of the opinion that this course may not be restricted only to one semester; rather it should be spread to two or more than two semesters. The respondent industrial views are shown in Table-4.5 and when the industries were categorically asked about the number of semesters in which this course may be taken up, then the majority of respondent industries recommended that personality development course may be spread over two semesters as indicated through Table-4.6. Survey indicates high variation in narrowing down on to appropriate semesters as well as on number of semesters in which this course may be taken up, but the ideal choice of respondent industries lies between 5th and 6th semester and 6th and 7th semester.

<table>
<thead>
<tr>
<th>Course Semester</th>
<th>% Respondent Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th.</td>
<td>9.52%</td>
</tr>
<tr>
<td>5th.</td>
<td>19.05%</td>
</tr>
<tr>
<td>6th</td>
<td>11.11%</td>
</tr>
<tr>
<td>7th</td>
<td>14.29%</td>
</tr>
<tr>
<td>8th</td>
<td>1.59%</td>
</tr>
<tr>
<td>4th and 5th</td>
<td>1.59%</td>
</tr>
<tr>
<td>4th, 5th and 6th</td>
<td>4.76%</td>
</tr>
<tr>
<td>5th and 6th</td>
<td>12.69%</td>
</tr>
<tr>
<td>5th, 6th and 7th</td>
<td>4.76%</td>
</tr>
</tbody>
</table>
Table-4.5: Apposite Semester for Personality Development Course

<table>
<thead>
<tr>
<th>Required Number of Semesters</th>
<th>% Respondent Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>One semester</td>
<td>11.11</td>
</tr>
<tr>
<td>Two semester</td>
<td>55.55</td>
</tr>
<tr>
<td>Three semester</td>
<td>23.82</td>
</tr>
<tr>
<td>All semester</td>
<td>7.93</td>
</tr>
<tr>
<td>Not Responded</td>
<td>1.59</td>
</tr>
</tbody>
</table>

Table-4.6: Number of Semesters for Personality Development Course

4.11.4 Assessment about Effective Class Strength for Personality Development Course

Proper student strength is highly significant in effectively running personality development classes. Faculty will be unable to heed better attention if student strength goes beyond the desired capacity, as one to one interaction will be missing. Contrary to this if class strength becomes lesser; a sense of healthy competition to spruce students may remain absent. Through industrial survey, feedback has been gathered about the desirable strength to achieve efficacy. Majority of the respondent industries vouch up to 20 students per class to effectively run personality development classes. 6.35% respondent industries remained silent on this issue. Respondent industries views on effective strength are presented through Table-4.7.
<table>
<thead>
<tr>
<th>Effective Student Class Strength</th>
<th>% Respondent Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>9.52</td>
</tr>
<tr>
<td>15</td>
<td>9.52</td>
</tr>
<tr>
<td>20</td>
<td>44.44</td>
</tr>
<tr>
<td>25</td>
<td>6.34</td>
</tr>
<tr>
<td>30</td>
<td>1.59</td>
</tr>
<tr>
<td>10-15</td>
<td>3.18</td>
</tr>
<tr>
<td>15-20</td>
<td>11.11</td>
</tr>
<tr>
<td>20-30</td>
<td>3.18</td>
</tr>
<tr>
<td>30-40</td>
<td>3.18</td>
</tr>
<tr>
<td>50-60</td>
<td>1.59</td>
</tr>
</tbody>
</table>

Table-4.7: Effective Class Strength for Personality Development Course

4.11.5 Assessment about Impact of Personality Development Program on Student Attributes

Everyone wishes to get along well and able to meet life's situations successfully. To be on regular winning spree, everything depends upon what personality one possesses and what is he trying to build. To achieve success, personality development programs are designed and conceived with a focus on overall development through acquisition of various skills. Importance of personality development programs was studied through industrial survey to understand expected level of improvements in different student's traits such as self confidence, communication skills, team work skills, discipline, attitudes, value education and leadership qualities. An improvement in student employability and overall personality enhancement was also studied through this survey. The industrial views on skill improvement through personality development course are as such:

4.11.5.1 Assessment about Improvement in Self Confidence

Self confidence develops belief to effectively discharge the responsibilities and authorities. It promotes initiative, enthusiasm and as a result of which one is able to do multifaceted tasks with a greater level of commitment and concentration.
Assessment through industrial survey reveals that 63.49% respondent industries believe that students become more self confident on scale of large to great extent after undergoing personality development programs. Overall respondent industrial views on improvement in student self confidence through personality development program is projected in Fig.4.145

4.11.5.2 Assessment about Improvement in Communication Skills

With businesses growing global, communication has become front runner skill in manpower recruitment. Students admitted to engineering colleges are not only from urban sector but many of them belong to rural area where communication is considered to be one of the biggest barriers for them in getting better employment opportunities. Feedback through survey indicates that 68.25% respondent industries are of the opinion that student’s communication skills improve on scale of large to great extent after undergoing personality development courses. Overall respondent industrial views on improvement in student communication skill through personality development program is projected in Fig.4.146
4.11.5.3 Assessment about Improvement in Team Work Skills

The concept of working together has gained momentum in last few years. Single person skill and knowledge is limited, but in a team every body is able to contribute through his skill. Group projects and personality development programs develop better familiarity about working in teams. Survey indicates that 50.78% respondent industries are of the opinion that students acquire good team capabilities on scale of large to great extent through personality development programs. Overall respondent industrial views on improvement in student team skills through personality development program is projected in Fig.4.147

Fig.4.147: Improvement in Team Work Skills through Personality Development

4.11.5.4 Assessment about Improvement in Student Discipline

Discipline is about self-control and it is a key attribute in a path to success. Through discipline one is able to build internal strength, integrity, credibility, time management, self-confidence and maximize happiness. It creates new habits of thought, action, and speech toward improving oneself and reaching goals. Undisciplined organizations and people are unable to create healthy place in the society and their survival is short.

Fig.4.148: Improvement in Discipline through Personality Development
Study through industrial survey reveals that 42.85% respondent industries believe that personality development programs brings a qualitative change in student’s discipline on the scale of large to great extent. Overall respondent industrial views on improvement in student discipline through personality development program are projected in Fig.4.148

4.11.5.5 Assessment about Improvement in Human Values

Value education turns people to learn and grow for the cause of the humanity. It cultivates essential values like honesty, simplicity, love, unity, peace, happiness, co-operation etc. so that the civilization that teaches us to manage complexities can be sustained and further developed. Study through industrial survey indicates that 26.98% respondent industries believe that personality development programs contribute to better human values on scale of large to great extent. Overall respondent industrial views on improvement in student human values through personality development program is highlighted in Fig.4.149

![Fig.4.149: Improvement in Value Education through Personality Development](image)

4.11.5.6 Assessment about Improvement in Student Attitudes

An attitude is a state of mind. It can either be positive or negative. A positive mental outlook feels wonderful and lead to positive changes. Half the success will be achieved if a person has positive attitude. Industries give high priority to attitude while selecting their man power. Negative attitude people are unable to find place in an industry, how best they may be in their field of work. The survey indicates that 31.74% respondent industries are of the opinion that positive transformation in student’s attitudes occurs on scale of large to great extent on account of personality development programs. Overall respondent industrial views on improvement in student attitudes through personality development program is projected in Fig.4.150
4.11.5.7 Assessment about Improvement in Leadership Qualities

Leader is a person who is able to empower and carry people to accomplish the required task to desired level of satisfaction. It is an art of motivating group of people to act towards achieving a common goal. The feedback indicates that 47.62% respondent industries are of the opinion that personality development programs are an important tool to upgrade leadership skills on scale of large to great extent. Overall respondent industrial views regarding expected improvement in student leadership abilities through personality development program is highlighted in Fig.4.151

4.11.5.8 Assessment about Improvement in Personality Enhancement

The assessment through industrial survey is made in student overall personality enhancement through personality development programs. The assessment indicates that majority of the respondent industries are of firm belief that personality development program is a highly viable mechanism to enhance student's overall personality. Overall respondent views
regarding expected improvement in student personality through personality development program is highlighted in Fig.4.152.

Fig.4.152: Personality Enhancement through Personality Development

4.11.5.9 Assessment about Improvement in Employability
Impact of personality development program on student’s employment was analyzed through industrial feedback. Survey findings indicate that 52.38% respondent industries have belief that personality development program encompass strong bearing on student’s placement on scale of large to great extent. Overall respondent industrial views regarding expected improvement in student employability through personality development program is highlighted in Fig.4.153.

Fig.4.153: Improvement in Employability Probability

4.11.6 Survey Outcome on Personality Development Programs
People with well rounded personality remain asset to an organization and are instrumental in turning wheels of growth. Industrial human resource personnel who are best personality developers, their interface with academia in developing student personality have not shown
any significant contribution. Personality development course is a high mandate to be a part of student’s academic program and two semester course viz. fifth and sixth semesters is an ideal choice to run these programs. A class with 20 students is a perfect strength to achieve higher efficacy. It has high capacity to enhance student personality, communication skills, self confidence and team work skills. It can considerably augment leadership skills, make a person more disciplined, can boost employment probability and has ability to inculcate value education and reform attitudes.