

Impact of Industry Institute Interaction in Engineering Education to Enhance Employability – A Case Study

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Abstract: This paper examines a case study of collaborative training through the industry-institute alliance to give sufficient exposure to the learners with recent technologies; recognize the practices to bridge the gap between institute and industry and improve the employability of students. The objective of any engineering institution is to create skillful and capable employable graduates through quality technical education. Hence, a good and energetic academic engagement with relevance to industrial collaborations to encourage not only modern technical education but also entrepreneurship is a must. The paper attempts to highlight strategies that can elaborate on the importance of industry-institute interaction to improve employability and strive towards overall excellence. It also focuses on the challenges faced during the course implementation phases and proposes remedies to overcome such challenges. Finally, we conclude by identifying the future needs and opportunities for methodological improvement of industry-institute interactions.

Keywords: Institute; industry; employability; collaboration.

I. INTRODUCTION

Engineering education is the backbone of the technological development of any country and is changing today at a furious pace. India is blessed with a population of about 70% below the age of 35 years, and youths are the most vibrant and dynamic segment as well as a potentially most viable human resource (Patil, 2014). However, it has been observed that every year the number of mechanical graduates passed is less than the requirement of the industry still only 30% of graduates are getting qualified jobs. Providing technical education alone does not craft an all-rounder technocrat; thus, various human resources survey studies stated that most of the graduates remained

unemployed due to not fulfilling industry requirements. One step towards generating graduates as per industry need is to increase the project-based learning or a joint up-skilled specialised course through the Industry-Institute-Interaction (III) cell.

Industry-institute collaboration is a broadly useful activity for the mutual benefit of both stakeholders, which further leads the nation to grow technologically and socioeconomically to minimize the real-life problems of society. Industry institute interaction can be in the diverse set of useful formal activities including organizing and extending services towards collaborative training and placement activities like expert talks, joint ventures, joint product development, curriculum design and development, training and skill development, collaborative research, industrial visit, etc.

The industry and institution are interdependent for strategic partnerships to meet the demands of the present problems of society. The primary challenge faced by the Indian industry is a shortage of technically competent skill professionals with good teamwork, ethical values, communication, and problem-solving skills. Thus, the government as well as the management of private institutions, has taken a significant role in establishing Industry-Institute- Interaction cell to promote industry participation in academics and stimulate technological advancement in certain key technology fields to achieve cent percent employability.

In the current era of the knowledge economy and response to the growing complexity of the industry environment, a productive interface between academia and industry is becoming a decisive requisite. Nowadays, technical institutions must endeavor for continuous enhancement in the various sub-system namely, curriculum and instructional processes, management, quality output, interaction with industry, and feedback mechanism to provide a competent human resource for the overall development of the industry. Henceforth, nowadays our focus is intensified on the more holistic working of industry-institute interaction cell.

Ramaswamy (2013), Chakravarty (2006), Murty (2002), Shollapur (2008), and Ghatol et al. (2004) have elaborately described the need for Industry-Academic partnership for sustainable development of technical and vocational education training. Perkmann et al. (2013) explored the significance of academic engagement and commercialisation of property rights in university-industry relations. Ahrweiler et al. (2011), and D’este et al. (2007) categorise the III cell interaction channels with industries like meetings and conferences, consultancy and contract research, creating spin-offs and physical facilities, training, and joint research. Whereas, Bruneel et al. (2010), and Lhuillery et al. (2009) categorise the barriers to enhance the III cell activities in two forms such as orientation related barriers, which refers to differences in the exposure between universities and businesses, and transaction-related barriers, which deals with conflicts over intellectual property and modes of university management. The growing importance of Corporate Social Responsibility (CSR) has made many industries in India willing to establish partnerships with technical education institutions. A joint add-on course development with the contribution of the students, faculty members, and industry personnel is great experiential learning for students to understand the industrial environment, importance of teamwork, project management, and got sufficient knowledge of the modern technologies used in the automotive industry. The overall objective of this paper was to analyse the importance of the establishment and development of a joint collaborative technical up-skilled specialised add-on course through industry-institute interaction.

II. A CASE STUDY

Industry-institute collaboration plays a vital role in learning various phases of automobile engineering and

generates the interest of students in the subject. It is seen that several multi-national companies do not entertain fresh passed-out graduates, other than the campus recruited as they require hands-on training and cultural shift from the university environment to the corporate environment. Therefore, faculty members of the Automobile Department of Marathwada Mitra Mandal’s Polytechnic (MMMP), Pune, India, developed a joint add-on technical apprentice program through the Memorandum of Understanding (MoU) with the automotive group of multi-national industry. The flow chart of such an add-on course is shown in figure 1.

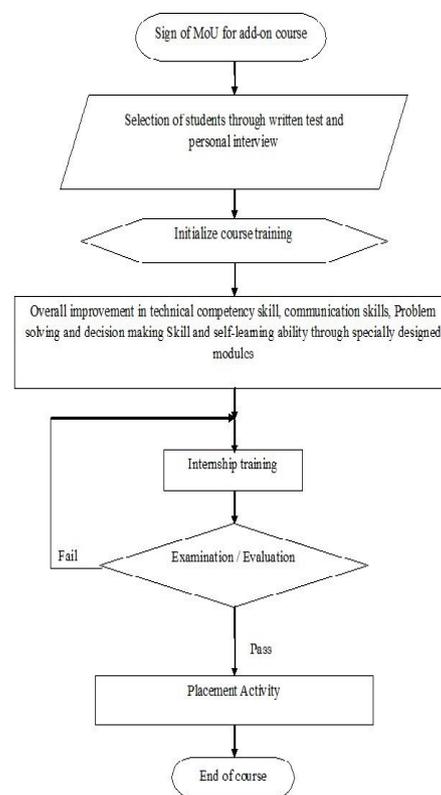


Figure 1 Flow chart of the add-on course

The faculty of automobile engineering at MMMP is running a full-time Automobile Engineering Diploma (DAE) course since 2008. DAE course of MMMP is approved by the All India Council for Technical Education (AICTE), the statutory body of the Govt. of India, and affiliated to Maharashtra State Board of

Technical Education (MSBTE), Mumbai, Maharashtra, India. The case study was conducted from Aug. 2012 to May 2013 with an academic objective of providing hands-on experience to students and an innovative approach that included modern collaborative teaching-learning methodologies, with following a set of goals:

- Exposure to the latest automotive technologies to the students
- Practices to be followed to bridge the gap between industry and institute
- Identification of significant challenges and their solutions, to overcome these obstacles in the future to improve the quality of course.

Phase I] selection of students

Training and placement officers from the automotive industry took an organized approach by initial advertising of the entire course by conducting an audio-video presentation followed by personal interaction. They deliver the overview of the course and prerequisite requirements to the faculty and students. After the presentation, a written examination which includes the aptitude, as well as fundamentals of automobile engineering, was conducted for the selection of the right candidates for the course. A total of 60 final year students appeared in the examination out of which only 20 students were shortlisted for the course.

Phase II] Training

The objective of the rigorous training is to diminish the gap between industry expectations (practice) and academic offerings (theory) through industry-institute interaction to attain a symbiosis. Thus the first and most crucial step is to know the requirements of the industries and how to align them in the current curriculum structure. Therefore, a high level of efforts were needed to keep the learning module design informative yet straightforward. The framework of the training course is fixed with deadlines but has sufficient flexibility. For such an add-on course, we prefer interactive and multifaceted blended teaching-learning methods along with MOODLE LMS to improve learners' active participation along with self-learning skills. Appropriate assignments were given to the students after the completion of each module. Also, after the completion of the in-house training course, all students have to do three

months of internship training in the authorized service station to live and learn in the present technologically reforming the world, making them industry-ready and placements. During the internship, students were kept in the loop and monitored their progress and performance by the departmental internal guide and the industry supervisor who was assigned to them.

Phase III] Examination/Evaluation

The in-course, as well as end-course theory and practical examinations, were designed along with rubrics based evaluation by the company personnel with the help of academicians to meet ever-evolving needs of the Industry. More explicitly, the students recognised the overall improvements in their personal as well as working attitude after completion of the training, which would benefit their employability.

Phase IV] Analysis & further development

It is increasingly more difficult for a multi-national industry to rely exclusively on in-house training activities for the upskilling of employees due to their limited expertise and resources. Industry-institute alliances represent an evolving trend for knowledge and technologies transfer through collaborations to achieve trained and employable human resources. The students are kept personally and professionally updated to the unfolding dynamic competitive industrial environment. The add-on course churned out to be a win-win model for both the students from a placement perspective and the participating industries from reducing the training cost of recruiters.

It has been observed that course curriculum structure was delayed due to unavoidable activities such as the institute's cultural program (tech-fest), college-level seminars of various types, dependency on few trainers, board examinations, and unexpected holidays. In the end, the course could not reach to implementation level and was counted as a failure.

Successful completion of regular diploma engineering courses was also a big challenge for students as such courses also have time and quality constraints. In the entire exercise, achieving a higher qualification along with improvement in technical competency skills, communication skills, and self-learning ability are some of the crucial milestones, as shown in figure 2. A

continuous feedback loop is generally preferred to monitor the progress of the course and improve its quality. Finally, after successful completion of the course and diploma engineering, all the students are placed as service advisors in the service sector of the company.

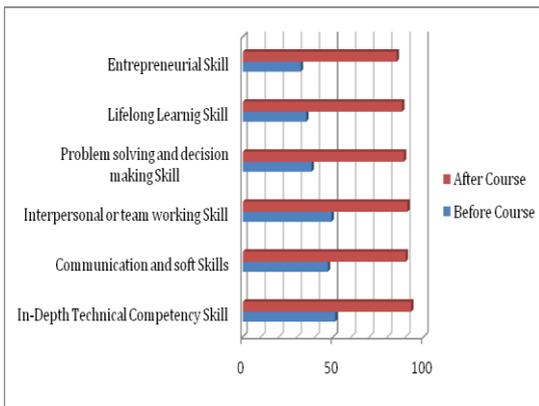


Figure 2 Overall improvements in skills

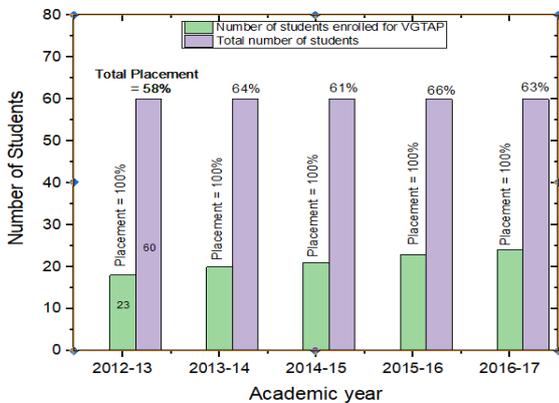


Figure 3 Number of placements year-on-year (2012-13 to 2016-17)

2.1 Significant challenges and their solutions

Challenge 1: Dependency on a single person must be avoided for delivering the course contents, moreover when compared with the industry as well as academic personnel, as students are not self-starters.

Solution: A hybrid of hierarchy and self-organized approach, with a team of at least three experienced members from the industry as well as the institute, is required to handle such a course for a longer span.

Challenge 2: Lack of Self-commitment: Such add-on course is enrolled for the final year students who were mostly involved in the project, exams, campus recruitment process, etc thereby delaying or not completing the course, which reflects the lack of self-commitment on the part of students.

Solution: Such courses must be allotted to the students who are not going for higher studies and want to do the job in the automotive domain. Students must be motivated by providing stipends and job assurance based on their performance during the course.

Although the biggest flaw in this entire approach was the big gap between the functional level of the students and MNC professionals, the highest level of education at the institute level was even less than the beginning level working at corporate, especially with the automotive industry. All the latest technologies are pretty new for the students; thus, the core technical module may be slightly challenging as per the students perspective. However, it is the beginning of a new story for developing millennial learners as per industry needs. Industry- Institute interaction cell provides a forum where the students, instructors, and industry personnel come together under one roof to interact with each other and bridge the gap between industry and institute.

III. CONCLUSION

The objective of any engineering institution is to create skilful and capable employable graduates through quality technical education in the present technologically reforming the world. Also, industries cannot achieve their set objectives without the proper human resource. Hence, a good and energetic industry-institute collaboration to encourage not only modern technical education but also entrepreneurship is a must. Such a unique symbiotic relationship enables a meaningful contribution to society by creating innovative solutions for local, real-life problems.

This paper evaluated a case study of collaborative training through the industry-institute alliance to give sufficient exposure to the learners with recent technologies;

recognise the practices to bridge the gap between institute and industry and improve the employability of students and strive towards overall excellence. It also focuses on the challenges faced during the course development phases and suggests the remedies to overcome such challenges. This paper argues that academic excellence is exaggerated not only by the existence of links with the industry but also by the extent of industrial collaboration. Finally, all steps were taken to transform from “An Aspirant” to “An Achiever”.

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