IEEE Student Quality Improvement Program:

To improve the employability rate of students

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***Abstract*—*In India, a large percentage of graduating engineers are not industry ready. The primary reason is that the colleges have outdated syllabi leading to a wide gap between the curriculum and the requirements of industry. Students who take up internships are very few among Tier-2 and Tier-3 colleges. All these problems result in graduates who are unemployable without training in basic skills by the industry. An internship could help the students in overcoming many of these shortcomings as they learn about corporate industries and receive basic training. This paper presents a novel initiative towards this end by the IEEE Student Branch, College of Engineering, Chengannur. It aims at spreading awareness about the advantages of taking up internship opportunities, providing the basic training and helping students get internships. The program was a huge success and helped a large number of students in securing internship offers. This model, if replicated in other colleges could significantly improve the employability of students and help them improve their academic performance and engineering skill sets.*

***Index Terms*—*engineering education, employability, placements, internships, industry collaboration, college initiatives, industry-academic interaction.*

I. Introduction

In the past, engineers were counted among the elite class, being seen as innovators, problem solvers and designers. However today, a large fraction of the engineers graduating from the innumerable colleges in India are barely employable, lacking in basic requirements of the industry, and hence turning out to be mere shadows of their predecessors. A recent survey conducted by National Association of Software & Service Companies stated that out of the 5.5 lakh engineering students graduating from India annually, only 25% of them are directly employable [1]. The Indian education system, which focuses on rote learning instead of a concept-driven approach, creates a bunch of graduates who lack real-world problem-solving capabilities, which adds to their lack of communication skills and other soft skills [2]. The skills students acquire do not match the requirements of the industry. Another survey by Aspiring Minds [3] showed the same trend. It also showed that there was a vast difference between the employability rates of students from the Tier-1 colleges and the rest. A flexible curriculum and exposure to the industry helped these students go a long way.

Taking the above facts into consideration, the IEEE Student Quality Improvement Program (ISQIP) was initiated in the year 2013 to uplift the students of Tier-2 and Tier-3 colleges into the same level. The program was conceived and designed by the IEEE Student Branch, College of Engineering, Chengannur and implemented as a pilot project with support from the IEEE Kerala Section.

A. Motivation

In India, although the students in Tier-1 colleges are able to easily avail internships, this is not so widespread among students of other colleges. These students as well as a few others with exposure are lucky enough to gain internships while the rest lag behind. However, as internships are not mandatory, only a few colleges in India with good track record have been doing it regularly. For a student, an internship can act as a bridge between classroom learning and the technical world. Most of the reputed universities around the world help their students to get internship opportunities during their course of study. This not only gives the students a chance to apply their academic skills into the jobs but also acts as an opportunity to correct their shortcomings in their respective fields. As the competition to get a good job increases, an internship can go a long way in boosting a student's resume [4]. Relationships made during the internships could also be a valuable asset. As a way of overcoming this shortcoming among the students, we came up with the idea of ISQIP. This initiative aims at providing technical and soft skills which they usually do not gather from their conventional academic curriculum. Several other initiatives including D2S in Indonesia [5] and Spoken Tutorial Project — IIT Bombay: Building IT literate India in India [6] have proved their effectiveness in uplifting the students and improving their skills.

B. Aims and Objectives

The major aim of this initiative is to bring about an internship culture to all colleges in India. Students could utilize their vacations by exploring new opportunities. With the help of internships, students could improve their technical and managerial skills by bridging the gap between industry and academia [7]. The ultimate goal is to develop a well-rounded industry ready professional. In this article we outline the

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structure of the program and its implementation. The program could help the students by providing a base for their higher education as well as allow students to experience real life engineering and acquire practical skills. In section II we discuss the impact of the program as well as an outline for future engagements. Section III discusses the results obtained.

II. PROPOSED METHODOLOGY

This section illustrates the program structure and presents a critical analysis of the novel features of the program and the implementation strategy adopted. First, we present the preliminary analysis which was done prior to designing the program structure so as to tailor the course according to the needs of the students.

A. Preliminary Study

To get a clear idea picture of the skill set the students already poses, skills they would like to learn and which are not included in the curriculum, how they fared at verbal and technical communication, and their choice of future careers, a survey was conducted among students in their fourth and sixth semester. Upon analysis, it was observed that a majority of the students had very little to no skills that would prepare them for a job in their preferred career realm. [8] It also showed that most of them lacked communication skills required for the corporate world. Very few students applied for internships and most of them, due to lack of proper guidance, had not even considered applying.

As a solution to this problem we decided to conduct a training program in which the students would first be given basic soft skill training and a hands-on workshop. Students who successfully complete this training would get a chance to intern at various companies thus getting a taste of the industry.

B. Program Outline

After several brainstorming sessions with teachers, alumni and students, the structure of the event was developed. The students would first be given awareness programs to help them realize its importance following which they could register for the event. The event would contain classes and workshops to improve their soft skills and technical know-how. Finally, after successful completion of the training they would be helped in availing internships in different areas with the help of the placement cell, alumni and the IEEE network.

C. Key Features and Novelty of Approach

One of the special features of this program was the way in which the entire course was designed. Inputs were taken from both the students and professionals and then the course was structured such that the students would find it interesting as well as beneficial in future. The teachers and the alumni of the college helped find internship offers for the students who successfully completed the training.

There have been very few initiatives in which the students were given training in both soft skills and technical skills so that they may develop into well-rounded engineers. As the entire program was conducted during the summer vacation it was ensured that there was no interruption to the academic schedule or distractions for the students.

D. Implementation and Timeline

1) Awareness

The first goal was to spread awareness on the importance of technical skills and internships. The students of the fourth and sixth semesters were given a session on "Why Internships?" They were also asked whether they had the necessary skills for the career they desired and what they could do to change it. Suggestions were taken from the students about their requirements and based on this a detailed syllabus was prepared.

2) Summer School

The Summer School Training program was then conducted in the first week of holidays. The program was divided into two stages:

Stage I – Communication and Soft Skills
Stage II – Technical Training

a) Stage I - Communication and Soft Skills

Sessions were conducted on email etiquette, social media profile optimization and resume making. Students were given a detailed idea about what would be expected of them in the corporate world and the necessity of proper etiquette. They were also taught how to use social media to their advantage and on how to attract prospective employers using sites such as LinkedIn. The students were asked to create a resume on their own at the beginning of the session. They were then asked to make corrections and improvisations finally producing a professional resume which they would ultimately use for applying to the internships at the end of the event.

b) Stage II – Technical Training

In technical training, [9] the students were split into different tracks depending on their subject of interest. In the Computer Science stream, these were HTML5, Ruby on Rails and Python. This three-day training began with each instructor starting with the basics and then proceeding to hands on interactive sessions. The classes were sized so that each student could get individual attention and the concepts could be conveyed thoroughly. Image 1 shows a session on Python in progress. At the end of the session, the students were asked to complete a small working project, in groups of two based on their respective programming platforms.

Image 1: A Python workshop in progress which the instructor is seen clarifying the doubts of the students

3) Internship

After the workshop, an internship drive was conducted for the students who successfully completed the training. Several companies were contacted with the help of the Placement Cell of the college and the alumni network. Students were asked to send in their resumes and this was followed by an interview with a representative of the company. In this way we were able to give a large number of students a taste of the corporate life, enabling them to get a better feel for the industry. Image 2 shows the distribution of the internship offers that the students received.

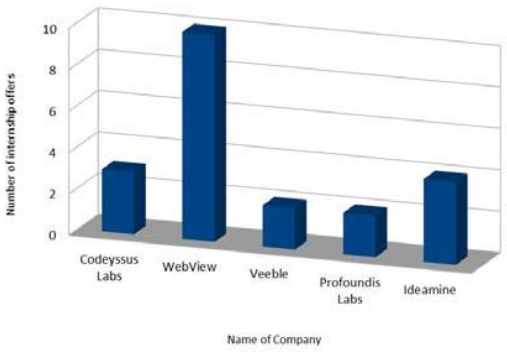

Image 2: The distribution of internship offers.

III. RESULTS AND DISCUSSION

The program had a great impact on the students. Awareness was created among students about the need for internships and the training provided also helped them secure several offers, which were previously out of their reach. An in-depth knowledge of several topics also helped them to gain a better understanding of their academic curriculum. The training also aided the students in developing their final year projects.

A. *Program Response*

ISQIP was met with an overwhelmingly positive response from the students. The event not only helped them learn new topics but also helped them to gain internship opportunities, which would bring them a step closer to the career of their choice. Image 3 shows the response pattern of the students.

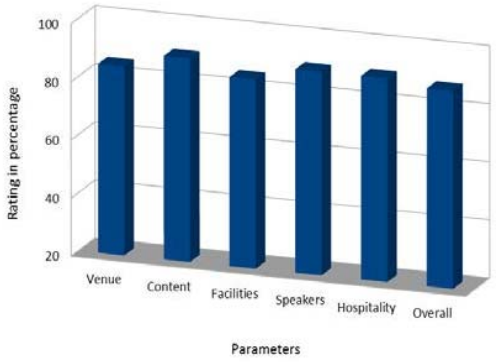

Image 3: The response of the participants. The participants were given a feedback form in with they were asked to cite their satisfaction with the venue, content, facilities, quality of the speakers, hospitality and the overall performance.

B. Impact as an Educational Model

The primary aim of the program was to create a model to produce students who are more employable by the industry than at present. This has been successful to a large extent as the program helped them acquire skills that are in demand by the industry. Additionally the internships also helped them gain an insight into the corporate world. If students in every college undergo similar training, it would provide more employment opportunities to the graduates.

C. *Challenges and Future Goals*

One of the main challenges any program faces is its sustainability. To overcome this, we trained the junior IEEE volunteers while conducting the program so that it could be conducted in the same way the following years. The success of this was proven as the second edition of ISQIP is soon to be implemented in the college with added tracks. The new edition also plans to include participants from other colleges so as to give them a taste of the program so that a similar model could be incorporated in their own colleges. As the program was conducted during the holidays, security and accommodation of the students were two big challenges. Teachers helped in solving this problem by providing supervision for the students and arranging safe accommodation. Also several companies were also reluctant to offer internships to inexperienced coders. This was overcome with the help of the alumni of the college who offered to provide internship in their startups.

This event was conducted only for the students of Department of Computer Science and Engineering, and Department of Electronics and Communication. In the coming years it could be expanded to tracks for students from all streams. Occasional classes held during the weekends and hack-a-thons could help the students improve their skills. The event could be replicated in other colleges thus training more number of students. A larger number of students could also help in attracting more companies that provide internships.

IV. CONCLUSION

The pilot program was first tested in the college to ensure that the model could indeed create well-rounded students and be means of securing internships for the students. The successes of the model prove that this could be successfully implemented in other colleges [10] as well thus improving the employability of the students and bringing the student quality on par with that of tier-1 college students. A better knowledge of topics outside the curriculum could also help the students in innovating and opening up a wider range of prospects.

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