

A Journey: Workshops to Start-ups

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Abstract: In this paper, we discuss the role of summer and winter workshops conducted during vacations in student learning. This is a story of conducting summer and winter workshops, which lead to two student's start-ups. The main goal of the workshop is to make students learn the basics of image processing (IP), computer vision (CV) and computer graphics (CG), so that students are ready to take up real time projects. The workshop is conducted in two phases, two weeks of conceptual learning with hands-on experience with tools, and four weeks of project phase. We observe this workshop is effective in learning the course beyond classroom teaching, as they explore the literature for state of art and design alternative solutions for the real time problems. Summer workshops are conducted during June-July and around 600 students are trained with the help of nine workshops till date.

Keywords: Summer Workshop, Startups.

1. Introduction

Participating in workshops can be an extra slice of cheese on students working capabilities. Harnessing such features in any student's life is a boon in disguise.

Going beyond the horizons of textbooks and making something innovative is certainly a measure to improve an individual in practical terms [3]. Workshops, seminars and conferences held at regular intervals do perform the same motive for a student. Being exposed to these practices makes them more prone towards learning and getting better with each session. Students attending such workshops can demonstrate their capabilities and can further more update their knowledge through such platforms [4].

Workshops have the potential to categorize same thinking people into a particular forum [5]. Such platforms do open the door for exercising minds of same thoughts and behaviours. The learning communities with similar passion for subject can certainly build a group of their own with the maximum utilization of resource thereby having a symbiotic relation. Such exercises do help students in understanding and learning different ways of thinking and solving parameters with more exposure to a large mass.

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Students participating in various workshops can always work on their leadership qualities thereby giving it the proper boost to grow [6]. Skills like learning, communicating, listening and experiencing new bonding can be developed through such platforms which have immense value for students and their upcoming future.

Table 1: a-k outcomes of ABET criteria 3.

3a	an ability to apply knowledge of mathematics, science and engineering
3b	an ability to design and conduct experiments, as well as analyze and interpret data
3c	an ability to design a system, component, or process to meet desired needs
3d	an ability to function on multidisciplinary teams
3e	an ability to identify, formulate, and solve engineering problems
3f	an understanding of professional an ethical responsibility
3g	an ability to communicate effectively
3h	the broad education necessary to understand the impact of engineering solutions in a global and societal context
3i	a recognition of the need for an ability to engage in lifelong learning
3j	a knowledge of contemporary issues
3k	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

ABET engineering criteria 2000 (EC 2000) [1] and NBA process for accreditation in India [2] requires that engineering programs demonstrate attainment of eleven (a-k) outcomes by the graduating student. However, all these courses are not sufficient to evaluate particularly the outcome g to k of ABET [7][8], which involves

communicate effectively (g), impact of engineering solutions in a global and societal context (h) and lifelong learning (i).

To address this, we plan to conduct workshops which effectively lead in attaining these outcomes and leading to start-ups.

2. Conduction of the workshop

The workshops in Computer Vision, Graphics and Image Processing (CVGIP) are started in June-July 2009 as a capacity building workshop to train students in these areas. The main goal was to make students learn the basics of IP, CV and CG, so that students are ready to take up projects to reconstruct heritage sites as a part of India digital heritage project (IDH). Our Cultural Heritage (CH) binds us as individuals and as a nation. CH also has significant economic impact as it attracts millions of visitors (Estimated foreign exchange between Jan to July 2015 was \$11.41 billion). Today our heritage both tangible and intangible faces a very real risk of being eroded from our physical and mental landscape due to natural and manmade threats. IDH is a unique initiative by Department of Science and Technology (DST) to support collaborative projects between researchers in the areas of technology and humanities for the digital documentation and interpretation of tangible and intangible heritage. This project highlights the art, architecture and cultural legacy of world heritage site Hampi, the medieval capital of Vijaynagar dynasty. Summer workshops are conducted during June-July and around 600 students are trained with the help of nine workshops till date.

The workshop is conducted in two phases (a) Conceptual training and tool learning (b) project phase. The workshop runs for 6 weeks, which contain a unique model of 2-3 weeks' theory sessions in the morning and lab sessions in the afternoon, and students carry out project during next four weeks. Student projects are reviewed twice a week and are evaluated at the end of four weeks by external evaluators who are experts in these areas.

A. Conceptual training and tool learning

During the workshop, many external faculties from IIT, IIIT and industries conducted theory sessions in addition to internal faculty.

The focus of this phase in the workshop focus is on:

- Conceptual learning/
- Hands on experience with state of art tools.
- Basic concept implementations for practical learning.

B. Project phase

The focus of this phase in the workshop focus is on:

- Literature survey to explore state of art.
- Identification of problems in the domain.

- Proposing alternate solution to the identified problems.
- Guidance from resource persons.
- Frequent reviews to monitor the project progress.

3. Measurement of effectiveness

During the workshop, many external faculties from IIT, IIIT and industry conducted theory sessions in addition to internal faculty. Many IIT professors appreciated the projects carried out in this workshop. The feedback from students and external reviewers was very positive and encouraging; hence we continued these workshops every year. DST funded few workshops and few are conducted with minimal fees from students. Every year few external faculty or industry experts conduct sessions in the workshop. Till date around 20 external faculties or industry experts have conducted sessions. Students who attended and completed projects during workshop period were doing better in Mini projects, Minor projects, Capstone projects and in placements. This motivated us to continue with the workshop series. The workshop also has unique model of using senior batch students to train the next junior batch during lab sessions and projects. More satisfying and proud moment is the initiation of two student start-ups, who got trained in the workshops. Four students (graduated in 2012), who attended the workshop after their 4th semester during 2010 and continued their project during third and final year, started a company called LabInApp and today their product is in 10,000+ schools across India. 2015 graduated students who attended the workshop after their 3rd semester during 2012 and continued their project during third year and final year started company called SnapTrude and today they have signed up with real estate venture.

We use feedbacks as often effective tool for the workshop. We observe student learn beyond their course text books in their activity. We took feedback from 150 students from the workshop and the results are as shown in Table 2 and Figure 1. Questionnaire aiming at the outcome of students and the feedback results of workshop are shown in Figure 1.

Table 2: Feedback of different activities conducted during the workshop.

Sl. No.	Details	Ratings				
		5	4	3	2	1
1	Overall experience of the workshop	21	31	7		
2	Enhancement of applications of theoretical concepts learnt	15	30	13	1	
3	Knowledge of problems present in the areas	13	21	25		
4	Knowledge of different solutions to the problems	11	25	21	2	

5	Extra knowledge gained beyond text books	15	31	12		
6	Knowledge gained during searching and finalization of the projects	29	23	8		
7	Enhancement of understanding	11	34	14		
8	Enhancement of understanding after discussion in reviews	7	19	31	3	
9	Enhancement of oral presentation skills	31	19	11		
10	Enhancement of written (ppt) presentation skills	24	22	13		
11	Enhancement of application areas of the concepts learnt	11	35	11	2	
12	Knowledge of contemporary issues in the area	5	26	25	2	
13	Knowledge of tools used in the area	5	17	26	10	
14	Your suggestions/comments:					

Note:

5-Excellent, 4-Very good, 3-Good, 2-Average, 1-Poor

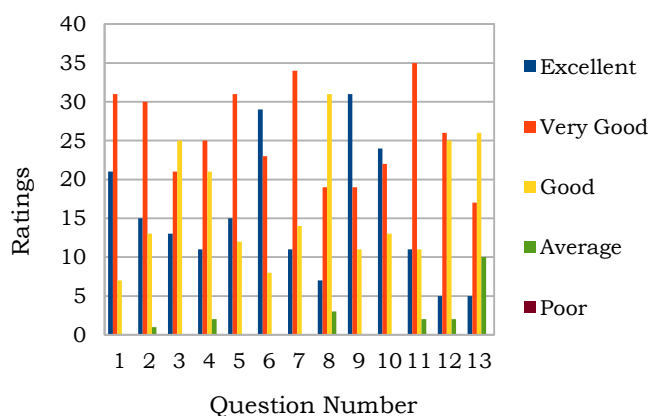


Figure 1: Survey of scores for questionnaire for students indicating the learning.

4. Conclusion

In this paper, we shared our experiences during the conduction of summer and winter workshop in IPCVG domain. Around 600 students are trained under the workshop (2009-2017), led to 2 start-ups (Snaptrude and

and LabInApp) provided jobs and internships to students. The feedback from students and external reviewers is very positive and encouraging to refine and continue the workshop.

5. References

- [1] Accreditation Board for Engineering and Technology (ABET). (2001, Nov.). Engineering Criteria 2000: Criteria for Accrediting Engineering Programs, Effective for Evaluations During the 2002–2003 Accreditation Cycle, Baltimore, MD.
- [2] <http://www.abet.org/images/Criteria/200203EACCcriteria.pdf>
- [3] Gerard Westhoff and Alex Drougas, Content design and methodology of seminars, workshops and congresses, European Centre for Modern Languages Council of Europe Publishing, August 2002 Printed at the Council of Europe.
- [4] Guidelines for Conducting Workshops and Seminars That Actively Engage Participants. © February, 2001 Richard Tiberius and Ivan Silver Department of Psychiatry, University of Toronto.
- [5] Coastal and Marine Studies in Australia: A Workshop Manual for Teachers – Conducting Effective Workshops Griffith University and the Department of the Environment, Sport & Territories, 1997 ISBN 0 868 57872 X.
- [6] Marva A. Barnett, How to Conduct an Interactive Workshop, Teaching Resource Center, University of Virginia Faculty, Department of French.
- [7] Forrester J, “Thinking Creatively; Thinking Critically”, Asian Social Science, Vol 4, No.5, May 2008pp.100-105.
- [8] Andrea A. DiSessa, “Changing Minds: Computers, Learning, and Literacy”, Cambridge, MIT Press, 2001 - Computers - 271 pages.