

# A Case Study to Improve the Employability of Materials Engineering Graduates Through Internship and Placement Office

Mudassar Shehzad\*, Amna Ashraf, Adeel Riaz, Hymna Taimoor, Muhammad Ali Gulfam Jahangiri and Mohsin Saeed  
\*Internship and placement office (I&PO), Department of Materials Engineering

**Abstract**—In order to get right jobs, the students must have right attitude. And again, in order to inculcate right attitude in our students, we must have to reform our schools. The mere change in syllabus is not enough for engineering students. The employability can only be improved by academia-industrial linkages. More we build understanding with industries higher will be employability for our students. The laziness of employs causes the serious threats for the academic institutes. If we reduce the possible weaknesses we can improve the status of any organization. In order to analyze the strengths and weaknesses a complete case study has been conducted and conclusion is drawn. The components of placement office have been functionalized properly and as a result the efficiency is improved. The comparison has been made with previous years. It is reported that the efficiency of placement office is improved by reducing the expenditures and by improving the quality of work. About 50% expenditures were cut down by installing our own printing setup. By doing simple reforms we were finally able to improve the employability of third batch (i.e. Batch-3) by almost 50 percent. Hence the percentage of unemployment of materials engineering graduates has been reduced gradually.

**Index Terms**— Employability, Materials Engineering, organization, reform, threats, efficiency, expenditures

## 1 INTRODUCTION

Strength, weakness, opportunity and threat (SWOT) is the basic factor which can govern the functionality of any person or organization itself [1]. The organizations always conceal their weaknesses and exaggerate strengths to high extent. The opportunities always produce out of the weaknesses likewise the threats are the outcome of the strength [2]. Like other organization we do have a huge set of our own SWOT. We have our own philosophy where we think that the global terrorism also affects the whole system whether it is petrol price or employability of our students [3]. The SWOT analysis is required in order to run an organization effectively. The cultural diversity and economic growth are key factors in defining the strengths or weaknesses [4]. Internship and placement office is essential part of every institute like National University of Sciences and Technology. Since 2008 there was scarcity of expert personnel in School of Chemical and Materials Engineering and that's why there was no any valuable work has been done towards employability of our students. So, there were more weaknesses than opportunities itself. The strength of this office is our heads (Principal and HoDs) but the previous stubborn IPO coordinators were considered as threats in same time. The inability of any component in a system causes serious threats. That's why after reforming the office we reduced our weaknesses and threats by hard work and with great passion of our team members.

The requirement of a complete case study was sensed for long time since 2014. In this regard a survey is conducted by our team members recently at the end of 2015. It is believed by Dr. Mohammad Mujahid that there is a strong linkage of employability and study tours, which is also true. The study tours are conducted in more than 30 industries in past two years to examine the effect upon employability. The list of top one hundred industries has been updated. More than 60 industries were targeted for internships. The contacts have been developed with strategic organizations and understanding was developed by inviting them in openhouses and jobfairs organized by SCME. The graduate profiles were standardized and expenditures were lowered by proper printing strategies. A team of passionate and talented members was made to functionalize the management. The communication was controlled by the new modern technology by keeping them update time to time.

It is also necessary to mention that the course loading strategies were same as the previous IPO members before I took charge. The work load of IPO is always doubles in spring session than in normal year due to mega event of openhouse every year. And yet, six to eight credit hours were also been taught with working in IPO as well. The contact hour of IPO is no match with lectureship. IPO is like twenty four hours job without any further incentive.

In spite of the regular course loading [Table, 1], various positive steps have been taken by this office to improve the status of our department. The following steps are been taken to functionalize this office, as follows

- Mudassar Shehzad is currently working as a Lecturer and Assistant Manager Internship and Placement Office, National University of Sciences and technology, School of Chemical and Materials Engineering, Pakistan, PH-0092-51-9085-5221. E-mail: [mudassar.shehzad@scme.nust.edu.pk](mailto:mudassar.shehzad@scme.nust.edu.pk)
- Amna Ashraf, Adeel Riaz, Hymna Taimoor, Ali Jahangiri and Mohsin Saeed are Students of School of Chemical and Materials Engineering, National University of Sciences and Technology, H-12, Islamabad-44000, Pakistan

TABLE 1  
COURSE LOADING TREND

Courses	Semester	Credit Hours	Other
M&A+Lab	Fall 2014	4	IPO
M&I+FEM	Spring 2014	5	IPO
M&A+W&J+Lab+CSL	Fall 2015	8	IPO
M&I+FEM	Spring 2015	5	IPO
W&J+CSL+NDT	Fall 2016	6	IPO

Table shows the course loading trend for faculty member involved in IPO during last two years. M&A stands for Metals and Alloys, M&I is Measurement and Instrumentation, W&J is Welding and Joining, CSL is Community Service and Learning program where FEM stands for Fundamentals of Engineering Materials

## 2 ORGANIZATIONAL REFORMS

### 2.1 Industrial Data Up-gradation

The first thing which is done in a very first step is the up gradation of list of existing industrial data with valid contacts and email addresses. It took almost one month. The access to the official phone is provided to key team members and they validate this data by making calls to the respective organizations. Almost 30 industries were added to the existing database in this year. We aim to include as many industries in the list in near future.

TABLE 2  
LIST OF UPDATED INDUSTRIES

Sr#	Industries
1	Oil & Gas Development Company, Pakistan
2	OMV Pakistan
3	Pakistan OilFields Ltd, (POL)
4	MOL Oil & Gas Co B.V.
5	Sui Nothren Gas Pipe Line (SNGPL)
6	Schlumberger
7	BHP Petroleum Pvt Ltd
8	Sui Sourthern Gas Company
9	Mari Gas
10	Nara Gas
11	OMS (thermal power plants)
12	National Refinery Limited (NRL)
13	Lasmo Oil Pakistan
14	Pak Arab Refinery Company Limited(PARCO)
15	Pakistan State Oil(PSO)
16	Ghani Glass (Pvt) Ltd
17	Gunj Glass Works Ltd.
18	Karam Ceramics (Pvt) Ltd
19	Balochistan Glass Ltd.

20	Glass Technology
21	Pakistan Safety Glass
22	Rachna Glass (Pvt) Limited
23	DESCON Engineering (Pvt) Ltd
24	Pakistan Aeronautical Complex Kamra
25	Millat Equipment (pvt) Ltd
26	Pakistan Ordnance Factories, Wah
27	KSB Pumps
28	Al-Ghazi Tractors Ltd
29	Pakistan Railways
30	Heavy Mechanical Complex(Pvt) Ltd
31	Abbas Steel Industires Pvt Ltd
32	Able Steel Industries Ltd
33	Adnan Steel Pvt Ltd
34	Bright Stainless Steel Industries
35	Hashoo Steel Industreis
36	Hilal Steel Industries (Pvt) Lrd.
37	Ittehad Steel Mills
38	Ishtiaque Steel Industries (Pvt) Ltd.
39	Mughal Steel (Pvt) Ltd.
40	Madina Steel Industries (Pvt) Ltd.
41	Naimat Steel Mills (Pvt) Ltd.
42	Naseem Steel Mills (Pvt) Ltd.
43	Nawab Brothers Steel Mills (Pvt) Ltd.
44	Peoples Steel Mills(Pvt) Ltd.
45	Raza Brothers Steel Mills(Pvt) Ltd.
46	Tuwaiqi Steel Mills (Pvt) Ltd.
47	Heavy Industry Taxila (HIT)
48	Rastgar Engineering Pvt Limited
49	Qadri group of industries
50	IKAN Engineering Services (Pvt) Ltd
51	Bolan Castings Ltd.
52	MEHRAN IRON & STEEL RE-ROLLING MILLS
53	Pakistan Steel Mills
54	Altawarki Steel Mills
55	Magna Steel
56	Metropolitan steel
57	Deewan Steel Mills
58	Abbas Steel
59	Japan Metal Industries

60	QADBROS Engineering (Pvt) Ltd
61	Peoples Steel Mills
62	Itefaq Foundries
63	Crown Steels
64	Moughal Steel
65	Pioneer Steel Mills
66	H.S Steel Mills Khawaja Steels
67	New Shalimar Steels
68	Lion Steel Industries
69	Afzal Steel Industries
70	Al-Bashir Steels
71	Ishtiaque Steel Industry
72	Al-Qamar Steels
73	Amir Asim Steels
74	Ansar Steels
75	Chaudhry Group of Steel Industries
76	Friends Steel Mills (Pvt) Ltd.
77	Ravi Autos (Pvt) Ltd
78	Mian tyre & rubber co. (pvt) ltd (panther tyres and limited)
79	Balochistan Wheels
80	Dawood Yamaha Limited
81	HINO PAK
82	Indus Motors (Toyota)
83	Suzuki Motors
84	National Engineering and Scientific Commission (NESCOM)
85	Pakistan Atomic Energy Commission
86	Pakistan Institute of Engineering and Applied Sciences
87	Human Resource Foundation
88	Pakistan Institute of Nuclear Science & Technology (PINSTECH)
89	Pakistan Council of Scientific & Industrial Research (PCSIR)
90	Khan Research Laboratories
91	Pakistan Machine Tool Factory (PMTF)
92	Karachi Nuclear Power Plant (KANUPP)
93	Pakistan Electric Power Company (PEPCO)
94	Orient Electronics (Pvt) Ltd
95	Engro Chemicals Pakistan Ltd
96	Hazara Phosphate Fertilizer (Pvt) Ltd
97	ICI Pakistan Ltd.

98	Shafi Chemicals Industries Pvt Ltd
99	Dawood Hecules Chemicals Ltd
100	National Fertilizer Corporation
101	Fauji Fertilizer Company Limited (FFC)
102	NASCOM Construction (Pvt) Ltd.

## 2.2 List of Recruitment drives from Industrial Liaison Official (ILO)

The recruitment drives through ILO is a rare activity for materials engineers. Hardly few recruitment drives have been conducted in previous years. Most of the major recruitment drives are not related to materials engineers. Even some multinational companies like ENGRO and NESTLE are not hiring materials engineers for jobs and even for internships. The relationship with ILO was never built good enough due to their undue complaints about materials engineering discipline. They always showing wrong image of Materials Engineering department. On the other hand the ILO is totally ignorant towards their fatal mismanagement.

TABLE 3  
LIST OF RECRUITMENT DRIVES

S. No	Email Date	Organization	Drive Name	Test Date
1	24-Feb	ENGRO	Engro recruitment Drive 2016	25-Feb
2	24-Feb	SHELL	Shell Campus Drive 2016	24-Feb
3	19-Feb	Philip Morris International	PMI Recruitment Drive 2016	23-Feb
4	19-Feb	P & G	P&G Summer Internship 2016	22-Feb
5	17-Feb	PTC	PTC Battle of Minds Campus Drive	18-Feb
6	16-Feb	Unilever	Unilever Recruitment Drive 2016	After 20-Feb
7	15-Feb	Nestle	Nestle Recruitment Drive	17-Feb
8	12-Feb	OBS Pharma	OBS Pharma Recruitment Drive	15-Feb
9	08-Feb	United Nations	UN Recruitment Session	16-Feb
10	18-May-15	Philip Morris International	PMI Graduate Trainee drive 2015	21-May-15
11	29-Apr-15	Tri-Pack	Pri-Pack Summer Internship 2015	03-May-15
12	20-Apr-15	Chenab Foundries	Summer Internship 2015	23-Apr-15
13	13-Mar-15	Shell	Shell Recruitment Drive 2015	19-Mar-15
14	07-Apr-15	ICI	ICI Recruitment Drive 2015	13-Apr-15
15	31-Mar-15	English Biscuit Manufacturer	Recruitment Drive 2015	08-Apr-15
16	30-Mar-15	Telenor	Telenor Internship 2015	12-Apr

Table shows the list of recruitment drives conducted by ILO for SCME most of them not related to Materials Engineering during previous year (2014 and 2015)

## 2.3 Industrial tours (Materials Engineering)

Study tours are considered vital for every engineering batch. It is prime duty of placement office (I&PO) to conduct the study tours for each batch. Therefore the Materials Engineering department was much focused in organizing the study tours especially for the graduating batches. However the number of tours conducted in previous years is increased by proper planning and coordination with industries. The following data is obtained for 2015-2016 academic years.

TABLE 4  
LIST OF INDUSTRIAL TOURS

Sr #	Industry	Discipline
1	National Center of Physics (NCP), NINVAST	ME-05
2	ICI Polyester Plant, Sheikhpura Road, Lahore	
3	Plastic Expo 2016, Lahore	
4	KSB Pumps, Hasanabdal	
5	Fazal Steel Mills	
6	Fiber Craft Industries	
7	KSB Pumps, Hasanabdal	
8	Millet Equipment PVT Ltd, Lahore	
9	AJR PVT Ltd Lahore	
10	HMC, Hattar Road, Texila	ME-06
11	IKan Engg Works Lahore	
12	Qadri Group of Industries	
13	Chenab Foundries, Faisalabad	
14	RASTGAR & Company Pvt Ltd, Islamabad	ME-07
15	KSB Pumps, Hasanabdal	
16	Gunj-Glass, Hasanabdal	
17	Chenab Foundries PVT Ltd	
18	Qadri Group of Industries	

Table shows the list of industrial tours conducted for undergraduate students where ME-05, ME-06 and ME-07 stand for 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> Batch of Materials Engineering Undergraduate Students

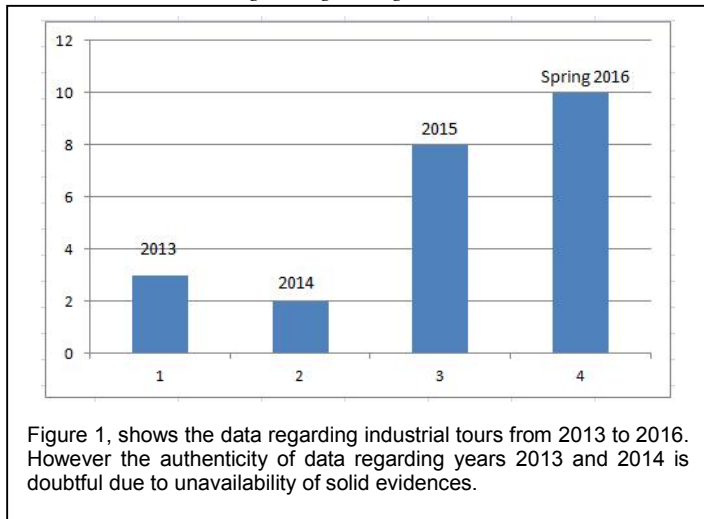


Figure 1, shows the data regarding industrial tours from 2013 to 2016. However the authenticity of data regarding years 2013 and 2014 is doubtful due to unavailability of solid evidences.

## 2.4 Printing of graduate profiles, brochures and post cards

The graduate book is the most important activity for the graduating students. The openhouses and jobfairs conducted every year in SCME. Hence it is the most important for securing jobs for our graduates. The expenditure of graduate book printing is regulated by planning and discussion with our heads. To lower the expenditures and to improve the quality work the printing machines were installed in placement office. The passionate team members were recruited and assigned them tasks. With the help of professional designers it finally made possible to produce a valuable work. The quality of work is improved than the previous years and hence the expenditure is lowered by installing our own high tech printing machines.

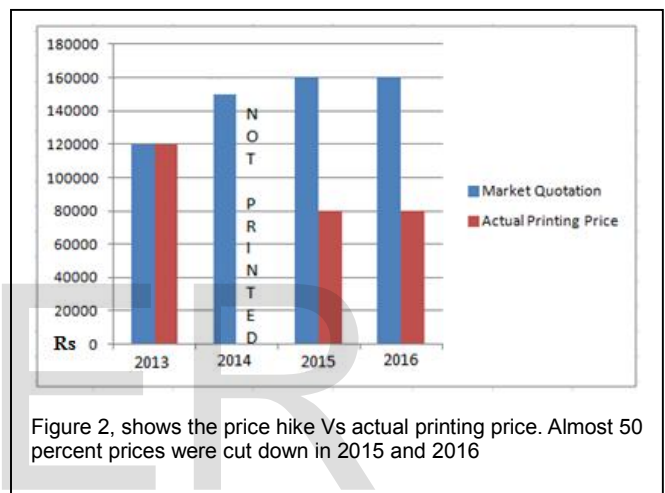
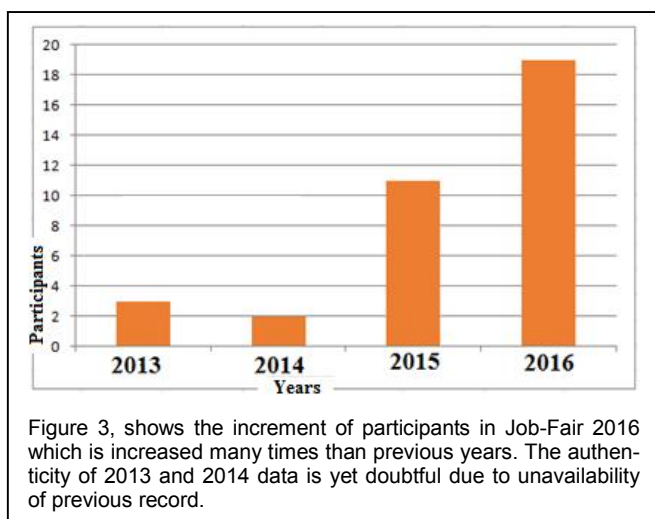


Figure 2, shows the price hike Vs actual printing price. Almost 50 percent prices were cut down in 2015 and 2016

## 2.5 PARTICIPANTS OF OPENHOUSES AND JOBFAIRS

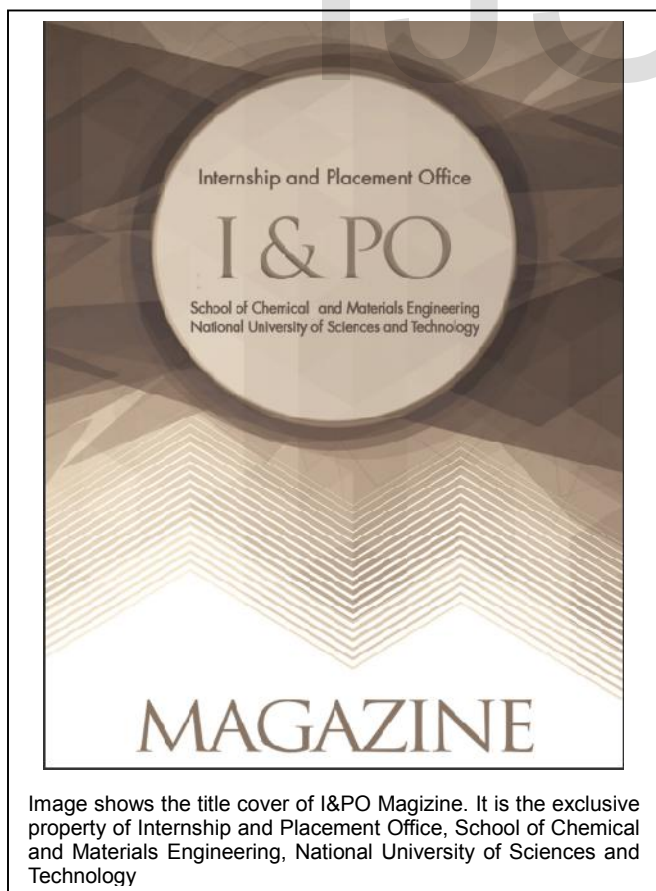
It is really difficult to attract the industrialists towards SCME to recruit materials engineers. It is seen that the previous record of participants was low in number. Hardly three to five participants were been reported in 2013 to 2014.in which majority participants were shopkeepers and others were related to chemical engineering discipline. During 2015 and 2016 and especially in 2016 a new strategy was made by IPO heads to attract other industrialists towards SCME. Therefore the number of participants was increased to 19 in number. In this regard Dr. Mohammad Mujahid (Principal SCME) is a person must be recognized due to his great vision. The performance of SCME towards ILO is always compared with other schools especially from SMME. The number of participants was 21 in SMME and we attracted 19 participants out of which 10 were representing Materials Engineering discipline and 9 representing Chemical Engineering discipline (data from Jobfair' 2016). It was also suggested by our heads that the openhouse should be centralized rather than separate for each schools. But due to unfavorable circumstances we were unable to plan the openhouse'2016 separately for SCME.





## 2.6 I&PO MAGAZINE

Our team agreed to publish the first edition of its Magazine and it was made possible after day and night hard work. Our designers finally compiled an IPO magazine and launched it as a test case. However the response is yet immature due to lack of perfection of our team. Some valuable data was tried to embed in the magazine. The purpose of the magazine was to attract the participants towards employability of materials engineering graduates. The following design is the outcome of I&PO office purely.



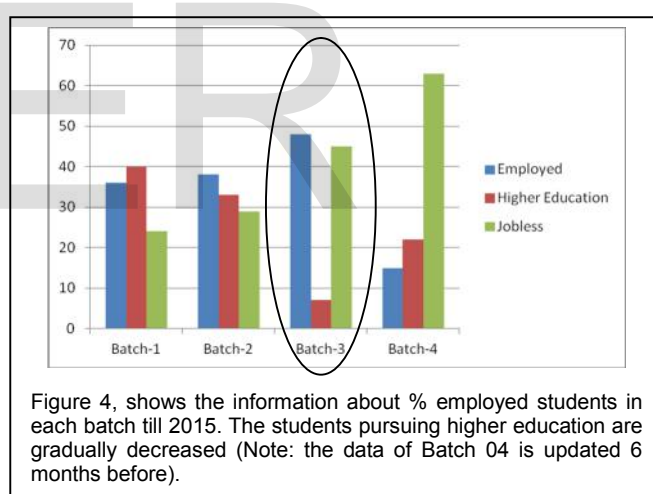
## 2.7 INTERNSHIP AND JOB DATA

The internship record of the previous years was successfully maintained by IPO. As the internship is mandatory for every graduate of SCME, therefore the previous data was available from training branch of SCME. However the number of internship opportunities was increased in 2015 and 2016. The job data was maintained by proper survey and is reported given below.

TABLE 5  
JOBS DATA OF MATERIALS ENGINEERING GRADUATES

Batches	%Employed	%Higher Education	%Jobless
Batch-1	36	40	24
Batch-2	38	33	29
Batch-3	48	7	45
Batch-4	15	22	63

Table shows the Jobs data of Materials Engineering Undergraduate Students from Batch-1 to Batch-4. Note that the Batch-4 is recently graduated so that the %age of unemployability is comparatively higher than others.



## 3 CONCLUSION

Every office like I&PO, SCME needs some reforms for its better performance. The passionate employs are considered as the strengths. This strength some time can be converted into threats if any component of system stops working properly. During academic years 2015 and 2016 IPO is restructured and new policies were adopted. After critical SWOT analysis we reduced our weaknesses and lessen the possible threats. The expenditures have been cut to almost 50 percent. The quality of work is also improved. Many industrialists were attracted to jobfair'2016. New ideas have been launched and hence the employability of batch 03 is increased gradually.

## ACKNOWLEDGMENT

The authors wish to thank Dr. Mohammad Mujahid (Principal SCME), Dr. Muhammad Shahid (HoD-ME), Dr. Arshad Hussan (HoD-ChE), Dr. Israr Qadir, Dr. Waqas Anjum, Lec. Zaeem Aman and SafeGuard team members. This work was supported by 323/I&PO/SCME/NUST.

## REFERENCES

- [1] *Excerpted from Essentials of Strategic Planning in Healthcare by Jeffrey P. Harrison (Health Administration Press, 2010).*
- [2] *Shafritz, J. M., Ott, S. J., & Jang, Y. S. (2011). Classics of Organizational Theory (7ed.). Belmont, Calif.: Wadsworth.*
- [3] *Sumera et. al. City University Research Journal, Volume 3, Number 1, June 2012, article XX*
- [4] *Madeeha Gauhar, Cultural Diversity: Essential for Peace or Root of All Conflict, Held at Museum Africa, Johannesburg, South Africa 24 September 2009*

IJSER