



ORIGINAL RESEARCH PAPER

Education

EMPOWERING EMPLOYABILITY OF ENGINEERING STUDENTS THROUGH SOFT SKILLS

KEY WORDS: soft skills, hard skills, domain-general skills, domain-specific skills, skill development, employability, workplace competencies, engineering students

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ABSTRACT

A professional course program like engineering strives to get the maximum number of its students placed through campus interviews. While communication skills have been added in all the engineering courses with the aim to improve their performance in placement, the syllabus mostly concentrates on the development of four language skills. The students are not made aware of the employability skills and their significance. This essay intends to enlist the importance of skills and why students need to be aware of the skills they possess and how they can work on packaging their candidature around a few skills. The discussion starts by addressing the apparent gap between academic programs for engineering students and industry skills requirements. A list of vital employability skills from the standpoint of engineering students follows, with a discussion on how to potentially develop such skills through campus life. The essay stresses the role of academia in filling this gap by acting as facilitators in a three-step process (i.e., awareness, self-analysis, and acquisition). The author concludes that the combination of both employability skills along with an engineering degree should ensure students meet the high expectations of the employers.

Introduction

Every year in India, around 1.4 million students appear in the all-India entrance examination for the 19 Indian Institutes of Technology, 31 National Institutes of Technology, 18 Indian Institutes of Information Technology, and other engineering colleges ("CBSE JEE main 2016", 2016). After a 4-year degree program, the students are expected to be ready to enter the industry. Yet, expectations from the multinational companies and growing competition has led to students' anxiety and failure in acquiring a job. In the rat race, individuality is often lost and students with technical training and average competencies dominate the list of degree holders. These engineers are assessed in interviews as the employers want to select people who are potential leaders and innovators, those who can change the shape of the world with their ideas and business acumen.

The general perception of an engineer's role is limited to acquiring technical skills along with sound knowledge of science and mathematics. However, Nguyen (1998), in her paper "The essential skills and attributes of an engineer: a comparative study of academics, industry personnel, and engineering students," disagrees and comments on the role of engineers by stating that the dynamic world in which engineers operate presents them with new demands and provides new challenges in the diverse, profound and incessant changes which confront mankind as it heads towards the 21st Century.

This paper aims to explore the importance of soft skills by investigating their effects on engineering Student's employability and suggest which should be focused by students. There are many soft skills that are essential to students, but for this study we focus on three elements only, namely the communication skill, teamwork skill and leadership skill. These soft skills had been appointed as a set of crucial skills required by future workplace in the corporate world. As stated by (John, 2009), modern corporations are often seeking a candidate that possesses this set of skills which they believe can give many benefits to the organisation. The purpose of this study is to give awareness to university students and prepare themselves with the related soft skills before getting into the workplace. This will assist them in job hunting by making them more competitive and can further polishing those skills at their workplaces.

Due to the fact that many students have problem with soft skills, the objective of this study is to investigate the of soft skills will on employability among engineering students. This will lead the student to become more aware of the importance

of possessing the required soft skills. They should know that those equipped with good soft skills have much better chance to be recruited as compared to students who are lacking of such skills. To achieve this aim, the research formulates four research objectives and four research questions.

Literature Review

Soft skills are essentially people's skills or personality-specific skills. Soft skills are "non-technical, intangible, personality-specific skills" which determines an individual's strength as "a leader, listener and negotiator, or as a conflict mediator". Soft skills are the traits and abilities of attitude and behaviour rather than of knowledge or technical aptitude (John, 2009). Soft skills are those skills that add more value to the hard skills adorned by an individual. Soft skills are not a substitute for hard or technical skills, but they act as harmonizing skills that serve up to unlock the prospective for highly effective performance in people even with good hard skills.

Leadership Skills

According to Crowne (2019) leadership is a process of influencing others and is an important resource for any group. Leadership has been defined as "the art of motivating a group of people to achieve a common goal" (Sheriff et al., 2017). Based on Gerhardt (2019) stated that the research has intervention among student's leadership and confidence towards employment for students. The research conducted in London and used the qualitative method. In this research had been used as a module that can across nine discipline and numerous projects towards leadership. The sample used five group leaders among the students. The content analysis included are planning phase, learning and reflection. The project for a tutor use action introduces leadership in week 2. This phase takes the week to complete the methodology. The reflection of the group can reflect their experiences, work-based application and knowledge. Therefore, the study hypothesis that leadership skills will positively affect employment among engineering Students.

Then, Nolan-Arañez and Ludvik (2018) mention on how a leader's perspective on leadership development activities that influence employability among students. The research conducted in the United States of America (USA) and used the qualitative method. This response takes ten students that been leaders during programme Spring 2015 — the students paired with a mentor as their guidance to complete the leadership development programme in two months. There have four sections which are leadership workshop, self-assessment, community service painting murals and

reflection paper. The community service needs students to paint with individuals' disabilities. Therefore, the study hypothesis that leadership skills will positively affect employment among engineering Students.

Next, Nga and Wai Mun (2013) stated that the correlation between leadership highly to driving organisational change among students in Malaysia is highly correlated. The method used is quantitative method and sample is 279 business school of undergraduate students — the survey questionnaire construct study in leadership, ethical values, professionalism and role to the driver change. The findings show that there is a positive correlation between leadership and employability and driver change of organisational. Therefore, the study hypothesis that leadership skills will positively affect employment among engineering Students.

According to Kelly (2017) had been stated about leadership topics to undergraduate students that need to prepare to face a profession in future. This research conducted in Australia and used a qualitative approach. The sample for this research is 100 respondents from students in the university. The section is described how the leadership by a graduate student in Australia. The section will be based on the week they want to research. The researcher takes 7 weeks to explore and found out that leadership skill is one of the critical skills for the students. The respondent gives their opinion on leadership skills that needed to face employment after graduates. Therefore, the study hypothesis that:

H1: Leadership skills will positively affect employment among engineering Students.

Teamwork Skills

Teamwork can affect the performance and effectiveness of organizational when the team members have abilities, knowledge and skills by working in teams. (Hanaysha, 2016). Furthermore, Gerhardt (2019) stated that proficiency of soft skills towards employability among students. This research had been conducted in Tanzania and using a quantitative approach. The respondent that answered the questionnaire is 221 respondents in Institute of Social Work (ISW) that involved final year student of bachelor degree and postgraduate student. The researcher used a two-sample test to examine teamwork skill in once an individual. The result that gets from this research there has a significant positive correlation between teamwork skills and employment among university students. Therefore, the study hypothesis that teamwork skills will positively affect employment among engineering Students.

According to Majid, Liming, Tong, and Raihana (2012) stated that there was a correlation between student perception of importance soft skill towards employment. This research conducted in Singapore and used quantitative method and collected from four universities in Singapore. The survey focus on teamwork skill among the four universities and the sample for this research are 188 students from several courses. The findings of this research show the importance of soft skills in teamwork skills towards employability give positive correlation. Therefore, the study hypothesis that teamwork skills will positively affect employment among engineering Students. Then, Riebe, Roepen, Santarelli, and Marchioro (2010) identified the university programme effectiveness in teaching the students about teamwork skills and future employment. This research had been done in Australia using a quantitative approach which is a questionnaire and two online surveys. After the research, it is shown that positive correlation between effectiveness of university programmes towards employability. Therefore, the study hypothesis that teamwork skills will positively affect employment among engineering Students.

According to Nusrat and Sultana (2019) identified the most desired soft skills frequently sought by recruiters for

engineering graduates to sustain employment and potential candidates to attain. The study was done in Bangladesh using a quantitative approach. Then, the study focuses on the faculties of university-level business education institutes and recruiters of entry-level business graduates. The result showed positive correlation between all the soft skills and to sustain employment among engineering graduates. Therefore, the study hypothesizes that:

H2: Teamwork skills will positively affect employment among engineering students.

Communication Skills

Communication defined a process understanding environment and themselves from the characteristic that happens in levels non-conscious, semi-conscious and conscious. (Salleh, Sulaiman, Mohamad, & Sern, 2017). According to Oussii and Klibi (2017) stated there is correlation communication skill and employment. This research conducted in Australia and had been researched focus on student. The sample used in this research is 180 students. Communication skills perception had formed two groups of students. Firstly, different profiles of students were classified based on average grade. Secondly, the classification was made based on the different of students' socio-economic profiles. The study found that there was a significant association between communication skills and employment profession after students graduate. Therefore, the study hypothesis that communication skills will positively affect employment among engineering students.

As stated by Salleh et al. (2017) have a correlation in soft skills like collaboration skills, communication skills, entrepreneurship and others towards employment. This study had been made in Malaysia by using a quantitative approach. The respondent was selected based on predetermined criteria. The criteria include respondent that come from students or lecturers in five different institutions. The questionnaire used an online survey and achieved 534 respondents. The design used a cross-sectional design because can collect data from the respondent in one time. Finally, base research the findings that get shows high mean score values in communication skills. This can be explained that important communication skills towards employment for the students after they graduate. The result shows high mean score values in communication skills. Therefore, the study hypothesis that communication skills will positively affect employment among graduated students.

Thirdly, Hassall, Arquero, Joyce, and Gonzalez (2013) show further evidence of positive relationship between communication skills and employment among students. This can see from questionnaires that achieved by students in the United Kingdom (UK). There have two questionnaires which are first about oral communication and secondly about the questionnaire that used to measure written and oral communication. The findings showed that these two separate questionnaires have a connection between the concepts that exist in the relationship between in two. This shown strongly the relationship between communication skills and employment among students. Therefore, the study hypothesis that communication skills will positively affect employment among graduated students. According to San-Valero et al. (2018), they stated that the relationship between communication skills and employment was also existed in an engineering course. They utilized a qualitative approach by taking a sample from Master Degree of engineering programme of a university in the United States of America (USA). The training focused on verbal, non-verbal, written and graphical communication. Student were asked randomly in an open session. The students that give cooperation will give a task to answer and settle it such as make a short video that support the documentation. The lecturers also take a part to help the students. Therefore, the study hypothesis that:

H3: Communication skills will positively affect employment among engineering students.

Employability

Employability is “a set of skills, knowledge and personal attributes that make an individual more likely to secure and be successful in their chosen occupation to the benefit of themselves, the workforce, the community and the economy (O’Leary, 2013). According to O’Leary (2013) was stated that there is positive soft skill collaboration about indications and improve the opportunity to get employment among graduated students. This research is conducted in London and the topic has using both qualitative and quantitative methods with primary research that add some material for debate and secondary research to capture the work done previously. The sample is 104 graduated students that come from different universities. The findings that get from this research shown positive correlation between soft skill indication and employment that needed by university students.

According to Stewart, Wall, and Marciniec (2016) has stated soft skills considered most valuable as the level of preparedness in recent college graduates, from the perspective of both employer and college student towards employment. The research conducted in United Kingdom and been used a qualitative approach. The sample that been choose is 214 college students from four university. The respondents 45.8% from seniors and 52.8% from juniors and for remaining to randomly students. The findings shown there have positive correlation between soft skills for the preparedness students face an employment after they graduate.

Next, Camps and Rodríguez (2011) stated that shown correlation between employee individual performance and transformational leadership behaviour towards employment. The employability considered only as an individual phenomenon that mediated by organizational learning capability. The sample used is 795 students used quantitative method from different university and been conducted in Spain. The findings that get from the research shown positive correlation between worker-perceived organizational, employability perception, leadership, perception, performance that significant influence on the group towards employment.

Methodology of Study

The study utilized a quantitative research design in order to examine the causal effects of a set of predictors on the outcome variable. The target population for the study are engineering students of Kanpur university. The population was consisted of four cohorts of graduate students from 2016 to 2020. The total number of the target population is 590 students which are 81 students in 2016, 111 students in 2017, 105 students in 2018, 113 students in 2019 and 180 students in 2020. The survey was distributed to all 590 students, however, only twenty percent or 140 participated and responded to the survey, hence selected as the sample of the study.

Findings and Discussion

The findings are presented according to the objectives that need to be achieved. Our research objectives in measuring the extent to which communication skills, leadership skills and team skills influence job opportunities among engineering students. There were 140 of respondents that cooperated in this research. In terms of consistency reliability or the Cronbach's Alpha reliability coefficients of the three independent and dependant variables were obtained. The results are reported in Table 1 below.

Table 1: Reliability Test

	Cronbach's Alpha	N of Items
Leadership Skills	0.758	9

Teamwork Skills	0.816	12
Communication Skills	0.879	9

The results indicates that the Cronbach's Alpha for the nine items leadership skills measure is 0.758. Next, the results indicates that the Cronbach's Alpha for the twelve items teamwork skills measure is 0.816. The results indicates that the Cronbach's Alpha for the nine items communication skills measure is 0.89. Then, internal consistency reliability of the measure used in this study can be considered to be good. It also means that the questionnaire about the leadership skills, teamwork skills and communication skills is acceptable.

Table 2: Descriptive Statistics

Variables	Employment	Leadership Skills	Teamwork Skills	Communication Skills
Mean	4.5929	4.3000	4.4071	4.2714
Median	4.5000	4.5000	4.5000	4.000
Std. Deviation	0.39139	0.48280	0.46297	0.54102

From the table descriptive statistic shows that mean of employment among Kanpur University engineering student (DV) are 4.5929 which mean that most the respondents agree with the employment among Kanpur University engineering student. The standard deviation result for the dependent variable (Employment) is 0.39139. Meanwhile the mean of leadership skills is figured at 4.3000 which are shows that respondent agree that leadership skills influence the employment among Kanpur University engineering student. The standard deviation result for leadership skills is 0.48280. For the teamwork skills shows that the mean is 4.4071 where the respondents agree that perceived usefulness a positively contribute on employment among Kanpur University engineering student. The standard deviation for Leadership skills is 0.46297. Lastly, the mean of communication skills is 4.2714 which means most of the respondents agree that communication skills influence the employment among Kanpur University engineering student while the result for standard deviation is 0.54102. The normality for this research is not normal because the result is lower 0.05. Maybe this happen because we only focus only to Student in Kanpur University engineering student and lack of respondents. This normality is referring from Shapiro-Wilk. Even assumption for normality data is violated, due to the sufficiently large sample size, the effects of non-normality might be reduced. According to Joseph F Hair, Black, Babin, Anderson, and Tatham (1998), larger sample sizes reduce the detrimental effects of non-normality.

Table 3: Coefficients

Variable	Coefficients	t-statistics	p-value	VIF
Constant	19.253	4.463	.000	-
Leadership skills	.509	4.690	.000	1.589
Teamwork skills	.219	2.400	.018	1.634
Communication skills	.252	2.930	.004	1.608

a. Dependent Variable: Employability

$$\text{Employment} = 19.253 + 0.509\text{Leadership} + 0.219\text{Teamwork} + 0.252\text{Communication} + \epsilon$$

Results from multiple linear regression analysis shown that there is significant linear positive relationship between leadership skills and employment, thus supporting H1. For every unit increase in leadership will increase in employment by 0.509 (adjusted b=0.51, 95% CI 0.29, 0.72, p 0.001) and this shown teamwork skills and communication skills is constant. Next, there is a significant linear positive relationship between teamwork skills and employment,

hence supporting H2. For every unit increase in teamwork will increase in employment by 0.219 (adjusted $b=0.22$, 95% CI 0.04, 0.39, $p = 0.001$). This shown leadership and communication skills is constant. Then, there is a significant linear positive relationship between communication skills and employment, thus supporting H3. For every unit increase in communication will increase in employment by 0.252 (adjusted $b=0.25$, 95% CI 0.08, 0.42 $p = 0.001$). This shown leadership and teamwork skills is constant. Furthermore, forty-five percent (45.5%) of the variation in employment is explained by leadership skills, communication skills and teamwork skills according to the multiple linear regression model ($R^2=0.455$).

Lastly, The VIF value of leadership skills is 1.59 while teamwork skills are 1.63 and communication skills is 1.61. There is argument about the VIF that said <10 is acceptable, but some papers said that the limit of VIF is only 5. Joseph F. Hair (2018) shown the maximum level for VIF is 10. While, (Ecke, Bergman, & Lagerkvist, 1998) said the maximum level for VIF is 5. This result acceptable based on the argument from Hair (2018) and Ecke et al. (1998). The results for VIF for all independent variable are less than 10 and less than 5, hence they are unbiased or free from multicollinearity issue.

Conclusion and Implications

This study investigated the effects of possessing the three basic soft skills (i.e., leadership skills, teamwork skills and communication skills) among engineering students on employability. As the findings from the study suggested, it can be summarized that all the independent variables are crucial factor to enhance the employability of Kanpur University engineering student and refer to the four objectives for this study that shown in the chapter 1 that employability have the relationship with all the independent variable that affect employment among graduated students.

As we can see the first objectives of this study shown that the most influence soft skills that gives effect to employment engineering student are leadership skills. Second objective which is leadership skills were capable to affect employment among engineering student. For third and fourth objective which are teamwork and communication skills gives impact to the employment among engineering students. The good soft skills are very important to be employment among engineering student.

Based on the outcome of the research, it clearly states that all independent variables affect employability among engineering student. Overall, the researchers conclude the first objective to identify most affect the employability which is leadership skills have been answered. For second, third and fourth objective which are to identify relationship between leadership skills, teamwork skills and communication skills affect employability among engineering students have been answered. According to the research that have been done by numerous researchers and academicians, it can be concluded that soft skills is important factor that need to be considered in ensuring the employability and marketability of the students. Therefore, to enhance the employability of engineering students, they must focus on improving their soft skills, particularly the leadership skills, teamwork skills and communication skills.

This research can be used for engineering colleges and universities to improve their education module to be more effective since to get employment is very important to engineering graduates that want to find job after finishing their studies at university. The knowledge and the skills they acquire from learning in university will help them seeking for job. Universities can act on this by ensuring the development of roles and projects that allow students to challenge them, and by providing training programmes that offer on-the-job opportunities for growth. Engaging students at all levels with

strategic direction and decision-making will also help to encourage more people to pursue leadership roles. For engineering students there is a strong desire for clarity in career development. Furthermore, another task-based method for improving student communication skills can be done through critical thinking exercises. This method should be done verbally or through written assignments that will give students the chance to answer questions creatively using their own words and expressions. Lastly, all members need to contribute to the project in one way or another in order to build teamwork which means everyone has to do their part and work towards the success of the team.

Limitation and Suggestions for Future Research

The study is limited to engineering college of Kanpur university. Therefore, future studies should consider expanding the study area and also collect information from both engineering and non-engineering students. This will provide comparative results and produce interesting insights.

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