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A Study on Soft Skill for Engineers and its Correlation's with Reference to Engineering Students in Mysore City

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Abstract

According to some of the Behavioral scientists when they have conducted a research on some of the most successful executives, they were able to identify that there are some characteristics, which made them to become successful executives. They are – Team player, Quick, Responsive, positive, Brave, Self-confident, Facilitator, Open, Resilient, Good learner, Good Teacher, Creative, Competitive, Imaginative, Fun, Reliable, Motivated, Enthusiastic, Inspirational, Committed, Persuasive, Adaptable, Flexible, Self knowing and Intuitive.

Based on the above characteristic features they have grouped and classified them as the following soft skills. They are Employee development / coaching, Customer service, Goal orientation, Planning / Organizing, Diplomacy, personal effectiveness, Negotiation, Persuasion, Empathy, Leadership, Team work, Inter personal skills, Problem solving, Creativity, Information exchange, adaptability, presentation, ongoing learning, prospective thought, decision-making, self-management, and listening, among other skills. Soft skills equip individuals to deal with the persons first and business issues later i.e., secondary. There are about 14 dimensions that have been considered as core dimensions of soft skills. They are- Leadership, Teamwork, Inter personal skills, Problem solving, Creativity, Information exchange, adaptability, presentation, ongoing learning, prospective thought, decision-making, self-management, and listening.

The 14 dimensions that have been considered as the core dimensions in evaluating the presence of soft skills are - Leadership, Team work, Inter personal skills, Challenge-solving, creativity, communication, flexibility, presentation, continuous learning, futuristic thinking, decision-making, self-management, and listening are some of the skills that are required. This study involved certain hypothesis formulation covering the various dimensions and testing these hypotheses using appropriate statistical techniques. The data was properly coded and analyzed with SPSS software package tool to establish the relationship between various dimensions, which discriminate between the students from urban and rural backgrounds.

Introduction

The workplace expectations and working circumstances have undergone significant change in recent years. This involves more multinational and multidisciplinary work groups in addition to the apparent technological advancements like computers and microelectronic gadgets. a higher level of self-responsibility and more frequent and diverse interactions with a larger range of individuals, such as senior management, clients, experts from other departments and organizations, as well as more distant coworkers and other employees.

It is now well acknowledged that having strong communication skills is one of the essential requirements for success in practically any setting. Employers place a high priority on the requirement for these non-technical skills, which is well-documented in their recruiting and promotion procedures.

"SOFT SKILLS" are the extra or additional skills required for engineers and scientists of the 21st century. In order to boost employment marketability and compete effectively

in this fast-paced global world, effective communication and interpersonal skills are essential. It is a necessary condition for success in the modern world. The students are given a solid conceptual and practical framework in team building, development, and management through the Soft Skills. It contributes significantly to the entire personality development of pupils, improving their employment chances.

A person who possesses strong soft skills will be able to improve his or her writing and verbal communication abilities, presentation skills, business correspondence, and ability to write efficient business reports. By developing his interpersonal, team management, and leadership abilities, he will grow more self-assured.

The 14 dimensions that have been considered as the core dimensions in evaluating the presence of soft skills are - Leadership, teamwork, interpersonal skills, problem-solving, creativity, communication, flexibility, presentation, ongoing learning, futuristic thinking, decision-making, self-management, and listening are all important.

Core Dimensions of Soft Skills

Dimensions	Features
Leadership	Leadership is the factor, which will be influencing, motivating and challenges others. Leadership will enhance the capacity to adapt to a range of conditions and scenarios.
Team Work	Cooperation, pride, trust, and a sense of group identity are all fostered and supported through teamwork. It promotes dedication, teamwork, and it will be helpful in working with others to achieve goals.
Inter Personal Skills	Inter personal skills will show excellent comprehension, decency, tact, sensitivity, and care for others. Relationship building and maintenance will benefit from it. Dealing with challenging, antagonistic, and upset individuals is made easier. People from many origins and circumstances can relate to it effectively. Additionally, it is subject to individual variations.
Solving Problem	Problem-solving abilities help to identify issues and assess the quality and relevancy of information. It makes recommendations that will aid in issue resolution by generating, assessing, and using solid judgement.
Crative Thinking / Innovation	It employs creative problem-solving techniques and creativity to provide fresh perspectives on circumstances. This ability will be useful for designing and creating new processes when existing techniques and procedures are unavailable or inapplicable.
Oral Communication	This ability will be useful in efficiently communicating information to people or groups while taking the audience and the nature of the content into account. If the oral presentations are strong and the answer is likewise suitable, it makes sense and is compelling.
Written Communication	It acknowledges the use of proper spelling, punctuation, and grammar in English. It will aid in effectively and efficiently conveying the relevant information in a way that is appropriate for the target audience.
Flexiblity	It is flexible and adaptable to new situations, knowledge, and working practises. Additionally, it will be useful in responding to new information, shifting circumstances, unanticipated barriers, and efficiently handling ambiguity.
Prsentation	Good presentations will affect the audience and lessen any issues or uncertainties that may occur as a result of poor presentations. This is where presentation skills come in handy.
Continuous Learning	This ability will be useful in learning new ways to learn and ways to pick up and use new knowledge and abilities. Additionally, it makes use of various training techniques, feedback, and other chances for personal growth.

Futuristic Thinking	This ability will be useful in considering solutions to deal with challenges or changes that may arise in the future for a variety of causes and in a variety of situations.
Decision Making	Making wise, educated, and unbiased judgements will be made easier with the aid of this ability. In order to achieve organizational goals, it also understands the effects and ramifications of actions, as well as the dedication to acting even in difficult circumstances.
Self-Management	It establishes clear and achievable personal objectives, shows a high degree of imitation, effort, and dedication towards competitive assignments, and does so on schedule. It will enable you to operate independently, inspire you to succeed, and show that you can act responsibly.
Listening	The ability to listen will be useful in better learning and comprehending the issues. This could lead to quicker and better responses.

Literature Survey

According to a research by Graham Horton on Engineering programmes should include professional skills training, according to the University of Magdeburg in Magdeburg, Germany. This essay asserts that graduates must possess abilities that go above and beyond those taught in conventionally structured university programmes since the engineering workplace of today and tomorrow demands them. Several of these professional competencies fall within the broad categories of teamwork and communication. He also explains why these abilities need to be regarded as essential credentials in the article. There are suggestions for adding this kind of training to existing programmes.

Engineers that possess additional abilities or talents will set themselves apart from their contemporaries. The people who have extra talents will be the ones who stay when decisions need to be made during right-sizing or down-sizing. According to a research conducted by Ted W. Hissey and that what he has published in the IEEE proceedings, Vol. 88, No. 8, August 2000.

Soft skills are a must for engineers. The concepts discussed here are based on conversations with global academic experts, business-savvy government officials, and industry executives and managers. The advice and suggestions made during the interviews between 1997 and 1999 are still relevant today. Local perspectives occasionally diverged due to cultural differences. The results of the consensus study suggest that engineers and scientists, young and old, should be aware of the significance of soft skills in advancing their careers.

According to the research conducted by Bethany S. Oberst, Ph.D, Russel C. Jones, Ph.D., and John Naisbit and by the three years International Engineering Education Digest as a data source four major themes emerge from the world of engineering education:

- Changes forced by the fragile world economy;
- Student and professional mobility;
- The use of communications and instructional technology;

The increasingly loud voice of the social imperative.

According to the study conducted by the above three, they emphasized the importance of soft skills training to the young software engineers and their inclusion during their graduation level can enhance the soft skills among engineers. So that the companies' may need not have to invest much on training them.

According to the study of Stephen Johnston who is an Adjunct Professor in the Faculty of Engineering at the University of Technology, Sydney. Who had research (1999) on the necessity of soft skills for engineers and the demand for it in today's globally competitive world emphasized the importance of soft skills training to the young engineers.

According to the research conducted by the "Office of University Research and Education U.S. Department of Transportation". A comparison was being made on engineers of different branches. And the study- revealed that, after soft skills training – results have increased.

According to the research conducted by the IDAHO Engineering Works (IEWORKS), Final

report 2002.The research indicates that a three-day training in interpersonal skills, management practices and sales strategies has increased the performance of the engineers, customer complaints and grievances decreased drastically. Even companies like IBM, Chase Manhattan Bank, Pacific Bell and FPL have acknowledged this and recognized its importance.

AIR TEL

Air tel company earlier called as Touchtel has also conducted research on the necessity and importance of soft skills, for the executives and agents of Airtel, a particular training programme was created, and everybody joining the company must go through the curriculum. The study was done for the fixed landline and broadband division. The training focused on teaching participants how to develop their soft skills. Topics like improving one's own presentation, honing presentation techniques, voice modulation, communication (inter, intra, & group), listening skills, body language (for showrooms), telephone etiquette (brushing up other office etiquette), customer service, relationship building, time management, team building, and collaboration, as well as doctors' suggestions and actions, were covered in detail during a detailed feedback session. More than 72%+24% of those polled during the post-event feedback session expressed a desire for the training to take place every three months and strongly suggested that their coworkers do the same. The activities were well-received by 30% of participants, the programme structure was well-liked by 20%, everything was well-liked by 13%, and 7% of participants rediscovered their missing self-confidence.

DELL

DELL company has also conducted research on soft skills- The company had additional challenge of making the employees educating them about the value of soft skills, the necessity of listening to their clients (the laptop division), and the value of the carefully crafted script created by their internal communications department. The employees' mentality makes it challenging to integrate them into a different culture to which they have not been exposed. This was accomplished using a methodical methodology that made frequent allusions to anthropology and psychology. With this group of people, the fundamental goal of having good leadership abilities was 70% attained. The AIDA (Attention, Information, Desire, and Actualization) philosophy of marketing was the methodology employed.

Another research was conducted at Institute for Industrial Manufacturing and Management (IIMM), Stuttgart, Germany. Numerous surveys have been conducted recently to determine the necessary engineering competencies for professional success. The opinions of personnel managers and business executives from reputable firms in Germany and abroad were solicited. They found that among the most appreciated characteristics are what are known as "soft talents" (teamwork abilities, social competence, adaptability, analytical skills, etc.) and a practice-oriented education. Survey results indicate that there is still a considerable gap between what colleges provide and what the market requires.

According to a research by Gulcin Cribb, The University of Queensland, Brisbane, Australia and Raeanne L. Steele - research objectives include

- To determine the female-friendliness of their work culture.
- To identify the jobs and skill-sets required by them.
- To identify the specific training required to increase the employability of women in engineering, science and technology.

According to Shauna Ryan published in slcontrols there are 9 Soft Skills Engineers Need to Maximize for better Career Success which will enhance their success in recruitment.

The reason that these talents are typically taken for granted is due to the lack of information and organisation on research relating to the significance of soft skills for professionals. It also illustrates how little emphasis is placed on soft skills in school. (Ríos Carmenado, López, & García, 2015; Veiga, 2017; Pereira & Costa, 2017)

The NAE study discussed the significance of technical, social, and global settings for engineering education and identified a number of qualities that future engineers should have. Although many of these qualities are comparable to those needed now and, in

the past, the study emphasizes how complicated they are now because of the effect of new technologies. Improved communication, higher ethical standards, and stronger analytical capabilities are a few of the talents identified in the report (Vasko, Al-Masoud, & Baumann, 2011; Koen & Kohli, 1998).

The study of human behaviour and its relationship to culture, history, and politics is the goal of the human sciences, which also tries to explain the seemingly contradictory behaviour of people as both distinct individuals and social entities (Vasconcelos, 2018).

Soft skills, often referred to as socio-emotional skills, are traits that one utilizes to interact with people and contribute to the formation of their so-called social web (Itani & Sprour, 2015). These abilities involve more than just interpersonal traits; they also include traits like social responsibility, creativity, ethics, and emotional intelligence.

The Humanities in Engineering must be validated in the same way as Technology, with reliable sources acting as evidence (Marrocu & Paci, 2012).

A combination of social and cultural indicators that serve as a gauge of economic and social growth is known as employability (Silva et al., 2019). Today's employability is different because of the workplace's quick transition to a more inclusive atmosphere and a fiercely competitive labour market. In addition to having the necessary technical skills for the position, job applicants must be aggressive and adaptable in their search for professional prospects.

Zaharim et al. (2009) defined employability skills as those needed to obtain and keep a fulfilling job, as well as the ability to teach and transfer their knowledge within the work environment. The OECD commissioned studies on employability from 2015 and 2016 pointed out that the desired skills for employability involve good text interpretation, mathematical knowledge and other soft skills. The study highlights information management and problem-solving as key factors for employability. These include the ability to evaluate, access, communicate and analyze information—both interpreting text-based information and handling mathematical data (OECD, 2015).

According to a research by the Australian Employment Agency and the Monarch Institute, 15% of the desirable skills for employability are technical abilities, and 85% of them are connected to soft skills, underscoring the need of emphasizing soft skills during the academic year.

According to studies, engineers should be in charge of acquiring new knowledge and aggressively, critically, and independently presenting their thoughts. The findings also highlight the necessity for engineering students to begin honing their capacity to offer novel and imaginative solutions to challenges encountered in the real world while still in college. Furthermore, putting the ecological, ethical, and political ramifications of their activities into context is necessary for working in teams, managing multidisciplinary groups, and comprehending society (Klafke, 2005).

According to Caten et al. (2019), the value of soft skills is greater than the importance of technical abilities for both current and future engineers. Skills that go beyond technical proficiency and allow professionals more capacity to take control of their own careers and meet the needs of the contemporary market include leadership, creativity, communication, management, professionalism, ethics, agility, resilience, and adaptability.

According to research by Compton (2008), the abilities needed for management and leadership roles after graduation are those that arise from the Humanities and Social Sciences, such as exhibiting passion and interest, accepting current roles and responsibilities that seek out opportunities for improvement, volunteering to participate in other projects and working groups, developing an understanding of how to address organizational challenges, and self-awareness.

Organizations have been searching for engineers with the technical expertise as well as the communication skills to connect this knowledge with the requirements of their workforce and the broader society. Ajit and Deshmukh (2013) claim that when a recently graduated engineer enters a firm, they immediately face their first obstacle: proving that they can successfully integrate into the company's culture and meet performance standards.

Other research supports the idea that businesses prefer to hire engineers who possess soft skills.

First and foremost, they demonstrate a person's dedication to pursuing a career that aligns with their beliefs, goals, and viewpoint on society (Bates et al., 2019). As a result, it exhibits improved innovation, such as sustainable technology advancement and infrastructure, that is in line with societal aspirations (Kulkarni et al., 2017).

Engineers must possess soft skills in order to apply and practise knowledge in the workplace successfully, as businesses increasingly seek out creative and inventive engineers who can help them gain a competitive edge (llamas et al., 2019).

According to the report by major US companies, Q21: Partnership for 21st Century Learning (Casner-Lotto & Barrington, 2006), only a quarter of university fourth graders are perceived as excellent in many skills, including reading, math, and sociability. This is despite the current hiring trends for engineers suggesting the need to emphasize soft skills. The rest are seen as being underprepared in reading, arithmetic, and writing communication.

Soft skills are crucial for enhancing engineers' employability. Results of Studies (MS Rao, 2014) -Soft skills increase the employability of engineering and management students Employers in India claim that students who have a strong personality, a positive attitude, and good behaviour are more likely to succeed in their jobs. Educational institutions must work together with students, faculty, employers, and directors of educational institutions to ensure that soft skills are developed to their full potential. (Nilsson, 2010) -Engineering graduates need to understand the value of soft skills and put a lot of work into increasing their employability. -Engineering education programmes must place more emphasis on building the soft skills necessary for students' employability and less on imparting technical information. (Zaharim, Yusoff, Omar, Mohamed, & Muhamad, 2009) -The majority of firms in Asia want for engineers that have the capacity to solve problems, communicate well, and work well with others. These competencies may even be more crucial than technical competencies (Blom, & Saeki, 2011). The following findings were obtained as a consequence of the authors' study of Indian employers: Employers do not find newly graduated engineers' qualifications satisfactory. Soft skills are crucial for engineering graduates' employability. Educational curricula must place more emphasis on high level thinking skills, such as engineering problem solving skills (Bloom's taxonomy), rather than just on basic thinking skills, like remembering and understanding. (Saad, Robani, Jano, & Majid, 2013) -Employers place equal weight on soft skills and hard skills when hiring engineering graduates. Universities must support their graduates as they transition into the workforce by gauging how satisfied they are with the graduates' level of skill development. Universities must continuously work with the job market to ensure that their graduates meet employer requirements.

The significance of these talents may be summed up as follows, per the research mentioned:

- The likelihood of having a competitive job is highest for students with the best developed managerial abilities.
- Soft skills, in addition to technical ones, help students flourish and survive in the workplace.
- Students who possess soft skills are paid more;
- Engineers who have highly developed soft skills are happier in their jobs.

In another article on Soft Skills for Entry-Level Engineers: What Employers Want Malar Hirudayaraj, Rose Baker, Francie Baker and Mike Eastman published in Education sciences. The Accreditation Board of Engineering and Technology (ABET) criteria for student outcomes include requirements for students to be able to communicate effectively with a variety of audiences, recognize ethical and professional responsibilities, work effectively in a team, and apply new knowledge. These criteria are among the requirements for engineering programmes.

Comparative Study on the Engineering Soft Skills Required by Moroccan Job Market Hind Chaibate1 , Amine Hadek1 , Souad Ajana2 , Soumia Bakkali2 & Kenza Faraj2, International Journal of Higher Education Vol. 9, No. 1; 2020

Scope or Need of the Research

In all fields now a days employers look for soft skills. Expectations and demands of employers have dramatically changed at work places. One needs to be confident, knowledgeable, responsible and

willing to take timely decisions. Hence the study and analysis of soft skills among engineering students from rural and urban background both at entry and as well at exit were being made as perceived by the user systems. It is very much essential and necessary to have knowledge of one's own strengths. This study revealed that some of those soft skills which were naturally developed in the course of their study. Such identification of soft skills that are yet to be imparted could be given to the students through non- curricular programs, so that there can be a better value addition.

Research Methodology

Questionnaire Design and Testing

A self-evaluating questionnaire was prepared to test the soft skills present among engineering students. Students of three engineering colleges of Mysore have given their perceived answers. Initially a questionnaire comprising of 70 questions was prepared. All 14 of the fundamental aspects that have been taken into consideration for research under the heading of soft skills are covered by the questions as they have been constructed. All of the questions were closed-ended in nature. All 70 questions should be answered by the students. The order of the questions is random. By conducting a questionnaire trail run, it was possible to determine the readability, whether all the questions were understood correctly and how they were intended to be understood, whether there were any redundant questions, unexpected responses, or a lack of understanding of the concepts used in the questionnaire. Students are supposed to give their rating ranging from 5, 4, 3, 2, 1 (5- Strongly agree, 4- Agree, 3- Neither agree nor disagree, 2- Disagree, 1- Strongly disagree).

Research Hypothesis

The objective of this study being to establish the differences in perceptions of the various variables and their dimensions between the Engineering students from Rural and Urban backgrounds, this study aims at the following hypothesis.

- H.1. The leadership qualities will be high among the Urban students than the Rural students.
- H.2. The Team Working capability will be high among Urban students than the Rural students.
- H.3. The Interpersonal skills will be high among Urban students than the Rural students.
- H.4. The Problem solving skills will be high among Urban students than the Rural students.
- H.5. The Creativity Thinking / Innovation skills will be high among Urban students than the Rural students.
- H.6. The Written communication skills will be high among Urban students than the Rural students.
- H.7. The Oral communication skills will be high among Urban students than the Rural students.
- H.8. The Flexibility skills will be high among Urban students than the Rural students.
- H.9. The Presentation skills will be high among Urban students than the Rural students.
- H.10.The Continuous learning skills will be high among Urban students than the Rural students.
- H.11.The Futuristic Thinking skills will be high among Urban students than the Rural students.
- H.12.The Decision making skills will be high among Urban students than the Rural students.
- H.13.The Self-management skills will be high among Urban students than the Rural students.
- H.14.The Listening will be high among Urban students than the Rural students.

Descriptive Analysis of the Sample

In any analysis it is essential to have an overall view of the samples studied. Thus, this section consists of the overall profile of the samples tested, descriptive statistics and frequency.

Description of Sample Size

Table 1

	1st Sem students (Rural and Urban)	8th Sem students (Rural and Urban)
Total number of questionnaires used	100	100
Total number of questionnaires received	80	80
Percentage of response	80 %	80 %

Table 1 shows the details of the number of questionnaires issued, received and the percentage

of response. As shown in the above table, First the questionnaires were issued to I th semester students. Here the sample was consisting of students from purely from rural and urban background. Here a total of 100 questionnaires were issued and among them 80 questionnaires have been received for analysis and the percentage of response was 80 %.

Next the questionnaires were issued to 8 th Semester students who are purely from rural and urban backgrounds. Here a total of 100 questionnaires were issued and among them 80 questionnaires have been received for analysis and the percentage of response was 80 %.

Analysis of the Data

Results of the Study - T – Test

Table 2 Independent Samples Test (1 Semester Students)

Dimensions	t – test for Equality of Means (1 Sem students)		
	t	df	Significance
Leadership	-2.095	78	.041**
Team Work	-3.691	78	.001**
Inter Personal Skills	-.894	78	.376
Problem Solving	-.448	78	.656
Crative Thinking / Innovation	-3.459	78	.001**
Oral Communication	-5.260	78	.000**
Written Communication	-6.441	78	.000**
Flexiblity	.608	78	.546
Prsentation	-4.295	78	.000**
Continuous Learning	-2.740	78	.009**
Futuristic Thinking	-1.452	78	.153
Decision Making	-2.840	78	.007**
Self-Management	-1.406	78	.166
Listening	-2.553	78	.014**

Table 2 displays information on the t-values, degrees of freedom, and significant values for each. As shown in the above table core dimensions such as leadership, Team work, Creative thinking, Written communication, Oral communication, Presentation, Continuous learning, Decision making and Listening are found to be significant and it is denoted with ** symbol.

Table 3 Independent Samples Test (8 semester students)

Dimensions	t – test for Equality of Means (8 Sem students (R & U))		
	t	Df	Significance
Leadership	-1.108	78	.275
Team Work	1.152	78	.257
Inter Personal Skills	-1.354	78	.184
Problem Solving	.814	78	.421
Crative Thinking / Innovation	1.148	78	.258
Oral Communication	-2.727	78	.010**
Written Communication	-2.942	78	.006**
Flexiblity	.479	78	.635
Prsentation	-2.270	78	.029**
Continuous Learning	.000	78	1.000
Futuristic Thinking	.343	78	.734
Decision Making	-2.396	78	.022**
Self-Management	-1.384	78	.174
Listening	-1.026	78	.312

Table 3 details the t-values, degrees of freedom, and relevant significant values. As shown in the above table out of 14 core dimensions only 4 dimensions are found to be significant. They are Written communication, Oral communication, Presentation and Decision making, it is denoted with ** symbol.

Table 4 T-Test for Equality of Means (Comparison between 1 & 8 Sem)

Dimensions	Significance 1 semester (R & U)	Significance 8 semester (R & U)
Leadership	.041**	.275
Team Work	.001**	.257

Inter Personal Skills	.376	.184
Problem Solving	.656	.421
Crative Thinking / Innovation	.001**	.258
Oral Communication	.000**	.010**
Written Communication	.000**	.006**
Flexiblity	.546	.635
Prsentation	.000**	.029**
Continuous Learning	.009**	1.000
Futuristic Thinking	.153	.734
Decision Making	.007**	.022**
Self-Management	.166	.174
Listening	.014**	.312

Table 4 shows the significant differences between 1 semester students and 8 th semester students.

1 semester students have significance differences in these core dimension such as Leadership, Team work, Creative thinking, written communication, Oral communication, Presentation, Continuous learning, Decision making, Listening.

8th semester students have got significances in the following 4 core dimensions as shown in Table 6. They are written communication, Oral communication, Presentation and Decision-making.

Table 5 Common Significances Among 1 Sem And 8 Sem Students

Dimensions	Significance 1 Sem	Significance 8 Sem
Written Communication	.010**	.000**
Oral Communication	.006**	.000**
Prsentation	.029**	.000**
Decision Making	.022**	.007**

As shown in the above Table-5 there are four core dimensions which are significant among engineering students of 1 semester and 8 th semester students.

Correlations

Correlation of I Semester Students

As shown in Table 6

If leadership skill is good – Team work, Oral communication, , Presentation, Continuous learning, Futuristic thinking and Listening skills will be good.

If Teamwork skill is good - Inter personal skills, Problem solving, Creative thinking / Innovation, written communication, Oral communication, Flexibility, Presentation, Continuous learning, and Decision making skills will be good.

If interpersonal skills are good - Problem solving, Continuous learning and Decision-making will be good.

If Problem solving skill is good - Creative thinking / Innovation, written communication, Flexibility, Continuous learning, Futuristic thinking and Decision-making will be good.

If Creative thinking / Innovation skill is good - Written communication, Oral communication, Presentation, Continuous learning, Futuristic thinking, Decision making and Listening will be good.

If Written communication skill is good - Oral communication, Presentation, Continuous learning, Decision making, Self management and Listening will be good.

If Oral communication skill is good - Presentation, Continuous learning, Futuristic thinking, Decision making, Self-management and Listening will be good.

If Flexibility skill is good - Continuous learning, Decision making and

Self-management will be good.

If Presentation skill is good – Decision-making will be good.

If Continuous learning skill is good – Decision making and Self management will be good.

If Decision-making skill is good - Listening will be good.

If Self management skill is good - Listening will be good.

Correlations of 8th Semester Students

As shown in Table - 7

If Leadership skill is good – Written communication and Decision-making will be good.

If Teamwork skill is good – Problem solving, Continuous learning and

Decision-making will be good.

If interpersonal skill is good – Continuous learning and Self management will be good.

If Creative thinking / Innovation skills are good - Presentation and

Self-management will be good.

If Written communication skill is good – Oral communication, Presentation and Decision making will be good.

If Oral communication skill is good – Presentation and Decision-making will be good.

If Presentation skill is good – Decision making and Self management will be good.

If Continuous learning skill is good – Self management will be good.

If Decision making skill is good – Self management will be good.

Table 6 Correlations of 8th Semester Students

	Lead	Team	Inter	Prob	Cr Th/I	W.C	O.C	Flex	Pres	C.Lrn	F.Think	D.M	Self	Listen
Leadership Corr Sign		.230 .153	.143 .377	.286 .073	.204 .207	.322* .043	.282 .078	-.148 .362	.257 .110	.237 .141	-.026 .876	.528* .000	.172 .289	.296 .063
Team work Corr Sign			.148 .363	.486 .001	.284 .076	.020 .903	.079 .626	.025 .877	.234 .147	.470 .002	-.014 .930	.343 .030	.008 .962	.233 .147
Inter personal skills Corr Sign				-.146 .370	.177 .275	.246 .126	.212 .189	.078 .631	.173 .286	.320 .044	-.112 .490	.220 .173	.338 .033	.133 .412
Problem solving Corr Sign					.236 .143	.102 .532	.059 .717	.074 .648	.048 .769	.039 .813	.218 .177	.300 .060	-.146 .370	.179 .270
Creative thinking Corr /Innovation Sign						-.044 .789	.102 .532	.229 .156	.324 .042	.150 .356	.103 .529	.295 .065	.383 .015	-.037 .819
Written Communication Corr Sign							.606 .000	.079 .627	.503 .001	.117 .472	-.155 .339	.525 .001	.225 .163	.056 .732
Oral communication Corr Sign								.000 1.000	.582 .000	.000 .999	.044 .785	.528 .000	.281 .079	-.061 .707
Flexibility Corr Sign									.209 .196	-.081 .618	.205 .203	.028 .862	.226 .160	-.115 .480
Presentation Corr Sign										.284 .076	-.109 .502	.512 .001	.371 .019	.024 .885
Continuous learning Corr Sign											-.025 .878	.237 .142	.463 .003	-.049 .762

Futuristic thinking Corr Sign												.103 .529	.152 .349	.000 .998
Decision Making Corr Sign													.328 .039	.181 .262
Self-Management Corr Sign														-.112 .492
Listening Corr Sign														

Table 7 Correlations of 1st Semester Students

	Lead	Team	Inter	Prob	Cr Th/I	W.C	O.C	Flex	Pres	C.Lrn	F.Think	D.M	Self	Listen
Leadership Corr Sign		.431 .002	.132 .360	.261 .068	.190 .187	.135 .351	.351 .012	-.020 .893	.320 .023	.438 .001	.316 .026	.260 .069	214 .136	284 .046
Team work Corr Sign			.295 .038	.440 .001	.434 .002	.354 .012	.415 .003	-.090 .535	.413 .003	.314 .026	.262 .066	.357 .011	.034 .814	.255 .074
Inter personal skills Corr Sign				.349 .013	.093 .521	.192 .181	.073 .613	.074 .612	.030 .834	.368 .009	-.070 .629	.356 .011	-.005 .974	-.103 .475
Problem solving Corr Sign					.439 .001	.309 .029	.065 .652	.280 .049	.039 .786	.391 .005	.316 .025	.362 .010	.186 .197	.286 .060
Creative thinking Corr /Innovation Sign						.467 .001	.446 .001	.268 .060	.492 .000	.404 .004	.326 .021	.602 .000	.205 .152	.346 .014
Written Communication Corr Sign							.705 .000	.248 .082	.415 .003	.442 .001	.157 .277	.632 .000	.290 .041	.385 .006
Oral communication Corr Sign								-.001 .996	.609 .000	.389 .005	.155 .283	.565 .000	.334 .018	.362 .010-.
Flexibility Corr Sign									-.056 .697	.309 .029	.057 .693	.289 .042	.495 .000	.198 .168
Presentation Corr Sign										.163 .257	.195 .175	.409 .003	.207 .150	.264 .063

Continuous learning Corr Sign											.271 .057	.425 .002	.368 .009	.106 .463
Futuristic thinking Corr Sign												.203 .158	.203 .158	.205 .153
Decision Making Corr Sign													.233 .103	.342 .015
Self-Management Corr Sign														.366 .009
Listening Corr Sign														

Conclusion

The data were statistically analyzed, and the following findings were made:

- There is a significant difference among the engineering students from Urban and Rural domiciles both at the entry level i.e., 1st semester students (9 - core dimensions), when compared to the 8th semester students (4 – core dimensions).
- 8th semester students (4 - core dimensions) are having less significant differences, when compared to I semester students (9 – core dimensions).
- From the conclusions of 1 and 2 it is evident that students will have low soft skills at the entry level i.e.

1st semester students and as they come for the final semester i.e., 8 th semester, some of the soft skills will be developed during their course of study. But still even among 8 th semester students from rural and urban domiciles there is a significant difference in some of the core dimensions of soft skills. i.e. 4 core dimensions – (Written communication, Oral communication, Presentation and Decision-making).

Hence there is a need to train in those 4 core dimensions of soft skills during their course of study.

- Correlation's of 1st semester students show that there are about 49 correlations.
- Correlations of 8th semester students show that there are about 18 correlations.
- From the conclusions of 4 and 5 there is a significant difference among engineering students between the I semester students and 8 th semester students. It is also evident that over the 4 years course of engineering there was a significant improvement in the presence of soft skills.

Hence there is a need to train in those 4 core dimensions of soft skills during their course of study.

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