



# COMMUNICATION SKILLS OF ENGINEERING GRADUATES – AN EMPIRICAL STUDY

**Dr.N.Samuel Babu<sup>1</sup>, V.Durga Bhavani<sup>2</sup> and K.Rupa Anusha<sup>3</sup>**

Assistant Professors-in-English 1,2&3

Department of Science & Humanities (S&H)

Holy Mary Institute of Technology and Science

Bogaram, Kesera Mandal, Medchal District, Telangana State- 500 301

**Abstract:** Communication skills are set of important employability skills. The National Employability Report of India (2011) reports that nearly 78 percent of the graduate engineers lack communication skills. As a result knowledge process outsourcing industry is able to pick up only 9 out of 100 engineers. Further, with the advent of the digital age and Industry 4.0, the communication skills of engineering students has been exerting gradually increasing influence on the need for enhanced student employability. The current study thrashes out Communication skills of Engineering graduates with special reference to active listening skills; verbal communication skills; communication building strategies; writing skills. A sample of 130 Engineering graduates from the Department of Computer Science in Engineering (CSE), AI&ML group in a semi-urban Engineering College were chosen through Non-random Convenience Sampling. A tool comprised twenty statements developed by Srivastava Kajal (2018) was employed to evaluate communication skills with a five-point Likert Scale. The results demonstrated that a good majority of engineering graduates exhibited a significant difference in communication skills and also they cannot express their thoughts effectively in writing in English; diffident in speaking English and hesitant in public speaking. It was suggested to enhance confidence in speaking and writing as well reading and listening. Further, professional development programmes are to be taken up along with revamping of existing English labs. Directions for future research were also portrayed.

**Index Terms - Communication Styles; Engineering Graduates; Empirical study; Active listening skills; verbal communication skills; communication building strategies; writing skills.**

## 1.0 Rationale of the Study

With the advent of the digital age and Industry 4.0, the communication skills of engineering students has been exerting gradually increasing influence on the need for enhanced student employability. Communication is defined as transferring information to produce greater understanding. In a nutshell, communication skills can be referred as the ability to convey information to another effectively and efficiently. Being able to communicate effectively is the most important of all life skills, especially for Engineering graduates. S. Shikha, (2012) put forth that good English Communication Skills are a vital element of an engineer's profession and the lack of such skills only undermines the image of an engineer. Communication skills are a vital component recognized by academia and industry alike. Communication is not just speaking but involves various aspects such as writing, listening, as well as visual, intercultural, and interdisciplinary aspects (Riemer, 2007).

Citing the significance of English for Engineering students, El-Raghy, S.,(1999) lucidly sums up, “English is the prime means for communication, and can often serve as the global language between two people from two different cultures where English is not the native tongue. For example, French engineers communicated with Egyptian engineers in English during the building of the Cairo subway”. In the same vein, Fornaro et al (2001) acknowledges that for engineers communication skills have been considered as at least as important as technical skills for their success in the corporate environment.

Conversely, the National Employability Report of India (2011) reports that nearly 78 percent of the graduate engineers lack communication skills. As a result knowledge process outsourcing industry is able to pick up only 9 out of 100 engineers (Mehra,2013). Ninety-one percent of the employers in USA and 84 percent in India have found communication as an important skill among engineers (Blom and Saeki 2011). Tenopir and King (2004) reported a survey of faculty and students at Michigan State University found that engineering students had trouble in communication. The Institution of Engineers in Australia identified core communication competencies for engineers as effective communication in English (Tenopir,2004). Research carried out by P'Rayan (2011) in engineering College of Anna University showed that only 50% students passed the English proficiency test despite scoring more than 70 percent in the University English examination. In India, an engineering student's success in "on campus recruitment" is largely determined by his or her ability to communicate (Berlina A. Lopes,2021)

Communication skills are important for growth and career progression of individuals as well. A research study concluded that recruiters rated communication skills as the most important characteristic of an ideal job candidate (Yate, 2009).Abundant research has proved that communication skills are essential for engineers (Bradshaw, 1992; Prentice, 1984, Margerison & Kakabadse, 1984). The results of earlier research indicated that a positive communication environment gives students opportunities to learn how to communicate thereby improving their communication skills (Srivastava,2018).

The existing body of literature certainly speaks volumes about communication skills but a few studies could speak about communication skills for engineering graduates. Moreover, the review of literature reveals that empirical studies on the subject on hand, especially in Telangana State is in nascent stage. Keeping in view the need of the hour, it is determined to assess communication skills among Engineering graduates. Hence, the present study is titled as: “**Communication Skills of Engineering Graduates – An Empirical Study**”.

### **Objectives of the study**

- 1.To delineate Communication skills with special reference to active listening skills of Engineering graduates in the State of Telangana.
2. To appraise Communication skills with special reference to verbal communication skills of Engineering graduates in the State of Telangana.
3. To assess Communication skills with special reference to communication building strategies of Engineering graduates in the State of Telangana.
4. To appraise Communication skills with special reference to writing skills of Engineering graduates in the State of Telangana.

### **Hypotheses of the study**

**HO<sub>1</sub>**. There is no statistically significant difference between Communication skills with special reference to active listening skills of Engineering graduates in the State of Telangana.

**HO<sub>2</sub>**. There is no statistically significant difference between Communication skills with special reference to verbal communication skills of Engineering graduates in the State of Telangana.

**HO<sub>3</sub>**. There is no statistically significant difference between Communication skills with special reference to communication building strategies of Engineering graduates in the State of Telangana.

**HO<sub>4</sub>**. There is no statistically significant difference between Communication skills with special reference to writing skills of Engineering graduates in the State of Telangana.

## 1.1 Previous Research

**Rayan and Shetty (2008)** carried out various strategies to overcome communication apprehensions among the students in order to develop their communication skills. This included brain storming sessions on various reasons that cause communication apprehension and the suggestions to overcome them. The strategy also included one-to-one interaction with the teacher and individualized training. In individualized training students who had high communication apprehension were grouped together for GD and public speaking.

**Deepshikha Mehra and Vinita Virgandham (2013)** in a research paper ascertains the global viewpoint as well as the Indian perspective on the specific types of communication skills required by engineers in order to become employable as well as successful at workplace. Various aspects of communication skills such as oral communication skills, interpersonal skills, written communication skills, effective listening skills, and confidence level in expression of ideas to an audience have been identified as important skills. An integration of communication and adaptive skills would help Engineers learn the functional aspects of the English language better.

**Meenu Pandey (2014)** in a boon on ‘*Communication skills for Engineers*’ deals with the tested techniques and strategies which are effective to develop communication skills of engineers. Further, it deals with phonetics and grammar, required to enhance communication skills of engineers.

**Tarjani Dakshesh Sheth (2015)** gauged the present scenario of the technical world, role and importance of communication in it, and the need for an engineer to sustain his talent as well as compete with the world holding two weapons-technical skills and communication skills.

**Kajal Srivastava (2018)** conducted a descriptive study on Communication skills of management trainees. at the time of joining the institute through a self-appraisal questionnaire. Findings indicated that there was fear of public speaking among the sample, respondents fall short of words while writing in English and need to be encouraged to read more English magazines and novels. Feedback from peers was recommended.

**Saravanan, V and Sankar G (2020)** presents literature review related to this title and also various methodologies, tools and techniques to enhance the communication skills of the mixed engineering classrooms. It discusses about the feedback as a technic for improving communication skills and better their spoken and written communication of the engineering students. It was suggested that the engineering students with better communication can face the global job market with self- confidence.

**AKakepoto, I., Laghari, A., & Buriro, S. (2022)** in a qualitative study attempted to discover communication skills needed for novice engineers. Findings indicated that communication skills play a significant role for engineers in the work environment of modern industry.

**Wu, Ying, Lin Xu, and Simon P. Philbin. (2023)** evaluated the influence of communication skills on the employability of engineering students from the aspects of verbal and non-verbal skills through the four key elements of Outcome-Based Education (OBE) theory. The results show that in the digital age, the verbal ( $p < 0.01$ ) and non-verbal ( $p < 0.001$ ) components of students’ communication skills play a significant role in the employability of engineering students.

## 1.3 Methodology

For the present study, Descriptive empirical Research Design was employed. The survey instrument was a closed ended questionnaire. A sample of **One hundred and thirty (130)** Engineering graduates from the Department of Computer Science in Engineering (CSE) AI&ML Group in a semi-urban Engineering College were chosen through Non-random Convenience Sampling. A tool comprised twenty statements developed by Srivastava Kajal (2018) was employed to evaluate communication skills with a five-point Likert Scale.

### 1.3.1 Reliability

Reliability refers to a consistency of the measure. A correlation coefficient is generally used to assess the degree of reliability. A high positive reliability is seen if a test is reliable. Test, re-test reliability and inter-rated reliability was established. The Cronbach alpha reliability coefficient of the tool was found to be 0.94.

### 1.3.2 Validity

Content was established by submitting the instrument to nearly ten professionals who have more than ten years of experience in teaching Engineering graduates under JNTU. They were requested to rate the relevance of each item in the checklist and also to suggest other items, if required. The content validity index of individual items ranged between 0.82 to 1.00 showing high content validity. On the basis of the suggestions the tools were suitably modified/ amended and used for the present study.

### 1.3.3 Administration of the tool

The tool was administered to the selected sample. Care has been taken to ensure their responses as objectively as possible. The respondents were requested to record their free, frank and independent responses. An assurance shall be given to the respondents that their responses shall be kept confidential and information collected will be used only for the purpose for it was collected. On-line responses were also entertained.

The data was entered in the excel sheet and statistical treatment was given. Statistical techniques like percentiles, mean and standard Deviations and correlation techniques were employed.

## 1.4 Results and Discussion

### 1.4.1 Table showing mean and Standard deviation measuring communication skills

S.No	Statement	Mean	SD
1	I pay attention to each and every word from others in conversation	4.1	.50
2	I listen carefully to grab the meaning of spoken words.	4.1	.57
3.	I respond to listening by asking questions in the class	3.9	.79
4	I fully comprehend lecture in the class	4.1	.63
5	I avoid using slang while speaking in English	3.5	1.0
6	I hesitate to speak in public	3.1	1.2
7	I try to use new vocabulary while speaking in English	4.0	.67
8	I speak grammatically correct English	3.6	.83
9	I feel confident in speaking English	3.8	.85
10	I find it easy to communicate my point of view to others	3.9	.59
11	I can easily summarize what I listen to	4.1	.68
12	I have a fear for impromptu (on the spot) speech	3.5	.96
13	I regularly watch English News channels	3.2	1.1
14	I have the habit of reading English Newspapers	3.2	1.1
15	I easily understand the content of English Newspapers.	3.6	.93
16	I prefer to write down new words from newspapers	3.2	1.0
17	I often use non-verbal communication	3.4	.99
18	I place emphasis on writing grammatically correct English	3.7	.83
19	I can express my thoughts effectively in writing in English	3.9	.85
20	I fall short of words while writing in English	3.6	.99

The mean values indicate that the respondents paid attention each and every word from others in conversation (4.1) ; able to grasp the meaning of spoken words (4.1); fully comprehend lectures in the class (4.1); can easily summarize what they listen to (4.1); use new vocabulary while speaking in English (4.0) *relatively higher values* for these statements.

Conversely, the sample confessed they never responded to listening by asking questions in the class (3.9); it was not so easy for them to communicate their point of view to others (3.9); they cannot express their thoughts effectively in writing in English (3.9); they felt diffident in speaking English (3.8); never placed emphasis on writing grammatically correct English (3.7); hesitated to speak grammatically correct English (3.6); never understood the content of English Newspapers (3.6); used slang while speaking in English (3.5) ; exhibited fear for impromptu speech (3.5) ; rarely used non-verbal communication (3.4).

Apparently, watching English News channels (3.2); reading English Newspapers (3.2) speaking in public (3.1) are the statements found to be relatively with low values.

### 1.4.2 Table showing Correlations of communication skills

		Correlations			
		ALS	VCS	CBS	WS
ALS	Pearson Correlation	1	.359**	.344**	.314**
	Sig. (2-tailed)		.000	.000	.000
	N	130	130	130	130
VCS	Pearson Correlation	.359**	1	.600**	.378**
	Sig. (2-tailed)	.000		.000	.000
	N	130	130	130	130
CBS	Pearson Correlation	.344**	.600**	1	.514**
	Sig. (2-tailed)	.000	.000		.000
	N	130	130	130	130
WS	Pearson Correlation	.314**	.378**	.514**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	130	130	130	130

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Karl Pearson product-moment correlation was adopted to find out the correlation between various communication skills. Results demonstrated that :

1. Active Listening Skills and Verbal Communication Skills is significant at 0.01 level (2-tailed), the Pearson Correlation is .359.
2. The correlation between Active Listening Skills and Communication Building Strategies is significant at 0.01 level (2-tailed), the Pearson Correlation is .344. The correlation between Active Listening Skills and Writing Skills is significant at 0.01 level (2-tailed), the Pearson Correlation is .314.
3. The correlation between Verbal Communication Skills and Communication Building Strategies is significant at 0.01 level (2-tailed), the Pearson Correlation is .600.
4. The correlation between Verbal Communication Skills and Writing Skills is significant at 0.01 level (2-tailed), the Pearson Correlation is .378.
5. The correlation between Verbal Communication Building Strategies and Writing Skills is significant at 0.01 level (2-tailed), the Pearson Correlation is .514.
6. The correlation between Active Listening Skills and Verbal Communication Skills is significant at 0.01 level (2-tailed), the Pearson Correlation is .359.

### 1.5 Major findings

1. The findings of the study revealed that Engineering graduates are relatively good at grasping the meaning of spoken words; fully comprehend lectures in the class ; can easily summarize what they listen to and used new vocabulary while speaking in English.
2. Further, it was found that they never responded to listening by asking questions in the class; they could not communicate their point of view to others easily ; they cannot express their thoughts effectively in writing in English ; diffident in speaking English ; writing grammatically correct English was never emphasized; hesitated to speak grammatically correct English; they never understood the content of English Newspapers ; used slang while speaking in English ; exhibited fear for impromptu speech ; rarely used non-verbal communication.
3. Moreover, the results demonstrated Engineering graduates significantly differ in their communication skills in watching English News channels ; reading English Newspapers and they hesitated to speak in public.

## 1.6 Implications of the Study

The findings of the present study holds theoretical as well as practical implications for Engineering graduates, professors as well as the implementing authorities.

The findings of the present study reveals that *Engineering graduates* need to develop Communication skills to face their lives with courage and confidence. The areas which need to be developed are the public speaking skills; reading of English newspapers and listening to English news channels. Good communication skills attracts the attention of people at all levels. Berlina A. Lopes (2021) corroborates this idea and urges that the core competence of professional students is based on their confidence and in speaking and writing as well reading and listening.

The findings also demonstrates that there is a need for *English professors* to train the engineering students for employability. Professional development programs for English professors working in engineering colleges may be taken up from time to time. Moreover, the teaching methodologies need to be enhanced as large number of students want more interactive sessions to improve their linguistic skills. Saravanan,.V and Sankar G (2020) articulates enhancing communication skills of the engineering students would result in better placement opportunities for them and it would help them to develop their self-esteem.

Further, language labs offer a broad range of learning materials and modes of language learning. The quality of the language proficiency will be more when they learn it from the multimedia, digital and computerized Language Lab. Hence, the *implementing authorities* should focus on this relentlessly. Sakshi (2014) explicitly supports this and urged the modern language labs offer an extensive and growing range of services to users. Most of the services relate to offering a variety of good communication skills.

## 1.7 Directions for future research

1. A similar study with a larger sample can be conducted to have an in-depth knowledge on Communication skills of Engineering graduates.
2. There is a need to explore the role of Professors in teaching Communication skills for Engineering students.
3. A phenomenological study can be undertaken in Colleges of Engineering with respect to enhancement of Communication skills in Post-COVID era.

## 1.8 Conclusion

It can be concluded that engineering graduates require an ever-increasing range of skills to wrestle with the global competition of the new millennium. Two weapons viz., communication skills and technical skills, which are equally recognized by academia and industry are *sine quo non* for engineering graduates. Curriculum modifications are a pre-requisite to instill a sense of confidence among the prospective engineers. So that they may find green pastures in their future globalized digital world.

## Acknowledgements

The authors wish to thank immensely the **Management**, especially **HOD (S&H)**, Holy Mary Institute of Technology and Science, Bogaram, Medchal Dist for their unstinted support in conducting this empirical study.

## Competing Interests

Authors declare that no competing interests exists.

## References

- [1]. AKakepoto, I., Laghari, A., & Buriro, S. (2022). Engineering Communication Skills for Novice Engineers: A Pilot Project. *Global Educational Studies Review*, VII(I), 12-19.
- [2]. Berlina A. Lopes (2021) Role and Importance of Communication Competence for Engineering Students. Retrieved from <https://www.researchgate.net/publication/354649216> .
- [3]. Blom, A., Saeki, H.,(2011) *Employability and Skill Set of Newly Graduated Engineers in India*, Policy Research Working Paper 5640, The World Bank, South Asia Region, Education Team, April 2011.
- [4]. Deepshikha Mehra and Vinita Virgandham (2013) Communication Skills for Enhanced Employability of Engineers: A Review of literature. *Confluence*. pp.70-76.
- [5]. El-Raghy, S., (1999) Quality engineering education: student skills and experiences. *Global J. of Engng.Educ.*, 3, 1, 25-29.
- [6]. Kajal Srivastava (2018) Self-assessment of Communication Skills by Management Students: An Empirical Study in Indian context. *Journal of English Education*. Vol.6.Issue.2.pp.11-18.
- [7]. P'Rayan, A., Shetty, R.T., (2008) Developing Engineering Students' Communication Skills by Reducing their Communication Apprehension. *English for Specific Purposes World*, Vol. 7, No. 4 (20).
- [8]. Meenu Pandey (2014) **Communication skills for Engineers**. Research India Publication.
- [9]. Sakshi Semwal (2021) The significance of Language Laboratories in Teaching/Learning English Communication: A Study in Indian Context Upstream Research International Journal.Vol2.Issue.1.
- [10]. Saravanan, V and Sankar G (2020) Enhancing communication skills of engineering Students -A Study. *European Journal of Molecular & Clinical Medicine*. Volume 07, Issue 11,pp.5358-5362.
- [11]. Tarjani Dakshesh Sheth (2015) Communication Skill: A Prerequisite for Engineers. *International Journal on Studies in English Language and Literature (IJSELL)* Volume 3, Issue 7, July 2015, PP 51-54.
- [12]. Tenopir, C., King, D. W.,(2004) **Engineering Education and Communication Skills, in Communication Patterns of Engineers**, John Wiley & Sons, Inc., Hoboken, NJ, USA.
- [13]. Wieserman, L., & Alshurafa, S., & Murad, M. M. (2023), *Impact of Communication Styles on Teaching Engineering*. Paper presented at 2023 ASEE Annual Conference & Exposition, Baltimore , Maryland. <https://peer.asee.org/43468>.
- [14]. Wu, Ying, Lin Xu, and Simon P. Philbin. 2023. "Evaluating the Role of the Communication Skills of Engineering Students on Employability According to the Outcome-Based Education (OBE) Theory" *Sustainability* 15, no. 12: 9711.