A Course on English Communication Skills for Indian Engineering Students in Industry 4.0 Era: A Proposal

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Abstract: Industry 4.0 emphasises the need for professionals with communication competence and knowledge of the interdependence among advanced technologies and human resources. In addition to domain skills, candidates must be adept in communication, have creative and critical acumen, and desire to devise innovative and customer centric solutions. The present study proposes a framework for designing a course on communication skills in English for engineering students. Guidelines relating to improving communication competence emphasise that communication competence should be integral to the curriculum rather than emphasising incorporating a subject on English or Technical communication in engineering education.

Keywords: Engineering education, Employability, Professional Communication, Interpersonal Skills, Teaching and Learning.

1. Introduction:

Industry 4.0 emphasises the role of the Internet of Things, drones, Big data, and advanced research in various fields with a vision to transform society. The focus is on better automated AI machines capable of communicating amongst themselves. It also has a vision of reducing human interventions with humanised and empathetic robots to make life simpler and more convenient. Nevertheless, for all these things to happen, the experts believe that intra and interpersonal communication skills will be crucial. As Gaulia mentions, companies prefer hiring professionals with a passion for adapting to meet challenges, a sound emotional intelligence quotient to handle conflicts and foresee and solve problems creatively (2018). The existing literature about the impact of technology on jobs and skills reflects a newfound preference for communication competence which is impossible, at least in the near future, to be replaced by machines. Nagarkar says that the focus in the coming years will be on recruiting professionals with higher order skills (2020). These skills include the capacity to adapt, perseverance, team spirit, emotional intelligence and interpersonal competence.

As AI today is replacing human intervention faster than ever, organisations will require more ethical and inclusive leaders. With ever increasing automation, it is imperative that technology complements human skills that require careful human intervention. Since technology is changing and evolving rapidly, it puts a great emphasis on having such leaders in organisations who can take tough decisions with ethical and social implications. The responsibility of using such advanced tools ultimately falls on human resources. Intricate interactions between humans and artificial intelligence will be the hallmarks of Industry 4.0. The situation calls for an in-depth understanding of managerial functions suited to meet the requirements of highly advanced workplaces. Foutty mentions that such workplaces can only be handled by professionals having impeccable interpersonal competence (2019). Therefore with the advent of 4.0, the qualities such as creativity, empathetic listening, openness to experience, persuasiveness, and emotional intelligence will be more significant than ever. As per a survey conducted by Deloitte Global, the most desired traits for becoming a successful professional are communication competence, confidence/motivation, ethics/integrity, and critical thinking (2019).

In India, apart from hundreds of dialects, there are over 22 official spoken languages. This makes India one of the most linguistically diverse countries. People use English as either their second or third language. This scenario makes learning fluent English difficult as the learners often speak their native language outside the classrooms/formal situations. Learners are only occasionally forced to communicate solely in English.

Especially in rural areas, teaching and learning English is problematic because of the lack of exposure and opportunities to learn English. This lack of exposure leads to great hesitation among students regarding using the English language, even at the graduate level. According to P'Rayan & Shetty, Indian students show discomfort while speaking English and display high levels of Communication Apprehension (2008). As noted by Gordon, such tendencies are common among English speakers who are not native English speakers (Cited in Hart-Rawung and Li, 2008). Since English is used in most educational institutions for instruction purposes and is also considered lingua franca across the globe, it significantly affects the communication competence of a student. The importance of the English language is very well established in a survey conducted by Blom & Saeki, according to which English communication skills lead to an increase in the hourly wages of engineers by 34 per cent (2011).

As Marina & Rajprasit (2014) noted, most nations in Asia consider communication competence as one of the most essential selection parameters. Mehra & Virgandham (2013) study the significance of communicative English, which includes listening, speaking, reading and writing skills vis-à-vis employability of Engineers in India. An employability report in 2016 finds that only 17.91% of engineers were employable in the software services sector in India (2016). About 3.67% were worthy of getting hired for software products, while 40.57% were fit for other jobs like BPOs. Competence in English communication was one of the significant parameters used for deciding employability. Blom & Saeki (2010) say that some recruiters consider communication competence to be greater in importance than professional skills. Therefore the recruitment of individuals lacking in communication skills becomes challenging. Even those companies which provide post-recruitment training to professionals report that around 52.21% of engineers fail in soft skills training. Puranik (2015) says that poor communicative competence adds to the total number of unemployed engineers as such individuals are unwilling to accept jobs which do not match their qualifications.

There are numerous studies that have studied the importance of the English language for engineers (Gimenez, 2014). According to Huckin & Oslen (1991), as most of the work in various engineering fields is primarily interdependent, the need to have good communication skills to work in coordination is as critical as having technical skills and creativity. Fisher (1998) notes that a survey conducted on 1,000 employers in the USA found that 96% of executives consider effective communication skills crucial for succeeding professionally. Similarly, in a report published by Wall Street Journal (2002), Leadership and communication skills were found to be the most in demand and necessary to stand out from the competition.

In India, English is not usually spoken in day to day life. As Hart-Rawang & Li (2008) note, a lack of communication skills leads to linguistic anxiety in different situations. It has been observed by Tahaineh (2010 that the problems related to learning and using a second language negatively affect other cognitive and linguistic skills. As a result, the students, despite their willingness and ability to learn various concepts, lag behind. NBA (2022) emphasises that apart from specific technical skills, an engineering graduate must also be able to work in a team, have intercultural sensitivity and intelligence and display adequate communicative competence. Similarly, ABET (2022) also emphasises the need for communication competence for engineers. Craig (2008) notes that the nontechnical skills that engineers are expected to be skilled in include teamwork skills, written and oral communication skills, presentation and selling skills, understanding of economics, business and travel etiquette, managing without authority, and leadership with a global view. Since communication competence goes beyond having command over the language, the students need the training to learn to analyse various engineering concepts while using their domain knowledge and expertise in other fields.

2. Teaching English as a Second Language in India

Thompson & Wyatt (1952) noted that teaching English in India started primarily to equip students with the ability to understand, speak, read and write English. The importance of learning a language with a utilitarian purpose in focus, thus, was understood decades ago, which rendered learning grammar rules and studying literary texts for learning a language less effective. This further led to the use and popularity of Communicative Language Teaching (CLT) across the world for teaching/learning the English language. The popularity of CLT, due to its effectiveness, grew around the 1970s. According to Richards (1986) CLT is now considered by the

Americans and the British as a method to treat communication skills as the desired outcome of teaching English and thus devise strategies to teach language to show the inherent relationship between language and communicative competence. The credit for introducing and propagating the CLT approach goes to Dell Hymes and Michael Halliday. According to them, the primary function of the language was to communicate (1973). This change in pedagogy also led to the use of the term 'communicative competence', which translates into one's capability to communicate using correct language in the second language. Stephen Krashen (1982), a linguist, proposed that learning a new language is possible by using that language communicatively. According to Krashen (1982), through this approach, the learner acquires the language subconsciously, comparable to a child acquiring his first language subconsciously. This method also speaks against over-dependence on learning grammar rules for language acquisition. The CLT approach to teaching English is based on the theory of language as communication. It upholds the importance of grammar and vocabulary but shifts our focus to understanding and learning how people use language to communicate with each other. Verbal fluency is given preference over accuracy in using grammar rules. Therefore a standard CLT classroom creates situations that simulate life and makes the learners play their parts accordingly. Role plays during such activities encourage participation and help learners achieve communicative competence. In India, the changes in English syllabus were introduced in the 1980s. However, it is unfortunate that many educational institutes, especially at the elementary and higher secondary level, still teach grammar rules and literary texts to teach communicative English.

Making students job ready is one of the major learning objectives of professional communication courses, however, the gap between graduates' job preparedness and recruiters' expectations often makes researchers worldwide question the effectiveness of educational institutions for the same (Bauer-Wolf, 2018; Campbell & Kresyman, 2015; Hart Research Associates, 2015). Studies have noted a gap between the preparedness perceptions of graduates and employers (Mourshed, Farrell, & Barton, 2016). This gap also creates misalignment between students' and employers' priorities for communication skill development (Ulinski & O'Callaghan, 2002; Hanover Research, 2016). Due to differences in jobs, role expectations and culture in different organisations (Briggs, 2007, Candy & Crebert, 1991; Moore & Morton, 2017), it is challenging for the educational institutes also to identify and hence teach/inculcate specific communication skills relevant to the industry needs in their respective courses (Moore & Morton, 2017). The difficulty of bridging the gap between academics and practical workplace needs is a common problem (Moore &Morton, 2017). The recruiters expect the interns/new recruits to be prepared with the basic communication competence as these skills are expected to be easily inculcated in the students during their studies (American Management Association, 2012). Although the stakeholders agree over the importance of communication competence for employment, however, there needs to be more of a consensus regarding the specific skills that should be taught to the students to inculcate this competence (Lucas & Rawlins, 2015). The need to integrate communication competence across the disciplines have been emphasised by the researchers (Kerby & Romine, 2009), however, educational institutes under Indian educational system teach communication skills as a dedicated course only (Conrad & Newberry, 2012; Moshiri & Cardon, 2014). The present study is a proposal for a course on Professional Communication for engineers, with a view to address the challenges faced by the instructors and the students of professional communication.

3. Professional Communication/Communication Skills Teaching in India: Existing Teaching Framework

In India, English is a compulsory subject in schools. A closer look at the curriculum, however, reveals that the focus is more on written aspects of the language, as a significant portion of the evaluation is dependent on written tests. The students who aspire to become engineers focus mainly on subjects other than English, as engineering entrance examinations do not have any section that tests the English language. Hence English as a subject hardly receives any attention from the students, especially at 10+1 and 10+2 levels. According to the *Hindu* (2015), 70 % of the Indian population lives in villages. They lack exposure to practical and functional English, which further adds to communicative incompetence in them.

In order to study the problems encountered by the teachers and learners in communication skills courses, the present research has considered the curriculum of most engineering institutions in India. The courses related to

English communication are usually offered in the first year of their degree and are compulsory for all students. Such course aims to improve their writing, speaking and listening skills and introduce them to various communicative situations to make them job/industry ready. Some institutions have courses specially designed for students weak in English, which focus on teaching grammar to such students. The course is covered in Lectures, Tutorials and Labs. The lectures cover the basic concepts related to various aspects of communication. The focus during the lecture classes is usually on imparting knowledge about models of communication, barriers that hinder the process and correct feedback which is crucial in improving interpersonal communication. Significant importance is given to teaching written communication concepts involving official documents, reports, résumé and letters. Lecture classes also provide theoretical knowledge regarding the role and importance of body language in interpersonal communication. Brief instructions relating to the activities to be done in the Tutorials/Labs are also provided during lecture classes.

The tutorial classes mainly focus on making students practice various activities related to interpersonal skills. The activities such as making and delivering PowerPoint presentations, participating in group discussions, Role Play, Interview Techniques, and handling stage fright are parts of tutorials. It is expected that students improve their oral communication skills and body language by participating in these activities. The other activities completed during the tutorials involve making students practice writing technical documents taught during lectures.

Due to financial constraints, Language labs are not a part of communication skills courses in all the engineering institutions in India. The Institutions with Language labs focus on making students learn the concepts related to written communication, grammar and phonetics. The teacher's involvement in the labs is minimal as students learn themselves with the help of the software/computer.

4. The Problems and Proposed Teaching Framework

As mentioned earlier, the course that is aimed at improving the overall communication skills of students is mostly taught for one semester only. Students from diverse backgrounds find it challenging to understand and assimilate the skill set taught in a short period of one semester. Reflective and analytical skills such as creativity, leadership, decision making, teamwork, and critical thinking, which are essential interpersonal skills crucial for success in the competitive world, are hardly touched upon. Such skills can only be taught to the students after they have overcome their initial inhibitions regarding speaking and stage fright. It is proposed that the courses related to professional communication should be a part of the curriculum in the second and third years of the engineering degree. Initially, the emphasis needs to be put on improving speaking skills, handling stage fright and improving body language. In the second and third years, the focus should be on developing reflective and analytical skills.

Engineering institutions have standard evaluation procedures where students are evaluated on the basis of their performance in written examinations, tutorials and labs. Written examinations have the maximum weightage i.e. 65-70%, and tutorial activities are given only 30-35 % of the total weightage. As the students realise that their success in a particular course is going to be evaluated on the basis of their performance in the written examination, their motivation to participate in tutorial classes is greatly affected. Since Indian students already show significant linguistic anxiety, the weaker students try to avoid participating in tutorial activities that deal with oral communication skills. Freisinger (1982), reports that due to such an evaluation pattern, the English language in India has become merely a tool for reporting and reproducing information mindlessly during written examinations. He further (1982) adds that rather than focusing on making the English language a Transactional language, it should be developed as the language of expression. For this purpose, it is proposed that the evaluation scheme should be modified and the practical activities in professional skills courses should be given more weightage than written examinations.

Lectures:

The course on communication skills/professional communication should be designed in a way that it encompasses all the aspects of interpersonal communication at workplace. The course may begin with the basic

concepts of effective interpersonal communication. The course module dealing with listening skills should emphasise the role and importance of empathetic listening in leadership communication. Non-verbal communication is a crucial part of professional communication and should be given due emphasis. Technical writing skills, effective presentation skills and introduction to intercultural communication are other modules that should be included in the course. The course should be designed keeping in mind the specific workplace needs of engineering students as and when they start working as professionals.

Course Learning Objectives (CLOs) help establish desired results from a course and assist in selection of suitable teaching-learning methods, instructional activities and evaluation scheme (Bedwell, L, W; Fiore, M.S; Salas, E., 2014). At the beginning of the course as well as while beginning each module, if students are made aware of the CLOs, it helps students understand the significance of the particular module. Students also know about the evaluation pattern and respective amount of hard work needed to master a particular skill. Students feel more connected to a course/topic, when they know the significance of the skills learned during a course in their future roles.

Lecture classes should be carefully divided in a way that only a part of it is dedicated to teaching and the other significant half for discussion of the concepts taught. Discussions facilitate checking/ensuring students' participation during the classes. 3-5 minutes online/offline quizzes help break monotony during theory classes and also help students assess their understanding of the concepts. While teaching written communication such as writing letters, memos, resume, or any other technical document related to official correspondence, the basic instructions should be followed by the practice sessions for the same. The students may be provided with the templates (soft/hard copy) for the same which they may complete/attempt during the lecture classes itself. This helps students practice writing as well as clarify their doubts regarding the same. Similarly, while teaching the basic principles of technical writing, the exercises such as filling in the blanks with suitable words/phrases, completing the sentences, spotting the error, etc., should be given to the students as classroom exercises. Such exercises make students practice the concepts while they are still fresh in their memory.

Public speaking practice activities (introduced in tutorial classes) should also be attempted during the lecture classes, as these activities help students handle speaking anxiety with practice gradually. In the beginning of this activity, volunteers should be invited to practice, as forcing unwilling/nervous students for such activities in the beginning may have detrimental impact upon their overall confidence. Students who need more confidence for public speaking activities may gradually be encouraged to attempt prepared speeches. Such students may also be encouraged to record their speeches privately which they can share with their instructor for feedback. After they are able to overcome their speech anxiety/nervousness, they may be encouraged to perform in front of the class.

Tutorials and Labs:

The tutorials should include various experiential/practical exercises that hone their oral communication skills. These exercises may include activities related to telephone etiquette, handling difficult conversations, interviewing a famous personality, self-introduction, and so on. It is suggested that group activities are introduced at the beginning of the course. Group activities help students handle their nervousness and confidence issues as the focus during such activities is on the group rather than the individual. The oral presentations should be aimed at improving confidence, pronunciation and body language of the students. The activities related to public speaking (two to three minutes speech) should be introduced and rehearsed during tutorial classes (smaller groups). The activity should be performed in front of larger groups in lecture classes only after considerable practice sessions in tutorials. Such activities in tutorials help students overcome stage fright as students feel more comfortable in front of smaller peer groups. As they gradually gain confidence by practising, getting feedback and observing other students go through the same process, they become more prepared to speak in front of larger and unfamiliar groups. The activities such as group discussions and panel discussions should be introduced in the first semester/year; however, the students should be evaluated for such activities in their second semester/year only when they are trained and confident enough to participate and perform effectively.

Giving constructive feedback using the right tone is of extreme importance during such a course. Feedback may be defined as a "dynamic and co-constructive interaction in the context of a safe and mutually respectful relationship for the purpose of challenging a learner's (and educator's) ways of thinking, acting or being to support growth" (Ajjawi R, Regehr G, 2019). Considering the problems related to speaking English amongst Indian/Asian students, it becomes important that students are provided feedback in a way that students learn interpersonal skills without developing any feeling of inferiority. Oral feedback should be accompanied by the written one so that students may work on the suggestions given by the instructor outside of the classroom as well.

It has been reported that peer feedback helps improve domain specific skills (van Zundert & Merriënboer, 2010). Peer feedback is important in making (i) students internalise the importance of various evaluation/performance parameters as they have to judge students on those basis (Lundstrom and Baker, 2009, Lee, 2015, Huisman et al., 2018) and (ii), it also makes them more accepting to the feedback if there is a parallel between the feedback by the students and the instructor (Falchikov & Goldfinch, 2000). Thus introducing peer feedback during tutorial activities will increase students' participation and understanding as well. The instructor should play an active role in helping students understand and participate in peer feedback system.

The students should be recorded during their presentations in the classes with an aim to providing them with specific feedback regarding their performance/participation later on. Weaker students/students low on confidence may be given feedback privately to eliminate the chances of them feeling inferior.

The lab component should be introduced for the students needing help understanding basic concepts related to grammar and pronunciation. The involvement of the teacher is minimal in lab classes and the students may pick up from any level (beginner to advanced) suitable to their needs. The teacher's presence, however, is mandatory as students may need assistance or clarification regarding the lab work.

5. Conclusion

When students enter higher education institutions, the onus of training them in various professional communication skills comes upon professional communication teachers. The students are expected to learn and perform various concepts and activities related to professional communication skills in one semester that effectively spans 4-5 months. As a standard professional communication/communication skills course has elements related to written and spoken communication, it becomes a herculean task for most students to master many skills in one semester. The communicative competence of students in Communication Skills courses is assessed through the written examination. Oral communication assessment components, although present, are not adequate. It is thus required to focus more on the oral communication skills of Indian students as they face more problems while speaking.

The basic concepts related to social and psychological aspects of communication should be taught in the first semester/year. Principles of technical written communication should also be introduced at this time in the lecture classes. The students should be imparted the theoretical knowledge during lectures and made to practice the same during tutorial classes. The role of teachers is crucial during tutorial classes as students need constant feedback regarding their writing style and accuracy. The course related to technical report writing should be introduced as a separate module in the second year. As report writing is an essential component of other engineering courses, the students need to have a deeper knowledge of report writing as per their needs. It is proposed that the faculty from all engineering disciplines should be involved while deciding the syllabus and evaluation scheme for the course so that it could be taught as per the specific needs of the engineers.

The courses related to concepts such as intercultural sensitivity and intelligence, intellectual property rights, sustainable development, and ethics not only help students develop specific skills related to the respective field, they also prepare students to work in diverse and challenging environments at home and abroad. Such courses should be introduced in the third year of their degree. While evaluating these courses, the focus should be more on projects and individual and group participations.

The Professional Communication/Communication Skills courses should be integrated with core engineering disciplines. It could be achieved only with the active participation of the faculty from these disciplines. Engineering faculty usually hesitate in grading/commenting on the students' communication skills due to their perceived lack of expertise in the field. Also, while teaching the core subjects, teachers consider focusing on communication skills an added burden. Communication/Professional Skills are considered the sole responsibility of the faculty from the Humanities Department. Nevertheless, the faculty from engineering disciplines should actively coordinate with Humanities teachers during the activities such as Mock interviews, report writing and evaluation to better understand the needs and challenges of engineering students. Communication skills teachers may evaluate subject specific seminars in collaboration with subject specific faculty. Faculty teaching tutorial classes should be adequately trained to understand and handle the needs and problems of students in dealing with linguistic anxiety. According to Kitao (2015), changing industry requires an engineer to cross sociocultural boundaries effectively. It is the need of the hour that educational institutions make necessary changes in their curriculum, as the role of such institutions will be significant in meeting the industry's specific requirements.

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