

# ORAL COMMUNICATION SKILLS FOR ENGINEERS: UNDERSTANDING INDUSTRY'S EXPECTATIONS.

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Communication skills are often addressed as soft skills which have gained much importance in the engineering industry. Poor communication in the engineering industry had been addressed in many previous studies. The purpose of this paper is to examine the expectations of the Industry's use of oral communication skills in the workplace for the engineers. In this study, the engineering segments involved were mechanical and electrical engineering. A qualitative method was used for data collection purposes. Data were collected from four engineering organizations by carrying out structured interviews. There were twenty-eight engineers involved from both segments in this research. Data were analyzed using the content analysis approach. Findings show that in the engineering industry there is a high need for the engineers to participate in interacting with co-workers about work, administrating, attending meetings, presenting to clients, and communicating with individuals with different backgrounds. Conversely, the findings of this study are constant with other literature review findings to show that oral communication skills for the engineering sector are important. Technical and vocational education training (TVET) institutions need to identify the challenges to match the needs of the engineering industry. These findings will aid as a good platform for further investigation on the relevancy of the use of oral communication in engineering industries.

In recognizing and developing strong technical knowledge engineers need to have strong oral communication skills. Employers seek language proficiency and oral communication skills to be successful, responsible, and confident in performing their work (Su-Hie, 2017; Young 2013). The competitive job market would need engineers with good oral communication skills to understand and perform their work not only technically but also in involving in communicating clearly and confidently in their subject matter. The engineers need to be engaged with other teams and involved in discussions (Masadlihani, 2020).

Oral communication continues to be an important tool in the engineering industry. Globalization and the development in all the sectors demand employees be highly skilled in all aspects including communication skills to achieve their goals in their career development. Therefore, this paper addresses what is expected by the engineering industry on oral communication skills to progress in their future careers.

Oral Communication competence as stipulated in Engineering Industry 4.0 revolves around an important role. TVET institutions in Malaysia are the main group of institutions that accommodates fresh graduates to the engineering industry. Therefore, it is important to address these issues to meet the demands of current employment. According to Lam et al. (2020), oral communication skills such as speaking, listening, presentation, and interpersonal communication were considered important skills in the engineering industry. According to JobStreet.com HR Networking Event 2019, Gan commented out of five traits that are valued by the employers the second is the communication skills. Oral Communication skills were always been a key part of a successful employer. Brown (2001: 267) has specified that when someone can communicate, it means that he can able to carry on a conversation reasonably competently. Thus, Oral Communication is important to engineers as they are required to communicate to accomplish the technical task. According to the Ministry of Higher Education, Malaysia (MoHE). (2012), one of the modules required to be taken by the under-graduates is Communicative English paper. Added to this, it is part of the challenges that oral communication skills are important in the engineering industry.

Oral communication skills are identified as part of job performance in the engineering industry. The engineers need to possess effective communication skills to solve their technical job. According to Masadlihani & Normah (2020), Communication represents a tool in the engineering industry to accomplish technical issues. Communication skills were regarded as further important than mathematics and science skills (Evans, Beakley, Crouch, & Yamaguchi, 1993). Engineers communicate in all situations daily. It ranges from the top management to the co-workers. All the communication is on a work-related and daily basis. According to Saleh and Murtaza (2018), communication skills are crucial in industries and this skill is most found lacking among the engineering graduates.

According to Spitzberg (2000) the ability to apply the given communication context at work is the actual performance. The Accreditation Board for Engineering and Technology (ABET,2018) had addressed communication skills as a wanted skill for engineering education. Hence, in the engineering industry communication skills such as presentation, speaking in public, having a small group discussion, social context conversation and work-related conversation takes place daily to accomplish technical work.

The role of engineers is significant with communication and it becomes magnified in the engineering profession. Lam et al. (2020), communication skills take place in many situations in engineering industries namely; speaking, listening, presentation, and interpersonal communication. Therefore, in this study, the work-related communication skills, the importance, and the need for fresh graduates from mechanical and electrical engineering were the focus.

1

Therefore, this research aims to examine closely how the generally negative attitude of fresh graduates towards the importance of acquiring competency in English has affected their ability to be employed.

This study aimed to study the expectation and requirements of English oral communication for the engineering sectors, namely the mechanical and engineering industry. This study explores the requirements, suggestions as well as common practices concerning English oral communication used in the engineering industry.

The purpose of this study was to identify the Oral communication skills for the engineering industry by employers of the mechanical and electrical engineering sector. Presumably, this study will highlight a clearer view of the overall expectation of the real needs of the engineering sector.

The methodology used for this research is a qualitative approach. The data were primarily drawn from semi-structured interviews with 28 respondents in the following subgroups: 1) Mechanical – oil and gas and manufacturing with 14 respondents and; 2) Electrical – power systems engineering and electronics with 14 respondents. Table 1 illustrates the position of the employers and the nature of the industry involved. Further details on the background and the nature of the industry cannot be provided to preserve the anonymity of the participants and the industries.

The methodology to conduct interview protocols for all the 28 engineers was carried out. The researchers made appointments and seek consent for the interviews using official and informal means. The interviews were carried out through online platforms and they were recorded. As this paper aims to find out about the industries' expectations in the use of oral communication skills, the interview protocol was more to inductive probing questions such as, "what are some of the work-related general oral communication takes place in your industry?", "Can you share some of the importance of oral communication being an engineer?" and "Can you recommend what are the oral communication skills should be possessed by fresh graduates?"

This study uses Miles and Huberman's (1983) proposed steps which are data reduction, data display, and making and verifying conclusions. The interview transcripts were coded to form categories and themes. The excerpts from the interview transcripts were minimally edited to ease reading and were used to illustrate the results.

The findings focus on the need of communicating orally in English and the different types of oral communication practiced in the engineering industry. The findings are presented from the perspective of the senior practicing engineers who had been directly involved in task-related communication in their industry.

Oral communication of an engineer is part of the ability of non-technical skills which is important as technical skills. The result of the study in finding out the oral communication skills in work-related genres is illustrated in Table 2. The themes categorized from the transcribed data show that there are five genres. The Genres show how the structure in delivering the technical knowledge is disseminated. First, in the engineering industry the genre of the oral presentation, appears that the engineers used presentation for different reasons namely; reporting, about technical issues, presenting ideas for new projects, progress work, budget, trends, and prediction of impacts on system operation. Almost all of

the respondents see that oral presentation skills are involved. An engineer mentioned, *"to enable to transfer technical information to a group of people one need to give a presentation, to share their message."* Another engineer had a similar response *"...being an engineer there are many types of presentations need to be done daily or weekly ... presenting ideas, project report, progress report, and other related sharing issues"*. This finding is supported by the study conducted by Bhattacharyya (2018) verbal technical presentation is part of engineering workplace tasks.

The second oral communication takes place in the engineering industry during the meeting. Engineers are in need to communicate during meetings. A variety of issues are discussed and shared in meetings. The remarks given by the senior engineers, *"meeting is the place where we starch out all the issues and ask for feedback"*. Another point of view, *"we need to respond to questions... give feedback"*. Communicating in a meeting helps to contribute ideas and help in assuring successful execution of work. The meeting is the most frequent and preferred form of communication among engineers in the industry. The engineers consider meeting, *"meeting is the platform to communicate to get a constant update and dyadic interactions"*. This shows that meetings are an important platform to communicate face-to-face with engineers and give them a clear understanding of their task performance routine. Referring to Nikolic et al. (2018), oral communication plays an important role in a work-based environment.

The third work-related genre is discussions. This is emphasized by all the respondents. *"Peer interaction relating to work discussion is of utmost needed to solve a lot of engineering issues"*. Respondents also mentioned, *"in many situations, we need to discuss and negotiate to solve problems"*. And they also mentioned, *"...clarity can be optioned true discussion to solve technical work"*. Referring to the findings there are similarities to the finding by Lam et al. (2020), that communication by discussion can achieve the best results in performing work. and supports the finding.

According to Almeida et al. (2019), Oral communication is preferred for engineers in becoming advanced in their field. The fourth genre or oral communication is where the Engineers give instructions and receives instructions from time to time throughout their work. According to the respondents *"...our job is partly giving instructions and receiving instructions daily"*. There were also responded, *"... we need to monitor and give feedback to the technicians ... correcting their mistakes on the side"* The study by Lenard and Pintarić (2018), that receiving instruction needs active listening and it will be an effective tool in oral communication. They responded, *"... we give instruction but if they are not a good listener it is still a problem the get the message across"*. Receiving and giving instructions should be an essential part of engineering communication.

The last genre which had been responded to by the engineers is work-related social conversations. *"... they need to attend phone class"*. Another response mentioned *"most of the time we discuss, give feedback, and receive instruction through phone calls"*. The engineers need social skills to communicate and take message from phone calls. Most of them responded they need to respond to calls for feedback, immediate meetings, and job discussions. The engineers are ready, and proactive in responding to phone calls be a wrong or negative response may hamper the workflow. When Negative communication behavior happens it may result in damaging the reputation of the industry and the organization for which the employee works (Bartelt & Dennis, 2014).

In the globalization era communication is vital. Industry 4.0 require the abilities that not only include technical skills but also efficient, good, and fast communication methods to be competent in the workplace. According to Masadliahani & Normah (2020), oral communication skills are the mode of instruction to accomplish the task. Thus, in table 2 the findings on the importance of oral communication are displayed according to the skills.

The importance of oral communication skills for engineers is illustrated in Table 3. Presentation and meeting skills play important role in both the mechanical and electrical industry. The clarity in presenting and delivering the message precisely and accurately place an important part during the presentation and involving in meeting discourse. The respondent mentioned, *"if the engineers could*

*not use the language well, they will not get the message across*". Twenty-six respondents gave similar feedback, *"...ability to participate in the meetings the employees need to communicate well with confidence"*. There was also a response where *"communicating during meetings or presenting in a meeting one needs to be efficient and communicate using the write choice of words or phrase"*. This claim was supported by Dwi et.al. (2019), Oral communication is part of the work profession for engineers to accomplish tasks such as meetings, discussions, and presentations.

Based on the findings interaction and discussion were clearly stated as important oral communication to succeed in carrying out an engineering job. To have satisfying teamwork, engineers need to communicate. They not only need to discuss but also carry out proper negotiation and respond to questions. *"every day there will be discussions to complete projects"*. Another engineer responded, *"to complete the work we need to be able to communicate, without it there will be no smooth progress... ability to negotiate is important in carrying out technical work"*. Communication is a medium of transferring information and it is important in the engineering industry. This finding is supported by the study carried out by Maciulyte et. al, (2020), Oral communication will generate productive and quality work achievement in an organization. Hence, oral communication takes place in the engineering industry and it is part of the job-related activity. Bhattacharyya (2018) mentioned that events that take place in engineering workplaces were not only a technical-related job but verbal communication to accomplish the work.

According to all the respondents, in the engineering sector ability to interact in a work-related and social context is important. It is part of engineers' work. They need to be active and responsive reacting to questions. *"engineers are supposed to react immediately to social discussions and using the right choice of words"*. They also need to make sure what they speak is understood and appropriate to the context". This finding supports the study by Kovac et.al., (2017), that there is a need for employees to respond to conflict and work-related conversations.

Given the importance of oral communication, it is highly assured that in attempting to deal with globalization the engineering industry needs to have engineers with not only competent technical skills engineers but also good oral communication skills.

The mechanical and electrical engineering industry requires engineers with good backgrounds in oral communication to succeed in the field. The TVET higher institutions should produce human capital that encounters the requirements of the employers. The Respondents in this study strongly suggested that the Malaysian TVET higher education institutions should emphasize public speaking skills, negotiation skills, questioning, and answering skills, listening skills, and interpersonal skills. Almost all the respondents had mentioned the need to produce fresh graduates who are equipped with the needs of industries. Ban et.al., (2020) in their study revealed that the concept of Industry 4.0 needs fresh graduates with good communication methods to enable them to work proficiently with their co-workers. The findings from this study supported by Lam et.al.(2020) that different oral communication such as speaking skills, listening skills, and interpersonal skills are important for the engineering industry. Hence, fresh graduates should be competent in the use of oral communication skills to be successful engineers.

This study provides the findings on oral communication skills for the Mechanical and electrical engineering industries. Data were gathered to find out the work-related genre of oral communication, and the importance and recommended oral communication skills expected from fresh graduate engineers. The research revealed that there are five themes identified for the work-related oral communication namely: Presentation, meetings, discussions, instructions, and work-related /social context. The TVET institutions should view the gap between the fresh graduates and the industry's requirements accordingly. By strengthening these skills, the institutions will produce fresh graduates with not only technical skills but with required oral communication

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PAGE 1

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PAGE 2

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PAGE 3

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PAGE 4

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