

Needs analysis of English for mechanical engineers in the Vietnamese context

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Abstract

This paper reports findings from the questionnaire for mechanical engineers as a part of a doctoral study which included interviews and observations. Its purpose was to examine real-world uses of English as required by mechanical engineers to function effectively in their job at various workplace contexts in Vietnam. The questionnaire was framed in relation to the Communication Needs Processor (CNP) model proposed by Munby (1978) to study English communication needs of mechanical engineers from a sociolinguistic perspective. Findings revealed that English language skills of listening, speaking, reading and writing were important for mechanical engineers to perform their work effectively. Of these, listening and speaking skills were more important as they were the most frequently used ones. These skills were also perceived as the most lacking skills. The focus of the study was to inform course design by exploring how language is used in the work site. Moreover, it focused on the investigation into the complexity of English use in the various workplace contexts where communication interactions take place such as the dynamics of English language use, power relationships and formality.

Key words and phrases: mechanical engineer, English language skills, workplace, communication, and communicative events

Introduction

- Reports findings from the questionnaire
- Examines real world uses of English in 4 workplaces
- Affects of social factors to the uses of English
- Recommendations

Literature review

What is meant by needs analysis?

- “the process of determining the needs for which a learner or group of learners requires a language and arranging the needs according to priorities” ([Richards & Schmidt, 2010, p. 389](#)).
- [Hutchinson and Waters \(1987\)](#) argue that any English course should be based on an analysis of learners’ needs
- A prerequisite for designing and developing courses, as well as the development of syllabuses and materials ([Brown, 1995](#); [Dudley-Evan & St John, 1998](#); [Hutchinson & Waters, 1987](#); [Jordan, 1997](#); [Long, 2005](#)).

Needs analysis studies

[Ab.Rahim \(2008\)](#) investigated the English language communication skills that the practising engineers need at the workplace. Findings showed that more time should be devoted to oral and writing communication to help the engineering undergraduates meet the requirements at the workplace; reading materials such as technical reports, user manuals, etc. are important for effective communication, and that practicing engineers usually communicate with customers and this makes them to use speaking and listening skills to the best of their ability.

Verbal skills were important as engineers needed real life experience such as group meetings and public speaking.

There was a need to design a more in-depth communication syllabus for engineering undergraduates, and this syllabus should focus on developing and improving students' speaking and listening skills to prepare for their future jobs.

[Kaewpet \(2011a\)](#) examined the communication needs of Thai civil engineering students. The results revealed that student's needs are various and it is very important to conduct a learning needs analysis to prepare for any ESP course.

[Salehi \(2010\)](#) investigated the English language needs of engineering students. Findings showed that Sharif students needed more speaking tasks in the curriculum, translation was not considered important for their future jobs, or technical writing was of crucial importance but no attention was paid to in their curriculum.

[Al-Tamimi and Shuib \(2010\)](#) investigated the English language needs of Petroleum engineering students at HUST in Malaysia. The study aimed to “identify the students’ perceptions of the frequency of English language skills used, the importance of these skills, their ability in performing the skills, the areas of language use that they need training/ teaching in, and their preferences for the English language course” (p1). The findings claimed the importance of English for petroleum engineering students at HUST who had low competence in English language (Al-Tamimi & Shuib, 2008a, cited in ([Al-Tamimi & Shuib, 2010](#))). Students had to know many English language sub-skills to perform effectively in the target situation. They did not have adequate level of English ability, and therefore wanted to be offered more training to develop their English ability, especially speaking and listening skills. The current English language course should be removed and more time should be added to be proficient in English language.

[Venkatraman and Prema \(2007\)](#) conducted a needs survey of English language skills for engineering students. Listening skills (category 1) and professional speaking skills (category 5) were ranked the highest, following by speaking skills, reading skills and professional writing skills. Other remaining skills received lower ranks.

[Sattar and Zahid \(2011\)](#) surveyed the linguistic needs of Textile engineering students at National Textile University in Pakistan based on Munby's model of Communicative needs processor. They found a mismatch between teachers' favourite teaching methods (grammar and translation methods) and student's learning preferences (communication strategies) and favourite skills (listening and speaking skills). The study provided a clearer insight of ESL learners' needs and ESL teachers' preferences to syllabus designers which can help to develop more appropriate language courses and supplementary materials for students of textile engineering.

[Huhta, Vogt, Johnson, Tulkki, and Hall \(2013\)](#) introduced a new model to study needs which was named the Common European Framework (CEF). The profile consists of target profession, occupational information, context information, the most frequent routine situations, the most demanding situations, and snapshots. It is an evidence-based approach to needs analysis which provides detailed instructions to apply in course planning and design. It provides a sample profile for mechanical engineers.

Data collection: The questionnaire

- Framed in relation to the CNP model proposed by [Munby \(1978\)](#), similar to [Kaewpet \(2008\)](#) but with adaptations.
- Three parts with both open and close questions
- Criteria to select participants:
 - (i) graduated from tertiary institutions; and
 - (ii) had at least one year's working experience as a mechanical engineer.
- Total questionnaires distributed: 100
- Returned: 71 (71%)

Findings

- Gender: male: 94.4%
female: 5.6%

- Age:

Age	20-30	31-40	41-50	51-60	Over 60
ME	74.7%	18.3%	4.2%	2.8%	0

- Work experience: 0-5 yrs: 80.3%
6-10 yrs: 11.3%

Positions

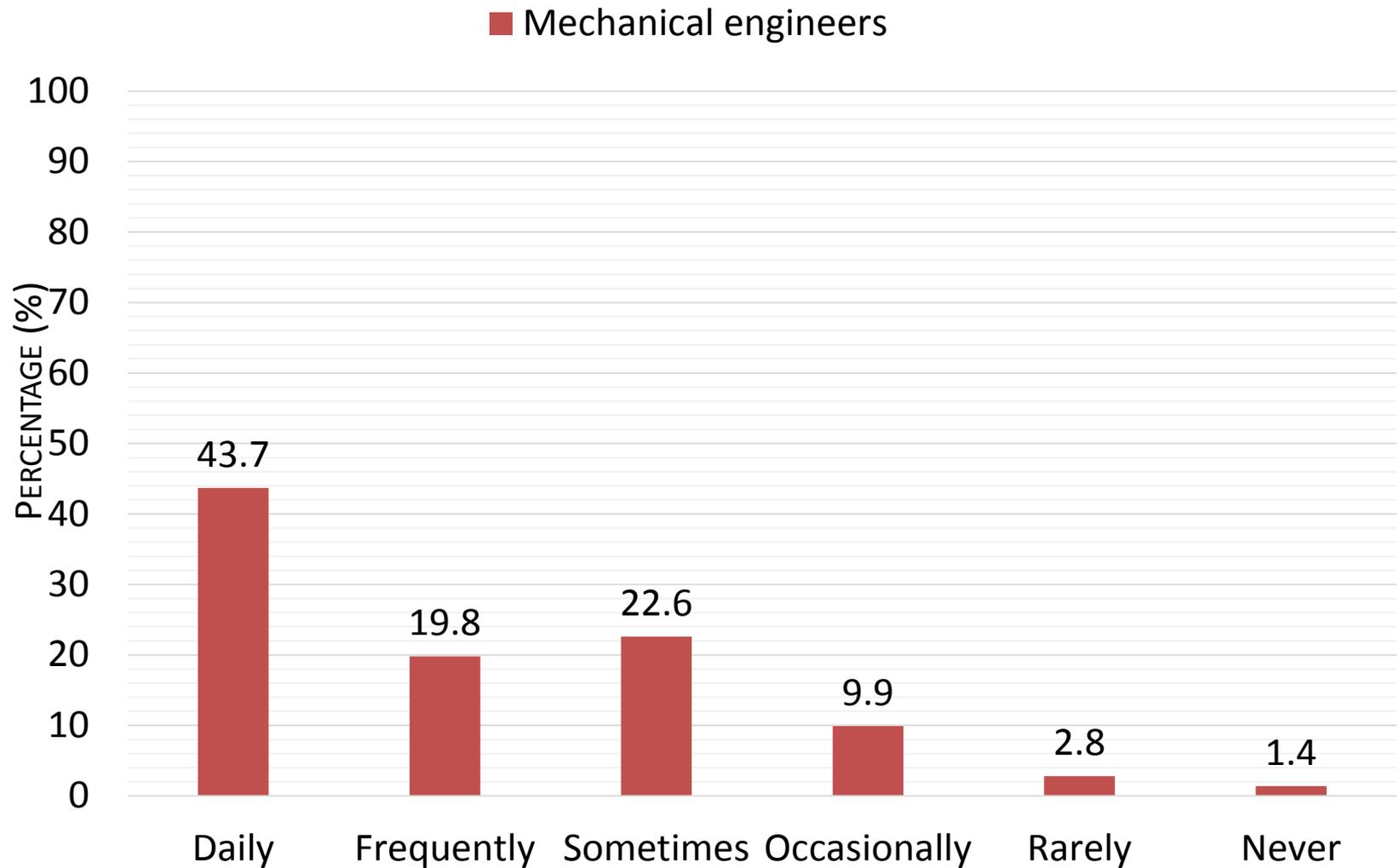
Different positions: mechanical engineers, mechanical specialists, supervisors, technical staff, quality engineers, and managers.

They mostly involved in manufacturing (38.3%), maintenance (27.8%), design (17.4%), and testing (14.8%).

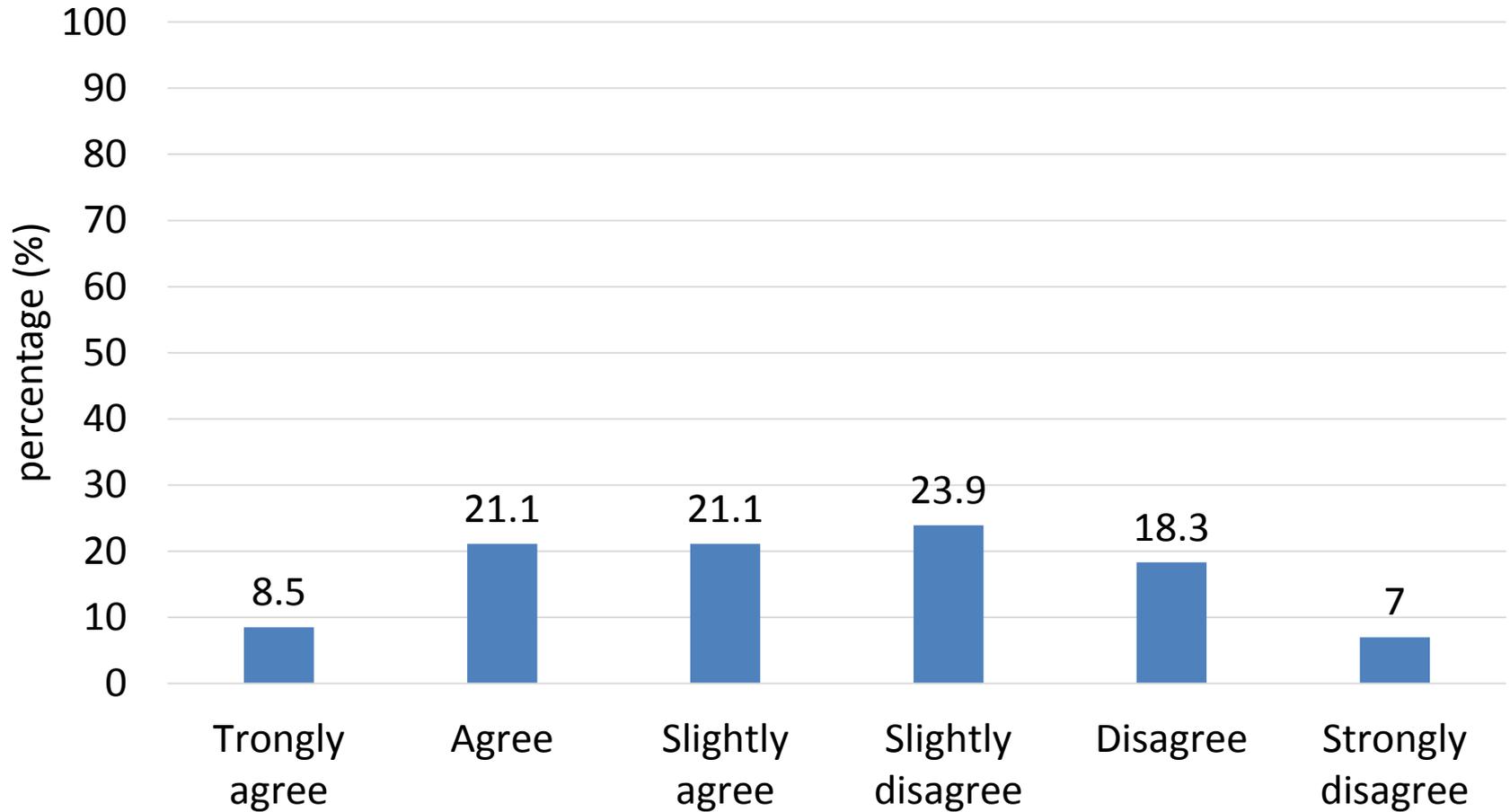
Types of English courses

- General English at university (51.3%)
- ESP course at university (27.4%)
- English language skills (7.1%)
- Other short courses (14.2%)

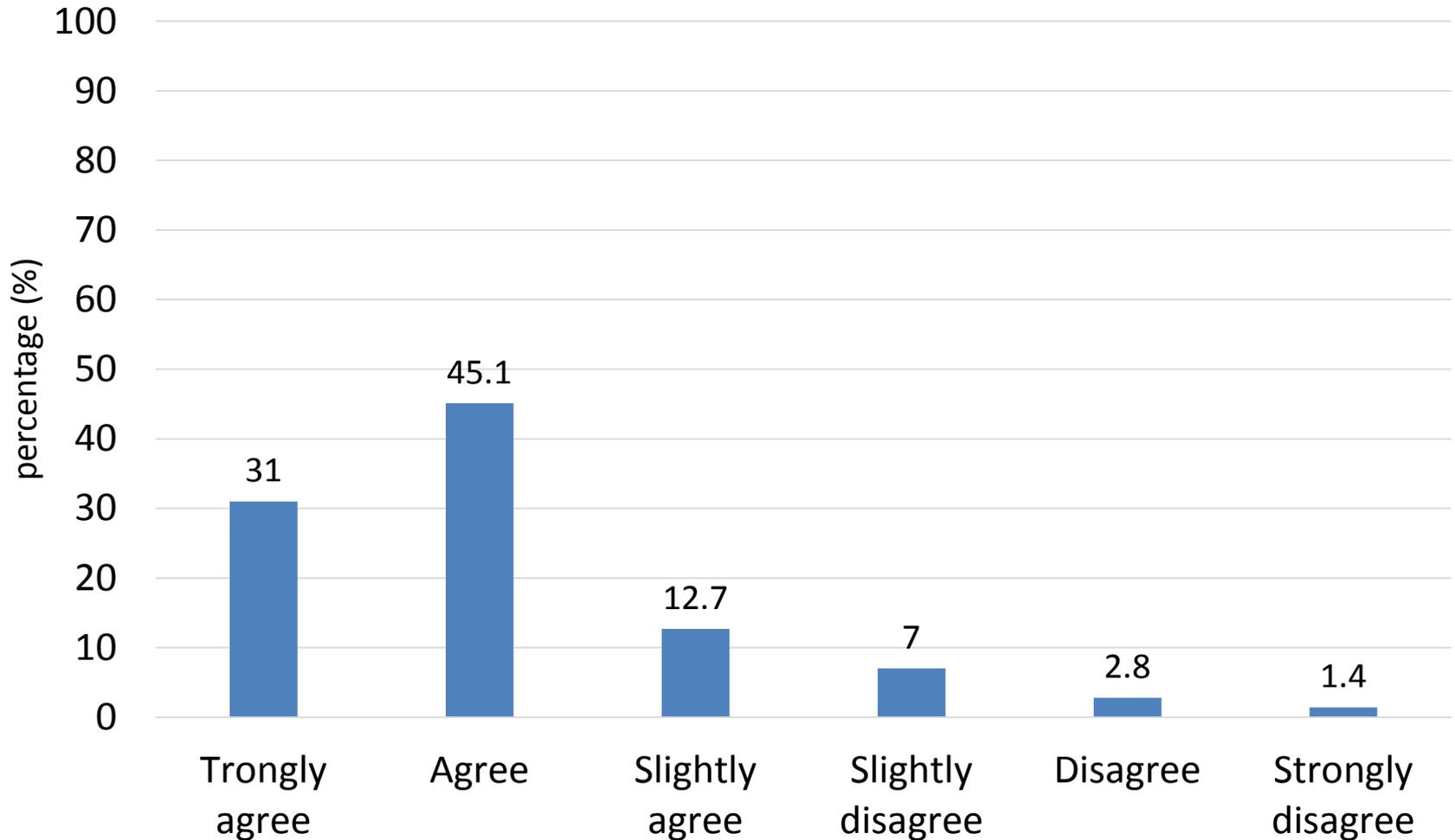
The frequency of using English



The degree of satisfaction of their English ability



To what extent do you agree or disagree that highly effective MEs have good communication skills in English?



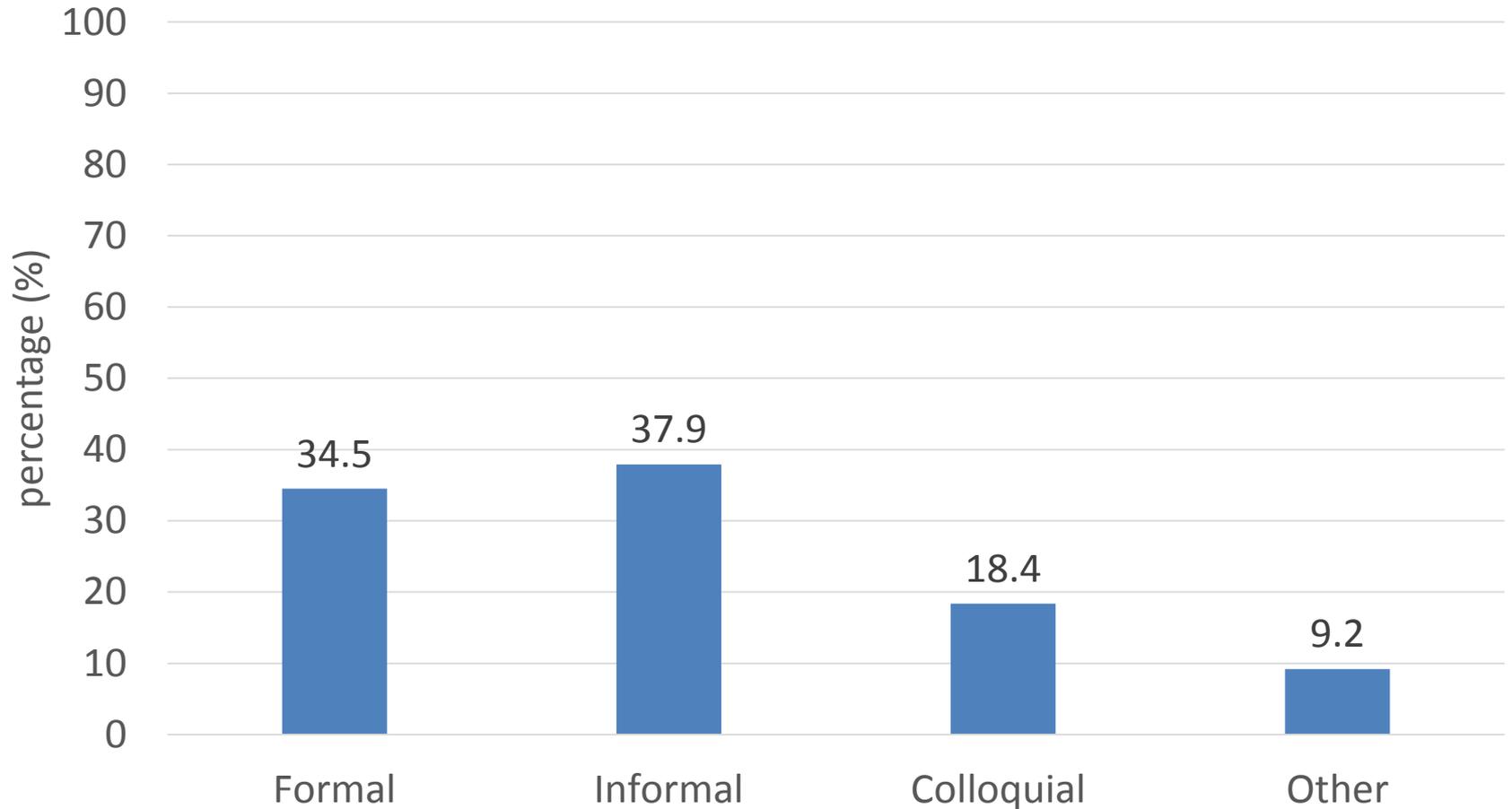
The most common communicative events

The average percentage (%) of the frequency of MEs' communicative events							
Communicative events	1-never	2-rarely	3-occasionally	4-some-times	5-frequently	6-daily	Missing *
9. Reading products specifications/ descriptions	1.4	7	9.9	19.7	36.6	16.9	8.5
20. Accessing information through the internet	4.2	8.5	12.7	22.5	25.4	18.3	8.5
19. Communicating through emails	9.9	5.6	12.7	18.3	23.9	21.1	8.5
8. Talking about everyday tasks and duties	8.5	11.3	9.9	23.9	23.9	11.3	11.3
13. Reading online manuals	4.2	14.1	15.5	23.9	31	2.8	8.5
1. Listening to English-speaking boss's instructions	9.9	18.3	9.9	25.4	18.3	7.0	11.3
2. Listening to presentations and discussions in a meeting, seminar or conference	4.2	19.7	12.7	39.4	5.6	5.6	12.7
11. Reading professional texts, e.g. rules of practice, contracts	8.5	14.1	11.3	42.3	12.7	1.4	9.9
10. Reading textbooks	11.3	21.1	5.6	29.6	16.9	2.8	12.7
15. Writing technical reports	26.8	7	8.5	22.5	15.5	9.9	9.9

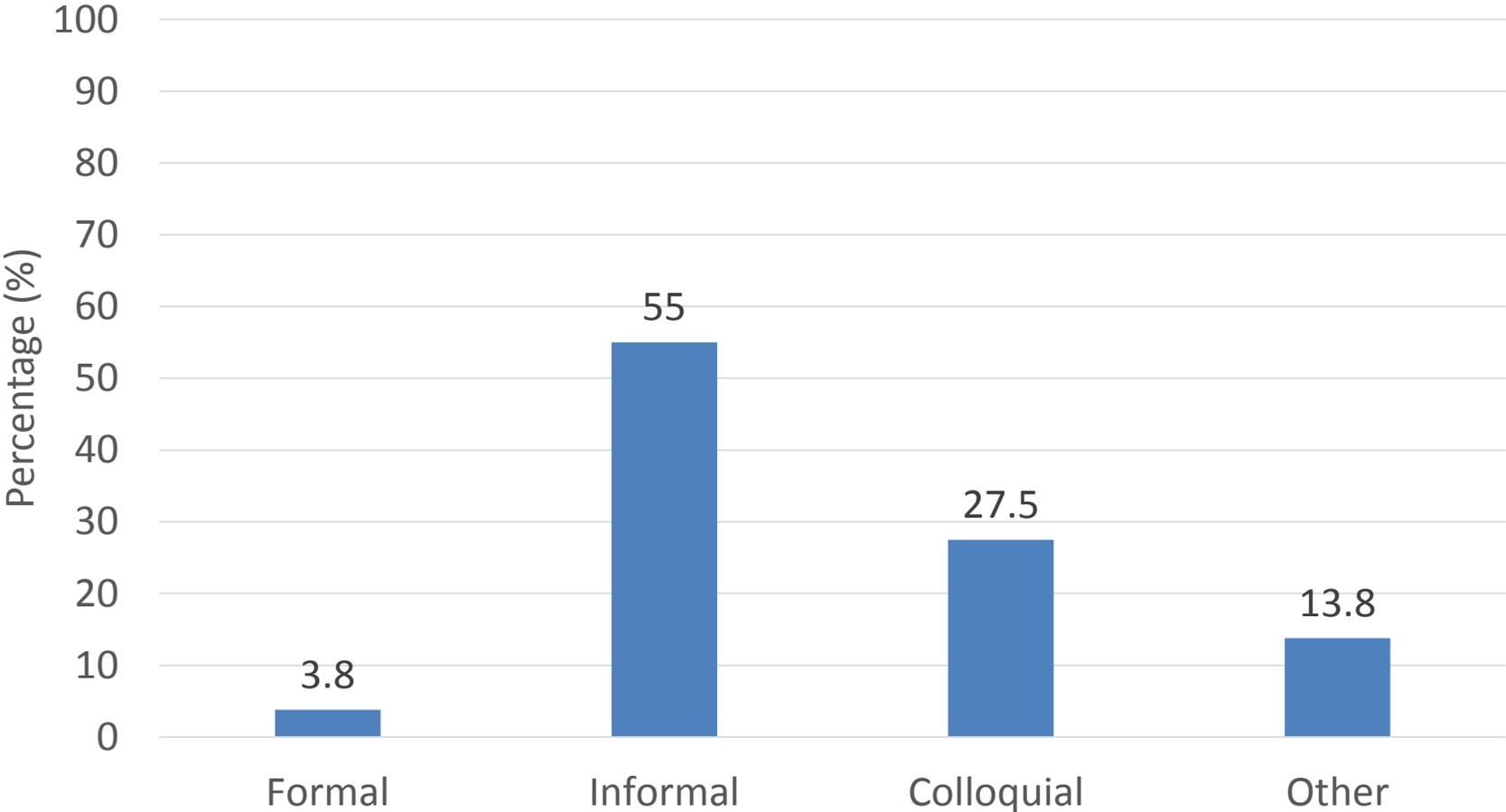
People to whom MEs communicate in English with

- Managers: 21.9%
- Supervisors: 21.9%
- Colleagues: 27.2%
- Clients: 7.9%
- Suppliers: 14%
- Others (experts, friends, relatives, safety staff at the construction sites, visitors to the company): 7%

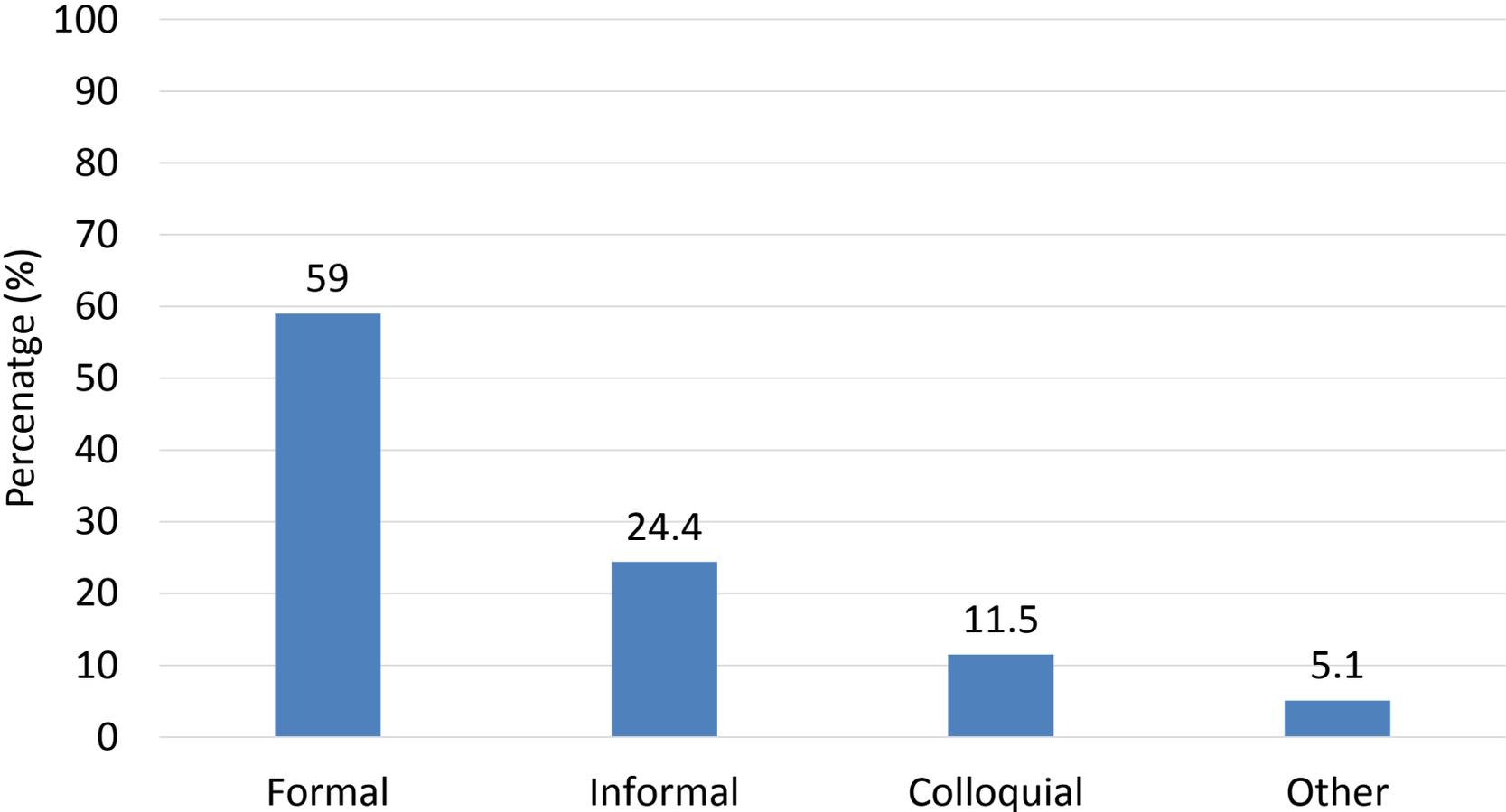
The kind of English MEs use in the presence of their boss



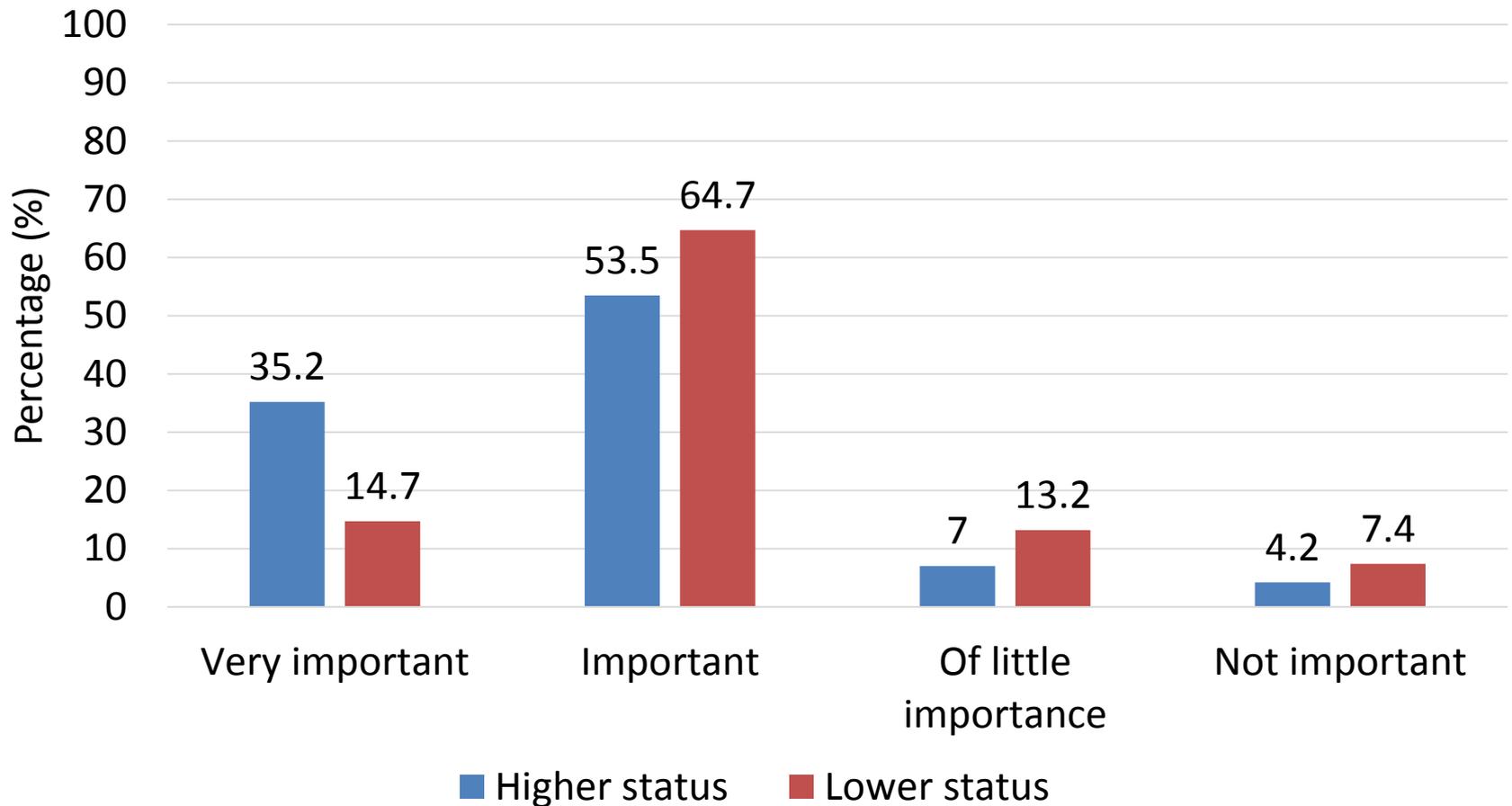
The kind of English MEs use with their colleagues



The kind of English MEs use with their clients and business partners



The importance of adapting the use of English for someone of higher/lower status



The English language skills that mechanical engineers use most as perceived by themselves

	Most frequently	Frequently	Less frequently	Least frequently	Total %
Listening skills	54.9	28.2	12.7	4.2	100
Speaking skills	22.5	52.1	18.3	7.0	100
Reading skills	19.7	8.5	39.4	32.4	100
Writing skills	9.9	8.5	26.8	54.9	100

The English language skills that mechanical engineers lack most as perceived by themselves

	Most lacking	Lacking	Less lacking	Least lacking	Total %
Listening skills	40.8	38.0	14.1	7.0	100
Speaking skills	39.4	35.2	19.7	5.6	100
Reading skills	8.5	15.5	29.6	46.5	100
Writing skills	19.7	8.5	33.8	38.0	100

English language skills that employers are looking for from mechanical engineers

59 out of 71 participants claimed the following skills:

- Listening and speaking skills (37.2%)
- All four main skills: listening, speaking, reading and writing (27%)
- Technical English (27%)
- English for communication (5%)
- Other skills (3.8%)

Suggestions to improve the ESP course at university

- Mechanical engineering students should prepare enough English for the workplace.
- Provide students real-world situations of English use, more opportunities for students to access to the workplace (office and construction sites) for observations and meeting with foreign experts, and more training on technical English, especially technical terms and standards in mechanical engineering.
- Be familiar with different kinds of writing tasks such as technical reports and email communication; speaking skills such as technical conversations (safety talks, drawing presentations, proposal presentations); and real contexts of English use in the workplace (group meetings, morning meetings, and construction sites).
- Be able to interpret and understand differing types of world Englishes such as Asian English, European English because they will be working with foreign managers, supervisors and experts from different countries in the world.

Conclusion

- English ability and communication skills in English are the only criterion that makes a difference among mechanical engineers
- English language is considered as a “life skill” ([P'Rayan, 2008](#)) and communication skills in English should be incorporated in the profile of a modern qualified engineer ([Venkatraman & Prema, 2007](#)).

Thank you for your attention!