Communicative needs of Saudi EFL engineering students in an EAP context: Task-based needs analysis

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Abstract

Because English language is the medium of instruction in the engineering colleges of all Saudi universities, the aim of this study is to identify the perceived communication needs of undergraduate engineering students using English for specific purposes (ESP) at one such institution, where English is considered a foreign language. Several needs analysis (NA) approaches have been suggested in the literature related to ESP (e.g., Munby, 1978; Hutchinson & Waters, 1987; Long 2005a,b; Long, 2015; Serafini, Lake, & Long, 2015). The current study demonstrates the use a task-based NA approach (Long, 2005a,b; Long, 2015; & Serafini, Lake, & Long, 2015), which involves the use of tasks as a unit of analysis and the triangulation of resources and methods to increase validity and reliability and to better inform course designers. This study uses semi-structured interviews and questionnaires in accordance with the exploratory sequential mixed-methods design (Creswell, 2014), whereby semi-structured interviews are conducted first and the obtained results inform the design of the questionnaires. The findings of this study provide a list of communication tasks as well as insight into the students' perceived frequency and difficulty of the reported tasks. The findings could inform ESP course designers in the university

studied in the present study and contribute to general NA literature by demonstrating the use of task-based NA and providing some pedagogical implications for ESP educators.

Keywords: *Needs Analysis, Task-based Language teaching, ESP, EFL, Engineering Students*

1. Introduction

Needs analysis (NA) plays a crucial role in the process of designing language courses in the fields of English for specific purposes (ESP) and English for academic purposes (EAP), as it can effectively pinpoint general course objectives (Brown, 2006). As a result, Hutchinson and Waters (1987) stated that target situation analysis can "act as a compass" in determining the destination (p. 62). The importance of NA was similarly stressed by Dudley-Evans and St John (1998), who argued that it is instrumental in designing any ESP course. NA is especially important nowadays, as a decrease in global resources has led to the growing need for accountability in education and other aspects of life (Long, 2005a,b).

In the literature of language teaching in general and ESP in particular, several researchers (e.g., Munby, 1978; Hutchinson & Waters, 1987; Long 2005a,b; Long, 2015; Serafini, Lake, & Long, 2015) have positioned NA approaches and frameworks for determining learners' needs as a fundamental step in the process of designing language courses. For example, one proposed method of identifying the needs of ESP learners involves utilizing task-based NA where task is the unit of analysis (Long, 2005a,b). In this approach, determining the tasks is the first step to adapting and implementing a task-based language teaching (TBLT) approach, which researchers have claimed is consistent with research and theories of second language acquisition, more accountable, relevant to learners needs, and learner-centered (Long, 2015). Furthermore, a recent meta-analytic investigation of the effectiveness of employing a TBLT approach in second language (L2) learning conducted with a sample of 52 studies revealed a positive effect of TBLT implementation compared to traditional teaching in a variety of contexts and at a variety of proficiency levels (Bryfonski & McKay, 2019). However, although NA — which utilizes task as the unit of analysis — is an integral element of TBLT programs (Long, 2015), the majority of TBLT programs reported in the literature do not include task-based NA (Bryfonski & McKay, 2019), which could negatively affect TBLT implementation.

Although NA has been extensively reported in the literature of language teaching in general and ESP in particular in the last few decades, there is still a significant need to triangulate the data resources and the data collection methods to better understand the communicative needs of learners by identifying the tasks they need to accomplish in a specific domain (Long, 2015). Therefore, in accordance with Long (2005b), Long (2015), and Serafini et al. (2015), the present study has been designed to collect data from different sources using different data collection methods in order to facilitate triangulation and identify tasks that engineering students in a Saudi public university need to accomplish. In addition, among the different kinds of ESP programs in Saudi Arabia, preparatory year programs (PYPs) — which prepare students during the first year for joining English-speaking colleges — are the most popular and are offered in almost all Saudi universities; however, to the best of the researcher's knowledge, most — if not all — PYPs are not built on the basis of professional NA, and periodical NA (McMullen, 2014) is required to effectively measure the needs of students and to compare them with the instructional materials offered in PYPs (Khan, 2019). Thus, the present study aims to contribute to the NA literature, especially task-based NA, by utilizing task-based NA in an ESP context. Furthermore, it is meant to shed some light on the communicative needs of engineering students in a Saudi university in order to inform PYP designers at the university and to provide pedagogical implications for future NA projects in the context of ESP.

2. Literature Review

2.1. Task-Based NA Approach

Various approaches and techniques have been suggested in ESP literature for collecting information needed to identify and analyze learners' communicative language requirements in order to help them function successfully (e.g., Munby, 1978; Richterich & Chancerel, 1980; Hutchinson & Waters, 1987; Long, 2005b; Long, 2015; Serafini et al., 2015). Since NA plays an instrumental role in the field of language teaching, and since it can influence and be influenced by advances in the field, the nature of the proposed NA approaches has evolved along with the developments in the field. A task-based NA approach, which uses task as the unit of analysis, has been proposed for identifying the communicative needs of learners as the first step in course design, especially in ESP contexts (Long, 2005b & Long, 2015).

Long (2005b) proposed this approach after investigating existing L2 NA literature and pinpointing various methodological issues affecting the validity and reliability of NA results. He argued that these issues can mainly be attributed to the data collection methods used to obtain the findings and to the sources of information regarding language needs. The use of learners as the primary, if not the only, source of information is very likely to negatively influence the validity of findings. Thus, Long suggested involving multiple sources of information — such as insiders and domain experts — in NA to facilitate the triangulation, which can increase validity and reliability of the findings. According to Onder-Ozdemir (2019), there is a consensus that data should be collected from different sources, especially in NA where various variables can affect the analysis. In addition, one of the motivations for Long's approach was the lack of adequate references in NA literature to research in L2 instruction methodology. Furthermore, because he observed that validating findings via the triangulation of methods and sources was not given enough attention in existing NA literature, Long asserted that triangulation in NA plays a fundamental role in enhancing the validity and reliability of research results.

Long (2005a,b; 2015) proposed several rationales for the task-based NA approach. First, he argued that organizing language instruction around tasks is consistent with second language acquisition (SLA) theories and research about the way people acquire languages. In addition, the principles of the philosophy of education provide theoretical underpinnings for the use of tasks in learning. For that reason, the logical first step in TBLT is to conduct a task-based NA. Second, he claimed that the use of units of analysis — such as tasks — that are compatible and coherent with units used in syllabus design, instructional methodology, and assessment and evaluation practices can effectively aid the implementation of new L2 instruction approaches. Thus, "the results of task-based needs analyses readily lend themselves as input for the design of a variety of analytic, task-based and/or (a small minority of) content-based second and foreign language courses" (Long, 2005b, p.23). Third, long proposed that informants (e.g., students, instructors, and employers) in task-based NA are usually well-informed about their work in terms of tasks rather than in terms of language units such as grammar and vocabulary.

Motivated by Long (2005a,b), Serafini et al. (2015) surveyed the designs, research methodologies, and procedures reported in NA studies in the context of ESP over a period of 30 years (1984–2014), and identified a number of issues regarding the research methods employed, the sources of information involved, and the validity and reliability of findings. On the basis of

this survey, they proposed a practical task-based NA model, which involves the following four steps: 1) conducting and analyzing semi-structured interviews with domain experts and in-service learners; 2) creating a questionnaire based on the information obtained from the interviews; 3) if needed, collecting and analyzing follow-up information; and 4) triangulating the data using various methods and sources.

2.2. Related Studies

Because the context of this study is English for engineering, and because it adapts the task-based NA approach of identifying learner needs, this section discusses NA studies in the context of English for engineering as well as NA studies that have employed a task-based approach. Kaewpet (2009) interviewed 25 stakeholders, including employers, engineers, lecturers, former students, and ESP instructors, to explore the communicative needs of Thai engineering students. Kaewpet's study revealed the following four communicative events: "talking about daily tasks and duties, reading textbooks, reading manuals, and writing periodic/progress reports" (p. 266). However, although the study included various sources of information, it did not include data triangulation or the use of different methods, which are effective for enhancing validity. Kassim and Ali (2010) used a self-developed questionnaire, which was informed by literature and informal discussion, to collect information from 65 participants from 10 companies in Malaysia about English communicative events and skills of engineers in the workplace. According to the findings, they stated that oral communication skills should be given more attention. They also identified the following communicative events: "teleconferencing, networking for contacts and advice, and presenting new ideas and alternative strategies" (Kassim and Ali, 2010, p. 168). Although some qualitative methods were informally involved, analysis and triangulation of methods was not reported in the article. The validity of the findings could have been enhanced by including different sources of information and triangulating the data.

Recently, there has been an increase in the use of the triangulation of methods and sources in NA studies to obtain valid and reliable findings that can effectively inform courses designers. In a large-scale study, Afshar and Movassagh (2016) investigated the needs of Iranian EAP students and examined how different stakeholders vary in their perceptions of learner needs. They used different methods and sources and triangulated the data. The findings showed that the participating stakeholders had different perceptions of learners' needs, but agreed on reading

comprehension as the primary need. This type of NA can provide general guidelines for designing EAP courses in specific contexts; however, it does not consider tasks' difficulty, which can help better depicting the needs of the learners' needs in a more detailed way.

Using triangulation NA (Long, 2005a, b), Caplan and Stevens (2017) employed a mixed-methods research design that involved interviews with 5 international students and a questionnaire completed by 191 students and 226 instructors to inform the redesign of an EAP program in a US university. The quantitative data showed agreement between students and instructors regarding the importance of 21 tasks; however, the instructors rated students less successful in most of these tasks than the students rated themselves.

Task-based NA has been increasingly employed in EAP/ESP context. A recent NA study conducted by Youn (2018) involved the conducting of interviews with instructors, administrators, and students and the administration of a questionnaire to 180 EAP students in North America to investigate their pragmatic needs. The questionnaire — which was informed by existing literature and the results of the interviews — asked students to rate a list of tasks according to necessity. Although the findings provided a list of tasks rated by necessity, it did not examine frequency and difficulty. Furthermore, the data from instructors and administrators were not examined using different methods to enhance the validity of the results. Following Long's (2005a, b) approach to NA, Iizuka (2019) explored the communicative needs of US students studying abroad in Japan through interviews and questionnaires. Interviews were conducted with samples of students and host families to explore the students' needs and to inform the questionnaire. The findings revealed a list of tasks and needs of students and showed that host families and students had different perceptions of the problems related to students' homestay experience, which was one components of this NA project. The study lacked examining the tasks' frequency. In an attempt to link NA to the design of instructional tasks, Malicka et al. (2019) conducted semi-structured interviews with 10 domain experts and domain novices as well as three observations in order to identify the tasks, perceived difficulty of tasks, and sequence of tasks. Although their study revealed practical findings, data were not examined with different methods to enhance validity.

In response to the scarcity of the triangulation of methods and sources in NA in existing literature, and in response to the lack of NA studies in the literature of ESP in the context of Saudi higher education and for the need for periodic NA in every PYP in Saudi Arabia (McMullen, 2014), the goal of the present study is to demonstrate the use of triangulated task-based NA

approach in the ESP context and to identify the communicative needs of undergraduate engineering students in a Saudi university via interviews and questionnaires, as suggested by Long (2005b, 2015) and Serafini et al. (2015). Furthermore, although task frequency and difficulty play a crucial role in determining the tasks and the appropriate sequence of tasks in curriculum design (Long, 2015), very few task-based NA studies have considered the perceived difficulty of the tasks (e.g., Serafini & Torres, 2015; Malicka et al., 2019). Therefore, this study considers both task frequency and difficulty in order to generate a rigorous report regarding the tasks and the possible sequence of materials in the ESP course designing process. This study seeks to contribute to ESP literature and inform ESP program designers by answering the following research questions:

1. From the perspective of in-service students and their instructors, what are the communicative tasks practiced by engineering students in the EAP context?
2. How frequently are communicative tasks practiced by engineering students?
3. To what extent are communicative tasks perceived as difficult by engineering students?

3. Research Methodology

The present study is an investigation of the communicative needs of undergraduate students in the engineering college at a Saudi university. In accordance with the task-based NA approach (Long, 2005a,b; Long, 2015; Serafini et al., 2015), which advocates for triangulation and the use of task as a unit of analysis, data for the study was collected using two data collection instruments. An exploratory sequential mixed-methods design was adopted to answer the research questions (Creswell, 2014). This type of research design involves the collection of qualitative data to be analyzed and then used in building the quantitative part of the study. Informed by the NA model proposed by Serafini et al. (2015), this study included three steps. First, the semi-structured interviews were designed and conducted with a sample of students and instructors. Second, the data from the interviews were analyzed and used to inform the subsequent questionnaire. Third, the findings were triangulated to generate a rigorous understanding of the research problem. In order to obtain data from different sources, the population of interest in this study included in-service engineering undergraduate students and their instructors, who were considered domain experts in this context.

3.1. Context

This study was conducted in the engineering college at a Saudi public university where English was the medium of instruction. All of the students in this college spoke Arabic as their L1 and used English as a foreign language. All of the faculty members spoke English as an L2 and had various L1s, with Arabic being the most common. As English language was the medium of instruction in the engineering college and some other colleges at the university in Saudi Arabia, high school graduates were required to complete PYP before they could join any of these colleges (e.g., the medicine and engineering colleges). The main purpose of a PYP is to facilitate the transfer from Arabic-medium instruction in high school to English-medium instruction in college. In order for this program to better facilitate this transition and to prepare students to use English successfully in the target colleges, there was a significant need to conduct a rigorous NA to help course designers meet students' communicative needs.

3.2. Instruments

For the purpose of triangulation, this study utilized two instruments (semi-structured interviews and a questionnaire) to collect information from two sources (in-service students and domain experts) about the tasks students need to accomplish in college and the communicative skills they have to manage, as well as the language challenges they encounter. There were two versions of semi-structured interview — the instructors' version and the students' version. Both versions included the same items with slight differences in order to obtain insights from the different stakeholders. The interviews consisted of five guiding questions derived from the ESP literature and from informal discussions with in-service students, graduates, and instructors in the college. To pilot test the interviews, the researcher conducted one trial interview with an instructor and one trial interview with a student and made some changes accordingly. The interviews were originally written in English and then translated to Arabic because it was the L1 of all students and some instructors. Arabic was used to maximize the information participants could provide. Two applied linguists were consulted to ensure translation accuracy and readability. The participants could choose between the English and Arabic versions of the interview.

The data obtained from the interviews with the domain experts and students were used to develop an online questionnaire. The questionnaire consisted of 28 tasks derived from the interviews and asked students to use a 5-point-Likert scale to rate the frequency (1= never, 2= rarely, 3= sometimes, 4= often, 5=always) and difficulty (1= very easy, 2= easy, 3= neither easy

nor difficult, 4= difficult, 5= very difficult) of each task. The purpose of rating frequency and difficulty was to obtain a list of tasks that could be sequenced and graded for TBLT syllabus design. According to Long (2015, p.229), "Frequency is important in designing a genuine task-based syllabus, but frequency of tasks, not words or grammatical patterns." Long (2015) also highlighted the importance of considering the difficulty of tasks for specific learners in a specific context when selecting and grading the tasks in task-based syllabi. Thus, the present study investigated the frequency and difficulty of tasks from the perspective of learners. The researcher designed the questionnaire and translated it to Arabic with the help of two applied linguists. After that, two engineering professors were consulted regarding the questionnaire clarity and readability. In addition, 14 students participated in a pilot testing of the questionnaire. After the consultation and pilot testing, some changes were made and the questionnaire was finalized and then administered online.

3.3. Procedure and Participants

Due to the use of an "exploratory sequential mixed methods design" (Creswell, 2014, p.224), the data collection for this study occurred in two phases. The first phase involved exploring the tasks through semi-structured interviews with 12 undergraduate engineering students and 12 of their instructors. The researcher conducted all of the interviews and tape-recorded them after gaining a signed consent from all participants. The interviews lasted around 25 minutes on average.

In the second phase, which was a month after phase one, a link to the online questionnaire was emailed to all of the students (approximately 550 students) in the engineering college. One hundred forty one students completed the online questionnaire.

3.4. Data Analysis

3.4.1. Interviews

In order to use the findings from the qualitative data to build the quantitative questionnaire, the researcher conducted and analyzed the interviews first. The analysis of the qualitative part of the study involved transcribing the tape-recorded interviews, reading the transcripts several times, and writing some notes and reflections to obtain a general sense of the data, which is a crucial stage of the qualitative data coding process. To understand the qualitative data and to develop the main themes, two stages of coding were implemented adapted from Dornyei (2007). These were: initial coding — which involved reading the transcripts, highlighting relevant extracts, and assigning descriptive labels — and second-level coding — in which the initial codes were compiled and clustered under the umbrella of wider labels. Influenced by Serafini and Torres (2015), the emerging tasks were categorized into three standards of communication proposed by the American Council on the Teaching of Foreign Languages (ACTFL, The National Standards Collaborative Board, 2015), which were defined by The National Standards Collaborative Board (2015, para. 1) as follows:

Interpersonal Communication: Learners interact and negotiate meaning in spoken, signed, or written conversations to share information, reactions, feelings, and opinions.

Interpretive Communication: Learners understand, interpret, and analyze what is heard, read, or viewed on a variety of topics.

Presentational Communication: Learners present information, concepts, and ideas to inform, explain, persuade, and narrate on a variety of topics using appropriate media and adapting to various audiences of listeners, readers, or viewers.

The identified tasks were used to create the quantitative questionnaire, which was then distributed to students in the engineering college.

3.4.2. Questionnaire

The 28 tasks identified through the analysis of the semi-structured interviews were used to create a questionnaire in which participants were asked to rate both task frequency and task difficulty. The tasks in the questionnaire corresponded to the three communication standards, as explained above. The questionnaire was completed by 141 students, four of which were excluded

from the analysis because of straight lining (where the respondent chose the same response — e.g., very difficult or never — throughout the questionnaire). Therefore, the analysis included a total of 137 completed questionnaires. To examine task frequency and difficulty as rated by the participants, descriptive statistics (mean and standard deviation) were computed using SPSS. The Cronbach's alpha (α) for the whole questionnaire was .90, which indicated a high level of internal reliability. The Cronbach's alpha values of the subsets of items are reported in the results section.

4. Results

4.1. Semi-Structured Interviews

The data from the interviews with domain experts and students revealed that both groups had shared views about the tasks students need to carry out in their study and the English language difficulties they face. As explained above, the tasks drawn from the interviews were categorized into three main communication standards, each of which was subcategorized into communication modes (see Table 1).

Table 1

Communicative Tasks

Communicative Tasks
Interpersonal Communication
Spoken mode
1. Participate in a class discussion.
2. Ask your instructor a clarifying question in class.
3. Speak with your instructor in class.
4. Speak with your instructor in their office.
5. Interact with the audience while giving a presentation.
Written mode
6. Compose an email to your instructor.
7. Read an email from your instructor.
Interpretive Communication

Spoken mode

8. Listen to your instructor explaining a complex idea in English.

9. Listen to your instructor's oral questions in class.

10. Understand a scientific YouTube video.

11. Understand technical terminology in a lecture.

12. Listen to students giving presentations.

Written mode

13. Read textbooks.

14. Read reference books.

15. Read academic research papers related to the engineering field.

16. Read your instructor's handouts.

17. Read lecture slides.

18. Understand technical terminology in reading.

19. Read directions of an assignment, project, training session, or experiment.

20. Read exam questions.

Presentational Communication

Spoken mode

21. Give a presentation individually.

22. Take part in giving a team presentation.

Written mode

23. Write a report individually (project, training session, field trip, or experiment).

24. Answer a theoretical question in an exam.

25. Write a theoretical piece in an assignment.

26. Use technical terms in writing.

27. Use English vocabulary properly in writing.

28. Take notes in lectures.

4.1.1. Interpersonal Communication

There was agreement between the domain experts and students regarding most of the interpersonal spoken tasks students need to carry out in college. Both groups believed that one of the most frequent speaking tasks is participating in class discussions. They also emphasized that participation in class discussion requires good English proficiency. For example, Student I stated:

> Participation in class is affected by the language used in class. When Arabic is allowed, we have more participation and we are more active. But when we have to use English, we are not that active because of the language barrier.

Similarly, asking clarifying questions in class was among the tasks identified as important for students to practice very often in class. However, some participants noted that students may face some difficulties asking questions in English. For example, Instructor F claimed: "Some students do not ask questions when I force them to use English in class."

Similarly, speaking with instructors in class was perceived as an important task and it was described difficult for some students for the same reason given for avoiding asking clarifying questions in class. However, speaking with an instructor in their office was not reported as a challenge. For example, Instructor I stated: "Some of them try not to speak English in class, but when they visit my office and speak English, they do not seem shy of speaking as in class."

The interviews with the students revealed that interacting with the audience while giving presentations was one of the tasks that occurred very often and posed a challenge to some students.

In terms of written tasks, the interviewed students reported a frequent need to compose emails to instructors and to read emails from instructors in English. Although neither task was considered challenging for students, participants did note that writing emails may take some students a relatively long time.

4.1.2. Interpretive Communication

The domain experts and students similarly believed that listening to an instructor explaining a complex idea in English, understanding instructors' oral questions in a lecture, and understanding technical terminology in a lecture are the most common interpretive listening tasks. These tasks were perceived by some interviewees to be difficult for some students. For example, Instructor L explained: "the problem is that some of the content is very complicated and me explaining it in English takes my students a long time to understand. So, I have to switch to Arabic, sometimes, to ensure they understand the content."

The interviewed students added that scientific YouTube videos are among the very common practices engineering students use as a supplementary source of information. They also described needing to listen to their classmates giving presentations.

There was an agreement among most of the participants that the most common interpretive written tasks are the following: reading textbooks; reading references books; reading academic research papers; reading directions of assignments, projects, training sessions, or experiments; reading exam questions; and understanding technical terminology in reading. Most of the participants described these tasks as difficult for many students. For example:

Sometimes there is a chance of misunderstanding, especially in the final exams when the professor is not around to explain. (Student G)

Reading books is difficult for some students because of the language. If you give them four pages to read, they will take half an hour to read them. (Instructor C)

Finally, some of the students participated in the interviews added that reading the lecture slides and reading the handouts provided by some instructors are frequently practiced by students.

4.1.3. Presentational Communication

The interviews revealed some presentational tasks that were classified into presentational spoken tasks and presentational written tasks. Two presentational speaking tasks were reported in

the interviews by students and their instructors: giving presentations individually and taking part in team presentations.

Similar to other tasks, some students described struggling to give a presentation individually or to take part in a team presentation for various reasons. For example, Student I stated, "I still have difficulty with presentations. It is difficult to speak in front of your classmates." In addition, Instructor J claimed, "Presentations are hard for many students and they cannot express themselves easily."

The presentational writing tasks identified from the interviews included writing reports individually, writing reports in teams, answering theoretical questions in exams, answering theoretical questions in assignments, using terminology and English vocabulary properly, and taking notes in lectures. However, most of these tasks were identified as difficult for some students. For instance:

> Their ability to write in exams needs some improvement. Sometimes, I put a question in the exam expecting at least a five-line answer. Then, I find that many of the students write two very short sentences in less than two lines. What is worse is that some of them write only some words, not even complete sentences. (Instructor E)

> It is difficult for us to answer written questions in exams. We prefer mathematical questions. We are not good in writing. (Student G)

4.2. Questionnaires

Students' perceptions of the frequency and difficulty of the 28 tasks are discussed in three sections corresponding to the three main communication standards. The discussion for each section will include the internal consistency of the subsets and the descriptive statistics that show the perceived frequency and difficulty of the tasks.

4.2.1. Interpersonal Communication

The descriptive statistics for the perceived frequency and difficulty of the interpersonal communication tasks are presented in Table 2. The internal consistency for the perceived frequency items was $\alpha=.73$, which indicated high reliability (Hinton et al., 2014). The internal

consistence for the perceived difficulty items was α=.65, which indicated moderate reliability (Hinton et al., 2014). As shown in Table 2, task 7 was perceived as the most frequent interpersonal task (M= 4.07, SD=.99) and task 4 was perceived as the least frequent task (M= 3.01, SD=1.07), although still a task that was practiced often. The other five tasks perceived as quite frequent were: task 6 (M= 3.50, SD=.97), task 2 (M= 3.45, SD=.95), task 5 (M= 3.43, SD=1.11), task 1 (M= 3.38, SD=.87), and task 3 (M= 3.27, SD=.99). In terms of tasks difficulty, participants tended to perceive the following four tasks as difficult: task 1 (M= 3.42, SD=.93), task 2 (M= 3.40, SD=.99), task 5 (M= 3.27, SD=1.07), and task 3 (M= 3.06, SD=.98). The table also shows that task 4 and task 6 were perceived as neither easy nor difficult (M= 2.22, SD=1.03 & M= 2.18, SD=.98, respectively). The only task perceived as easy was task 7 (M= 1.71, SD=.88).

Table 2

Interpersonal Communication Tasks

Task	Frequency		Difficulty	
	M	SD	M	SD
Spoken Mode				
1. Participate in class discussion.	3.38	.87	3.42	.93
2. Ask your instructor a clarifying question in class.	3.45	.95	3.40	.99
3. Speak with your instructor in class.	3.27	.99	3.06	.98
4. Speak with your instructor in their office.	3.01	1.07	2.22	1.03
5. Interact with the audience while giving a presentation.	3.43	1.11	3.27	1.07
Written Mode				
6. Compose an email to your instructor.	3.50	.97	2.18	.98
7. Read an email from your instructor.	4.07	.99	1.71	.88

4.2.2. Interpretive Communication

Table 3 presents the descriptive statistics for the perceived frequency and difficulty of interpretive communication tasks. The internal consistency for perceived frequency (α= .85) and difficulty (α= .89) indicated high reliability and suitability. Students rated task 17, task 19, and task 16 as highly frequent tasks with mean values of greater than 4.00, (M= 4.33, SD= 1.02; M= 4.23, SD=.98; & M= 4.04, SD=.99, respectively). The tasks perceived as being conducted often were: task 8 (M= 3.96, SD=.97), task 18 (M= 3.87, SD= 1.06), task 10 (M= 3.82, SD=.95), task 20 (M= 3.80, SD=.80), task 9 (M= 3.75, SD=.99), task 11 (M= 3.72, SD= 1.09), task 13 (M= 3.63, SD=.96), and task 12 (M= 3.07, SD=.95). The interpretive tasks perceived as least frequent were: task 14 (M= 2.40, SD=.97) and task 15 (M= 2.14, SD=.99).

In terms of difficulty, as shown in Table 3, the interpretive tasks perceived as most difficult were task 15 (M= 3.51, SD=.98), task 14 (M= 3.42, SD= 1.07), task 18 (M= 3.26, SD=.90), and task 13 (M= 3.20, SD= 1.06). Task 11 (M= 2.85, SD= .80), task 10 (M= 2.58, SD= .94), task 9 (M= 2.50, SD= .99), task 16 (M= 2.28, SD= 1.06), task 12 (M= 2.07, SD= .94), task 20 (M= 2.03, SD= .98), task 19 (M= 2.02, SD= .99), and task 17 (M= 2.01, SD= .92) were perceived as neither easy nor difficult. Among the 13 interpretive tasks, only one was perceived as easy, which was task 8 (M= 1.98, SD= .98).

Table 3

Interpretive Communication Tasks

Tasks	Frequency		Difficulty	
	M	SD	M	SD
<u>Spoken Mode</u>				
8. Listen to your instructor explaining a complex idea in English.	3.96	.97	1.98	.98
9. Listen to your instructor's oral questions in class.	3.75	.99	2.50	.99
10. Understand a scientific YouTube video.	3.82	.95	2.58	.94
11. Understand technical terminology in a lecture.	3.72	1.09	2.85	.80

12. Listen to students giving presentations.	3.07	.95	2.07	.94

Written Mode

13. Read textbooks.	3.63	.96	3.20	1.06
14. Read reference books.	2.40	.97	3.42	1.07
15. Read academic research papers related to the engineering field.	2.14	.99	3.51	.98
16. Read your instructor's handouts.	4.04	.99	2.28	1.06
17. Read lecture slides.	4.33	1.02	2.01	.92
18. Understand technical terminology in reading.	3.87	1.06	3.26	.90
19. Read directions of an assignment, project, training session, or experiment.	4.23	.98	2.02	.99
20. Read exam questions.	3.80	.80	2.03	.98

4.2.3. Presentational Communication

Descriptive statistics for the frequency and difficulty of the presentational communication tasks are presented in table 4. The Cronbach's alpha for task frequency (α= .73) and task difficulty (α= .84) indicated reliability and suitability. The frequency ratings for the presentational communication tasks showed that almost all of the tasks were perceived to be frequent. As shown in Table 4, the task identified as the most frequent was task 22 (M= 3.91, SD=.97). This was followed by task 23 (M= 3.84, SD=.98), task 26 (M= 3.81, SD= 1.07), task 21 (M= 3.67, SD= 1.09), task 27 (M= 3.66, SD=.99), task 28 (M= 3.44, SD=.97), and task 24 (M= 3.02, SD=.88). The task identified as least frequent was task 25 (M= 2.86, SD=.95).

In terms of tasks difficulty, the only task perceived as difficult was task 24 (M= 3.18, SD=.99). Tasks perceived to be neither easy nor difficult were task 21 (M= 2.91, SD=.99), task 26 (M= 2.91, SD=.96), task 23 (M= 2.86, SD=.98), task 27 (M= 2.67, SD=.97), task 22 (M= 2.64, SD=.95), task 25 (M= 2.29, SD= 1.00), and task 28 (M= 2.13, SD= 1.00).

Table 4

Presentational Communication Tasks

Tasks	Frequency		Difficulty	
	M	SD	M	SD
Spoken Mode				
21. Give a presentation individually.	3.67	1.09	2.91	.99
22. Take part in giving a team presentation.	3.91	.97	2.64	.95
Written Mode				
23. Write a report individually (project, training session, field trip, or experiment).	3.84	.98	2.86	.98
24. Answer a theoretical question in an exam.	3.02	.88	3.18	.99
25. Write a theoretical piece in an assignment.	2.86	.95	2.29	1.00
26. Use technical terms in writing.	3.81	1.07	2.91	.96
27. Use English vocabulary properly in writing.	3.66	.99	2.67	.97
28. Take notes in lectures.	3.44	.97	2.13	1.00

5. Discussion

As the present study was designed to identify the communication needs of Saudi EFL engineering undergraduate students, the findings clearly demonstrated how a task-based NA approach could effectively facilitate the exploration and validation of the communication tasks that learners need to carry out in a targeted ESP context. The findings provided a thorough description of the communicative tasks in this context, which could be contributed to various factors. First, learners were not the only source of information; instructors were also involved in a way that provided rich information and permitted the triangulation of the data and sources, in accordance with the recommendations made by Long (2005b). As shown in the results section,

some of the tasks highlighted by the students were not mentioned by the instructors, and vice versa. Second, since the study investigated the tasks rather than the language skills, the respondents were well-informed and elaborated very well on the description of the tasks. This clearly illustrates why Long (2005b) and Serafini et al. (2015) promoted the use of a task as a unit of analysis rather than using language skills as a unit of analysis. The use of task as a unit of analysis in this study provided results that can be used as input for the design of task-based instructional materials, as theoretically stressed in existing literature (e.g., Long, 2005a,b; Long, 2015). For instance, the tasks "read textbooks", "ask your instructor a clarifying question in class", and "understand technical terminology in reading", which perceived relatively frequent and difficult, could constitute the TBLT program to be designed for such learners. This clearly showed how task-based NA could pave the way for TBLT implementation.

Third, using two different instruments increased the validity and reliability of the process of identifying the communication tasks of the learners. The open-ended nature of the interviews allowed the researcher to collect sufficient information from both sources. Students and their instructors agreed to a great extent in terms of describing the tasks; however, in some cases there were some discrepancies in the description of the difficulty of carrying out some of the tasks. Consulting both sources qualitatively elicited information from different viewpoints and, consequently, increased the validity and reliability of the information obtained from the interviews. The results of the semi-structured interviews were further examined through the close-ended questionnaire that investigated the perceived frequency and difficulty of the tasks in a larger sample of the targeted population (137 students). This part of the study played a crucial role in validating the findings and determining the tasks in a more reliable way that can better inform ESP course designers. In studies (e.g., Kaewpet, 2009; Malicka et al., 2019), where only qualitative data were used, it is relatively hard to confidently describe the learners needs because what is a need for one participant is not always the need of the majority; therefore, using quantitative method with larger sample of the population is very likely to reveal more rigorous findings about the learners' need.

Furthermore, this present study exhibited that examining perceived difficulty in addition to perceived frequency was an integral part of task-based NA because it allowed providing not only a list of tasks but also a list of tasks categorized according to frequency and difficulty. Therefore, it is vital to survey both frequency and difficulty to better inform the course designer

because rating frequency indicates the most common tasks and rating difficulty determines how much help students need to perform the tasks successfully. In fact, surveying both frequency and difficulty can accordingly affect the sequence of instructional materials because what is perceived as a frequent task is not always perceived as difficult. This discrepancy between frequency and difficulty was clear in the results of the current study, which was in line with some previous studies (e.g., Serafini & Torres, 2015). For example, while "Read an email from your instructor" was perceived a quite high-frequency task (M= 4.07, SD=.99), it was not perceived as difficult (M= 1.71, SD=.88). This should not be one of the priorities in the ESP program for such learners because it is frequent but not posing difficulty for them. Therefore, this study demonstrated the importance of examining both frequency and difficulty in task-based NA to course designing, because it showed that examining one factor alone (e.g., Afshar & Movassagh, 2016; Youn, 2018) might not sufficiently inform curriculum designers.

To sum up, as shown in the results section, most of the tasks received high frequency scores, which provided a list of communication tasks that were considered the most common tasks in this context. The tasks were categorized into three communication standards: interpersonal, interpretive, and presentational communication. The quantitative data showed tasks with different levels of frequency in each category, thereby illustrating the spread of the tasks among these three categories. Some of tasks that were identified as frequent tasks aligned with the results of previous NA studies (e.g., Kassim and Ali, 2010; Kaewpet, 2009).

6. Implications

In addition to the implications of the present study for program design in the PYP, which was the context of this current study, it could provide several pedagogical implications for ESP practitioners and researchers. First of all, conducting a task-based NA prior to design an ESP program can serve the whole process of curriculum design, starting from formulating the objectives of the course to evaluating the outcomes; therefore, one recommendation for ESP educator would be to use task as a unit of analysis, as highlighted in Long (2005a,b; 2015) and demonstrated in the current study. That is because the outcomes of the analysis can constitute the ESP course. To apply that to the findings of the present study, one of the possible objectives of the potential PYP ESP course is to have students able to read engineering textbooks because it was one of the tasks that were perceived relatively frequent and difficult. This objective should

accordingly influence the type of activities and tasks students are to be involved in, and the method of assessment to be employed. This clearly showed one of the main rationales to recommend using task as a unit of analysis in NA projects (Long, 2005).

Second, as discussed and illustrated above in detail, it is highly recommended to consult more than one source of information and to use more than one instrument to ensure validity and reliability of the results. The more sources you include in the analysis, the more rigorous findings you obtain about the context of the study and the more you design a course meeting the needs of learners. That is very important because it has been found here and in similar studies (e.g. Afshar & Movassagh, 2016; Caplan & Stevens, 2017) that different stakeholders hold different perspectives and view the context from different directions. Third, the present study emphasized the importance of examining both perceived frequency and difficulty to determine the needs of the learners and to make decisions about the components of the program and the appropriate sequence of the instructional materials.

7. Conclusion

The purpose of this study was to employ task-based NA approach, whereby task was the unit of analysis and data sources and collection methods were triangulated, to identify the communication needs of Saudi EFL undergraduate students in an engineering college at a Saudi university in order to inform ESP course designers at this university and of similar courses in similar contexts. In order to achieve this goal, the researcher conducted semi-structured interviews and administrated online questionnaires. The results of the semi-structured interviews with students and their instructors and the questionnaire administered to students revealed a list of tasks that were categorized into three standards of communication: interpersonal, interpretive, and presentational. In addition, the students' perceptions of tasks frequency and difficulty were reported to inform course designing and to facilitate prioritizing and grading the instructional materials. This study demonstrated that task-based NA can reveal valuable pedagogical implications and can provide course designers with some instructional inputs for ESP course designing (e.g. Long, 2005a,b; Long, 2015; Serafini et al., 2015). In line with previous studies (Kaewpet, 2009; Kassim and Ali, 2010; Malicka et al., 2019; Caplan and Stevens, 2017; Afshar & Movassagh, 2016; Youn, 2018; & Iizuka, 2019), task-based NA was found effective in identifying the needs of ESP learners and informing courses designers.

Finally, the limitations of this present study should be noticed for future NA projects. First of all, although the current study involved students from different years and levels of college; the questionnaire did not ask the participants to report how new/old they were to college. Considering that in NA projects would allow better understanding of the results because students' perceived frequency and difficulty of the tasks might be influenced by how new/old they are to college, as explicitly claimed by some participants. For instance, Student G stated, "In the beginning we had a problem with reading, but we solved that by using the Google Translate camera. As time moved on, we got used to the terminology and reading," and Student H similarly claimed that "Engineering terminology in daily lectures has affected my understanding, especially at the beginning of my study in this college." Thus, it is highly recommended to survey student's levels in the target contexts and consider novelty in the analysis in future task-based NA projects. Secondly, although using only interviews and questionnaires in the present study revealed rich information, the lack of employing other instruments, such document analysis and observation, could have affected the thoroughness of the findings. To make NA projects' findings more rigorous, additional instruments would be necessary.

8. Acknowledgment

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