
| RESEARCH ARTICLE

Teaching English for Polytechnic Purposes: Guidelines for an Integrated, Communicative Approach

Prof. Reima Al-Jarf

Full Professor of English and Translation Studies, Riyadh, Saudi Arabia

Corresponding Author: Reima Al-Jarf, **E-mail:** reima.aljarf@gmail.com

| ABSTRACT

To help ESP college instructors improve the English curriculum taught at polytechnic institutes, colleges and universities, the current study proposes a model for designing English for Polytechnic Purposes (EPP) courses for undergraduate students majoring in mechanical engineering, chemistry, technology, economics, textile industry and other applied sciences. It aims to show instructors the following: how to identify students' needs; how to assess students' proficiency level in English; how to define the EPP learning outcomes (course objectives); how to identify the language skills and language elements that should be taught to a particular group of students; how to select technical terms and topics related to the students' area of specialization; how to select the course content and material to be used; how to integrate the content and skills while teaching, i.e., how to teach content and listening skills, content and speaking skills, content and reading skills, content and writing skills, content and technical terms, content and grammar, and how to integrate current global events in the course; how to develop students' prior knowledge in their area of specialization; teaching students how to search for information in online resources; the types of technologies that can be integrated in EPP instruction; the kind of assignments, practice and application activities to give to the students and assessment.

| KEYWORDS

English for Specific Purposes, ESP, Polytechnic purposes, course design, needs analysis, needs assessment, language teaching, language learning

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1. Introduction

Being a global language, English is used in almost all fields in all countries. It is taught for general purposes to students of all ages in many schools and universities in non-English speaking countries. It is also taught for Academic Purposes (EAP) and for Specific Purposes (ESP) to graduate and undergraduate students majoring in a variety of subject fields such as medicine, engineering, computer science, business, oil industry, aviation, and others to enable the students to continue their studies in English and find a job after graduation.

In addition, the study of EAP and ESP has numerous advantages. For example, undergraduate students majoring in engineering at Dhofar University in Oman indicated that studying an ESP course has a positive effect on understanding the course content, enriching their vocabulary and grammar, and promoting their specific English language skills (Irudayasamy, Souidi & Hankins, 2020). Engineering students can acquire professional vocabulary in ESP classes and develop their communicative skills. Learning ESP provides the students with high levels of stimulus for future job opportunities in the engineering field and prepares them for the job market (Bekteshi & Xhaferi, 2020).

A review of the ESP literature conducted in the past decades has revealed a multitude of studies that focus on different aspects of ESP teaching and learning. The first group of studies focused on the different approaches used in designing ESP courses, such as

the *Language-centered* course design; the skills-centered design; the learning-centered approach¹; the integrative model (Sifakis, 2003); and the functional-notional approach which emphasizes the communicative purpose of the language, students' special needs, self-motivation, and identification of functions (Kim, 1992). More recent studies recommended outcome-based and student-centered approaches (He, Zhang & Yan, 2021; Hernandez (2016); a standards-based approach (Brown & Prendergast, 2020); the content and language integrated learning approach for developing students' language skills and content knowledge and empowering them with high employability and mobility in a globalized job market (Yang, 2018). The content-based language teaching curricula connect second language learning theory with backward design curriculum development theory in institutional settings in which the administration mandates and changing faculty and student populations affect the curriculum design process (Miller, Klassen & Hardy, 2021).

Another group of studies recommended a needs-based ESP course design such as Trujeque-Moreno, Romero-Fernández, Esparragoza-Barragán and Villa-Jaimes (2021); Al-Jarf (2021); Anwar and Wardhono (2019); Jiang, Zhang, May and Qin (2020); Xie (2019); Irshad and Anwar (2018); Poedjiastutie and Oliver (2017); Ulla and Winitkun (2017); Al-Jarf (2013); Al-Jarf (2009); Al-Jarf (1994). These studies have two prominent constraints of students' needs analysis: focusing more on the target needs and learning needs and less on affective factors as the basis of all needs, including learning experience and achievement motivation. In Turkey, a vocational ESP course for undergraduate students at the Electric and Energy Department, was based on a broader analysis of the environment (situation) and context, students' needs, learning styles and perceptions, language needs, language teaching and learning methods, and strengthening the connection between the students and the target workplace (Öztürk & Bal-Gezegin, 2019). In China, Chinese science and language majors have different purposes for learning professional English as they have discipline-specific learning needs. Language majors have more communication with English users than science majors. However, both science and language majors reported limited English language use, limited opportunities for learning English outside the classroom and difficulties in learning English due to lack of motivation and interest (Xie, 2019).

Regarding the skills and content taught in ESP courses, some prior studies found that computer science students in Pakistan need all four language skills, with speaking as the most frequently needed skill (Irshad & Anwar, 2018). Chinese-major university students taking a Journalistic English course were exposed to a combination of subject-specific language and content reinforcement followed by strategic reading instruction using subject-specific articles (Chou, 2013). Students learning Business English at the University of Economics in Katowice, Poland appreciated the 'real-life examples' of successful companies in their business coursebook and showed a strong preference for the Internet-based texts that provided them with an opportunity to acquire 'basic knowledge' related to specific business issues. The integration of content-based instruction, properly selected professional content, and language for specific purposes fostered the students' engagement and motivation (Lacka-Badura, 2021). Information literacy skills and project-based learning were integrated in an EAP course for pre-medical Arab students at a USA medical college in Qatar (Saliba, Mussleman, Fernandes & Bendriss, 2017).

Moreover, a variety of ESP and EAP effective teaching approaches and strategies were reported in some prior studies such as Task-Based Language Teaching (Trujeque-Moreno, Romero-Fernández, Esparragoza-Barragán & Villa-Jaimes, 2021); the Communicative Language Teaching approach (Khalil & Semono-Eke, 2020); teaching practices that provide a comfortable and enjoyable environment, not those involving activities and assignments (Mauludin, 2021); case meetings in which students were case authors and directors rather than case analysts because the former strengthened the students' personal proactive engagement with authentic industry experiences in aeronautics (Tatzl, 2015). Other studies used Information Communication Technology (ICT) tools to support ESP textbooks (Keshtiarast & Salehi, 2020) and social media networks for effective teaching, for improving students' proficiency level, for enhancing students' motivation to study foreign languages, and for using them as corpora of authentic materials (Saienko, Semyda & Akhmad, 2020).

Other studies in the literature described the challenges faced in teaching and learning ESP in numerous countries. In Mexico, many instructors find it challenging to match what the students need and want to learn with innovative pedagogical strategies (Trujeque-Moreno, Romero-Fernández, Esparragoza-Barragán & Villa-Jaimes, 2021). The ESP curriculum in Thailand does not develop students' speaking skills. English classes do not expose the students to the foreign language, do not use engaging activities and strategies, and do not use technology in language learning (Ulla & Winitkun, 2017). In Indonesia, students' English proficiency is unsatisfactory. Making the ESP curriculum relevant for the students' needs has been a major challenge because the ESP curriculum and classroom instruction are not based on a systematic analysis of students' needs (Poedjiastutie & Oliver, 2017). In the Philippines, there is no instructional designs for the English language curricula in private tertiary-level institutions. The instructors do not know what instructional design really means (Hernandez, 2016). In China, Chinese language majors have more communication with English users than science majors. Both language and science majors reported limited English language use

¹ <https://espeed2016.blogspot.com/2016/06/chapter-7-approach-to-course-design.html>

and learning opportunities outside the classroom and have difficulties learning English due to lack of motivation and interest (Xie, 2019). After graduation, university graduates do not meet the English requirements of employers in Vietnam, which makes unemployment a serious problem (Hoa & Mai, 2016). Similarly, students who complete engineering courses at Dhofar University in Oman face frequent rejections in the labor market despite their outstanding academic grades (Irudayasamy, Souidi & Hankins, 2020).

Furthermore, an exploratory study by the author revealed further shortcomings of ESP courses taught in Saudi Arabia. Those include teaching grammar and technical terms rather than skills. Teachers usually teach general English. Students with different specialties study together. What students study in the courses has nothing to do with their area of specialization. Students do not know how to search for information. Many ESP instructors have negative attitudes towards teaching English for Polytechnic Purposes (EPP) and find it difficult to teach EPP as they feel that they are specialized in TESOL and general English not engineering, computer science, business, oil industry, medicine, and other applied sciences. They are not familiar with the technical terms and find specialized texts in those disciplines difficult to teach (Al-Jarf, 2021o; Al-Jarf, 2013g; Al-Jarf, 2009d; Al-Jarf, Al-Jarf, 1994).

To help ESP college instructors improve the English curriculum taught at polytechnic institutes, colleges and universities, the current study proposes a model for designing EPP courses for undergraduate students majoring in mechanical engineering, chemistry, technology, economics, textile industry and other applied sciences. It aims to show instructors the following: (i) how to identify students' needs; (ii) how to assess students' proficiency level in English; (iii) how to define the EPP learning outcomes (course objectives); (iv) how to identify the language skills and language elements that should be taught to a particular group of students; (v) how to select technical terms and topics related to the students' area of specialization; (vi) how to select the course content and material to be covered in the course; (vii) how to integrate the content and skills while teaching, i.e., how to teach content and listening skills, content and speaking skills, content and reading skills, content and writing skills, content and technical terms, content and grammar, and how to integrate current global events in the course; how to develop students' prior knowledge in their area of specialization; teaching students how to search for information in online resources; (viii) how to present the material in class and the types of technology that can be integrated in EPP instruction; (ix) what kind of assignments, practice and application activities to give to the students; and (x) assessment of students' learning.

2. Definition of Terms

Polytechnic is most commonly used to refer to schools, colleges, or universities that qualify as an institute of technology or vocational university, also sometimes called universities of applied sciences. *Polytechnics* focus solely on applied skills training. They offer accredited degrees in everything from health sciences and engineering to business and computing. They combine the in-depth study found at universities with practical, technology-based skills training. Thus teaching EPP covers teaching English for Technology, English for Mechanical Engineering, English for Chemistry, English for Economics, English for Textile Industry, and other applied sciences.

3. Proposed Model

The EPP courses at polytechnic institutes, colleges and universities need to be designed by a team of native English language speaker, subject-matter, and curriculum design experts. The register, discourse structure, stylistic features, and specific listening, speaking, reading, writing, vocabulary and grammar skills should be taken into consideration in the course design. The following guidelines should be taken into consideration when designing EPP courses (Al-Jarf, 1994; Al-Jarf, 2013g; Al-Jarf, 2021c).

3.1 Identifying Students' Needs

Before designing the course, a needs assessment questionnaire can be used to find out why undergraduate students majoring in engineering, technology, economics, textile industry and other applied sciences need to learn English and what they will be using English for while studying and after they graduate from college and join the labor market. Ask the students:

- Why do they need to learn English?
- Which skills do they need while studying their courses?
- In which situations will the students use English while studying?
- Which skills do they need after they graduate and work in their area of specialization?
- In which situations will the students use English in the workplace after graduation?

3.2 Assessing students' proficiency level in English

Use a test to assess students' proficiency level in the different English language skills (listening, speaking, reading, writing, vocabulary and grammar). You may use a standardized test such as the IELTS or TOEFL or a teacher-made test.

3.3 Defining the EPP Learning Outcomes (Course Objectives)

On the basis of the students' needs assessment questionnaire and the English proficiency tests, the major skills that the students need to acquire must be defined (listening, speaking, reading, writing and/or using technology etc.). Specific sub-skills that the students are expected to master at the end of the EPP course should be identified. Technical vocabulary and grammatical structures typical of the students' major area that the students are expected to acquire at the end of the EPP course should be also identified.

3.4 Identifying which language skills and language elements to teach

- **Listening skills:** (i) Auditory discrimination, i.e., identifying and discriminating phonemes, minimal pairs, syllables, assimilation, elision, pause and juncture, stress and intonation; (ii) Auditory Comprehension, i.e., identifying main ideas and details in the spoken discourse.
- **Speaking skills:** (i) Oral Production of phonemes, allophones, syllables, geminates, assimilation, elision, stress, intonation, pause and juncture; (ii) Oral Expression which includes generating and organizing ideas, using vocabulary and grammatical structures, correct pronunciation, stress, intonation, fluency and speed.
- **Reading skills:** (i) Reading process skills that include decoding, identifying word meaning, using phonic and structural clues, syntactic structures, text organization, anaphora, making inferences, and background knowledge; (ii) Reading product skills which include Literal, inferential, and critical comprehension and appreciation.
- **Writing skills:** Identifying a recipient for writing, a purpose for writing, generating and organizing ideas, writing a thesis statement, developing a paragraph and an essay, word choice, choosing appropriate sentence structures, writing the first draft, revising, writing the final draft, correcting their spelling, indentation, punctuation, capitalization, and formatting the essay.
- **Technical vocabulary:** The students should practice spelling, pronunciation, part of speech, word structure (prefixes, suffixes, roots), singular and plural forms, verb conjugation, standard and non-standard usage, word meaning, synonyms, antonym, idioms and others.
- **Grammatical structures:** The following grammatical structures may be taught: (i) Morphology: Gender, Number, Person, Case, Tense and aspect, Mood, Transitivity, Voice, Comparison; (ii) Syntax, i.e., word order, sentence types, sentence transformations, agreement. (iii) Word-formation, i.e., derivation and compounding (Al-Jarf, 2005; Al-Jarf, 2017).

3.5 Selecting the Technical Terms and Topics

The following are examples of technical terms and specialized topics to choose from in the course:

3.5.1 Technology Examples

- *Cybernetics, cybercrime, cybersecurity, CPU, security, networking, forensic computing, computer specifications, hackers, communication, algorithm, programming, programmer, program, broadband, encryption, firewall, gateway, malware, cloud, megahertz, gigahertz, terabyte.*

3.5.2 Engineering Examples

- *combustion chamber, machinery, manufacture, structure, system, process, processing, equipment, detonation, mechanization, deflection, biotechnology, metallurgy automation, footing, base, bases, foundation, composite, atmospheric pressure, convection, electric, electrician.*
- *oil-gas deposition, raw materials, intensification, properties, industrial, industrialization, industrialize, erection.*
- *hydraulics, resources, exploitation, cartography, reconstruction, design, plan, electromechanical, electro-technological, automation, conduction, compression, compressor.*

3.5.3 Chemistry Examples

- *Organic, elements, oxides, compounds, oxidization, acids, alkali, reaction, apparatus, atoms, gas, molecules, ions, matter, structure, bonds, melt, properties, electrons, composition, protons, particles, crystals, solids, liquids, gaseous, isotopes, evaporation, sublimation, condensation, equation, solidification, mass number, atomic number.*

3.5.4 Textile Industry Examples

- *Fabric, polyester, design, fashion, yarn, synthetic fibre, jute, natural fibre, products, cotton, hemp, manufacturing, process, flax, weaving, garment factory, suppliers, quality, safety, sustainability, standards, fabric defects, sewing, knitting, stitching, stickering, bundling, layering, fusing, needle, thread, bobbin.*

3.5.5 Economic Examples

- *microeconomics, inflation, macroeconomics, finance, financial, economy, capital, exports, imports, share-holding, finance, book keeping, commerce, management, enterprises, banking, demand & supply, profit & loss, interest, recession, unemployed, unemployment, investment, welfare, budget, costs & benefits, scarcity.*

3.5.6 Examples of current global events related to the students' major:

- *the Covid-19 Pandemic and its effects on education, health, economy, tourism, sports; pollutions; gas, oil and food crisis as a result of the Russia-Ukraine war; unemployment; global warming; hackers; shooting (security) in schools.*

3.6 Selecting the content and material to be used.

The selected content should be related to the students' area of specialization. Select articles from Google, chapters from books, journal articles, newspaper articles and headlines, research papers, abstracts, reports, specialized encyclopaedia articles, specialized monolingual dictionaries, statistics, graphs, illustrations, and/or YouTube video lectures. Choose specialized texts with familiar topics. Texts should be of different topics, lengths, and difficulty levels. Seek help from colleagues specialized in the content area. The students can propose topics of interest to them.

3.7 Integrating the Course Content and skills

1) Teach Content and Listening Skills

The listening texts (themes) should cover general themes from the students' area of specialty. The listening material can be chosen from online lecture videos on YouTube, podcasts, TED Talks, mobile audiobooks and mobile apps. The students can practice listening in the multimedia language lab, in the classroom, or on their own outside the classroom. They practice listening comprehension skills, auditory identification and discrimination skills (Al-Jarf, 2022f; Al-Jarf, 2021f; Al-Jarf, 2021k; Al-Jarf, 2021n; Al-Jarf, 2020b; Al-Jarf, 2012a, Al-Jarf, 2012b; Al-Jarf, 2012c; Al-Jarf, 2011d). A variety of online lecture videos can be used for listening practice from the following:

Management lectures:

- https://www.youtube.com/results?search_query=management+lectures+in+english

Business law lectures:

- https://www.youtube.com/results?search_query=business+law+lectures+in+english

Economics lectures:

- https://www.youtube.com/results?search_query=economics+lectures+

Computer lectures:

- https://www.youtube.com/results?search_query=computer+lectures+in+english

Engineering lectures:

- https://www.youtube.com/results?search_query=engineering+mechanics+lectures+in+english

Textile industry lectures:

- https://www.youtube.com/results?search_query=textile+industry+lectures+in+english

Chemistry lectures:

- https://www.youtube.com/results?search_query=chemistry+lectures

organic chemistry lectures

- https://www.youtube.com/results?search_query=organic+chemistry+lectures+in+english

Information technology lectures:

- https://www.youtube.com/results?search_query=information+technology+basics

Try the video, podcast, TED Talk or audiobook chosen first. Pay attention to the video length, speed of the speaker, accent, topic familiarity, complexity, and difficulty level. Give an overview of the video. Explain few new words in video. Give pre-

questions about what the students are going to watch in the video (main ideas and important details such as stats, reasons, factors, structure). The students may watch a video or TED Talk, listen to a podcast or audiobook in class or at home. The students should never watch a video passively. They take notes or answer questions while watching. Discuss answers with the students. The students write a summary or make an outline of the video or TED Talk content.

2) Teach Content and Speaking Skills

Use debates, project-based and inquiry-based speaking activities. The students can talk about familiar topics in their area of specialization. They may prepare a topic of their choice at home and give a presentation about it in class. They can brainstorm a topic in class. To generate ideas, students ask *what, when, why, who, where, how* and then answer their questions. Help with vocabulary that the students need to generate ideas. Correct students' pronunciation (phoneme and syllable production, word stress and sentences stress and intonation, pause and junctures). The students can locate information (word meaning) in Google on their mobiles in class. They can give a summary or a report about the topic discussed in class orally (Al-Jarf, 2022f; Al-Jarf, 2021d; Al-Jarf, 2012a).

3) Teach Content and Reading Skills

Select texts related to the students' specialty. Check the reading text and analyze it before assigning it to see if it is appropriate for the students' proficiency level. Underline the new technical terms and a grammatical structure. It is not possible to teach all the reading skills in one text and in one class session. The students may skim to form a general idea about the text. They scan a text to find an answer to a question. They connect/interpret illustrations, graphs, figures, pictures with ideas and information in the text. They answer questions about the main ideas and important details in the text. They summarize the text or make an outline of the main ideas and important details in it. They may fill a graph or a table with main ideas and details. Teach the students how to recognize and understand the organizational structure of a text (*definition, classification, enumeration, contrast, comparison, how-to (process), exemplification, spatial order, chronological order*). Show words that signal structure: Enumeration: *first, second, another*); Cause-effect: *because, as a result, consequently*); Classification: *is divided into, categorized, classified into*); Comparison/contrast: *similar to, like, likewise, but, however*; Chronological order: *then, ago, last, when, while, during*); and Exemplification: *for instance, for example*). The students can work individually, in pairs or collaboratively in small groups. They can use mind maps to show the main ideas and supporting details in the text. They can use mobile apps for further reading on their own at home (Al-Jarf, 2021b; Al-Jarf, 2021m; Al-Jarf, 2012d; Al-Jarf, 2011c).

4) Teach Content and Writing Skills

The students practice summarizing or making an outline of a text that they have read, filling out forms, designing a short questionnaire, writing a business letter, writing a report, writing an essay (*descriptive, process, how-to, cause-effect, classification, whole-part, chronological order, spatial order...etc.*), writing a term paper and/or writing a statement of purpose. The students can use a class blog to write about familiar current global events related to their area of specialization. The instructor can integrate participation goals that require the students' involvement in social and civic issues. Writing teachers can select topics related to local and global social, educational, health, political and/or technological issues with which the students are familiar and to which they can relate. The students can describe the problem, its causes and propose solutions to it. As a brainstorming activity, the instructor and the students can use mind maps to organize their ideas and show the topics and subtopics they are going to write about. A variety of online writing tasks can be integrated as supplementary or remedial tasks. The students can work on those in class or on their own at home. The instructor gives communicative feedback on the location of errors without giving the correct forms. The students have to correct their own errors and may correct each other's (Al-Jarf, 2022a; Al-Jarf, 2022b; Al-Jarf, 2021a; Al-Jarf, 2021h; Al-Jarf, 2014c; Al-Jarf, 2013c; Al-Jarf, 2011b, Al-Jarf, 2008).

5) Teach Content and Specialized Terminology

When teaching specialized terminology from a particular text, show the students the following:

- Pronunciation: *opportunity; negotiate, mutual insurance, continuum,*
- Prefixes, suffixes and roots: *multinational, monopoly; oligopoly; bureaucracy, democracy, autocracy.*
- Negative prefixes: *indifference, unequal, uneven, unemployed, disproportionate.*
- Singular and plural: *data, media, quota, appendix.*
- Derivatives and Parts of Speech: *bank, banker, banking; monopoly, monopolize, monopolistic; compete, competitor, competitive, competition.*
- Antonyms: *Supply and demand; implicit & explicit.*
- Near synonyms: *Managing director, executive director, CEO, GM.*
- If the term is English or from a foreign origin: *Per capita, entrepreneur.*
- Compounds and differences between compound and the same word with a preposition: *withdraw & with draw*; undertake & under take*; underwrite & under write**

- Abbreviations & acronyms: *LTD, GNP, GDP, CEO, RMB, co. SAMBA, NCB.*
- Symbols and what they mean: $\$$; TM ; ϕ ; β ; ρ ; σ ; φ ; Ψ
- Formulas and what they mean: $PEoD = (\% \text{ Change in Quantity Demanded})/(\% \text{ Change in Price}) = \text{Price Elasticity of Demand}$
- Words with multiple meanings: *Statement, bank statement; balance (banking; physics), balance sheet; base; system.*

Technical terms and new general lexical items should be taught in context. Semantic, syntactic, and morphological clues available in the text should be used to infer the meaning of new words through definitions, use of punctuation marks, synonyms and antonyms, examples, and others. Teach related terms together using a concept map to show the relationships among the lexical items. The students can use specialized online dictionaries and mobile dictionary apps to check the meanings of the technical terms that they encounter. They can create their own vocabulary flashcards for studying and reviewing their vocabulary (Al-Jarf, 2006c; Al-Jarf, 2007a; Al-Jarf, 2011e; Al-Jarf, 2013f; Al-Jarf, 2014b; Al-Jarf, 2015; Al-Jarf, 2021j; Al-Jarf, 2022e).

6) Teach Content and Grammar

Do not teach all the grammatical structures in an English grammar book. College students learning English for academic/specific/professional purposes need to learn functions for daily communication. They should be able to identify the Part of Speech of certain terms that they encounter in a text. They need to focus on English grammatical structures that are common in the written texts of their major (scientific papers, reports, instruction sheets, advertisement, patents) such as nominal phrases, compounds, derivatives, and passive forms with no by-phrase to specify the actor. Teach imperatives as they are used in instructions and directions. Teach tenses that are used in a particular genre and words that signal tenses such as *last week, always, since, for, as soon as, while, before, after*. Teach some prepositions, modals, compound, and complex sentences in context, i.e., as they occur in the reading text. Break embedded and complex sentences into phrases with slash lines. Students can work on online grammar tasks and mobile grammar apps as extension activities. They can produce and apply certain grammatical structures using online courses, blogs, discussion forums, a social media page. They can practice grammatical structures under study individually, in pairs or collaboratively in small groups. As in writing activities, give communicative feedback that focuses on the location of errors and having students correct their own errors (Al-Jarf, 2022d; Al-Jarf, 2017c; Al-Jarf, 2009b; Al-Jarf, 2009c; Al-Jarf, 2005).

3.8 Develop Students' Prior Knowledge in Their Area of Specialization

Having some background knowledge about certain topics in their area of specialization will help the students in listening and reading comprehension and in speaking and writing about those topics. Therefore, to build their background knowledge, the students can read online newspapers on their own. They can watch news on BBC, CNN, Aljazeera (in English and Arabic), RT channels and others. They can collect articles related to topics covered in the course, read them, keep them in a portfolio, and answer questions about their content. (Al-Jarf, 2022c; Al-Jarf, 2007b).

3.9 Teach Students to Search for Information Online

Since students live in the age of information and communication technologies, they need to acquire electronic searching skills to be able to search online resources for information that they need. All college students need to acquire the following skills: Selecting specialized search terms in the students' area of specialty such as *chemistry terminology, economics terms, mechanical engineering lectures, technology lectures, chemistry topics, economics topics, cost & benefits, supply & demand, cybersecurity, analytical mechanics, aerodynamics, nanomaterials, nanotechnology, nuclear power, global warming, composite materials, fibre optics, fibres & yarns, fibre sources and types, common uses for textiles, types of fabric, thermochemistry, electrochemistry*; entering the search terms of interest to them in Google, Google Play and Apple App stores, YouTube and specialized databases on the Internet and at their university library and selecting relevant results (Al-Jarf, 2021m; Al-Jarf, 2017a; Al-Jarf, 2013b; Al-Jarf, 2003).

3.10 Presenting the Material

To present the new material to the students, use advance organizers to link previously learnt or known material to the new lesson, graphic organizers, infographs and concept maps to connect information and show relationships among ideas and technical terms (viz whole and parts). Sequence and grade the material. Proceed from the general to the specific; from the known to the unknown; from the whole to the part; from the concrete to the abstract; from the examples to the generalization (inductively); and from the generalization to the examples (deductively). It is important to tell the student the objectives of the lesson and what skills and content they are expected to learn and master in a single class session, at the end of a unit and at the end of the course (Al-Jarf, 2017b; Al-Jarf, 2015; Al-Jarf, 2011d; Al-Jarf, 2009a).

3.11 Assignments, Practice and Application

Assignment should not focus on memorization and recall. The students should not copy and paste from a textbook, website or class material. Assignments can be performed individually, in pairs or small groups (teams). Guide the students throughout the

assignment, project, or term paper. Provide individualize feedback. Use guided practice with feedback in class and independent practice at home. Give clear, direct, detailed instructions. A variety of assignment can be given such as project-based, task-based activities, giving an oral presentation, writing a report, a project, a term paper, answering questions, role playing (negotiation, interview), field trips (visiting a bank, a factory, corporation, travel agency), and problem solving (pollution, unemployment). Assignments should focus on application and transfer of skills to new situations, not on rote memorization. Show the error location and have the students correct themselves and each other. Give positive reinforcement. Students can use an online course, a blog, an online discussion forum or a social media page to post and discuss their assignments with their instructor and classmates and to give and receive feedback (Al-Jarf, 2019; Al-Jarf, 2021a; Al-Jarf, 2011a).

3.12 Integrate Technology

A wide range of technologies can be integrated in teaching the different skills in EPP courses such as using a Facebook/Twitter page, a blog, an online discussion forum, an online Learning Management Systems (Blackboard, Zoom, Microsoft Teams), specialized Internet websites, online videos, web-conferencing software, online magazines and newspapers, online specialized dictionaries, associations, banks and corporations' websites. The students can also use mobile apps (Al-Jarf, 2022a; Al-Jarf, 2022b; Al-Jarf, 2021i; Al-Jarf, 2021j; Al-Jarf, 2014a; Al-Jarf, 2013e; Al-Jarf, 2012e; 2020c, 2020c; Al-Jarf, 2009d; Al-Jarf, 2006a; Al-Jarf, 2006b; Al-Jarf, 2005)

3.13 Assessment

In assessing the EPP course, focus should be on identifying the skills that have been acquired by the students and those that have not. Assessment should provide feedback on the suitability of the material, activities, and assignments in terms of difficulty level, skills developed and students' improvement. Students can be tested weekly, biweekly or at the end of a unit to identify the students (formative evaluation), in addition to summative evaluation at the end of the course. It is advisable to use a table of specifications to be able to design a test that covers all the content areas and specific skills taught and the number of items allocated to each. iRubrics can be used for scoring students' answer sheets as they identify the specific skills to be acquired, the performance levels and scores assigned to each (Al-Jarf, 2021o; Al-Jarf, 2020a; Al-Jarf, 2013g; Al-Jarf, 2011a; Al-Jarf, 2011c).

It is noteworthy to say that the reading and listening texts and speaking and writing topics included on the tests should not be identical or even similar to those taught and practiced in class. Knowledge of technical terms and grammatical structures should be tested in context, i.e., as they occur in the text given on the test and should not be given in sentences identical to those taught in class.

Mobile apps flashcards can be used by the students to prepare for standardized tests such as the IELTS, TOEFL, TOEIC, GRE and others (Al-Jarf, 2021).

4. Conclusion

The current article proposed a model for teaching EPP to undergraduate students majoring in a variety of applied sciences in Saudi Arabia. The author has applied the strategies delineated in the EPP model in teaching ESP to graduate and undergraduate students over several semesters, adjusting the types of texts and specialized terminology to the students' area of specialty such as selecting art texts and art terminology in teaching graduates students majoring in art education and selecting geography texts and geography terminology when teaching graduate students majoring in geography and so on. Comparisons of pre and posttests scores of students who practiced EPP using the model and students who did not, showed significant differences in EPP skill development. Students who practiced EPP had developed good listening, speaking, reading, and writing skills and a good repertoire of technical terminology. The students the EPP course in the model fun and beneficial. They benefited from the gradation of the teaching material and exercises, the quantity and variety of texts selected from different sub-fields in their major area of study (Al-Jarf, 2021c; Al-Jarf, 2021o; Al-Jarf, 2013g, Al-Jarf, 1994).

However, there are few more tips that EPP instructors need to take into consideration. When EPP instructors assess students' proficiency level at the beginning of the semester, and find out that their English is poor, they may use supplementary practice material that consists of short, easy texts and move on to longer and more difficult texts for 2-3 weeks before starting the actual EPP course material. EPP classes should be student-centered, not teacher-centered. The students should have an active role in the classroom. They may identify the difficult words and structures, read, speak, bring texts of interest to them in their preferred area of specialization from paper and online resource, and correct their own and each other's errors. The learning environment should be secure for making mistakes. Focus should be on communication and not on correcting every single error made by the students. Effective EPP instruction using the proposed model depends on the EPP instructor's qualification, teaching competence and willingness to put the time and effort to deliver an EPP course that benefits the students (Al-Jarf, 2022d). Therefore, EPP instructors should receive some orientation about EPP through training programs, as they might be specialized in teaching General English, not EPP. A professional development page on social media such as Facebook can be especially created for EPP instructors to

introduce them to students' needs analysis, assessment of students' proficiency level, EPP course components, selection of the listening and reading texts and speaking and writing topics in the students' area of specialization, the teaching of listening, speaking, reading, writing, specialized terminology, and content; the presentation of the material; assignments and assessment of learning outcomes. The instructors can raise questions about the difficulties they are having in different aspects of teaching EPP and receive answers and support from colleagues who are members of the same professional development page (Al-Jarf, 2021e; Al-Jarf, 2013d).

Furthermore, it is important that EPP, ESP and EAP instructors have a positive attitude towards teaching EPP rather than General English to students. It is a mindset. Look at it as an opportunity to learn something new. If an instructor puts her mind into it, she will do it. At first it is difficult, but it gets easier with practice. We all have some background knowledge in engineering, textile industry, technology, chemistry, economics, agriculture, medicine...etc. The instructor can read articles about general topics in those areas. She can search Google for pedagogical skills that she needs.

At the end of the EPP course, students and instructors' feedback on the course is significant for the continual improvement of the EPP course. To take full advantage of the proposed EPP course model and to continue to make adjustments to it, the study recommends that future researchers try out the model with samples of students enrolled in different types of polytechnic specialties in Saudi Arabia, compare the students' pre and posttest scores and survey students and instructors' views of a specific EPP course.

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ORCID iD: <https://orcid.org/0000-0002-6255-1305>

References

- [1] Al-Jarf, R. (2022a). Blogging about current global events in the EFL writing classroom: Effects on skill improvement, global awareness and attitudes. *British Journal of Teacher Education and Pedagogy*, 1(1), 73-82. <https://doi.org/10.32996/bjtep.2022.1.1.8>. [Google Scholar](#)
- [2] Al-Jarf, R. (2022b). Blogging about the Covid-19 Pandemic in EFL writing courses. *Journal of Learning and Development Studies (JLDS)*, 2(1), 01-08. <https://doi.org/10.32996/jlds.2022.2.1.1>. [Google Scholar](#)
- [3] Al-Jarf, R. (2022c). Developing students' global awareness in EFL reading and speaking. *South Asian Research Journal of Arts, Language and Literature (SARJALL)*, 4(1), 31-38. <https://doi.org/10.36346/sarjall.2022.v04i01.005>. [Google Scholar](#)
- [4] Al-Jarf, R. (2022d). Role of instructor qualifications, assessment and pedagogical practices in EFL students' grammar and writing proficiency. *Journal of World Englishes and Educational Practices (JWEEP)*, 4(2), 6-17. DOI: 10.32996/jweep.2022.4.2.2. [Google Scholar](#)
- [5] Al-Jarf, R. (2022e). Specialized dictionary mobile apps for students learning English for engineering, business and computer science. *Journal of Humanities and Education Development (JHED)*, 4(1), 1-10. <https://doi.org/10.22161/jhed.4.1.1> <https://theshillonga.com/index.php/jhed/article/view/287>. [Google Scholar](#)
- [6] Al-Jarf, R. (2022f). YouTube videos as a resource for self-regulated pronunciation practice in EFL distance learning environments. *Journal of English Language Teaching and Applied Linguistics*, 4(2), 44-52. [Google Scholar](#)
- [7] Al-Jarf, R. (2021a). A model for communicative error correction in Saudi EFL freshman students' writing. *iManager's Journal on English Language Teaching (IJELT)*, 11(2), 32. <https://doi.org/10.26634/jelt.11.2.17719>. <https://eric.ed.gov/?q=EJ1321733&id=EJ1321733>. [Google Scholar](#)
- [8] Al-Jarf, R. (2021b). Collaborative mobile ebook reading for struggling EFL college readers. *IOSR Journal of Research & Method in Education (IOSR-JRME)*, 11(06), 32-42. DOI: 10.9790/7388-1106023242. [Google Scholar](#)
- [9] Al-Jarf, R. (2021c). Designing English for Islamic studies courses: Some basic considerations. *Journal Educational Verkenning*, 2(2), 10-19. <http://www.hdpublication.com/index.php/jev/article/view/128/159>. [Google Scholar](#)
- [10] Al-Jarf, R. (2021d). EFL speaking practice in distance learning during the coronavirus pandemic 2020-2021. *International Journal of Research-GRANTHAALAYAH*, 9(7), 179-196. DOI: <https://doi.org/10.29121/granthaalayah.v9.i7.2021.4094> ERIC ED615084. [Google Scholar](#)
- [11] Al-Jarf, R. (2021e). ESL teachers' professional development on Facebook during the Covid-19 pandemic. *European Journal of Education and Pedagogy (EJ-EDU)*, 2(6), 75-81. <https://doi.org/10.24018/ejedu.2021.2.6.220>. [Google Scholar](#) <https://www.ej-edu.org/index.php/ejedu/article/view/220/106>
- [12] Al-Jarf, R. (2021f). Feasibility of digital multimedia language labs for interpreting instruction as perceived by interpreting instructors in Saudi Arabia. *International Journal of Linguistics, Literature and Translation (IJLLT)*, 4(4), 70-79. [Doi: 10.32996/ijllt.2021.4.4.8](https://doi.org/10.32996/ijllt.2021.4.4.8). ERIC ED613819.
- [13] Al-Jarf, R. (2021h). Integrating participation goals in writing activities for EFL college students. *Journal for Research Scholars and Professionals of English Language Teaching (JRSP-ELT)*, 23(5)1-11. ERIC ED613141. <https://www.jrspelt.com/wp-content/uploads/2021/01/Reima-Writing-Activities.pdf>
- [14] Al-Jarf, R. S. (2021i). Issues in using Periscope for live academic lectures during the COVID-19 pandemic. *Journal of Educational Technology*, 18(1), 15-25. <https://imanagerpublications.com/article/17711/6> <https://eric.ed.gov/?id=EJ1310187>. [Google Scholar](#)
- [15] Al-Jarf, R. (2021j). Learning vocabulary in the app store by EFL college students. *International Journal of Social Science and Human Research (IJSSHR)*, 5(6), 216-225. DOI: 10.47191/ijsshr/v5-i1-30. [Google Scholar](#)

- [16] Al-Jarf, R. (2021k). Mobile audiobooks, listening comprehension and EFL college students. *Listening Comprehension and EFL College Students. IOSR Journal of Research & Method in Education (IOSR-JRME)*, 11(6). 32-42. DOI: 10.9790/7388-1106023242. [Google Scholar](#)
- [17] Al-Jarf, R. S. (2021l). Standardized test preparation with mobile flashcard apps. *United International Journal for Research & Technology (UIJRT)*, 3(2), 33-40. <https://uijrt.com/paper/standardized-test-preparation-with-mobile-flashcard-apps>. [Google Scholar](#)
- [18] Al-Jarf, R. (2021m). Teaching reading to EFL freshman students with mind-mapping software. *Journal for Research Scholars and Professionals of English Language Teaching (JRSP-ELT)*, 24(5), 1-12. March 2021. <https://doi.org/10.2139/ssrn.3825817>
- [19] Al-Jarf, R. (2021n). TED talks as a listening resource in EFL college classrooms. *International Journal of Language and Literary Studies (ijlls)*, 2(3), 256–267. <https://doi.org/10.36892/ijlls.v2i3.691>. ERIC ED615127
- [20] Al-Jarf, R. (2021o). Testing reading for specific purposes in an art education course for graduate students in Saudi Arabia. *International Journal of Advance and Innovative Research*, 8(1), 32-42. ERIC ED617119. <http://iaraedu.com/about-journal/current-issue.php>
- [21] Al-Jarf, R. (2020a). How EFL college instructors can create and use grammar iRubrics. *Journal of Global Research in Education and Social Science (JOGRESS)*, 14(3): 22-38. <https://www.ikprress.org/index.php/JOGRESS/article/view/5759> [Google Scholar](#)
- [22] Al-Jarf, R. (2020b). *Integrating TED lectures in EFL college listening practice*. 25th TCC worldwide Online Conference. April 14-16, 2020. <https://www.researchgate.net/publication/356815037> [Google Scholar](#)
- [23] Al-Jarf, R. (2020c). Mobile apps in the EFL college classroom. *Journal for Research Scholars and Professionals of English Language Teaching (JRSP-ELT)*, 4(22), 1-5. ERIC ED613138
- [24] Al-Jarf, R. (2019). Effects of electronic homework-assignments on Arabization skill development in student-translators. *Journal for Research Scholars and Professionals of English Language Teaching (JRSP-ELT)*, 16(3). ERIC ED613087. [Google Scholar](#)
- [25] Al-Jarf, R. (2017a). A model for integrating electronic resources in university courses. *King Fahad Al-Library Journal*, 23(1), 89-122. [Google Scholar](#)
- [26] Al-Jarf, R. (2017b). Teaching & learning with medical animations & videos. *EALTHY Magazine*, 6, 17-18. <http://www.ealthy.com/ealthy-magazine>. <https://eric.ed.gov/?q=reima+al-jarf&pg=2&id=ED613121>. [Google Scholar](#)
- [27] Al-Jarf, R. (2017c). *What teachers should know about online grammar tasks*. In Handoyo Widodo, Alistair Wood, Deepti Gupta, Winnie Cheng's (Eds.) *Asian English Language Classrooms: Where Theory and Practice Meet*. Routledge. Pp. 113-130. <https://doi.org/10.4324/9781315755243-8>. [Google Scholar](#)
- [28] Al-Jarf, R. (2015). A model for enhancing EFL freshman students' vocabulary with mind-mapping software. *Journal of Teaching English for Specific and Academic Purposes*, 3(3), 509–520. ERIC ED613122.
- [29] Al-Jarf, R. (2014a). *Integrating Elluminate in EFL reading instruction*. The 10th International Conference on eLearning and Software for Education (eLSE), 3, 19-26. Carol I" National Defense University, Bucharest, Romania. DOI: 10.12753/2066-026X-14-142. [Google Scholar](#)
- [30] Al-Jarf, R. (2014b). *Online Arabic-English-Arabic specialized dictionaries*. In Miguel Ángel Campos and José Ramón Calvo's *Investigating Lexis: Vocabulary Teaching, ESP, Lexicography and Lexical Innovations*. Cambridge Scholars Publishing. Pp. 95-102. <http://www.cambridgescholars.com/investigating-lexis>. [Google Scholar](#)
- [31] Al-Jarf, R. (2014c). What ESL teachers should know about online writing tasks. *ELTAM Journal*, 1, 47-54. ERIC ED613065. [Google Scholar](#)
- [32] Al-Jarf, R. (2013b). *Developing students' searching skills*. First International Conference on Teaching English for Specific Purpose. Nis, Serbia. May 17-19, 2013. <http://www.Academia.edu/17020199/Teaching-and-Assessment>. [Google Scholar](#)
- [33] Al-Jarf, R. (2013c). *Enhancing freshman students' performance with online reading and writing activities*. 9th eLearning and Software for Education Conference (eLSE). Bucharest, Romania. 2, 524-530. DOI: 10.12753/2066-026X-13-193. [Google Scholar](#)
- [34] Al-Jarf, R. (2013d). *ESL teachers' professional development on Facebook*. 3rd International Conference on Foreign Language Teaching and Applied Linguistics (FLTAL). International Burch University, Sarajevo, Bosnia. May 4-6. [Google Scholar](#)
- [35] Al-Jarf, R. (2013e). *Integrating Elluminate webconferences in EFL grammar instruction*. Second International Conference, Technologies of Information and Communications in Education and Training (TICET 2013). 60-76. ERIC ED610560. <https://doi.org/10.2139/ssrn.3842144>.
- [36] Al-Jarf, R. (2013f). *Learning vocabulary in the app store*. 13th International ELT Conference: "Changing Times, Emerging Opportunities for ELT". Sultan Qaboos University, Muscat, Oman. [Google Scholar](#)
- [37] Al-Jarf, R. (2013g). *Teaching and assessing graduate students' research skills in English for art education purposes*. 1st International Conference on Teaching English for Specific Purposes: "Connect and Share". University of Niš, Faculty of Electronic Engineering, Serbia. pp. 771-780. ERIC ED610674.
- [38] Al-Jarf, R. (2012a). *Mobile technology and student autonomy in oral skill acquisition*. In Javier E. Díaz Vera's *Left to My Own Devices: Innovation and Leadership in English Language Teaching*. 105-129. Brill. [Google Scholar](#) https://doi.org/10.1163/9781780526478_007
- [39] Al-Jarf, R. (2012b). Online videos for specific purposes. *Journal of Education and Social Research (JESR)*, 2(6), 17-21. Italy. <https://doi.org/10.5901/ichss-2012-vol-07>. [Google Scholar](#)
- [40] Al-Jarf, R. (2012c). *Online videos for specific purposes*. In Antonello Biagini, Giovanna Motta, Andrea Carteny, and Alessandro Vagnini's 2nd International Conference on Human and Social Sciences ICHSS 2012 - March 23-24, 2012, Tirana, Albania. Vol 7, 15-19. [Google Scholar](#)
- [41] Al-Jarf, R. (2012d). *Reading in the app store*. IATEFL-Hungary 22nd Annual Conference, Eger, Hungary. October 5-7. <https://www.researchgate.net/profile/Reima-Al-Jarf/publication/356833385> [Google Scholar](#)
- [42] Al-Jarf, R. (2012e). *Teaching and learning languages with mobile technology*. 1st International Conference on Information & Communication Technologies in Education & Training (TICET). Hammat, Tunisia. [Google Scholar](#)
- [43] Al-Jarf, R. (2011a). Creating and sharing writing irubrics. *Asian EFL Journal*, 51(April), 41-62l. [Google Scholar](#)
- [44] Al-Jarf, R. (2011b). *Correcting students' writing errors: The role of communicative feedback*. National Seminar on Foreign Language Teaching: Towards a Multilingual Generation in a Globalized World. Kedah, Alor Setar, Malaysia, Nov 2-3. ERIC ED614900.

- [45] Al-Jarf, R. (2011c). Developing and testing reading skills through art texts. *Language and Communication through Culture*, 168-176. [Google Scholar](#)
- [46] Al-Jarf, R. (2011d). Helping medical students with online videos. *International Journal of Language Studies (IJLS)*, 5(3), 99-110. ERIC ED613074 <http://www.ijls.net/pages/volume/vol5no3.html>
- [47] Al-Jarf, R. (2011e). *Teaching Greek and Latin Roots to premedical students with mind-mapping software*. 2nd FLLAS International Conference on Language for Specific Purposes: Challenges and Prospects, Beograd, Serbia, Feb 4-5, 2011. ERIC ED613146.
- [48] Al-Jarf, R. (2009a). *Enhancing freshman students' writing skills with a mind mapping software*. 5th eLSE - eLearning and Software for Education. Bucharest, Romania. Vol 1, 375-382. [Google Scholar](#)
- [49] Al-Jarf, R. (2009b). *Teaching professional English to Saudi students studying abroad*. The International Language Conference on the Importance of Learning Professional Foreign Languages for Communication Between Cultures. The Faculty of Logistics, Celje, Slovenia. doi:10.2139/ssrn.3851491. ERIC ED613145.
- [50] Al-Jarf, R. (2009c). *Teaching grammar for professional purposes*. The International Language Conference on the Importance of Learning Professional Foreign Languages for Communication Between Cultures. The Faculty of Logistics, Celje, Slovenia. September 24-25. [Google Scholar](#)
- [51] Al-Jarf, R. (2009d). Using online instruction in English for art education. *Asian EFL Journal*, 23, 46-65. [Google Scholar](#)
- [52] Al-Jarf, R. (2008). *How to write a statement of purpose*. A Training workshop for scholarship students at the College of Science, Malaz. Riyadh, Saudi Arabia, 2008. <https://www.researchgate.net/profile/Reima-Al-Jarf/publication/283725495>. [Google Scholar](#)
- [53] Al-Jarf, R. (2007a). Teaching vocabulary to EFL college students online, *Call-EJ Online* 8(2), 1-16. [Google Scholar](#)
- [54] Al-Jarf, R. (2007b). *Integrating global culture in EFL college materials*. In *7th Annual English Language Teaching Conference*. Sultan Qaboos University, Muscat, Oman. April (pp. 18-19). [Google Scholar](#)
- [55] Al-Jarf, R. (2006a). Integrating technology in EFL college instruction in Saudi Arabia. *Education and Psychology Journal*, 26, 215-242. Saudi Association for Psychology and Education. Risalat al-Tarbiyah wa-'Ilm al-Nafs. King Saud University: Saudi Society for Educational and Psychological Science. Doi: 10.33948/0059-000-026-004. [Google Scholar](#)
- [56] Al-Jarf, R. (2006b). The effects of elearning on teaching English as a foreign language to Saudi college students. *Education and Psychology Journal*, 26, 215-242. [Google Scholar](#)
- [57] Al-jarf, R. (2006c). *Making connections in vocabulary instruction*. 2nd ClaSic Conference proceedings. Singapore. ERIC ED497939.
- [58] Al-Jarf, R. (2005). The effects of online grammar instruction on low proficiency EFL College students' achievement. *Asian EFL Journal*, 7(4), 166-190. [Google Scholar](#)
- [59] Al-Jarf, R. (2003). Training ESP college students in electronic searching. *Multimedia-Assisted Language Learning*. 6(1), 9-17. ERIC ED613067
- [60] Al-Jarf, R. (1994). An ESP program model for graduate students at King Saud university based on their academic and occupational needs. *King Saud University Journal: Educational Sciences*, 6(1), 67-95. <https://jes.ksu.edu.sa/ar/node/3620>. [Google Scholar](#)
- [61] Anwar, K. & Wardhono, A. (2019). Students' perception of learning experience and achievement motivation: Prototyping English for academic purposes (EAP). *International Journal of Instruction*, 12(3), 271-288.
- [62] Bekteshi, E. & Khaferi, B. (2020). An analysis of English for specific purposes among university students. *Educational Process: International Journal*, 9(2), 90-102.
- [63] Brown, C. R. & Prendergast, L. J. (2020). Improving academic performance through a unique curriculum development process. *Journal for Leadership and Instruction*, 19(2), 33-37.
- [64] Chou, M. (2013). Strategy use for reading English for general and specific academic purposes in testing and nontesting contexts. *Reading Research Quarterly*, 48(2), 175-197.
- [65] He, Y.; Zhang, W. & Yan, J. (2021). The design of the college English curriculum from the perspective of international engineering education accreditation--A case study from the Beijing institute of petrochemical technology. *Journal of Curriculum and Teaching*, 10(1), 18-28.
- [66] Hernandez, H. (2016). OBE EAP-EOP model: A proposed instructional design in English for specific purposes. *Journal on English Language Teaching*, 6(4), 1-12.
- [67] Hoa, N. & Mai, P. (2016). Difficulties in teaching English for specific purposes: Empirical study at Vietnam universities. *Higher Education Studies*, 6(2), 154-161.
- [68] Irshad, I. & Anwar, B. (2018). Designing English for specific purposes course for computer science students. *Journal of Education and Educational Development*, 5(1), 156-171.
- [69] Irudayasamy, J.; Souidi, N. & Hankins, C. (2020). Impact of an ESP course on English language proficiency of undergraduate engineering students: A case study at Dhofar university. *International Journal of Higher Education*, 9(2), 309-320.
- [70] Jafari Pazoki, S. & Alemi, M. (2020). Engineering students' motivation to learn technical English in ESP courses: investigating Iranian teachers' and students' perceptions. *RELC Journal: A Journal of Language Teaching and Research*, 51(2), 212-226.
- [71] Jiang, A.; Zhang, L., May, S. & Qin, L. (2020). Understanding novice teachers' perceived challenges and needs as a prerequisite for English curriculum innovation. *Language, Culture and Curriculum*, 33(1), 15-31.
- [72] Keshtiarast, B. & Salehi, H. (2020). Investigating employing information communication technology for ESP learning: A case of Iranian EFL students' attitudes. *International Online Journal of Education and Teaching*, 7(2)412-433.
- [73] Khalil, L. & Semono-Eke, B. (2020). Appropriate teaching methods for general English and English for specific purposes from teachers' perspectives. *Arab World English Journal*, 11(1),253-269.
- [74] Kim, Y. M. (1992). A functional-notional approach for English for specific purposes (ESP) programs. ERIC ED343435.
- [75] Lacka-Badura, J. (2021). Acquiring business knowledge through business English reading materials: Pre-experience students' perspective. *Language Learning in Higher Education*, 11(2), 433-451.
- [76] Mauludin, L. (2021). Students' perceptions of the most and the least motivating teaching strategies in ESP classes. *Iranian Journal of Language Teaching Research*, 9(1), 139-157.

- [77] Miller, L. R.; Klassen, K. & Hardy, J. (2021). Curriculum design from theory to practice: Preparing Japanese students to study abroad using content-based language teaching. *Curriculum Journal*, 32(2), 215-246.
- [78] Öztürk, G. & Bal-Gezegin, B. (2019). Developing a vocational English for Specific Purposes Curriculum for the Department of Electric and Energy. *Journal on English Language Teaching*, 9(3), 16-26.
- [79] Poedjiastutie, D. & Oliver, R. (2017). English learning needs of ESP learners: Exploring stakeholder perceptions at an Indonesian university. *TEFLIN Journal: A publication on the teaching and learning of English*, 28(1), 1-21.
- [80] Saienko, N. Semyda, O. & Akhmad, I. (2020). Using social networks in teaching ESP to engineering students. *Advanced Education*, 14, 38-45.
- [81] Saliba, R., Mussleman, P., Fernandes, M. & Bendriss, R. (2017). Promoting information literacy of pre-medical students through project-based learning: A pilot study. *International Journal of Education and Literacy Studies*, 5(4), 1-11.
- [82] Sifakis, N. C. (2003). Applying the adult education framework to ESP curriculum development: An integrative model. *English for Specific Purposes*, 22(2), 195-211.
- [83] Tatzl, D. (2015). Case meetings for teaching English for specific academic purposes in a tertiary aeronautical engineering programme. *Innovation in Language Learning and Teaching*, 9(3), 191-217.
- [84] Trujeque-Moreno, E., Romero-Fernández, A., Esparragoza-Barragán, A. & Villa-Jaimes, C. J. (2021). Needs analysis in the English for specific purposes (ESP) approach: The case of the Benemérita Universidad Autónoma de Puebla. *MEXTESOL Journal*, 45(2), 1-24.
- [85] Ulla, M. B. & Winitkun, D. (2017). Thai learners' linguistic needs and language skills: Implications for curriculum development. *International Journal of Instruction*, 10(4), 203-220.
- [86] Xie, Q. (2019). Analyzing professional English learning needs and situations of science and language majors in a Chinese university. *Higher Education Studies*, 9(2), 141-153.
- [87] Yang, W. (2018). Evaluating contextualized content and language integrated learning materials at tertiary level. *Latin American Journal of Content and Language Integrated Learning*, 11(2), 236-274.