Original Paper

An Exploration of an Innovative Curriculum and an Effectiveness of Pedagogy of ESP Courses with Special Reference to Engineering World

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Abstract

The present study is an effort to explore a cutting-edge engineering-English curriculum and a time-tested pedagogy based on longitudinal needs-analysis to best suit the students and professionals of engineering world. The needs analysis in this study drew on both English for Academic Purposes (EAP) and English for Occupational Purposes (EOP) that the students and professionals of engineering disciplines need to master in order to perform well in their respective domains. The quantitative and qualitative surveys were conducted on one thousand respondents including the engineering students, professionals, professors and ELT/ESP practitioners of Saudi universities to collect valid and reliable data with the purpose of confirming what kinds of innovative English curricula and effective pedagogies will be the best panaceas for Saudi engineering students' academic and occupational needs. With regard to the English curriculum, the findings reveal that it needs to be contents-based embedded in integrated language activities, vocabulary and communicative grammar teaching. For pedagogy to be effective and productive, as the findings reveal, the ESP educators have to be highly learner-centered, multidimensional, communicative, collaborative and interdisciplinary.

Keywords

ESP curriculum, pedagogy, effective, productive, communication

1. Introduction

The quest for the best English curriculum and the best pedagogy for engineering world can never culminate without a comprehensive needs analysis pertinent to a vast spectrum of academic and occupational needs of engineering students and professionals. There is a need to cross-examine the existing curriculum if any and then to explore what kinds of linguistic components and language skills

are to be further incorporated in the curriculum. The needs analysis will also help the pedagogues and the course designers to embed into the curriculum the most relevant teaching-contents and linguistic components that cater for both the EAP and EOP spheres. Needs analysis is undoubtedly significant before designing any ELT curriculum but it seems to be more significant before designing an ESP curriculum. More specifically, it is prerequisite for Saudi engineering students and professionals who have less conducive learning environment and their previous exposure to English is also sporadic.

ESP curriculum varies from subject to subject and from professional to professional. For example, a medical- English curriculum for academic purposes will be embedded in medical-contents whereas an engineering-English curriculum for academic purposes will be ingrained in engineering contents. Similarly, a curriculum for adult professionals might rely more on restricted linguistic components hence aims to raise more specific language skills within specified timeframe. Therefore, any ESP curriculum that emerges after a thorough analysis acquaints the ESP learners with a set of linguistic and professional skills that assist them to perform a particular academic or job-related function.

The idea to do research on the said topic occurred to me while I was writing an English course book for Saudi engineering students. Prior to book writing, I carried a comprehensive quantitative and qualitative survey and found that an engineering-English curriculum must be designed after a thorough analysis of what level of linguistic proficiency and what kinds of language skills Saudi engineering students and professionals really need in their academic and professional disciplines. After a rigorous study of research papers, I found only a few empirical data on ESP curriculum and effectiveness of pedagogy which too don't match with Saudi educational and occupational environment. Therefore, it calls for an immediate venture to explore an innovative English-curriculum and an effective pedagogy for engineering students within Saudi context. In fact, an ESP curriculum can't be effective if doesn't coincide with the target environment. In compliance with this, any English curriculum for Saudi engineering students will be relevant and effective only if it takes into account the proficiency level of Saudi engineering students, their educational and occupational needs within Saudi context.

The context varies from country to country so does the engineering-English curriculum. After a thorough needs analysis, it was found that some ESP course-books have been introduced in Saudi universities but the curricula and instructional methodologies lag far behind the standard benchmark. The books which are prescribed in ESP courses in Saudi universities don't match with the level and needs of Saudi ESP students who are pursuing their higher studies in different domains of specializations such as medical sciences, engineering, business, managements and information technology, to name a few. The students of these specializations need sound ESP curricula that could match with their levels and their educational and occupational needs. There is no denying the fact that General English teaching is not inclusive enough to meet the dire and pressing needs of ESP learners in Saudi Arabia.

The fastest growing demand of English in educational and occupational fields of engineering has prompted the engineering students and professionals to enrich their proficiency in English and thereby,

to perform very well in their educational and professional careers. The engineering students and professionals need to communicate in English in order to share their findings with global specialists and to outreach to the wider readership with their intensive research papers. Saudi engineering students who have very low proficiency in English need to pursue engineering-English curriculum in continuation of their preparatory General English courses to improve integrated language skills. In Saudi context, there is a perception that General English Courses alone aren't sufficient to improve Saudi engineering students' proficiency in English. Therefore, to design engineering English courses are indispensable for Saudi engineering students, because English language learning is almost ignored at school level. Consequently, Saudi school graduates get enrolled in universities with absolute lack of proficiency in English. Therefore, an engineering English curriculum needs to be thoroughly analyzed and redesigned according to the students' proficiency in English, cultural context and their linguistic and professional requirements.

To design the best English curriculum for engineering students and professionals is based on a comprehensive needs analysis, because, it determines both, the stakeholder's academic and professional needs. A thorough analyst will determine the students' exact linguistic and professional needs which will assist the course designers to come out with best and the most productive engineering English curriculum. For example, to write an ESP book on civil engineering at Saudi universities, the author, primarily, needs to examine what major topics are taught in civil engineering and what kinds of linguistic skills they need in their educational and occupational settings. Therefore, it is essential to include engineering -related topics currently taught at Saudi universities in order to prepare a content-based and context-based curriculum embedded in tasks-based linguistic activities.

The students of ESP courses such as medical sciences, engineering, business, management, information technology face a big challenge while pursuing their higher studies in non-English speaking countries, more so in Saudi universities. Prior to joining higher studies, Saudi school graduates were not given reasonable opportunities and effective English curriculum at schools to improve their proficiency in English. Owing to less amount of exposure to English, they are unable to cope up with the kind of English used in their aforesaid professional courses. And this linguistic barrier to the emerging career of ESP students propel me to do intensive research in order to redesign sound ESP curricula and to explore effective teaching methodologies. Therefore, the present research will address well the aforesaid difficulties the students of engineering are specifically beset with in their educational and professional environment at Saudi universities.

With regard to the effective teaching in ESP classes, an ESP educator needs to adapt to the ESP students' needs, circumstances, curriculum and their subject of specialization. He can prove his credential well if he knows the nitty-gritty of ESP learners' academic and occupational needs and develop his interdisciplinary skills to make his teaching enormously rewarding and attractive. His background knowledge about ESP learners' domain of specialization and their linguistic requirements would be an important asset for his pedagogical performance. An ESP teacher has to ascertain and

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predict different situations where ESP students and professionals need integrated language skills to master. This will help the educator to groom the ESP students for real conversation. The knowledge of ESP learners' domain of specialization will be an added advantage and it adds extra sparkle to an ESP teacher's competence. Therefore, an ESP teacher should nurture an appetite to know more about ESP learners' linguistic and professional requirements. Communication skills should be at the heart of ESP teaching curriculum. Students-centered approach should be the preferable choice, because it builds inspirational learning environment. The ESP teacher should also collaborate and let the students share their ideas and improve their communication skills. To engage them in peer-to-peer and group learning activities will be extremely productive. Through group activities, they support each other and learn effectively.

2. Literature Review

Earlier studies also recommend needs analysis before designing an ESP curriculum because it ascertains what kinds of linguistic components and what kinds of language skills, an ESP learner specifically requires to meet his educational and occupational needs. The notion of needs analysis for ESP has been since (1978), with Munby's pioneering observation which manifests needs analysis as an important means to make ESP learning programmes more interesting and productive. He came up with best framework of needs analysis which is based on "a profile of students' language needs and then converting them into a communicative competence specification". Robert Phillipson (1992) points out that to make ESP courses context based the "contextual and functional needs must be taken into account". Swales (1990) also specified the relevance of needs analysis in ESP learners' academic and occupational zones. Kennedy (2001) considered it indispensable to examine the degree of homogeneity among ESP students with respect to their needs, abilities and subject disciplines. Gatehouse (2001) opines "Target situation analysis proceeds by first identifying the target situation and then carrying out rigorous tasks such as linguistic features and knowledge requirement of that situation". Harmer (2007) and Master (2007) focused on the significance of NA in designing and developing ESP courses, because it makes curriculum designers fully understand learners' immediate academic needs and later their professional needs. Graves (2008) pointed out that "evaluating and planning about what to be taught" are prerequisite in order to make ESP course very effective". This was further strengthened when Basturkmen (2010) pointed out that NA "plays a role in refining and evaluating ongoing ESP courses". Needs analysis integrates various approaches such as "target—situation analysis, present-situation analysis and learning situation analysis". Chovancova (2014) concluded that even the pre-service students should be consulted to know their needs and what they need English for to make the courses realistic and productive.

With regard to the effectiveness of pedagogy, many ELT specialists recommended the implementation of context based pedagogy in ESP classes. Maggie and Diane (2016) also focused on context based ESP course books, teaching and research. Platzer and Verdonk (2011), Gözüyeşil (2014) and Teekens

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(2004) endorsed the integration of integrated language skills in ESP classes. The importance of both formal and informal communication skills in the global professional workplace has been investigated by many researchers. Darling and Dannels (2003) conducted a survey on 123 mechanical engineers in the United States of America and concluded that engineers in industry work in an "oral culture" however acknowledged that "good writing skills were also in demand". Spence and Liu (2013) reported "highly frequent oral events, such as meetings, teleconferences and presentations" in engineers' professional fields.

Earlier researchers also found pronunciation as one of the problematic areas for non-native ESP students. Webber (2005) identified pronunciation and intonation as problematic for ESP students. Slepovitch (2002) and Tatzl (2012) found Austrian engineering students facing pronunciation problems while giving academic presentation. Murphy (2004) also noted that inaccurate accent and word -stress influence the intelligibility of new words or specialized terms. For an ESP instructor to be effective he must have some qualities as suggested by Dudley Evans (2006) to perform different roles in ESP pedagogical set-up. The first role of an ESP teacher is to be an inquisitive teacher and collaborator who is more willing to encroach his knowledge about learners' specialization. According to Sager (1990), Vocabulary teaching is also one of the important aspects of ESP teaching.

3. Materials and Methods

The present empirical study is based on the primary data as well as secondary data. The primary data drawn on quantitative surveys, which include statements about how to best design engineering -English curriculum and explore the best instructional methods for engineers and professionals. The primary data have been collected by administering structured statements from Saudi respondents randomly selected. On the contrary, secondary data are based on published online resources such as research papers published in ESP and ELT journals, and ESP and ELT published books.

This is undeniably true that the most important means of data collection in empirical is a quantitative survey which is designed to elicit overwhelming response from the participants (Cohen, Manion, & Morrison, 2007). However, lots of empirical data prove that just to rely on self-reporting statements usually depict an incomplete picture of the situation. Therefore, Pintrich and Schunk (2002) besides quantitative survey, also realized "the nitty-gritty of qualitative survey in order to delve deeper by having group discussion and individual interviews". Likert five point scales which are frequently used in empirical research are used to measure how much or what degree the participants agree or disagree with a particular statement. The sample survey is comprised of one thousand male participants including ESP teachers, engineering students and engineering professors, ranging in age from 25 to 50 years. With a view to illustrating the statistical findings, figures and tables were used, because it is easy to analyze collected data quantitatively. In addition, applied linguists, researchers and the ESP students also find it easy to understand.

4. Result and Discussion

The remarkable findings that emerged from quantitative and qualitative surveys cover a broader spectrum about the best English curriculum and innovative pedagogy for the engineering students and professionals. The findings of these surveys give a clear picture about the inclusion of linguistics components and effective teaching methodologies that could improve integrated linguistic skills and professional competence of the students and professionals of engineering world. The overwhelming responses of the participants and their insightful arguments that lead to a fresh perspective are given below:

Table 1. Quantitative Survey on an Innovative Engineering English Curriculum

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.Needs analysis is prerequisite before designing engineering-English curriculum	70%	20%	0%	5%	5%
2. Engineering-English curriculum needs to be contents based and tasks-based.	70%	25%	0%	5%	0%
3. Integrated language skills and in-depth grammar-components must be the part of the curriculum.	70%	10%	5%	15%	0%
4. Lexical words and generative vocabulary of engineering world must be embedded into the curriculum.	80%	10%	2%	5%	3%
5. Conversation (dialogue) based on Engineering world must be the integral part of the curriculum.	65%	20%	5%	5%	5%
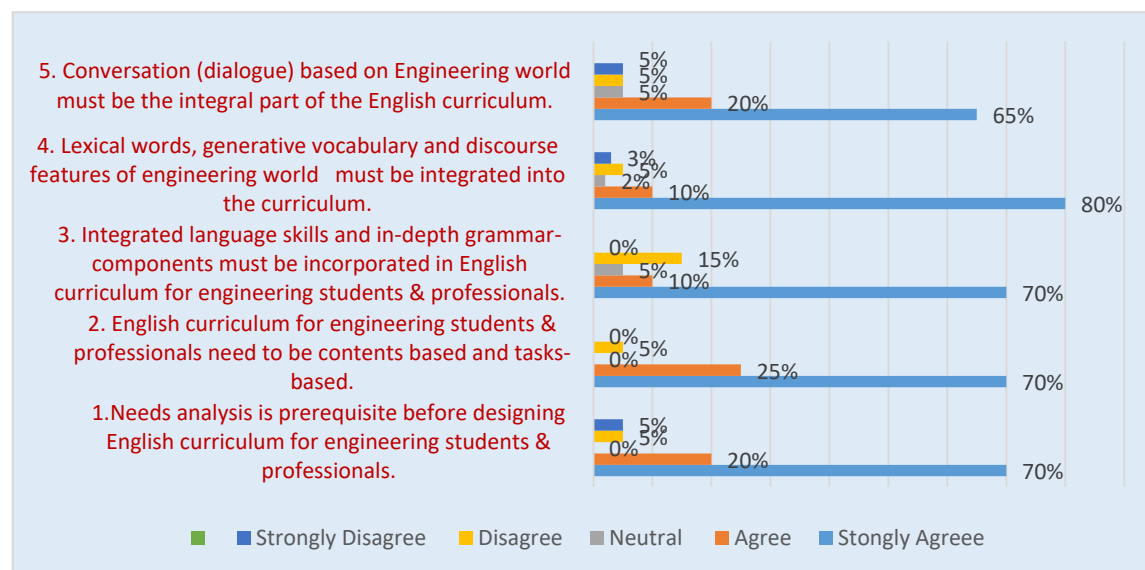
Figure 1. Result of Survey on an Innovative Engineering English Curriculum

The stunning responses and the logical arguments about the first statement in table.1 confirm the indispensability of a comprehensive needs analysis before designing an effective English curriculum for engineering students and professionals. 90% of the respondents agreed that needs analysis is essential before designing an engineering English curriculum. Only 10% respondents were found disagreeing with the statement. The substantive arguments of qualified ESP educators and engineering professors in qualitative survey argued that an effective engineering curriculum is possible only after a thorough analysis of academic and occupational needs of engineering students. One of the qualified ESP professors argued that for any curriculum to be effective, the analysis of context is inevitable. His context analysis includes ESP learners' proficiency level, specific linguistic and professional needs that they frequently face in their educational and occupational fields. The proficiency level of Saudi engineering students might vary from that of English speaking countries. This variation must be kept in view while designing engineering English curriculum. And it might be difficult for an ESP educator alone to predict the exact engineering students' proficiency level and their linguistic needs that they have to master to perform well in their educational and occupational fields. It is the engineering students, engineering professors and professional engineers who can easily identify what levels of linguistic proficiency and language skills the engineering students need to meet their challenges ahead. In addition, needs analysis will also assist the designers of English curriculum to ascertain what kinds of grammar components and language components the Saudi engineering students exactly need in their educational and occupational careers. This move will further leads the ESP educator towards greater customization of engineering English curriculum to meet the requirements of engineering students and professionals of engineering fields.

In response to the second statement, 95% of respondents agreed that engineering-English curriculum needs to be drawn on engineering related contents and tasks-based activities, whereas only 5% respondents were opposed to the statement. Contents-based teaching of English is an age-old formula which enriches learners' skimming/scanning abilities, subject knowledge and learning of abundance of lexical words in context. To be more specific, the engineering-English curriculum based on engineering contents will reinforce engineering related knowledge, numerous lexical words and sustainable flow of writing. Almost all the participants of qualitative survey argued that the extensive and intensive reading of engineering related contents and vocabulary will boost engineering students' confidence and spontaneity to speak and to write effectively. According to them, it is the subject related knowledge that does increase learners' confidence to speak. It is assumed that English shouldn't be taught as a separate subject, instead it's integrated into the subject- matter that is equally important for the learners. The ESP students will acquire English while working with the learning materials relevant to their educational or professional studies. Therefore, their learning process will be more rewarding if they learn English in context.

By tasks-based, it means the inclusion of different language activities including integrated language skills, grammar components and generative vocabulary learning, which will practically engage the

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students to do the tasks with their own linguistic acumen. The tasks- based activities synonymous with students-centered approach will make learning more reflective, exciting and productive. In addition, the tasks based activities could be accomplished through peer to peer, group activities and collaborative learning activities which yield creative learning outputs.

The findings of third statement, confirm the integration of integrated language skills and in-depth grammar components into engineering-English curriculum. 80% of the participants gave extremely favorable response to the statement, whereas only 15% respondents did not indorse the idea of grammar teaching. The overwhelming majority approved the inclusion of skills oriented and in-depth, grammar components because they often found ESP course books containing just lexical words unexciting and boring. While interacting with Saudi engineering students, the need to incorporate the teaching of pronunciation in listening skills also emerged. They argued that they need to learn word stress and accentual patterns so that they can understand well the fluent native and non-native speakers of English. They will abysmally fail in global context with faulty pronunciation, because they can't fully understand PowerPoint presentation in international conferences held worldwide. With better pronunciation, engineering students can perform well in their communication skills. Another reason to include pronunciation practice is that so many engineering English words are non-phonetic, because they are not pronounced the way they are spelled. The following engineering words: absorptance */abˈsɔ:pt(ə)ns/*, hygrometer **/hʌɪˈɡrɒmɪtə/**, Rheology **/ri:ˈɒlədʒi/**, paramagnetic **/parəmaɡˈnɛtɪk/**, torsional **/ˈtɔ:ʃ(ə)n(ə)l/**, trigonometric **/ˌtrɪɡənəˈmɛtrɪk/**, are case in point which are not pronounced the way they are spelled.

The respondents also recommended the integration of communication-skills into engineering- English courses to improve communication skills of Saudi engineering students, because they are likely to interact with professionals of multinational communities. With a view to improving communication skills, peer-to peer and group activities must be taken into account while designing engineering-English curriculum. The proficiency in English will enable Saudi engineering students and professionals to communicate well with their counterparts across the world. In addition to this, tasks based—activities need to be included in engineering- English curriculum to improve writing skills so that they can publish their innovations and findings in English. The engineering-English curriculum should contain the teaching of some grammar components which can enable learners to produce grammatical correct sentences while writing research papers. The engineering English curriculum containing in-depth language error analysis will definitely improve the students' propriety in producing the language. This will also assist their writing skills a great deal, thereby making their script free from linguistic errors. In fact, lack of propriety and grammatical inaccuracy lead to the rejection of research papers.

The sizeable responses to the fourth statement is also noteworthy. 90% of the respondents agree that the integration of engineering-English vocabulary teaching in multiple ways need to be integrated into engineering-English curriculum, whereas only 5% respondents opposed the statement. The participants

in qualitative survey recommended multiple ways to incorporate vocabulary teaching activities. For example matching of words with meaning, changing of nouns into adjectives and vice versa, making sentences, and so forth. In response to the fifth statement, 85% respondents agreed with the statement, whereas only 10% respondents disagreed. They are of the view that incorporation of dialogue (conversation) based on core engineering related issues, into engineering-English curriculum will be effective in reinforcing engineering related information and improving their communication skills as well. To embed dialogue into ESP curriculum will be of paramount importance for engineering students.

The second quantitative survey was about how an ESP educator can make his teaching more effective and productive while teaching English to engineering students. The responses of participants in the second survey are overwhelming and worth noticing. The findings of the interviews and the focus groups with regard to the effectiveness of pedagogy aim to delve far deeper to explore the most convincing reasons for their being agree or disagree with the statements. The elaborate analysis of the findings are given below:

Table 2. Quantitative Survey on an Effective Pedagogy for Engineering Students

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. An ESP teacher needs special training to make his teaching more effective in engineering domains.	80%	10%	0%	0%	10%
2. He must have interdisciplinary approach meeting with engineering core teachers to know more about engineering students' linguistic and professional needs.	70%	20%	5%	5%	0%
3. An ESP teacher can make his teaching more productive if he has a good command on communication skills in engineering domains.	85%	10%	0%	5%	0%
4. An ESP educator must be competent enough to use visuals and create customized courses well suited to engineering students and professionals.	80%	10%	2%	5%	3%
5. Learners centered approach and communicative approach to grammar teaching will be extremely useful for the students and professional of engineering world.	90%	5%	0%	5%	0%
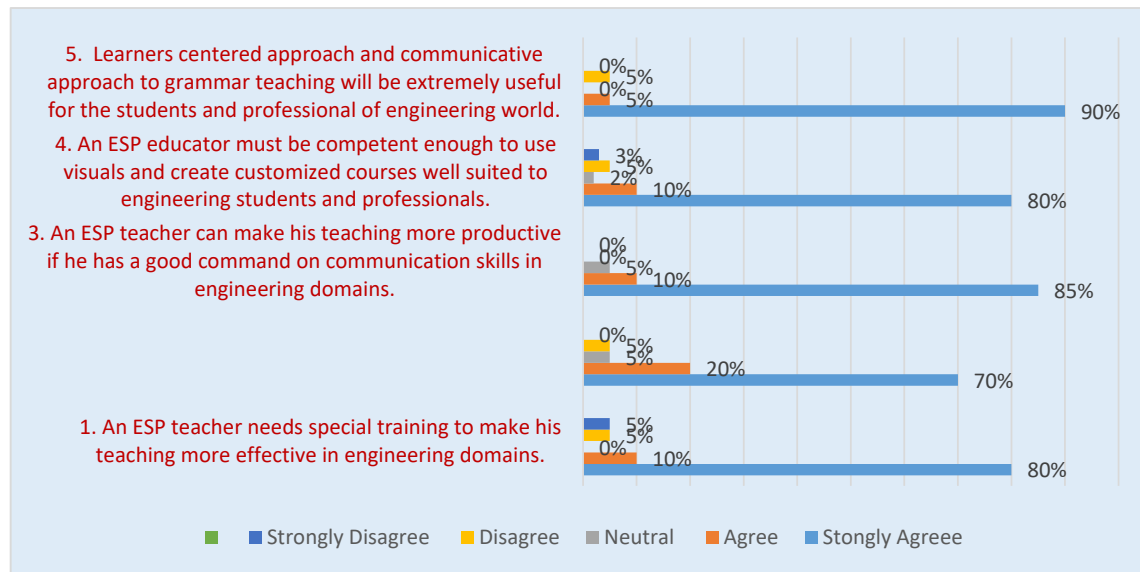
Figure 2. Survey on an Effective Pedagogy for Engineering Students

In response to the first statement of the second survey, 90% respondents agreed with the statement. They are of the view that an ESP teacher needs special training, because, It is through training he will come to know what he should prioritize in the curriculum and what language skills and language inputs can assist engineering students and professionals in national and multinational environment. Therefore, the essence of teacher-training programs is more strongly felt in ESP settings in comparison with other educational programs because an ESP educator can learn many teaching tips, strategies, and techniques that contribute to the effectiveness of teaching. The participants of the focus groups came up with insightful arguments. They argued that an ESP teacher needs to expand his study in order to get a good account of engineering contents. He has to improve his awareness about the engineering related topics and engineering vocabulary so that he can teach with enough confidence and foster a convivial and stimulating ambiance in ESP classes. Since his teaching is centered on engineering related issues, so, his knowledge about engineering related topics will be an important asset to an effective teaching. This will privilege him above those who have no subject knowledge. As a matter of fact, An ESP teacher's knowledge about engineering fields and engineering vocabulary will also pave the way to design the most productive engineering English curriculum.

The findings of the second statement in the second survey reveal that 90% respondents supported that an ESP teacher should apply interdisciplinary approach while teaching English to engineering students. Here, interdisciplinary means the profound knowledge of instructional methodology and a greater degree of awareness of engineering contents and engineering lexical words. Therefore, an ESP educator must gather a good account of knowledge about engineering world along with engineering lexical words so that he can do well within different situations of educational and occupational world. This collaboration equips ESP educators with engineering core contents and different educational and occupational situations which manifest what kinds of language skills and language components need to

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be taught in engineering-English curriculum. In addition, an ESP teacher has to take multidimensional responsibilities to fulfill short-term and long-term learners' needs in either academic or occupational domains. It can also be inferred from the interviews in qualitative survey that an ESP teacher must reflect his sound knowledge of engineering- related topics and his linguistic capabilities while teaching engineering students and professionals. Lack of competence in either discipline will lead to substandard teaching.

It's quite interesting to note that 95% respondents in response to the third statement agreed that an ESP teacher must have command on engineering-English which contains engineering contents, terminologies and registers frequently used in engineering fields. His teaching will suffer a major meltdown if he doesn't have command on engineering contents and engineering terminologies. His illustration of terminologies will be misconstrued if he reflect any doubt while teaching engineering terminologies. Therefore, an ESP teacher must have sound knowledge of engineering terminologies and must know how to use them in different contexts. Since teaching specialized vocabulary/terminology is an integral, and probably the most important part of ESP lessons where students study English through a field that is already known and relevant to them to a certain degree.

In response to the fourth statement in second survey, again 90% of the respondents agreed with the statement whereas only 8% respondents disagreed. Most of the respondents endorsed the fact that an ESP educator needs to have the ability to customize the teaching materials in line with the engineering students' proficiency level and their immediate academic and occupational needs. In fact, ESP programs must be tailored to fit the needs of specific groups of learners throughout a small duration. With a view to making his teaching materials more relevant and effective, an ESP teacher should keep in touch with the core engineering professors. Such a regular collaboration will assist an ESP teacher to design the engineering-English curriculum more exciting and productive. Regular collaboration will also assist ESP practitioners to explore what various roles they need to adopt in order to ensure success of an ESP teaching. In addition, an ESP teacher will be more effective if he illustrates engineering terminologies with visuals, because visual illustration can make engineering students understand engineering terminologies at a glance. For example, such engineering words: *crane*, *bulldozer*, *excavator*, *shovel*, *road roller*, *dredger*, etc. can be better explained with visual illustration. Therefore, if an ESP teacher uses the images of engineering terminologies, he can reinforce those words along with their images in the minds of engineering students and their effect will be far reaching. In addition, an ESP educator while teaching English to engineering students should focus on learners' academic and linguistic needs besides using his professional knowledge of teaching English for communicative purposes.

The fifth statement of the second survey determines the effectiveness of teaching and learning. 95% of the respondent agreed with the statement whereas just 5% are opposed to the statement. The overwhelming majority strongly supported the application of learners centered approach in the teaching of engineering English and recommended communicative approach to grammar teaching. The focus

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group in qualitative survey reveals that the most effective and inspiring educator is a "guide on the side rather than a sage on the stage". An ESP educator while teaching engineering English should never consider himself an absolute authority rather a facilitator who opens the floor for peer-to-peer, group discussion and PowerPoint presentation. He should provide ESP learners with plenty of opportunities to share their knowledge, skills and expertise. He should take regular feedback to know whether the students enjoy or do not enjoy the whole learning process. He shouldn't speak nonstop thereby turning the students' learning process unexciting. His teaching will be more effective if he encourages engineering students to participate in different communicative opportunities. An ESP educator should start his teaching by putting questions so that engineering students brainstorm and communicate with each other to improve their speaking skills. The ethos behind students centered learning is to inculcate in learners an intrinsic motivation for learning integrated language skills with the emphasis being on cooperation rather than domination. The shift towards a learner-centered approach in teaching English to adult professionals becomes more important. An ESP educator should adopt a highly learner-centered approach especially when he is teaching adult professionals. In such situation, he needs to follow a comprehensive adulthood-oriented approach focusing on their exact linguistic and professional needs. Therefore, an ESP educator needs to change his role as a facilitator, collaborator, course designer and materials provider, researcher and an evaluator. He has to facilitate ESP learners to make masterful use of ESP resources and to become effective and reflective learners. Here the ESP teachers' role as "researcher" is especially important, with results leading directly to appropriate materials for the classroom. The ESP course designers should take into account the criteria of learnability and teachability of ESP learning materials. The final role as "evaluator" deals with assessing the outcomes of both the course and the students' results and is inseparable part of the learning process.

5. Conclusion

The current research primarily focused on the quest of an effective engineering- English curriculum and an effective pedagogy best suited to the students and professional of engineering fields. The findings of both quantitative and qualitative surveys prioritize comprehensive needs analysis before designing an effective engineering-English curriculum, because this will determine the exact linguistic skills that an engineering student needs to meet the challenges in his academic and occupational fields. It is also inferred that for an engineering-English curriculum to be effective, it needs to be contents-based and skills-based. In other words, the engineering-English curriculum must contain engineering-related paragraphs, engineering related lexical words, generative vocabulary, communicative grammar, dialogue, communication skills and writing skills.

The second aspect focuses on effectiveness of pedagogy that could assist an ESP educator to teach effectively and to make engineering students learn effectively. The overwhelming responses of the participants in quantitative survey and their cogent arguments endorse and recommend some invaluable

teaching strategies that make an ESP teacher triumph and receive lots of admirations from the engineering students. The findings of both surveys suggest special training sessions for ESP teachers, collaborative and interdisciplinary approach towards teaching, learners centered rather than teachers centered, integration of visuals in teaching and ESP educators' ability to customize the teaching materials well suited to the students' context and proficiency levels. His ability to use pictures to teach engineering terminologies will be more productive, because picture paints a thousand words and is far more descriptive than words. In addition, an ESP teacher's friendly relationship with ESP learners will be constantly motivating and intrinsically rewarding.

5.1 Limitations and Recommendations

The present research paves the way for other researchers to analyze the pros and cons regarding the ESP courses and use of instructional methodology in the teaching of ESP courses. The findings of quantitative and qualitative surveys conducted in this this study are based on the responses and arguments of Saudi male respondents only. Based on this intensive research, other researchers can conduct quantitative and qualitative surveys on female respondents. It is possible that female respondents have different responses and arguments and come up with entirely divergent interpretations and findings. It is assumed that female students learn languages faster than their counterparts do. Therefore, their responses and the arguments might be different leading to more innovative and productive results.

Acknowledgements

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Appendix

Researcher: Dr. Jameel Ahmad

Title: An Exploration of an Innovative Curriculum and an Effectiveness of Pedagogy for ESP Courses with Special Reference to Engineering World

You are requested to share your experiences on quantitative and qualitative surveys of the said research approved by KAU Deanship of Scientific Research, Saudi Arabia. Your responses to the given questions will be kept confidential, will be used only for the aforesaid research, and under no circumstances will be disclosed and shared to anyone. Your prompt response in this regard is highly appreciated.

1. Quantitative Survey on an Innovative Engineering English Curriculum

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.Needs analysis is prerequisite before designing engineering -English curriculum					
2. Engineering -English curriculum need to be contents based and tasks-based.					
3. Integrated language skills and in-depth grammar-components must be incorporated in engineering English curriculum.					
4. Lexical words, generative vocabulary and discourse features of engineering world must be integrated into the curriculum.					
5. Conversation (dialogue) based on Engineering world must be the integral part of the English curriculum.					

2. Quantitative Survey on how to teach English effectively to engineering students

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. An ESP teacher needs special training to make his teaching more effective in engineering domains.					
2.An ESP teacher must have interdisciplinary approach by having regular meeting with engineering core teachers to know more about engineering students' linguistic and professional requirements					
3. An ESP teacher can make his teaching more productive if he has a good command on communication skills in engineering domains.					
4. An ESP educator must be competent enough to use visuals and create customized courses well suited to engineering students and professionals.					
5. Learners centered approach and communicative approach to grammar teaching will be extremely useful for the students and professional of engineering world.					