Language Skills among Students in the Field of Engineering

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Abstract

The present paper aims to shed light on the importance of language skills perceived by students in the field of engineering. The English course is designed to help students to improve their reading, writing, listening and speaking skills related to the specific topics in engineering, and thus to prepare them for their future career. Students are aware of the fact that in today's globalized and competitive world companies need highly qualified specialists who possess not only professional knowledge and competencies but also adequate language proficiency necessary to succeed in the job market. So, the study examines students' perceptions and attitudes towards the use of language skills for understanding, explaining and doing engineering. The results of the research show a strong interest in taking a career-related course and strengthening knowledge of the English language.

Key words: *English course, engineering students, language skills*

1. *Introduction*

Today, in the age of international integration and the exchange of knowledge and ideas, the English language has received the status of the global language (Crystal 2003). As English has become "the primary means of communication *at workplaces both within and across boundaries"* (Purpura & King, 2003), there is an increasing demand for learning English for Specific Purposes (ESP). ESP as a form of English language teaching focuses on teaching a language with a particular aim to empower students to use a language in professional settings. The purpose of ESP is to prepare students (future specialists) to communicate effectively in the professional field and real-life situations. The ultimate goal is to become 'operational' in any learning situation (Živković, 2013).

ESP focuses on the specific linguistic knowledge and communication skills in order to accomplish specific purposes (Orr, 1998) within a specific discipline or profession. Students have the specific language needs (Basturkmen, 2010) for their field of study and work (Lowe, 2009). It means that ESP courses help students develop communicative skills they will need in the future target situation (industry or business settings).

Therefore, ESP is specialty-oriented which means it refers to specific needs of the students (Hutchinson and Waters, 1987). This can be achieved with a content-based curriculum, where students learn the language by focusing on the subject matter with the help of authentic materials. This points to the rise of the ESP approach which has reshaped the English language curriculum to meet students' specialized communication needs. At this point, it should be noted that ESP is "goal directed" (Robinson, 1991) as "language does not exist for its own sake, but because people do things with it. In other words, language can be looked at from the point of view of function" (Hutchinson and Waters, 1987).

In order to be successful in the workplace and to follow the developments in time, students need to have not only the knowledge of engineering science, but a good command of language skills. Accordingly, in order to provide adequate preparation for future work, the ESP teacher should teach the following: a) reading (e.g. scanning, skimming, extensive reading, critical thinking); b) writing (e.g. academic discourse, genres, grammar); c) listening/speaking (e.g. lectures, oral presentation)" (Howard and Brown, 1997). Having a high level in listening, reading, writing and speaking helps students to communicate effectively and to become expert members of their professional and discourse communities (Basturkmen, 2010).

2. ESP for engineering students

ESP courses are designed to teach language and communication skills that students need or will need in their disciplines or professions (Basturkmen, 2010). Engineering students are taught the skills of listening, speaking, reading and writing. In addition, they need to acquire basic grammar and expand specialized vocabulary in order to improve language proficiency. "This fourfold categorization of language proficiency has been adopted as the organizing principle behind the series because it continues to occupy a central role in the activities of examination boards and other language test providers" (Taylor, 2011).

The importance of teaching vocabulary in ESP to succeed in the academic studies Cartner (2009) is widely accepted for "a successful achievement of a specific communicative purpose"(Swales, 1990). The emphasis on technical vocabulary development is crucial for the engineering students in the process of language learning. There are four distinct types of vocabulary (Cummins, 1999, cited in Herrel, 2004):

Reading vocabulary – words students are able to identify when reading a text,

Listening vocabulary - words students are able to understand when listening to speech,

Writing vocabulary - words students are able to use in writing,

Speaking vocabulary - words students are able to use in speech.

The important thing is to provide students with practical knowledge that they will be able to apply after completing the course. It means, to be familiar with technical terminology and practice using the domain-specific vocabulary words they need for future work.

To sum up, engineering students require an ever-increasing range of skills to maintain relevance with the global environment of the new millennium. "It is no longer sufficient for a new graduate to have knowledge of an academic subject; increasingly, it is necessary for students to gain those skills which will enhance their prospects of employment" (Fallows & Steven, 2000). Employers want a number of new competencies, with an emphasis on an increased ability to communicate, as well as good foreign language skills (Jensen, 2000).

1. Goals and objectives of the course

"People are generally motivated to pursue specific goals; the use of goals in teaching improves the effectiveness of teaching and learning; and a program will be effective to the extent that its goals are sound and clearly described" (Richards, 2001).

Student-centered learning requires students to set their own goals for learning, and determine resources and activities that will help them meet those goals (Jonassen, 2000). It is said that the way you organize your course depends on a number of factors which include: "The course content, your goals and objectives, your past experience, your students needs, your beliefs and understandings, the method or text and the context" (Graves, 2000).

The ESP course for engineering students is designed to meet students' needs (Hutchinson and Waters, 1987; Dudley-Evans and St. John, 1998; Munby, 1978; Nunan, 1988; Strevens, 1988). Any vocationally-oriented course must be based on the fundamental issue of "what learners need to do with English" (Dudley-Evans, 1997). It offers the opportunity to study English with a focus on technical terminology required in the particular field. The course concentrates on achieving an effective balance of linguistic skills (listening, reading, speaking and writing) and oral communication in the engineering setting.

The objectives of the ESP course in the engineering classroom are:

- to develop all four language skills (listening, speaking, reading, writing);
- to enhance the ability in listening comprehension;
- to provide practice in realizing the meaning of a text;

- to understand the general features of a text;
- to make students become familiar with different reading strategies; - to make notes of the main points of a reading text;
- to write reports, business memos, emails;
- to understand and improve technical vocabulary;
- to enable students to use words appropriately in the engineering context;
- to enhance students' ability to communicate effectively in English in their professional field;
- to provide students the opportunity to speak in public (e.g. presentations) and take part in discussions, seminars, conferences;
- to discuss, ask and answer questions related to engineering topics;
- to develop proficiency in the language use in job-related situations.

"Stating your goals helps to bring into focus your visions and priorities for the course" (**Graves, 2000).**

3. METHODOLOGY

The ESP course for the engineering students focuses on the development of oral and written communication skills which are required in the globalized world community.

The study describes the implementation of four basic language skills into the engineering course. It has been examined students' attitudes towards basic language skills and how students perceive the use of the skills in the engineering classroom.

3.1. Research questions

The following research questions were used to guide the pilot study:

- What are students' attitudes towards basic language skills?

- How do students perceive the use of the skills in the engineering classroom?

3.2. Sample and data collection

The investigation was performed at the Faculty of Civil Engineering and Architecture in Niš, based on the sample of 95 undergraduate students. Data collection was done in winter semester, 2014. For the purpose of the study, a questionnaire method on students' attitudes (opinions and reactions) towards the significance of written and oral communication in the engineering classroom has been developed. Data analysis was carried out through qualitative analysis technique. It has produced insightful results into students' perceptions of the basic language skills in the engineering classroom as constructivist oriented.

4. Findings

4.1. Students' perceptions of the importance of language skills

The findings on students' attitudes towards basic language skills indicate that students support learning these skills, and in that way they increase knowledge and abilities. Taking this into consideration, results can be summarized as the following:

4.2. Students discussion

Listening skills

- Listening is useful since it enables us to understand specific information.
- Listening helps us to comprehend the main points of engineering.
- Listening is a good way of increasing technical vocabulary.
- Listening activities enable us to interact in oral communication.
- Listening helps us to be successful in communicating with our colleagues.
- Listening enables us to speak clearly to other colleagues about relevant topics.
- Listening is an important skill which helps us understand specific details in the field of expertise.
- We listen to each other when presenting and discussing different projects.
- We are used to hearing a variety of different accents.
- We are able to follow instructions given in class activities.
- We listen to intonation patterns and pronunciation.
- Listening helps us to pronounce words properly.
- We can understand telephone messages.
- We are capable of finding the main idea of a related text.
- We are able to comprehend a short presentation about the field of engineering.
- Listening helps us to discuss, give opinions and ask questions in class.

Speaking skills

- We can communicate effectively with our colleagues about expertise topics.
- We can ask and answer questions related to engineering topics.
- We are able to use vocabulary appropriately.
- We are able to use the correct forms of words.
- We can communicate in job interviews.
- We can organize presentations and present them in front of a large group of colleagues.
- Oral presentations help us learn English better and practice our speaking skills.
- We are able to carry on a conversation on a related topic.
- Speaking helps us to participate in seminars and conferences.
- We can share information and ideas with other colleagues.
- We discuss the content of the text in order to develop thinking skills.
- We gain ability to manage the various communication situations outside the classroom.
- Speaking helps us to practice pronunciation.

- We are able to use grammar structures accurately.

Reading skills

- Reading helps us to get the main point from authentic texts.

- Reading stimulates our interest in different topics.

- We can read a range of technical-related topics.

- We receive practice in reading for different purposes, such as finding main ideas, or discovering the author's point of view.

-We are able to identify key words from the text.

- We are able to scan a passage to find specific information.

- Reading helps us to understand texts in areas related to our research.

- We can distinguish the main idea from supporting details.

- Reading helps us to improve vocabulary skills.

Writing skills

- We learn how to write a CV which leads to a job interview.

- We are able to write clear and concise professional emails.

- We are able to summarize material which has been read.

- We can write summaries which include the topics in the engineering area.

- We learn how to take notes on lectures quite satisfactorily by taking engineering into consideration.

- We can write the English language correctly taking into account sentence construction.

- We are able to write short paragraphs about engineering topics.

5. Discussion

The ESP course for engineering students is focused on four basic skills: listening, speaking, reading, and writing. By doing these activities, students increase technical vocabulary by knowing terms which helps to communicate effectively in English in their professional field. "No matter how well the student learns grammar, no matter how successfully the sounds are mastered, without words to express wider range of meanings, communication cannot happen in any meaningful way" (McCarthy, 1990).

All four language skills are needed in the ESP context according to the needs of particular group of learners in the specialized area. One of these skills is sometimes more emphasized than the others. This depends on the objectives of language course, methods of teaching and needs of learners (Derradji, 1995). A linear acquisition sequence of skills of listening, speaking, reading and writing has led curriculum designers and language educators to introduce these four types of language (Celce-Murcia, 1991). Through reviewing these four skills of English, the last skill as well as the most complicated skill, writing could be constructed. Writing expertise can be accomplished in a more effectual and well-organized system if a lecturer can follow sequence of linear acquisition (Celce-Murcia, 1991).

Everson (2009) emphasizes that "listening is vital skill of language in the sense that it enables one to be able to understand what other people are saying or communicating". Listening is necessary in the sense that it also enables individuals to be able to pay attention to others in order to understand what is being delivered or communicated to them (Littlewood, 1995).

"The reading purpose is to find answers to the questions (e.g. the main idea of a section)" (Jordan, 1997). The skill of reading enables individuals to develop ways of seeing through written texts, the descriptions of cultures and worlds, and how the text try to position or influence the reader to be part of the cultures and worlds. Reading texts is therefore always necessarily a "complex conjoining of "word" and "world", "text" and "context" (Cobb, 2008). It enables the reader to become aware of how reading skills could be used to read purposefully, actively and critically.

Students "must possess strong listening and reading abilities in order to succeed in university courses" (Murphy, 1996).

As far as speaking is concerned, Ostler (1980) lists oral tasks to highlight the order of importance: asking questions, discussing issues, giving talks, participating in panel discussions and receiving interviews. "The university students' needs for improved academic speaking abilities are considered more important than other skills" (Ostler, 1980). According to Krashen (1987) "speaking and listening are two essential language skills in the sense that without the speaker and an understander there can be no language at all".

As for writing, concise and clear writing is an extremely important aspect of an engineer's education. Engineering is certainly one field where proficiency in written communication is valued. 'Knowledge of genre is a key element in all communication and especially significant in writing academic or professional texts' (Dudley-Evans et al. 1998). "We may well find that writing helps us to come to terms with our experience and understand it better" (Brookes & Grundy, 1990).

6. Conclusion

To sum up, the research study presents a clear conception of what students perceive to be the quality of learning in the classroom. The study creates the opportunity for student voice "to express their opinions and make decisions regarding the planning, implementation, and evaluation of their learning experiences" (Rogers, 2005).

The course trains students in both theoretical knowledge and practical skills essential to transformative pedagogy (Giroux 1997; Benesch, 1993) in contemporary society.

The purpose of ESP is to prepare students to use a language to effectively communicate in real-life situations and cooperate with partners in professional fields. More specifically, the focus is on the practical experience and direct activity of students. Student-centered learning requires students to set their own goals for learning, and determine resources and activities that will help them meet those goals (Jonassen, 2000).

Course activities are designed to introduce teamwork skills, to encourage students in their learning, and to use processes to solve a problem and continue improving them (self-regulation). More specifically, students are encouraged to search for solutions to real-world problems, and thus, they are engaged in transformative learning, leading to critical and analytical thinking which is essential for success in the *21st century.*

ESP courses allow students to interact with learning materials, and to explore and construct vocabulary and meanings. The ultimate goal of today's ESP students is to acquire the ability to successfully communicate with others (professionals) in a meaningful and appropriate way. As stated earlier, ESP courses prepare students to use a language to communicate effectively in real-life situations and cooperate with colleagues in professional fields.

The teacher as a course developer (Graves, 1996) should encourage communication through dialogue interaction aimed at mutual development and enrichment. As previously noted, the Socratic method, as a form of dialogic discussion, can be really efficient in ESP constructivist settings, as it can empower and support group learning based on either individual or a social constructivist approach. It highlights students' engagement in the discussion with a specific topic as a central focus. Consequently, students learn to think critically by examining one another's ideas and questions in an attempt to create a better understanding and "to have their voices heard and build on their previous experiences and interests to plan for their continuing growth" (Dewey, 1938).

Students are encouraged to search for solutions to real-world problems, and thus, they are engaged in transformative learning, leading to critical and analytical thinking which is essential for success in the *21st century.*

References

[1] Basturkmen, H. (2010). *Developing Courses in English for Specific Purposes*. Palgrave Macmillan, New Zealand.

[2] Benesch, S. (1993). Critical Thinking: A Learning Process for Democracy. *TESOL Quarterly*, 27(3): 545.

[3] Blanchard, K., & Root, C. (2005). *Ready to read now: A skills-based reader*. New York: Pearson Education, Inc.

[4] Brookes, A. & Grundy, P. (1990). Writing for Study Purposes. Cambridge: Cambridge University Press.

[5] Brown, G. (1997). *Teacher education for languages for specific purposes*. Clevedon - Philadelphia: Multilingual Matters Limited.

[6] Cartner, H. (2009). *Blended learning and the academic word lists*. New Zealand Studies in Applied Linguistics, 15(2):30-40.

[7] Celce-Murcia, M. (1991). (Ed.), *Teaching English as a second or foreign language*. Boston, MA: Heinle & Heinle Publishers.

[8] Cobb, T. (2007). *Computing the Vocabulary Demands of L2 Reading: Language Learning &Technology*. London: Education Center Ltd.

[9] Crystal, D. (2003). *English as a global language* (2nd ed). Cambridge: Cambridge University Press.

[10] Derradji, S. (1995). *A Syllabus for Developing Oral Proficiency: Institute of Commerce* (Algies). University of Constantine.

[11] Dewey, John. (1966). *Democracy and Education.* New York: Free Press.

[12] Dudley-Evans, T. (1997). An Overview of ESP in the 1990s. Proceedings 1997: The Japan Conference on English for Specific Purposes, University of Aizu, Japan, 5–9.

[13] Dudley-Evans, T., & St John, M. (1998). *Developments in English for Specific Purposes*. Cambridge: Cambridge University Press.

[14] Everson, P. (2009). *The importance of four skills in English education.* Seoul: EducationPublishers.

[15] Fallows, S., & Steven, C. (2000). Building Employability Skills into the Higher Education Curriculum: A University-wide Initiative. *Education & Training*, 42(2), 75-83.

[16] Gatehouse, K. (2001). Key Issues in English for Specific Purposes (ESP) Curriculum Development. *The Internet TESL Journal*, Vol. VII, No. 10. Retrieved November 29th, 2006 from http:// iteslj.org/

[17] Giroux, H. A. (1997). *Pedagogy and the politics of hope: Theory, culture, and schooling. A critical reader.* Boulder, CO: Westview Press.

[18] Graves, K. (1996). *Teachers as course developers*. England: Cambridge University Press.

[19] Graves, K. (2001). A framework of course development processes. In Hall, D.R. & Howard, R. & Herrel. A. L. (2004). *Fifty strategies for teaching English language learners*. An ESL teacher's tool kit. 2nd ed. Winnipeg. Canada. Penguin Publishers.

[20] Howard, R. & Brown, G. (1997). *Teacher education for languages for specific purposes*. Clevedon-Philadelphia: Multilingual Matters Limited.

[21] Hutchison, T. & Waters, A. (1987). *English for Specific Purposes: a learner-centered approach*. England: Cambridge University Press.

[22] Jensen, H.P. (2000). Strategic planning for the education process in the next century. *Global J. of Engng Educ*., 4,1, 35-42.

[23] Jonassen, D. H. (2000). Revisiting activity theory as a framework for designing student-centered learning environments. In Jonassen, D. H., & Land, S. M. (Eds.), *Theoretical foundations of learning environments*. 89-121. Mahwah, NJ: Lawrence Erlbaum.

[24] Jordan, R. R. (1997). *English for Academic Purposes. A guide and resource book for teachers.* Cambridge: Cambridge University Press.

[25] Krashen, S.D. (1987). *Principles and Practice in Second Language Acquisition*. New York: Prentice-Hall.

[26] Littlewood, W. (1995). *Foreign and Second Language Learning*. Cambridge: CUP.

[27] Lowe, I. (2009). "Principles of ESP Course Design". Available: www.scientificlanguage.com/esp/course design.pdf

[28] McCarthy, M. (1990).Vocabulary. Oxford: Oxford University Press.

[29] Munby, J. (1978). *Communicative Syllabus Design.* Cambridge: Cambridge University Press.

[30] Murphy J. M. 1996. Integrating listening and reading instruction in EAP programs. *English for Specific Purposes,* 15(2):105-120.

[31] Nunan, D. (1988). *The learner-centred curriculum.* Cambridge: Cambridge University Press.

[32] Orr. T. (1998). "ESP for Japanese Universities: A Guide for Intelligent Reform", The Language Teacher Online. Retrieved on Oct. 23, from <http://www.jalt-publications.org/tlt/files/98/nov/orr.html

[33] Ostler, S.E. (1980). A survey of academic needs for advanced ESL. *TESOL Quarterly* 14(4): 480-503.

[34] Purpura, J. & Graziano-King, J. (2003). Investigating the Foreign Language Needs of Professional School Students in International Affairs. *TESOL &Applied Linguistics*, 4 (1). pp: 1-33.

[35] Richards, J.C. (2001). *Curriculum Development in Language Teaching*. Cambridge: Cambridge University Press.

[36] Robinson, P. C. (Ed.). (1988). *Academic writing: Process and product (ELT Documents 129).* London: Modern English Publications.

[37] Robinson, P. (1991). *ESP Today: a Practitioners Guide*. Hemel Hempstead: Prentice Hall International.

[38] Rogers, A. (2005). *Student voice: Bridges to learning.* Seattle: University of Washington. Online.

[39] Strevens, P. (1988). ESP after twenty years: a re-appraisal. In M.Tickoo (Ed.), *State of the Art.* SEAMEO Regional Language Centre: Singapore.

[40] Swales, J. M. (1990). *Genre analysis: English in academic and research settings.* Cambridge, UK: Cambridge University Press.

[41] Taylor, L. (2011). *Studies in Language Testing. Research and practice in assessing second language speaking.* Cambridge: Cambridge University Press.

[42] Young, L.D. (2003). Bridging Theory and Practice: Developing Guidelines to Facilitate the Design of Computer-based Learning Environments. *Canadian J. Learn. Technol*, 29(3), Fall/Autumn.Retrieved May 14, 2007, from http://www.cjlt.ca/

[43] Živković, S. (2011). *Modernization of English as Foreign Language Studies in University Education*.

[44] Second International Scientific Conference: University Education in Transition,

[45] Transition in University Education – Modern and Universal. Belgrade. Higher Education Institution for

[46] Applied Studies for Entrepreneurialship.

[47] Živković, S. (2013). To Modernize or not to Modernize - There is no Question. *Academic Journal of Interdisciplinary Studies*. MCSER Publishing: Rome-Italy.

[48] Živković, S. (2014). *Constructivism – An Emerging Trend in ESP Teaching and Learning.* Language, Literature and Culture in Education. Nitra, Slovakia.