Chapter 26
Developing Engineering Students' Language Skills

Julia Kurovskaja
Bauman Moscow State Technical University, Russia

ABSTRACT

At present, language training is part and parcel of engineering education in Russia. A modern engineer must have both a communicative competence in the professional sphere and an intercultural view of the world. Accordingly, the topic of the assessment of foreign language textbooks for technical universities is highly relevant. This chapter is dedicated to this issue. The analysis of foreign language textbooks for technical universities is conducted through a cognitive-linguistic approach, using its toolkit, namely the diagnostic matrix. The diagnostic matrix is based on criteria that allow analyzing training materials, carrying out their diagnostics from the point of view of the specifics and regularities of the formation of students' language picture of the world. This pedagogical research innovation will allow pedagogical science to effectively solve issues related to the elaboration of pedagogical semiology as a new area of pedagogical knowledge.

INTRODUCTION

Current global world has a significant impact on education (Ivanova, & Ivanov, 2016; Lorenzo, & Gallon, 2015; Sorina, 2016; Thindwa, 2015). The quality of engineering personnel is one of the major factors of the competitiveness of each state. Therefore, the enhancement of engineering education becomes a topical issue in the world (Gill, Ayre, & Mills, 2017; Steuer, Bouffier, Gaedicke, & Leicht-Scholten, 2017).

In this regard, the development of educational content is of great importance. Indeed, which should be based on understanding education as an integrative and multidimensional process, forming the personality of a future engineer, specifically, in the sphere of foreign language proficiency.

Obviously, thanks to the knowledge of foreign languages, which in turn represent a socially significant value of modern society, a specialist possesses indisputable advantages, such as: The opportunity to integrate into a rapidly changing society, to find a job in the best way, to fully enjoy the achievements of the culture of world civilizations, to understand the modern world and its problems, and also to realize

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himself/herself as a part of this world. Therefore, the study of the "Foreign Language" subject within the educational program of a university is a vital necessity. Also, professional communicative competence, taking into account the knowledge of a foreign language, is the most important quality of a contemporary specialist in general and of a modern engineer in particular.

BACKGROUND

Russia will be able to enter the international educational community and implement the right of technical university graduates for academic mobility only when the whole system of language training in higher education institutions will be modernized.

Going into depth, some of the primary objectives of the Bologna Process were to promote transparency, increase the mobility of the citizens, create joint academic programs, create networks for the exchange of information, and provide language teaching, employability and student-centered learning. (Bologna Declaration, 1999; Ghinea, 2014, p. 63)

The new system implies transition to multistage education in conformity with international standards, helps learners acquire the skills of interaction in a global world, and requires that a future engineer complies with modern levels of communicative competence in professional spheres and, generally, of intercultural perception (Caschera, D'Ulizia, Ferri, & Grifoni, 2014; Faletta, Meier, & Balderas, 2016).

In this respect, the question of software support and methodological guidance of the language training of students of technical universities becomes particularly relevant. The purpose of the training is to acquire the communicative and professional competencies which are necessary for qualified information and creative activity in various fields and situations of both professional communication and day-to-day interaction. Indeed, the textbook is the most important didactic tool and an integral part of the software and methodological support for future engineers' language training. The textbook is the source from which knowledge about professional life activity is extracted. It is also the source from which knowledge about the specifics of a student's future profession as well as professional mission is determined. In the process of mastering the textbook in the context of language training at technical university, the terminological and conceptual content of professional disciplines are clarified. This contributes to the improvement of the professional thinking of future engineering personnel and to the development of students' general cultural worldview as a whole.

The above features of the modernized system necessitate innovative instructional strategies and new approaches to examination of foreign language textbooks in STEM higher education.

COGNITIVE-LINGUISTIC APPROACH TO EXAMINATION OF TEXTBOOKS

One of the new approaches to examination of foreign language textbooks is a cognitive-linguistic approach, which implies analyzing language modeling of a student's world and revealing the concepts contained in exercises, texts, and illustrations. As initial conceptual position, this chapter takes the postulate of dialectical relationship between language, consciousness, and culture which a number of works on cognitive linguistics mention (Arutyunova, 1999; Boldyrev, 2001; Karasik, 2004, 2009;