Advanced Education, 2016, Issue 6, 11-15.
DOI: 10.20535/2410-8286.72947

TEACHING STUDENTS OF INFORMATION TECHNOLOGY SPECIALTIES ENGLISH WRITING

Nataliia Dychka
National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine
ndichka@yandex.ru

Olena Lazebna
National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine
ntuu_kpi@i.ua

Viktoriia Kotvytska
National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine
ntuu_kpi@bigmir.net

The paper deals with the problem of professional competence formation in ESP writing, which is especially important with the introduction of the new government standards for higher education. In this paper, the vital factors of acquiring knowledge, skills and abilities in English writing for students of IT specialties are studied. The importance of teaching students writing technical documentation − Software Requirements Specification − in English is emphasised taking into account the requirements of their educational qualification characteristics and programs. The difficulties which IT specialists have while writing professional texts in English are described. They are related to a technique of writing – spelling, punctuation skills; the language form – genre of the text, lexis and grammar; the content – compositional skills; the organisation of teaching – cooperation and correction of mistakes. The effectiveness of teaching ESP writing can be achieved through the combination of the classroom and the self-study work.

Keywords: teaching; English for Specific Purposes; students of IT specialties; self-study; ESP writing; technical documentation; Software Requirements Specification.

Introduction

The integation of Ukraine into the European educational space and the expansion of international relations encourage society to prepare highly skilled IT specialists who speak English on the professional level. It leads to the significant changes in qualification requirements, in pedagogical theory and in teaching practice of technical specialties' students. The main purpose of teaching English for Specific Purposes (ESP) students in universities is to develop a communicative competence in speaking, reading, listening and writing. It provides the ability to speak foreign language within a social context and also knowledge, skills and characteristics which allow the individual to perform professional activities (ESP, 2005, pp. 35-36).

This paper aims to outline the linguistic needs of future IT specialists. The task of the research paper is to demonstrate the importance of teaching IT students writing technical documentation in English.

In today's society, the obtaining of writing skills and abilities is one of the most important requirements for a specialist in any field. It is because English has acquired the status of international communication language (ESP, 2005, p. 1) and the vast majority of international contacts are made via writing in English. During the last two decades great effort has been devoted to the study of ESP writing (eg., Brooks & Grundy,1991; Byrne, 1991; Hedge, 1988; Reid, 1993; Swales, 1994; Tribble, 1996; Axelrod, 1997; White, 1997; Slaouti, 2000; Evans, 1998; Badger & Pedley, 2003; Morley, 2007; Tarnopolsky, 2008; Glazunova, 1997; Pinska, 2001; Boretska, 2005; Krivchykova, 2005; Vasilyeva, 2005; Bezhenar, 2012, and others). Much research on teaching ESP writing to the students of economic specialties has been done in recent years (e.g., Tarnopolsky, 2008; Ustymenko, 2002; Skurativska, 2002; Zinukova, 2004; Byconya, 2006; Bebyh, 2009; Kameneva, 2010, and others). Some researchers (Korzh, 2008; Metolkina, 2009; Synekop, 2009) improved the methods for ESP writing in technical universities. Also, the problem of ESP writing at universities has attracted much attention from scientists (Tarnopolsky, 2008; Glazunova, 1997; Pinska, 2001; Boretska, 2005; Krivchykova, 2005; Vasilyeva, 2005; Bezhenar, 2012, and others). In particular, the problems of ESP writing of the students of IT specialties studied Strilez (2007) and Synekop (2010). As part of the project methodology Strilez (2007) developed methods of teaching future programmers ESP writing using distance learning course. The researcher presented a methodical description of the project work, elaborated the methodological principles of the integration and variability, described different typological features of the project and revealed technical and didactic possibilities of distance learning course. Synekop (2009) developed a method of interactive teaching ESP writing students of information security using

computer mind map, blogs and Wikipedia; improved requirements for the research paper writing. Methodological principles of teaching ESP writing students of IT-specialities of the 1st year designed Moroz (1999), Ruzhentseva (2005), Chirva (2008).

Although the problem of teaching ESP writing holds an important place in a scientific research, it can not be considered completely solved. The foreign methods do not address requirements of the Ukrainian educational process. The textbooks include lack of exercise, aimed at the formation of ESP writing. Insufficiently studied are the issues, the specific conditions, the learning objectives, the mentality of the country, the professional and psychological characteristics of future specialists in certain areas, the learning model. This is confirmed by a survey of teachers and students.

The vital factors of acquiring knowledge, skills and abilities in English writing by students of IT specialties are:

– writing is an important factor in the development of culture and education, means of information storage, people's communication and intercultural connection, production and materialisation of a new knowledge, intellectual enrichment and development, essential condition for the development of person's abstract thinking;

– the role of written communication in the world is increasing as the most international contacts are conducted in writing form;

– work with the computer, without which specialist's modern life is impossible, involves writing;

– academic mobility of students, training in European universities.

According to the reviewed educational qualification characteristics, and educational programs the graduates who acquire education in the field of IT must have practical knowledge in ESP within professional topics, including writing communication. The students of IT specialties have to write reports on professional topics, a resume, a letter of application; fill in the forms; write articles and conference papers; prepare professional correspondence, business letters, memos, technical documentation, technical manuals, academic essays. The graduates whose professional life is connected with IT sphere have to be able not only to communicate but also to create a technical documentation in English for the developed software, in particular, to write Software Requirements Specifications (SRS).

The educational programs state that IT graduates should be competent in such professional activity aspects: consultation on IT, software creation, data processing, work with databases, searching and processing of electronic texts posted on Forums of professional societies, professional electronic publications, online workshops, discussing production issues with colleagues, administration, customers on terms as direct communication and communication by means of e-mail, forum, instructions, posts, reports, producing reports, presentations and documents. The research has revealed the importance of such a technical legal document as SRS in the field of IT.

The above mentioned confirms the needs for students of IT-specialties to be professionals in ESP writing. It stresses the importance of teaching students writing technical documentation in English. The creation of any software starts with writing and signing technical of documents by a customer and a developer. Thus, according to the needs of students of IT specialties for their future professional activity, a skill to create English technical documentation in accordance with international standards should be added. For this purpose, relevant skills should be formed: skills of writing techniques, lexical and grammar skills and skills of using linking words. Following Tarnopolsky (2008), we believe that the main skills of IT specialists in ESP writing should be the skills to express their own thoughts in full compliance with the genre features of a written document and the sociocultural requirements of English society (p. 58). The ESP writing is the writing used for professional purposes.

The Bachelor Course Topics for English lessons have professional character. At this stage, the students' professional knowledge is deepened, complex skills in ESP writing are developed. However, IT-specialists have considerable difficulties while writing professional texts in English, according to the conducted surveys of IT companies' employees and students.

The ways to eliminate difficulties in the process of technical documentation writing

Research analysis devoted to teaching ESP writing, questionnaires of teachers and students at IT departments, observations of the educational process made it possible to identify these difficulties arising in future IT professional sphere. The analysis of questionnaires has proved that there are some difficulties in ESP writing. The questionnaires among 120 students and 70 teachers of ESP have been conducted in the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", the National Aviation University and the Kharkiv National University of Radioelectronics. The students of IT-specialties have considerable difficulties in ESP writing. They are related to a technique of writing – spelling, punctuation

skills; with the language form – genre of the text, vocabulary and grammar; with the content – compositional skills; with the organisation of teaching – cooperation and correction of mistakes. This indicates the insufficient level of professional competence in ESP writing and necessitates of the development of teaching methods which facilitate more efficient learning.

To identify the causes of these difficulties English textbooks for students of IT specialties have been analysed by such criteria as the presence of non-communicative, half-communicative and communicative exercises, availability of reference material, genres of writing, use of technologies: "English Language: economics and information technology" by Antonina Badan & Svitlana Tsareva, 2004; "English for computer users and programmers" by Yevgeniya Gol'tsova, 2004; "English for programmers" by E.A.Malyutin & Y.I. Shitov, 1992; "Information Technology" by Dinos Demetriades, 2004; "English for Computer Users" by Santiago Remacha Esteras, 2006; "Oxford English for Information Technology" by Eric H.Glendinning & John McEwan, 2002; "University Writing Course" by J. Morley, P. Doyle, & I. Pople, 2007; "Cambridge English for Engineering" by Mark Ibbotson, 2009, "Oxford English for Computing" by Keith Boeckner & P. Charles Brown, 1993, "English grammar and technical writing" by Peter Master, 2004. The analysis shows that textbooks are often not related to University programs, do not reflect modern methods, do not have enough exercise for writing tasks. Most of the books contain half-communicative and non-communicative exercises for ESP writing. Textbooks include mostly exercises on the formation of general lexical and grammar skills. They do not have theoretical materials and guidelines for writing certain professional texts, assignments, do not always meet the needs of students of ITspecialties.

In terms of language and speech material presentation, the textbooks are not clearly structured; do not include the use of technical means of learning. This causes some difficulties for students of IT specialties. The textbook used for the students of IT-specialties (4^{th} year) is "Oxford English for Information Technology" by Eric H.Glendinning & John McEwan, 2002, 222 p. It is aimed at integrated development of skills in all types of speech activity, it takes into consideration the needs of future professionals, provides relevant informative material. For example, this textbook is the base for teaching students of the Applied Mathematics faculty at the Igor Sikorsky Kyiv Polytechnic Institute. But it lacks exercises for ESP writing for students with narrow specialisation.

The result of the analysis conducted among English textbooks for IT students confirms the necessity to develop techniques for mastering ESP writing. The textbooks for future IT professionals should have a clear professional orientation; take into account the foreign language communication needs of IT specialists; contain intercultural, professional, social and cultural information. Ensuring these tasks in training IT professionals may be provided under an organised classroom work in a conjunction with the self-study work, which takes into consideration the interests of students and aims to develop a motivational sphere of autonomy.

Self-study activities have been studied by many scientists (Andreev, 1999; Belyaeva, 2006; Zadorozhna, 2012; Zymnya, 2002; Mayer, 2010; and others). Following Zadorozhna (2012), self-study can be determined as a form of organising self-studying and learning of students, managed and controlled from the outside mediated guidance of a teacher (p. 112). Depending on the place of the performance, self-study work is divided into classroom and extracurricular. In technical universities, the importance of self-study work is increasing. It is mainstreaming the issue of finding ways of effective extracurricular self-study work for future IT professionals in the sphere of ESP writing.

The important issues related to the content of teaching, the needs of students, writing genres, psychological and professional skills of the students of IT specialties need further investigation.

To determine the content of teaching ESP writing during the final year of a bachelor degree you need to identify the needs of students which are dictated by the peculiarities of their future profession, in our case – the students of IT specialties "Computer Engineering", "Software Engineering", "Computer Science", "Applied Mathematics", "Informatics". Under the needs of students we understand the most important foreign-language types of the texts they would create during their professional activities.

SRS as a genre of a written text

The survey, devoted to the problem of necessity to teach students writing SRS at universities, has been conducted in the three IT companies of Ukraine, which confirmed that the creation of technical documentation, namely writing SRS, is of great importance. After analysing the definition of the term SRS in the dictionaries and standards in Ukraine and abroad, in this research work, we interpret it as: "Software Requirements Specification is a technical document which specifies the requirements for the software, includes the purpose, objectives, a set of use cases describing system behaviour and user interaction with the software and also nonfunctional requirements" (IEEE, 2003, p. 3; Leffingwell & Widrig, 2003, p. 74;

Pressman, 2005, p. 130; Sulema, 2011, p. 98). The SRS can be considered as a separate genre that has its own linguistic features. A genre is defined as a complex entity, a numerous system of relationships and dependencies. Genres are functional and stylistic unities, components of the substyle of a functional style, characterised by a certain way of the reality reflection with relevant characteristics and with the structural and compositional organisation. According to Kuznetsov (1991), a scientific and technical substyle of a scientific style is shown in such genres as technical reports, patent descriptions, specifications. Vannikov (1984) refers the specification to the genres which are combined by the informative functions and which have the status of the legal document.

The genre factors include communicative purpose, the content of expression, the author, recipient, subject and form of communication (description, report), standard components of the expression. The specification has a communicative purpose – to meet the needs of a customer, the content of the SRS text – description of the software requirements, the author – SRS developer, recipient – the project manager and the client who ordered a software, the conditions of communication – the project, a form of communication – interpersonal, organised. SRS has standard components of the statements. A typical text of the specification has such features as clarity, specificity, objectivity, impartiality, accuracy. The structural organisation of SRS is reflected in a strict compositional structure, division into sections, subsections, specified by IEEE-830 standard. The structure of SRS comprises title page, table of contents, main part (introduction, overall description, specific requirements), notes, appendixes and index.

IT professionals in their careers constantly have to create SRSs, as any software development starts with the signing of this document between a developer and a customer. But the staff survey of a number of Ukrainian companies showed that experts do not adhere to international standards of writing specifications and do not have sufficient knowledge of standards for writing specifications in Ukraine and abroad and it prevents mutual understanding with foreign partners. There is a lack of literature guidance on developing SRS. Therefore, teaching to write technical documents such as SRS in English is extremely important for students of IT-specialties.

Teaching ESP writing, including SRS, is appropriate for the final year of a bachelor degree. It can be explained by such factors. We know that the essence of teaching ESP writing future professionals involves the integration of disciplines for professional training of students and special skills in writing in reliance on professional knowledge (ESP, 2005, p. 81).

Professional ability to create SRS in mother tongue begins to be formed in students of IT-specialties at the early stage of a Bachelor program while teaching professional disciplines: fundamentals of programming, object-oriented programming, databases, systems programming, computer networks, multimedia technology, corporate design information systems. As the students of IT specialties have got good professional skills to create SRS from professional disciplines and have developed Basic English grammar, vocabulary and stylistic skills at the early stages of the bachelor program (course works, projects), the choice of the stage of teaching SRS writing is the final year of a Bachelor degree. It will deepen students' professional knowledge, develop skills of ESP writing and promote the development of personal professional skills.

This is the year of the study that will enable the interdisciplinary relationship between professional and English language training in the educational process, through the cooperation of teachers of relevant disciplines. While creating SRS in English for their bachelor projects students will be able to receive advice of English teachers and teacher of professional discipline. This situation necessitates the development of the methodology of teaching ESP writing, including writing SRS in the final year of a Bachelor degree.

Conclusion

Thus, analysis of current requirements for teaching ESP writing IT specialties, a survey of IT companies' experts, a survey of teachers and students about the difficulties they face while studying English writing showed the prevalence of problems associated with the techniques of writing, linguistic form, the content and form of training. The analysis of the textbooks showed their lack of focus on the formation of professional competence in ESP writing.

The desire of IT students to carry out an independent self-study work in combination with the classroom work and the key role of such an important task as writing SRS for a Bachelor project make English lessons more effective. Received results of a research work have confirmed the urgent need to develop methods of teaching ESP writing future IT professionals on the materials of English SRSs that will meet the current trends in education and information technology.

References:

English for Specific Purposes. *National Curriculum for Universities* (2005). Kyiv, Ukraine: Lenvit.

IEEE Recommended Practice for Software Requirements Specifications (IEEE Std 830-2008, Revision of IEEE Std 2003). Retrieved 01.03.2016 from http://ieeexplore.ieee.org

Kuznetsov, V. G. (1991). *Funktsionalnyie stili sovremennogo frantsuzkogo yazyika (publitsisticheskiy i nauchnyiy)* [Functional styles of modern French (publicity and scientific]. Moscow : Vyissha shkola.

Leffingwell, D. & Widrig, D. (2003). *Managing Software Requirements: A Use Case Approach* (2nd ed. Ed.). Addison-Wesley.

Pressman, R. (2005). *Software Engineering: A Practitioner's Approach*. New York: McGraw Hill Companies, Inc.

Strilecz, V. V. (2010). *Proektna metody`ka navchannya anglijskoyi movy majbutnix programistiv iz zastosuvannyam informacijny`x texnologij* [Project method of teaching English future programmers using Information Technology]. Unpublished candidate dissertation. Kyiv, Ukraine: KNLU.

Sulema, E. S. (2011). *Diploma projects in the areas of „Applied Mathematics", „Computer engineering", „Software Engineering": Teaching Guidances*. Kyiv, Ukraine: NTUU „KPI".

Synekop, O. S. (2009) Vpravy dlya organizaciyi interaktyvnogo navchannya anglomovnogo pysma u nemovnomu VNZ [Activities for the organisation of interactive English writing in a non-linguistic university]. *Inozemni movy*, *2*, 29-34.

Tarnopolsky, O. B. (2008). *Methods of teaching university students writing in English: guidances for students of higher education*. Vinnytsya, Ukraine: Nova Knyha.

Zadorozhna, I. P. (2012). *Theoretical and methodological foundations of independent work of the future teachers to master the English language communicative competence.* Unpublished candidate dissertation. Kyiv, Ukraine: KNLU.

Vannikov, Yu. V. (1984). K obosnovaniyu obschey tipologii tekstov, funktsioniruyuschih v sfere nauchno-tehnicheskogo perevoda [On the justification of the general typology of texts in the field of scientific and technical translation]. In *Tekst kak ob'ekt lingvisticheskogo analiza i perevoda* (pp.15-26). Moscow, Russia: IYAZ.

Received: June 25, 2016
Accepted: October 10, 2016