The article deals with the issue of effective technologies of teaching academic writing to students of non-philological specialities with regard to the realities of Ukrainian higher educational institutions. The purpose of the article is to substantiate the technology of teaching academic writing and to validate its effectiveness experimentally on the basis of Uzhhorod National University. The theoretical (content-analysis of the sources of subject study, arrangement and generalization of theoretical assumptions, substantiation and elaboration of the technology model) and empirical research methods (scientific observation, methodological experiment, methods of mathematical statistics) were used to achieve the research goal. It has been justified that creation of the product of foreign language academic writing requires the students of non-philological specialities to possess the following skills: to define intention and main idea of utterance, to see connection between expressed thoughts; to correctly use lexical units, namely terms in the professional filed; to correctly use grammatical structures that comply with a certain genre of academic written communication; to classify and evaluate the role of lexical, grammatical and stylistic tools of foreign language in effectiveness of message transfer; to understand influence of the chosen verbal means on effectiveness of speaking and addressee’s communicative intention. The model of teaching technology of academic writing has been presented. The effectiveness of suggested technology of teaching academic writing to students of non-philological specialities has been proved by two-staged methodological experiment.

Keywords: teaching academic writing, academic written communication, product, students of non-philological specialities, skills, techniques, technology of teaching.

Introduction
Teaching the basics of academic communication, both oral and written one, encompasses the work with written, printed, on-line and other sources of information and is aimed at building foreign language academic competence in the students of non-philological specialities, especially the competence in writing by revealing the essence of interaction between a writer and a reader via the product of written communication, namely – a text of an academic genre.

A number of scientific studies of Ukrainian and foreign scholars are dedicated to the research of the basics of academic communication, namely T. Dudley-Evans and M. J. St John study the peculiarities of Foreign Language for Academic Purposes as a Branch of Foreign Language for Specific Purposes (Dudley-Evans, 1998); N. Mykytenko, M. Kozolup and V. Sylum investigate the distinctions of teaching English academic communication to students of Sciences (Mykytenko, 2017); T. Yakhontova offers the ways of teaching English academic writing (Yakhontova, 2003); M. Curry and A. Hewings offer the model of teaching academic writing in higher educational institutions, presenting effective methods, tools and means of learning (Curry, 2003).

The scientists state that academic writing should be considered primarily in the framework of integration of academic disciplines which are offered by a certain curriculum of training specialists (Baccalaureate, Master’s courses, Doctoral courses). The contents of teaching and methodical provision of academic writing course should reflect immediate ties with the content, material and assignments of different academic disciplines. The advocated assumption is confirmed by the experience of U.S. universities where effective and well-developed system of teaching academic writing is presented and integrated in Bachelor’s curricular to provide continuous and gradual
gain of more complex and special skills of academic communication along with acquisition of professional knowledge. Thus, gradual immersion into certain academic genres of professional discourses occurs. In the context of Ukrainian higher educational institutions teaching foreign language academic writing to the students of non-philological specialities takes place while studying academic disciplines “Foreign Language”, “Foreign Language for Academic Purposes” during the study at Baccalaureate (2-4 years), studying “Foreign Language”, “Foreign Language for Academic Purposes” / “Foreign Academic Communication” at Master’s courses and “Foreign Academic and Scientific Communication” at Doctoral courses.

The content-analysis of the sources on the issue has proved that nowadays there are no comprehensive studies which would provide and validate effective technologies of teaching academic writing to students of non-philological specialities with regard to the realities of Ukrainian higher educational institutions, thereby it proves the topicality of the research.

Aim and tasks

The purpose of the article is to substantiate the technology of teaching academic writing to the students of non-philological specialities based on the analysis of the researches in teaching academic writing and to validate its effectiveness experimentally on the basis of Uzhgorod National University.

According to the purpose of the article the following objectives have been established:

1) to perform theoretical content-analysis of the sources of the researched issue, namely to find out the essence of the concepts “communication”, “academic communication”, “academic writing”, to define the key lexical-grammatical and stylistic features of foreign academic writing, to define the register of academic genres of writing texts of non-philological fields;
2) to outline the skills that students of non-philological specialities should possess in order to create a product of foreign academic writing;
3) to substantiate the technology of teaching academic writing to the students of non-philological specialities;
4) to define the criteria of skills acquisition of academic writing in the students of non-philological specialities and prove the effectiveness of the technology of teaching academic writing to the students of non-philological specialities while conducting the experimental research.

Results

The concept of Foreign Language Academic Writing

Foreign Language for Academic Purposes is considered to be a branch of Foreign Language for Specific Purposes along with Foreign Language for Occupational Purposes. Foreign Language for Academic Purposes in its turn includes Foreign Language in specific fields and General Foreign Language either independent or integrated. According to professional area there exists one more classification of Foreign Language for Academic Purposes, namely Foreign Language for Academic Science and Technology, Foreign Language for Academic Medical Purposes, Foreign Language for Academic Legal Purposes and Foreign Language for Management, Finance and Economics (Dudley-Evans, 1998: 6).

Within the above mentioned groups and subgroups of Foreign Language for Academic Purposes, foreign academic communication is realized.

The concept “communication” can be defined as a social and rhetorical action that rests on the process of transfer of information from one communicator to the other or a group of communicators in the form of verbal and non-verbal codes (Struhanets, 2000). Consequently, academic communication is the process of information transfer in the form of verbal and non-verbal codes among the participants of academic community.

As academic communication is a social and rhetorical action, the objective of the course “The Basics of Foreign Academic Communication” is to develop a set of rhetorical skills in the students of non-philological specialities, namely:

- the skills to outline the intention and objectives of utterance adjusted to addressee’s need and expectations;
- the skills to select style, genre and structure of utterance that reflect a rhetorical situation;
- the skills to make one’s own author’s position within norms, etiquette rules and traditions of certain genres of academic communication (http://www.engl.niu.edu/composition/outcomes.html).

Furthermore, academic writing is a process of information transfer among participants of academic community in writing by means of verbal codes. A code that serves as a communication medium is the combination of rules and restrictions that ensure operation of a language as a system of signs (Struhanets, 2000: 29).

The key features of academic writing involve being formal, objective, impersonal and technical. The feature of formality involves avoiding informal conversational language, i.e. informal lexis, contractions, etc. It is impersonal and objective due to avoiding direct references to people, i.e. I or we, and highlighting facts, processes and results instead. The feature of being technical lies in using vocabulary specific to the discipline. It is worth noting that different disciplines have different styles and, respectively, structures of writing. The main goal of writing in science and technology is to present data and ideas with a high level of detail so that the validity of the results and conclusions could be evaluated. Thus, academic writing in science and technology requires a clear argument, careful use of methods to generate the data as well as evidence and sources, proper organization, correct use of grammar and lexis in the field or discipline, logic of the layout to present the result and draw conclusions from the data obtained (Myktyenko, 2017: 42). It is characterized by short paragraphs with no topic sentences. The information presented should be brief, laconic, dense and factual (https://sydney.edu.au/students/writing.html).
Academic writing in various non-philological fields envisages creation of written texts of academic genres, namely: academic essay, review, conference proposals, article, and diploma paper, research report, grant proposal and etc. (Mykytenko, 2017; Yakhontova, 2003).

Hence, the objectives of courses in foreign writing academic communication develop the following skills (Mykytenko, 2017):

- the skills to define intention and main idea of utterance, to see connection between expressed thoughts;
- the skills to correctly use lexical units, namely terms in the professional filed;
- to correctly use grammatical structures that comply with a certain genre of academic written communication;
- the skills to classify and evaluate the role of lexical, grammatical and stylistic tools of foreign language in effectiveness of message transfer;
- the skills to understand influence of the chosen verbal means on effectiveness of speaking and addressee’s communicative intention.

The development of the skills of foreign academic writing does not occur without familiarizing with research strategies, mastering methods of information search and understanding of academic ethics. Thus, besides main skills of academic writing, prospective specialists of non-philological areas should be able (Mykytenko, 2017):

- to effectively work with the sources of information, using available library and on-line resources of the university;
- to adhere to the rules of scientific and academic ethics, be responsible for the content and form of communicative product;
- to avoid plagiarism, correctly quote references and citations.

Resting on the model of teaching academic writing, designed by M. Curry and A. Hewings (Curry, 2003), that reflects the main stages of teaching and reveals its non-linear character vividly, we suggest a model of technology of academic writing teaching for developing the skills of academic writing while teaching foreign languages in students of non-philological specialities (figure 1).

Figure 1. Technology of Teaching Academic Writing to the Students of Non-Philological Specialities
A successive practice of certain techniques at all stages with the use of the appropriate methods under the guidance of a teacher in the classroom and also during independent extracurricular work constitutes the basics of the technology of academic writing teaching. Training students for effective independent extracurricular work incorporates a principle of gradual enhancement of their autonomy (scaffolding). The implementation of this principle allows learners to create their own approach. Let us examine the main methods and techniques of learning at certain stages of teaching of academic writing thoroughly.

At the initial stage of academic writing teaching the techniques of ideas generation and work with the sources of information are applied (Mykytenko, 2017) that include brainstorming, journal writing, freewriting, mind mapping, clustering, and outlining.

The teacher can use appropriate teaching methods in order to train each abovementioned technique. A frontal method with involvement of the whole group is advised to be applied for brainstorming. Each participant is to be provided with an opportunity to express one’s thoughts, ideas and opinions freely. The techniques of mind mapping and clustering can be trained via frontal and group methods of teaching, i.e. with involvement of the whole group of students or in small groups (Curry, 2003). Journal writing and freewriting require individual work, its feedback can be discussed in group work.

The main stage of academic writing teaching includes sub-stages: 1) text compilation based on the material, which had been gathered at the initial stage; 2) critical analysis of a working version of the written product. The first sub-stage is mainly represented by independent extracurricular work, but recently the technique of collective writing has proved its effectiveness. In that case each student, working in the microgroup (3–4 participants) is responsible for writing a certain part of the text under mutual communicative assignment. To spare classroom time, that is significantly limited as far as teaching foreign language to the students of non-philological specialities concerned, the team work on the text could be accomplished in a distant way after classes by means of computer and internet technologies, namely blogs, chats, forums, social networks and social educative platforms. Initially, students carry out critical analysis of a rough version of the written product independently, using the checklist of assessment criteria of writing which is either given by a teacher or is jointly designed beforehand, and afterwards there is exchange and critical analysis of a working version of the written product.

Self-assessment as a form of feedback in which a student acts as a reader and critic of his/her own work is a formative process when a student reveals strengths and weaknesses in his/her work and tries to remedy them (Andrade, 2009). The researches of American scientists (Andrade, 2009; Andrade, 2008) prove that adherence to the certain conditions (understanding communication assignment, appropriate level of the improvement of lexical, grammatical and discursive skills, clear assessment criteria of products of academic writing, support on behalf of groupmates and a teacher, self-assessment) ensures effective learning.

At the sub-stage of mutual check students read, analyze and criticize one another’s works in groups or micro groups, using the same checklist which will serve as a checklist of mutual assessment of written works. With due regard for critical remarks students create second working version of the written product. They will keep exchanging their written products and with an allowance for the remarks of colleagues and the teacher as well which should perform both the role of a moderator and active participant of creating a working version of the written product especially with the students of non-philological specialities and check this second working version of the written product of each participant of the learning group, the students create final version of the written product.

Work in groups and small groups is an essential moment while implementing the technology of teaching academic writing to the students of non-philological specialities. In the process of the team work students have an opportunity to improve their reflexive skills, verbalize their own learning experience in the area of academic writing and share it with other students.

Research Methods

Theoretical and empirical research methods are used to solve the objective of the research. The theoretical methods include: content-analysis of the sources of subject study with the aim of defining the state of investigation of the scientific problem, discovering its topicality and theoretical substantiation of the issue of effective learning technology of foreign academic writing to the students of non-philological specialities; arrangement and generalization of theoretical assumptions about the teaching of academic writing to the students of non-philological specialities; substantiation and elaboration of the technology model of teaching academic writing to the students of non-philological specialities at higher educational institutions.

The empirical methods used in our research encompass: scientific observation of teaching foreign academic writing to the students of Master’s specialities “Computer Engineering” and “Applied Physics and Nanomaterials” in Uzhgorod National University while studying academic disciplines “English for Scientists”; questionnaire survey of the students of Master’s specialities “Computer Engineering” and “Applied Physics and Nanomaterials” with the aim of defining learning needs; methodological experiment (observing and formative stages) with the aim of proving the effectiveness of the technology of teaching foreign academic writing to the students of non-philological specialities; methods of mathematical statistics (statistical processing of the findings of experimental work and its interpretation) with the aim of validating the reliability of research findings.

Experimental research on the effectiveness of teaching academic writing to students of non-philological specialities

As noted earlier, methodological experiment with the aim of revealing the effectiveness of suggested technology of teaching academic writing to students of non-philological specialities has been performed in two stages:
Observing stage. The level of the maturity of lexical, grammatical and discursive skills of the students in control and experimental groups before and after the methodological experiment has been assessed, a questionnaire survey of the participants about their learning needs concerning academic writing has been carried out;

Formative stage. The technology of teaching academic writing has been introduced into the educational process of the students of non-philological specialties of Master’s courses in Uzhgorod National University throughout one semester.

The participants of the experiment were 36 first year students of the Master’s courses in “Computer Engineering”, and also “Applied Physics and Nanomaterials” of Uzhgorod National University.

A structured questionnaire was used as an instrument for data collection. On the basis of the questionnaire the conclusion was drawn about the importance for the students of Master’s course of non-philological specialties to have a good command of main genres of foreign academic writing in order to enjoy the rights for academic mobility in global educational environment, and also the conclusion about students’ aspiration to master the main genres of foreign academic writing.

In the process of scientific observation over teaching foreign academic writing to the students of experimental and control groups as well that was performed throughout the whole formative stage of the experiment (one semester), we arrived at the conclusion that collective writing in microgroups and work in pairs and small groups activate students’ motivation and enhance the effectiveness, since they communicate, bear collective responsibility for the quality of the product of foreign academic writing, share their experience of learning foreign academic writing, improve their reflexive skills.

The scientific observation has also confirmed the expediency of application of mutual assessment of a first version of the written product by the students on the basis of criteria (in the experimental group) to counterbalance formal assessment of the first version of the written product of foreign academic writing by the teacher in scores (in the control group). The scientific observation provides evidence that formal assessment of the researched skills by the teacher in scores demotivates most of the students. For that reason the assessment of the final version of the product of academic writing by the teacher based on the calculation of quantitative criteria of the development of lexical, grammatical and discursive skills was chosen to raise effectiveness of teaching foreign academic writing. Such a decision was affected by some scientific observation. Formal assessment in figures and scores has proved to discourage students which make efforts to improve their academic writing. Thus, in the experimental group the teacher offered guidance in rendering useful information, provided a real assistance in the form of friendly criticism, inherent remarks and prompts instead of formal assessment.

An appropriate test to assess the skills in academic writing of specialists of non-philological areas has been designed which included four blocks: lexical skills diagnosing, diagnosing of the skills of layout and production of written message of certain genres, structure and contents; diagnosing of paraphrasing skills. On the basis of the findings of initial diagnosing at the observing stage the methodological experiment participants were divided into experimental and control groups. The participants of both the experimental and control groups were in the same conditions as to the length of the experiment, its content, number of students. The mentioned factors were invariable conditions of the experiment. The application of the experimental technology of teaching foreign academic writing was a variable condition of the experiment. The technology involved a special organization of learning process and application of certain methods, tools and assessment of students’ performance.

In the process of experimental learning in the experimental group the described experimental technology of teaching academic writing to students of non-philological specialties was implemented.

Assessment criteria of students’ skills in foreign academic writing included:

- lexical skills – presentation of rich vocabulary, knowledge of lexical units that are pertinent to genres of academic writing communication, knowledge of terms in professional field;
- grammatical skills – correct use of complex grammatical structures;
- discursive skills – skills to correctly arrange and produce written messages of certain genres, skills to structure a product of foreign academic writing, skills to correctly present the content of foreign academic writing, skills to paraphrase with the aim of avoiding plagiarism.

The indicators of assessment criteria of students’ skills in academic foreign writing were measured by the means of 100 scores according to the ECTS scale that uses gradation of A, B, C, D, E, F.

At the observing stage of the experiment an average indicator of the general level of the maturity of lexical, grammatical and discursive skills in the students of the control group was 72.1 (C), while an average indicator of the general level of the maturity of lexical, grammatical and discursive skills in the students of the experimental group was 71.8 (C). After experimental learning an average indicator of the general level of the maturity of lexical, grammatical and discursive skills in the students of the control group (CG) was 72.6 (remained at level C), while the average indicator of the general level of the maturity of lexical, grammatical and discursive skills in the students of the experimental group (EG) was 84.2 (increased to B) (Fig.2).
The application of mathematical apparatus, namely interpretation of the obtained data by the help of defining the mean value of lexical, grammatical and discursive skills maturity, Shapiro-Wilk test and Student’s t-test allowed to reveal the general level of lexical, grammatical and discursive skills maturity in the students of the control and experimental groups on the observing stage that was not statistically significant, and also the general level of lexical, grammatical and discursive skills maturity in students of the control and experimental groups after the execution of the formative experiment that is statistically significant and is higher in the students of the experimental group.

Conclusions
Communication is a social and rhetorical action that implies transfer of information from one communicator to the other or to a group of communicators by verbal and nonverbal codes. In its turn, academic communication is a process of information transfer among the participants of a certain academic community by verbal and nonverbal codes. The main genres of academic writing on non-philological fields are academic essay, review, conference proposal, article, term and diploma paper, research report, grant proposal.

Creation of the product of foreign academic writing requires the students of non-philological specialities to possess the following skills: to define intention and main idea of utterance, to see connection between expressed thoughts; to use lexical units correctly, namely terms in the professional field; to use grammatical structures correctly that comply with a certain genre of academic written communication; to classify and evaluate the role of lexical, grammatical and stylistic tools of foreign language in effectiveness of message transfer; to understand the influence of the chosen verbal means on effectiveness of speaking and addressee’s communicative intention.

The model of teaching the technology of academic writing includes: completion of certain assignments with the aim to create a product of academic writing by stages; practice of certain methods and tools at all stages of the creation of an academic writing product during work in classrooms under supervision of the teacher and during independent extracurricular work as well.

In order to prove the effectiveness of the suggested technology of teaching academic writing to students of non-philological specialties, a methodological experiment has been planned and organized. It has been performed in two stages: observing and formative ones. Lexical, grammatical, discursive assessment criteria of students’ skills in academic foreign language writing have been defined. Application of the methods of mathematical statistics, namely determination of the mean value of development of lexical, grammatical and discursive skills, criteria of Shapiro-Wilk test and Student’s t-test have made it possible to validate the effectiveness of the suggested technology of teaching academic writing to students of non-philological specialties.

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ТЕХНОЛОГІЯ НАВЧАННЯ СТУДЕНТІВ НЕФІЛОЛОГІЧНОГО ПРОФІЛЮ ІНШОМОВНОМУ АКАДЕМІЧНОМУ ПИСЬМУ
Стаття розглядає проблему технологій навчання іншомовного письма студентів нефілологічних спеціальностей з урахуванням реалій українських ЗВО. Мета статті – обґрунтувати технологію навчання іншомовному академічному письмовому студентам студія нефілологічних спеціальностей і здійснити експериментальную перевірку її ефективності на базі Ужгородського національного університету. Для роз'язання завдань дослідження використано теоретичні (контент-аналіз та аналіз джерел з проблеми дослідження, систематизація та узагальнення теоретичних положень, обґрунтування і розроблення моделі технології навчання іншомовного академічного письма) й емпіричні методи досліджень (наукове спостереження, анкетування, методичний експеримент (констатувальний і формувальний етапи, методи математичної статистики). Було доведено, що до переліку лексичних, граматичних та дискурсивних умінь, якими повинні володіти студенти нефілологічних спеціальностей для створення продукту іншомовного академічного письма, належать уміння: визначати мету, головну ідею повідомлення, бачити зв’язок між висловлюваними думками; коректно вживати лексичні одиниці, зокрема – термінологічні у сфері фаху; коректно вживати відповідні віршові й кольорові які перебільшення комунікації граматичні структури; класифікувати і оцінювати роль лексичних, граматичних, стилістичних засобів в іншомовному повідомленні; визначати вплив ображних інтенсивних засобів на ефективність виявлення та досягнення адекватності комунікативної мети. Представлено модель технології навчання академічного письма. З метою досягнення ефективності обґрунтованої технології навчання іншомовного академічного письма студентів нефілологічних спеціальностей було сплановано та організовано методичний експеримент, що проводився у два етапи: констатувальний і формувальний.

Ключові слова: навчання академічному письму, академічна письмова комунікація, продукт, студенти нефілологічних спеціальностей, уміння, засоби, технології навчання.

Подано до редакції 07.03.2018