

**PROBLEMS OF EDUCATION
AND METHODS OF TEACHING IN HIGHER EDUCATION**

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**FUNDAMENTALS OF SCIENTIFIC WRITING IN ENGLISH
FOR JUNIOR STUDENTS FROM NON-LINGUISTIC
HIGHER EDUCATIONAL ESTABLISHMENTS OF UKRAINE**

Summary

At present, much attention is paid to students' research work since it is an efficient tool in developing their scientific view and solving the problems that are of vital importance for our country, the English language being the dominant form of scientific communication. In this

*ПРОБЛЕМИ ОСВІТИ
ТА МЕТОДИКА ВИКЛАДАННЯ У ВИЩІЙ ШКОЛІ*

context, the article deals with issues of English scientific communication and discourse with regard to junior students from non-linguistic higher educational establishments who haven't acquired corresponding knowledge in this subject matter yet. Distinctive features of a four-stage work with English scientific texts are described in the paper. A special attention is paid to stages of information recording and its application in practice. The standard structure of a scientific paper is analyzed in the article. Examples of special English clichés are given in the work to develop junior students' skills of scientific writing.

Keywords: research work, scientific communication, discourse, style, format, scientific writing, relevant information, clichés.

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**ОСНОВИ НАПИСАННЯ НАУКОВИХ ПРАЦЬ АНГЛІЙСЬКОЮ МОВОЮ
ДЛЯ СТУДЕНТІВ МОЛОДШИХ КУРСІВ
НЕМОВНИХ ЗАКЛАДІВ ВИЩОЇ ОСВІТИ УКРАЇНИ**

Анотація

На даний момент у нашій країні багато уваги приділяється науково-дослідній роботі студентів, оскільки вона є ефективним інструментом формування їхнього наукового світогляду та розв'язання надважливих задач. Водночас англійська мова є домінуючою формою наукового спілкування. В цьому контексті у статті розглядаються питання англомовного наукового спілкування та дискурсу щодо студентів молодших курсів немовних закладів вищої освіти, які ще не набули відповідних знань у цьому напрямку. Підготовка наукових праць іноземною мовою на міжнародні конференції є невід'ємною складовою наукової діяльності студентів вже з першого курсу навчання в ЗВО. Проте не володіючи навичками роботи з автентичними матеріалами та алгоритмом написання наукових робіт, початківці стикаються з великими труднощами. У дослідженні детально описується специфіка роботи з науковими текстами, яка складається з таких чотирьох етапів, як відбір релевантної інформації; обробка інформації; письмова фіксація інформації для подальшого використання; застосування відібраної та записаної інформації на практиці. Кожний етап роботи передбачає формування у студентів молодших курсів певних навичок наукового спілкування. Особлива увага приділяється письмовій фіксації інформації та її застосуванню на практиці. Письмова фіксація спрямована на складання студентами різноманітних планів, які стануть їм в пригоді в процесі подальшої роботи. Метою завершального етапу є написання й оформлення студентських наукових праць та представлення результатів дослідження цільовій аудиторії у вигляді різних видів публікацій. У роботі перелічено основні розділи та підрозділи, з яких складається більшість наукових статей відповідно до сучасних стандартів і вимог. Кожний підрозділ містить певні англійські кліше, автоматичне використання яких сприятиме побудові високоорганізованого семантичного простору наукового тексту. Автором зауважується, що

PROBLEMS OF EDUCATION AND METHODS OF TEACHING IN HIGHER EDUCATION

поступове засвоєння студентами молодших курсів конкретних мовних формул є необхідною умовою для написання якісних наукових робіт англійською мовою. Створення кожним студентом власного банку корисних англійських кліше під час роботи з оригінальними науковими матеріалами вважається за доцільне.

Ключові слова: науково-дослідна робота, наукове спілкування, дискурс, стиль, формат, написання наукових праць, релевантна інформація, кліше.

Problem statement. In the course of globalization and integration processes taking place in our country today higher educational establishments of Ukraine are required to train highly qualified specialists who will be able to realize their potential in the professional environment as well as to become competitive in terms of the European dimension in education. In this context, much attention is paid to students' research work since it is an important tool in developing their scientific view and solving the problems that are of vital importance for science and practice. Besides, the language of professional communication, containing both business and scientific communication, stipulates negotiating with international partners; listening to foreign scientists' lectures; reading original scientific papers and texts; conducting numerous research; attending scientific and practical conferences; writing articles, abstracts, summaries; preparing various reports and presentations and other activities.

The language of most international scientific events is English as it is considered to be the dominant form of scientific communication. It is obvious that the scholars should possess theoretical and practical skills in English scientific communication to prepare their research papers in accordance with all requirements. In practice, it is very difficult for many young investigators to write a scientific paper in English if they haven't acquired particular knowledge of how it should be done, and therefore they cannot present their findings in a proper way [1].

In this regard, Ukrainian students taking an active part in international conferences and writing research papers in English need some special recommendations as for peculiarities of scientific style, format and discourse. Nowadays, English Scientific Communication is taught in most linguistic universities of Ukraine while some non-linguistic higher educational establishments aim at introducing it as a separate subject.

Analysis of recent studies. The issues connected with scientific discourse were investigated by numerous Ukrainian and foreign scholars. Such scientists

as R. Day, B. Fischer, Ch. Mack, T. Mihelson, O. Potanina, N. Uspenska, M. Zigmond devoted their works to general standards for a research paper presentation. We should also mention J. Hurd, F. Woodford, L. Zhyzhytova studying the basic problems of scientific communication; O. Krushelnytska, R. Slobodnyuk, G. Tsehmistrova analyzing the importance of students' research work; K. Voronina, L. Horchinska, L. Markushevska, A. Podorozhna describing the accepted formats of writing article reviews and summaries. Key research findings published by the above-mentioned scholars are very helpful for undergraduates (bachelors, masters), post-graduates and applicants who have already acquired the necessary competencies in English scientific communication and discourse. However, the issue remains unresolved for freshmen and sophomores, i.e. for junior students who haven't possessed such knowledge yet. Consequently, it needs further investigation.

Immersion into English-language scientific environment from the very beginning of students' professional training is very important in terms of current transformations taking place at all levels of the national educational system. Moreover, this matter is of particular relevance for students from non-linguistic higher educational establishments who learn English for Specific Purposes for approximately 2 years but should be involved in research work since freshman year, the number of teaching hours allocated to this subject according to the curriculum being insufficient.

In this respect, **the primary objective** of the article is to analyze the stages of junior students' work with scientific texts and to review special clichés corresponding to each individual section of a research paper in order to develop their skills of scientific writing in English.

Basic material. Research paper writing, i.e. scientific or academic writing, generates the students' abilities to work on their own, search for necessary information, analyze it, make appropriate conclusions and eventually get the final product published. In this connection, Robert A. Day (2012), a famous American scientist and Professor of English, points out that the goal of scientific research is publication. He also adds that a scientific experiment is not complete until the results are published [2].

It is undoubtedly that the more practice a person has, the better he is in completing research papers. Actually, first-year students – the so-called freshmen – cannot present a coherent scientific work corresponding to all

standards and formats. If the beginners are required to write a particular research paper and show its results to their scientific advisor, the latter predominantly finds out a compilation of entire paragraphs taken from different sources and presented by the students as their own research. In other words, the problem of plagiarism arises. According to Chris A. Mack (2018), "often, plagiarism is more a consequence of intellectual laziness than intellectual dishonesty" [3, p. 91]. We would agree with this statement in principle, but in our case plagiarism happens due to the students' lack of proficiency in English scientific communication. This is not surprising, as fundamentals of scientific writing are not taught at secondary school.

The key thing one needs to know about a research paper is that it is an investigation of a certain problem, issue or phenomenon. Both format and content must comply with the standards of scientific style. A scientific style is characterized by accurate, logical, consistent and objective conveying of thoughts. Scientific texts contain precise definitions of investigated notions and phenomena; each sentence or statement is logically connected with the preceding and subsequent information [4, p. 32].

Before writing a scientific work in English, a student needs to conduct research on a particular issue by turning to original sources (books, manuals, articles, reviews etc.), which investigate the same problems. In other words, a researcher deals with numerous scientific texts trying to understand them.

It is worth noting that a word-for-word translation of scientific literature into the mother tongue is impossible. It is necessary for students to be aware of the lexical and syntactical structure of the English scientific text to be able to express their thoughts in future investigations [5].

In this context, the most difficult task for junior students is how to use scientific literature in writing research papers. Efficient work with scientific texts includes the following four stages to be examined below:

1. Selection of relevant information.
2. Information processing.
3. Information recording for further use.
4. Application of selected and recorded information in practice.

1. Selection of relevant information. A new research project always begins with a literature or information search, the goal of which is to evaluate investigators' prior knowledge on a proposed scientific topic before they start

advancing it. The literature search focuses mainly on reading rather than on just finding relevant papers. It implies choosing special information resources on issues under investigation. Selection of relevant information plays an important role since during this process junior students acquire abilities of identifying and understanding the necessary scientific material.

2. Information processing. This stage is considered to be the most significant in training junior students on how to work with foreign scientific literature. It is concerned with extracting and semantic processing of information contained in sources, which have already been selected during the searching stage. Information processing facilitates the students' abilities to choose, classify and measure the data; to discover, correlate and compare different facts and views presented in the texts; to determine the value, objectivity and novelty of information as well as to consider its prospects. Taking into account the above-mentioned, junior students are required to master the skills of analytic and synthetic processing of information, i.e. the skills of conceptualization, analysis and assessment of scientific texts.

It is not just enough for junior students from non-linguistic higher educational establishments to fully or partially understand and absorb the original information (analysis). It is necessary to learn how to highlight the basic information, formulate and present it briefly in logical sequence (synthesis), thereby creating a secondary text in order to retain, process and systematize the background information [6]. Ultimately, development of students' skills in semantic processing of the text has a positive effect on improvement of their reading competency.

3. Information recording for further use. The stage of information recording aims at retaining and additional processing of information. The task of data retention is realized by students' taking notes of necessary data in the process of reading and rereading scientific texts. The ability of junior students to take relevant notes is crucial for efficient work with scientific texts since recording of information optimizes its further use, namely facilitates the students' ability to systemize, generalize and remember the information. Accordingly, recorded data should be clarified, structured and presented in a coherent and logical manner.

In this respect, a primary tool for beginners before presenting the results of their own research in a scientific paper is to make a plan. It is intended to simplify the final stage – application of selected and recorded information in

practice. There exist many kinds of plans (simple, detailed, complete, question, sentence etc.), but no matter which of them students prefer, planning enables them to:

- organize their thoughts efficiently;
- decide on the most efficient way to present information;
- keep to a logical sequence of points and not wander off on a tangent;
- remember all the information that must be included;
- cut out unnecessary or irrelevant bits [7].

Once the plan has been completed, it is worth proceeding to presentation of a scientific paper in written form.

4. Application of selected and recorded information in practice. Not so many years ago a lot of students doubted practical value of research work. Some claimed that scientific writing wouldn't influence their performance in future activities. Fortunately, the things have changed in recent years. At present, most students realize that writing research papers helps them generate almost all their abilities while searching, selecting, processing and recording the relevant information on topic under investigation and applying it in practice. It is obvious, that all these abilities will be very useful at students' future workplaces. Whenever they work (in business, sales, marketing, finance etc.), they will always face the need to get more information about potential clients, certain services, new technologies and so on. After that, they will have to process the obtained information and draw the necessary conclusions. Thus, the practical value of scientific writing is under no doubt, for that reason it is an important part of any student's academic performance.

The major purpose of any research paper as an academic piece of writing is to communicate the results of the study to a target audience through various publications in scientific journals, books of abstracts, conference proceedings and other sources. To make the communication efficient, scientific works have a standardized framework today so that the authors could present their findings and ideas in an orderly, logical manner. The research paper format is as important as its content.

As noted by M. Katz (2009), most scientific papers have a stereotyped format, i.e. (1) Abstract; (2) Introduction; (3) Materials and Methods; (4) Results; (5) Discussion; (6) Conclusion; and (7) References [8, p. 3]. However, the exact section headings may differ according to the type of a paper and special requirements for its publication.

Taking into consideration junior students from non-linguistic higher educational establishments of Ukraine who just start getting acquainted with fundamentals of scientific writing in English, the sections 'Abstract' and 'References' are not touched upon in our study. The limitations seem to be clear as the mentioned sections are added only when the whole text of a research paper has been completed. In order to simplify the freshmen's task at the initial stage, it is worth using a simulation model for the first scientific paper which would contain three basic sections: (1) Introduction; (2) Main Body; (3) Conclusions. The students' common understanding of such a simple structure would help them in its further modification by dividing the main sections into particular subsections. Moreover, the number of subsections is expected to vary in every case with due regard for required format.

It should be mentioned that each section / subsection differs from others by special phrases or clichés, which are the means of linking the parts of a scientific text into a coherent whole.

Cliché is defined by A. Podorozhna (2016) as a figure of speech, typical, formulaic or 'one-size-fits-all' phrase that is easily reproduced under certain conditions and contents. It is a ready-made formula facilitating the communication process [9, p. 106].

By drawing the junior students' attention to the standard structure of a scientific paper, we have illustrated what possible subsections may the basic sections of a research paper include, and what appropriate clichés should be used in each particular subsection (see Fig. 1). Classification of widely-used clichés is necessary for developing students' mechanical skills of scientific writing as well as for saving their efforts, time and reflective activities [10].

As can be seen from Fig. 1, the easy-to-use classification of clichés is made on the conceptual basis enabling students to understand the content of every subsection. We have deliberately chosen no more than three corresponding clichés so as not to overload freshmen from the very beginning of their research activities. With regard to blank spaces contained in the column "Appropriate Clichés", they are supposed to be supplemented directly by students every time when working with scientific texts and discovering new clichés. In such a way, the students will succeed in creating the so-called "Bank of Useful Clichés", which will contribute to further development of their knowledge about scientific writing in English.

**PROBLEMS OF EDUCATION
AND METHODS OF TEACHING IN HIGHER EDUCATION**

SECTIONS	SUBSECTIONS		APPROPRIATE CLICHÉS
1. INTRODUCTION	1.1. Problem Statement/ Problem Background		1) ... plays an important / vital role in ...; 2) In recent years there has been a growing interest to ...; 3) A challenging problem which arises in this sphere (area) is ...; etc.
	1.2. Literature Review / Analysis of Recent Studies		1) The literature review shows that ...; 2) However, very few publications address the issue of ...; 3) Only a few studies suggest that ...; etc.
	1.3. Aims and Objectives		1) The main aim of this work is to develop ...; 2) The overall goal of this paper is to analyze ...; 3) The major objective of this study is to examine ...; etc.
	1.4. Relevance / Significance		1) The problem / issue of ... is of particular relevance for...; 2) ... has particular advantages over other ...; 3) It has significant benefits in terms of ...; etc.
2. MAIN BODY	2.1. MATERIALS AND METHODS	2.1.1. Experimental Setup	1) We started by investigating ...; 2) The experiments were performed with ...; 3) We designed a new technique for ...; etc.
		2.1.2. Data Collection and Analysis	1) For this study, we analyzed the data collected from ...; 2) Data were analyzed and correlated with ...; 3) This analysis was confined to ...; etc.
		2.1.3. Statistical Testing	1) We used ... statistics to report ...; 2) The test for ... found no significant differences between ...; 3) To investigate this statistically, we calculated ...; etc.
		2.1.4. Reference to figures, graphs, tables, diagrams	1) Fig. 2 shows / presents / illustrates ...; 2) Table 1 summarizes ...; 3) The graph / diagram suggests / indicates that ...; etc.
	2.2. RESULTS AND DISCUSSION	2.2.1. Findings and Comparison with Previous Studies	1) Our results demonstrated that ...; 2) From the results, it is clear that ...; 3) Contrary to the findings of ... we did not find ...; etc.
		2.2.2. Limitations	1) Because of the lack of ... we decided to not examine ...; 2) Another limitation in ... involves the issue of ...; 3) It presents such limitations as ...; etc.
		2.2.3. Casual Arguments	1) This is particularly important when investigating ...; 2) It is unlikely that ...; 3) This was included to verify that ...; etc.
		2.2.4. Speculations and Deductive Arguments	1) Therefore, it remains unclear whether ...; 2) It is difficult to explain such results within the context of ...; 3) These findings support the notion that ...is not influenced by...; etc.
3. CONCLUSIONS	3.1. Overall Summary		1) Summing up the results, it can be concluded that ...; 2) In conclusion, it is evident that this study has shown ...; 3) The analysis of...leads to the following conclusions: ...; etc.
	3.2. Possible Application		1) The technique / approach / result is applicable to ...; 2) The findings suggest that this approach could also be useful for ...; 3) The findings are of direct practical relevance ...; etc.
	3.3. Prospects for Further Research		1) In our future research we intend to concentrate on ...; 2) Clearly, further research of ... is necessary to / for ...; 3) Several other problems remain to be addressed / resolved ...; etc.

*Fig. 1. Standard Structure and Appropriate Clichés of a Scientific Paper **

* Source: developed by the author according to [7, 11].

Conclusions. Scientific writing has a pivotal role in students' intellectual development. It helps them acquire strong writing and reading competencies, and finally master the skills of English scientific communication. In addition, during the work with scientific texts such research-related tasks as selecting, processing and recording of relevant information are helpful for development of students' analytical thinking.

It is obvious that scientific writing is entirely different from formal one since the former type focuses on the technique. Consequently, one must be aware of the ways how to use these techniques in order to convey the ideas in the best possible way. In this respect, presentation of research papers in English will be much easier for junior students from non-linguistic higher educational establishments provided they learn a stereotyped format of writing a scientific work and implement it since their early academic careers.

The task can be improved by dividing a research paper into different sections and subsections as it is impossible to be successful in trying to accomplish all the work together. Application of special English clichés in students' research papers facilitates the process of linking the parts of a scientific text into a coherent whole.

Prospects for further research. This article has only been able to touch on the most general features of a four-stage work with scientific texts and the standard structure of a scientific paper divided into certain sections and subsections, which contain special English clichés corresponding to each of them. However, fundamentals of scientific writing cover not only these issues. The subject matter of scientific style is equally important for junior students from non-linguistic higher educational establishments since it is concerned with a number of lexical and grammar peculiarities. Clearly, further research will be needed to analyze lexical and grammar dominants and their functioning in English scientific texts.

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PROBLEMS OF EDUCATION AND METHODS OF TEACHING IN HIGHER EDUCATION

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ІНТРАПРЕНЕРСТВО ЯК ФОРМА УПРАВЛІННЯ ЛЮДСЬКИМ КАПІТАЛОМ В ОСВІТНЬОМУ ПРОСТОРИ

Анотація

В статті розглядається використання інтрапренерства як концептуальної методики викладання у вищій школі. Дослідження проблеми молодіжної міграції та конкурентоспроможності закладів вищої освіти України виявило необхідність вивчати освітню діяльність з точки зору підприємництва. Виокремлено найактуальніші інноваційні технології,