The Genre of a Grant Proposal in the Modern Teaching Context: Challenges and Possibilities

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Abstract. Nowadays attaining a grant is a criterion of success for an early-career researcher and an important indicator of effective work of a university as a research-based and corporate institution. During its thirty-year history in Russia, grants have become a traditional and even routine practice for every Russian PhD student and an early-career researcher. Like their international colleagues, Russian researchers often don't get sufficient support from their scientific advisor and an academic writing expert. A few attempts to improve current situation have been made in a number of research universities. One of such cases is a course "Grant Writing" that has been recently implemented in the English-language writing-intensive program of the Moscow Institute of Physics and Technology. The complex aim or the paper can be explained by the multidimensional nature of a grant. After characterizing a grant proposal as an up-to-date text genre in the international and interdisciplinary context in the framework of Genre Field Analysis, we consider the full process of applying for a grant in real-life environment and classroom settings. Finally, in the lens of Critical Genre Analysis, the qualitative analysis of the introductory sections of Russian grant proposals is conducted. The modern genre theory gives the basis for using a combination of methods in our research. In the lens of Genre Field Analysis, the sociopragmatic approach to the grant proposal provides an opportunity to get acquainted with the modern practices of applying for a grant, while Critical Genre Analysis may contribute to the deeper understanding of the text production mechanisms. The synthesis of theory and practice and its role could be seen in the qualitative analysis of grant proposals written by PhD students, attendees of the course "Grant Writing" at the Moscow Institute of Physics and Technology. The findings give evidence for insufficient disciplinary expertise and substitution of one genre − a grant proposal − by another one, more familiar for Russian students, − a research paper and an abstract. The obtained results testify in favor of the implementation of the course "Grant Writing" as well as other genre-based courses deeply rooted in the cross-disciplinary context and aimed at developing the researcher competence.

Keywords: genre, grant, grant proposal, Genre Field Analysis, Critical Genre Analysis

Жанр заявки на грант в современном образовательном контексте: перспективы и вызовы

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Аннотация. В настоящее время грант является критерием успешности молодого исследователя и важным показателем продуктивности университета третьего поколения. За свою тридцатилетнюю историю гранты стали реальностью и повседневной практикой для российского аспиранта и учёного. Как и их зарубежные коллеги, российские молодые учёные часто не получают достаточной поддержки ни со стороны научного руководителя, ни со стороны лингвиста-эксперта по письму. Немногочисленные попытки изменить ситуацию к лучшему и внедрить жанрово-ориентированные курсы в программу обучения английскому языку делаются в некоторых российских университетах, в частности в МФТИ. Комплексная цель статьи объясняется многоаспектной природой гранта: охарактеризовать заявку на грант как актуальный академический жанр в международном и междисциплинарном контексте в рамках анализа жанрового поля; рассмотреть процесс подачи заявки на грант «с нуля» в реальной жизни и образовательном контексте; с позиции критического анализа жанра провести качественный анализ письменных работ российских студентов. Современная концепция жанра даёт основание использовать совокупность методов в своём исследовании; в то же время применение смешанного метода в педагогической практике состоит из нескольких этапов. Так, в рамках анализа жанрового поля социопрагматический подход к жанру заявки на грант позволяет слушателям познакомиться с современными практиками подачи на грант, а критический жанровый анализ способствует глубокому пониманию механизмов текстопорождения. Эффективность сочетания теории и практики можно увидеть в качественном анализе письменных заявок на грант аспирантов – слушателей курса «Написание заявки на грант» в МФТИ. Анализ работ позволяет говорить о недостаточной подготовке аспиранта к написанию собственного проекта, а также частой подмене одного жанра – заявки на грант – на другие, более знакомые для аспиранта – статью или аннотацию к статье. Полученные данные свидетельствуют в пользу внедрения курса «Написание заявки на грант», а также других англоязычных курсов, направленных на развитие исследовательской компетентности студентов и аспирантов.

Ключевые слова: жанр, грант, заявка на грант, анализ жанрового поля, критический жанровый анализ

Academic Writing

Introduction

A grant is among the major productivity markers of the early researchers' career as well as an important criterion of effective work of any research university in Russia and abroad. In the business model of a modern research university, there is not only the vertical or state funding of a given laboratory but an individual or corporate initiative, which is getting to be a necessary prerequisite for obtaining a grant.

Russia was not a pioneer in setting up and developing a grant system. The first foundation in Europe to issue and administer grants was established in 1907 in France [1]. The first grant in the North American context is considered to be the foundation of the land-grant institutions under the Morrill Acts of 1862 and 1890. The major federal grant-giver, the National Institute of Health (NIH), was founded in the late 1870s, and its competitor, the National Science Foundation (NSF), was set up by the President Truman bill in 1950.

In contrast, Russia saw the abundance of international and national funding opportunities only in the 1990s. Thinking retrospectively, in the 2016 Decree "On the Strategy of Scientific and Technological Development of the Russian Federation", Vladimir Putin described two major stages of the state policy to financing science. The first stage (1991–2001) covers the period of transition toward the market economy and, as a result, a changing role of science in the development of the country. Symbolically, the first two federal funders were established in the 1990s: the Russian Foundation of Basic Research (1992) and the Russian Foundation for Humanities (1994). The foundations awarded grants on the principle of initiative and competitiveness; however, this principle coexisted with the targeted financing of leading scientific organizations known since the Soviet times. In the complex economic conditions of the emerging market economy, such a policy gave an opportunity to preserve the country's scientific and technological potential. On a different end, there were foreign grant givers that provided financial support to the Russian researchers, the most well-known of whom is the Open Society Foundation. In 1993-1994 George Soros invested about 100 million dollars to Russian researchers [2]. As a result, the system of grant funding had been established by the beginning of the 21st century [3].

The second stage (2001–2016) is characterized by the transition of Russia to the innovative, knowledge-based economy, with a significant increase in the amount of funding science. One of the positive features of that time is the integration into the global trend of corporatization of a research university, "drawn from the world of business", which emphasized the "marketing visibility and public image promotion, research and other financial collaborations with the corporate world" [4, p. 31]. Russia is responding to the "third mission" of a research university, whose function is to be a platform of entrepreneurship along with fulfilling its traditional function in organizing scientific research and education [5]. The third mission of a university, interpreted as either corporatization and entrepreneurship or the benefit for the society, emphasizes a growing significance of grants and emphasized grants in the new model of financing science.

Along with the upraise of university science, Russia witnessed the process of mergers of research institutions in the academic sector. Such a process happened in 2013 when the Russian Academy of Sciences, the Russian Academy of Medical Sciences, and the Russian Academy of Agricultural Sciences started their work under the roof of the Russian Academy of Sciences.

The process of monopolization of the state policy to financing science is getting to be underway in the third stage (2016 – present time). One of the major federal funders, the Russian Foundation for Humanities, lost its independent status while getting to be a structural unit of the Russian Foundation of Basic Research in 2016. In November 2020, the Chairman of the Government of the Russian Federation Mikhail Mishustin announced the merger of the Russian Foundation of Basic Research and the Russian Science Foundation (founded in 2013). The Russian Science Foundation has obtained its monopoly in the market of federal foundations.

Adapting the structure of the NSF to the domestic context, the RSF has its own mission and policy. While implementing the strategic goal for scientific and technological development of the Russian Federation, the foundation has been working on the prioritized areas of science in the Presidential program of megagrants. The megagrants are aimed at "effective science", emphasizing the need for the "transition to advanced digital, intelligent production technologies, robotic systems, new materials and design methods; personalized medicine; environmentally friendly and resource-saving power"[1]. With the budget for 2023-25 to be 121.1 mn roubles, all these initiatives are possible through systemic support or interaction of large companies and government bodies of the Russian Federation with small and medium-sized innovative, scientific and educational organizations located in Russia and abroad. The program sponsors basic and exploratory research by international big collaborations and small-number research groups, with the major foreign partners of the foundation being Germany, France, and China.

Since 1991, Russia has created a new model of science organization with grants playing its own unique role. Despite the obvious positive results in the state policy of financing science, its effect is rather contradictory. One of the targets of criticism has been a poor process of expertise that prevents the applicants from considering the process of winners' selection to be open and competitive [6; 7]. The quality of a grant proposal as a key factor of success is getting to be of increasing interest for potential grant writers. As the international cooperation has been of key priority and the English language is a language of science, a grant proposal is considered among the powerful academic genres in the global research context.

However, in the educational context, writing a grant "is a part of the hidden curriculum where grant-writing skills are often taught informally with a PI (principal investigator) [8, n/p]. Such a trial and error method of "learning as you go" seems to be quite natural for many principal investigators and faculty. On the other hand, the need for formal grant proposal education for higher education instructors and its influence on the success is the focus of Kristin M. Shuman's research [9]. No matter if there is any correlation between education and winning grants or not, for PhD students, such informal grant proposal education is most often replaced by "home-grown workshops taught by any combination of research office personnel and grant-savvy faculty" [10, p. 42]. Special courses on grant writing for final-year PhD training are offered by University of Washington, Emory University, Ludwig Maximilian University [11].

Especially dramatic is the teaching context in Russia. On the one hand, students face an increasing pressure to become members of international discourse community. On the other hand, they don't get enough guidance in the world of grants due to an inadequate system of writing instruction both at university level and in emerging writing centers. The current political situation has made the process of integration in the global community even worse. Few attempts to change this situation are getting to be even more valuable.

Related work

An extensive literature on grants provides an insight into the complexity of the genre of a grant proposal. A big part of existing works is aimed at grantsmanship – the art of obtaining grants. These are guides, handbooks, and manuals that consider a grant as a bid with the funder and pay much attention to the budget [12–15]. As a rule, these books are focusing on the given funder, the most important of whom are the federal grants as a whole [16] or in particular the National Science Foundation [17] and the National Institutes of Health [18].

As a grant is about competition and peer review is the process of choosing the best grant proposal, parameters of success are of great

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[1]   Strategy for Scientific and Technological Development of the Russian Federation. URL: https://tadviser.com/index.php/Article: Strategy_for_Scientific_and_Technological_ Development_of_the_ Russian_Federation (accessed: 02.03.2023).

importance. The quality of research known as the scientific merit is a key factor of the peer review. For example, the major reviewing criteria for the NSF are intellectual merit and "broader impacts", seen as the value for the society. Some researchers – Bornman and Marx – highlighted the "Anna Karenina principle", applying it to three essential fields in contemporary science – peer review of research papers and grant proposals (funding and journal space), citations of publications (reception), and new scientific discoveries (recognition) [19]. All these achievements are seen as essential factors of success, and the resources that are scarce would inevitably lead to failure. Such a social constructivist view is also developed in the context of grant writing with the focus on a principal investigator (PI). Thus, Tohalino and Amancio [20] considered bibliometric parameters of the principal investigator – the affiliation, number of publications, and citation index to be of equal importance than a research topic itself.

Finally, substantial research is devoted to the writing product – a grant proposal. The genre of a grant proposal is put in the context of scientific writing [21–22], compared against a scientific research paper [10], a PhD dissertation [23], or an abstract defined as a subgenre of a grant proposal [24]. On the other hand, a grant proposal and its discursive features has become a center of research in multiple works. For example, Boyack et al. [25] distinguished five linguistic parameters: the length of the grant proposal; the Gunning fog index for writing clarity; male-oriented language, the language based on the general vocabulary, not the overuse of specific terminology; positive emotional language; the story arc of the emotional words. David Markowitz [24] explored the writing style of NSF grant abstracts. The results of his study "contradict the NSF's call to communicate science in a plain manner" [24, p. 1]. European scholars continued to consider the correlation of the writing style and success of grant applications. Abstracts, project descriptions, and CVs are analyzed according to the following categories: discourse and thinking style complexity, clarity of the text, and confidence in the proposal

[25]. The findings showed that more complex texts have a positive effect as well as a more narrative style and the use of certainty words and causal words.

The wealth of sources and resources do not give emphasis on the real-life pedagogical cases of teaching a grant proposal in the Russian modern sociocultural context. Here we are trying to fill the gap by providing our own experience of teaching the course "Grant Writing", launched at the Moscow Institute of Physics and Technology for the first-year PhD students in Fall 2022 semester. The course attracted much attention, with about 100 students enrolled in the course. As this is a semester-long course, its duration is 30 academic hours, with seminars conducted on a weekly basis. As I am a course designer and a teacher, the paper will present my own perspective in the authorial stance.

Aim and Objectives

In this paper, we examine the genre of a grant proposal in the Russian sociocultural and pedagogical context and explore the most effective method in teaching "Grant Writing" course. To achieve this aim, the following objectives should be addressed:

1. Seeing a grant proposal as a powerful academic genre that is deeply rooted in social practices, in the framework of Genre Field Analysis;

2. In the framework of Critical Genre Analysis, conducting the qualitative analysis of the specific cases of the introductory sections of Russian grant proposals.

We hypothesize that the course provides a good opportunity not only to see the genre of a grant proposal as a writing task but put it in the Anglo-American sociocultural professional context. The mixed-methods approach to teaching seems to have a great potential for integrating the rhetorical situation with the requirements of audience, purpose, and genre.

Methodology, materials and methods

The research exploits a mixed-methods approach that could be explained by the complex nature of genre in discourse analysis and writ-

ing studies. Along with the theoretical methods, the methods of data collection and data analysis are used. In the teaching context, we applied the Systemic Functional Linguistics approach in the so-called curriculum cycle [26]. The curriculum cycle has three major stages, and each of them has its own outcome as well as the theoretical concept.

Stage 1. Building the Field: Genre Field Analysis.

In the context of modern genre theory, a genre is seen as a "framework for social action" [27, p. 19]. Having a textual and socio-cultural dimension, genres are far more than just textual practices. The leading approach used in our research is the Genre Field Analysis that involves "no single method, qualitative or quantitative, rhetorical or social" [28, p. 51]. The mixed methods used in the GFA are rhetorical analysis (content and textual features), genre analysis (textual features and genre system), and social perspective (genre system and play theory).

The term "field" is defined as a "way to demarcate the space where mediation, or transformation, occurs" [29, p. 2]. Genre fields are understood through play theory where various agents play. Christensen et al. are making an analogy of a football field that "might be seen as a genre field, but each game played upon that field will have its own dynamics" [29, p. 3].

Genre analysis is an essential method offering both a theoretical and applied perspective, serving as a contextual launching pad for the text production. Genres are "linked together in a way that constitutes a more coordinated communicative effect" [29, p. 3]. In this way they are seen as key pedagogical objects and practice. Guided by the New Rhetoric proponents, genres are put in their professional context as complex, fluid, and dynamic entities. Their nature is explained by S. Auken (2021) in his concept of "embedded genre" – "a genre that is included within the framework of another genre" [30, p. 164].

Stage 2. Modeling the genre or deconstruction stage: Critical Genre Analysis.

Professor Vijay K. Bhatia suggests the term "Critical Genre Analysis", which ranges from "close linguistic studies of texts as products to investigations into the dynamic complexities of discursive practices of professional and workplace communities, and further to a broad understanding of sociocultural and critical practices often focusing on processes of interpreting these textual genres in real life settings" [31, p. 9].

At this stage, the source texts of grant proposals are analyzed holistically where the discursive features are in line with the discursive practices.

Stage 3. Independent writing: Case studies and data analysis.

While integrating the rhetorical analysis and social perspective along with the genre analysis, case studies method is used. Case studies method is defined as a "strategy of inquiry in which the researcher explores in depth a program, event, activity, process, or one or more individuals" [32, p. 13]. Forty-five academic research proposals that are the materials of our study are analyzed.

In classroom settings, a grant proposal is analyzed holistically in the sociocultural context (field). What is more, all constituent text genres are both analyzed and produced in the learning environment. The SFL and New Rhetoric approaches to genre analysis are used. Teaching classroom genres in academic settings or real-life dynamic genres in the professional settings is calling for the integration of the explicit genre pedagogy and implicit genre analysis.

Results

Systemic Functional Linguistics approach is the organizing principle of our work. First, the discursive practices and generic features of a grant proposal are set in the professional settings, while the students learn the funding opportunities and look for the appropriate grants, taking into account the eligibility criteria and the mission statement of the funder. Second, the discursive features of a grant proposal as a product are given in the academic settings; the introduction sections of PhD students are chosen for analysis. Finally, the students' introduction errors are reported and interpreted.

Sociopragmatic approach to the genre of a grant proposal: Understanding discursive practices (Stage 1)

Being a social practice, applying for a grant is far beyond writing issues. "Total proposal building" is an "art, a science, a program, a system, a game, a way of doing business" [33, p. 7]. Knowing the diversity of funding opportunities is an essential step towards understanding discursive practices. Grants can be individual and collaborative, short-term and long-term, graduate study and research grants. As research grants are in focus of our course, it is good to specify the definition of a grant and apply it to a research context: "A grant is funding provided by a charitable giving foundation, public charity, or a government agency to a nonprofit university (in our case – university) that enables the nonprofit organization to perform specified activities (research) for the common good" [34, p. 1]. Research grants awarded to institutions usually cover costs of investigation and clinical trials. Research grants for individuals are called fellowships.

An essential product of the grant is a grant proposal. A grant proposal is seen as an academic genre as it contributes to the gaining of socio-academic excellence commitment to the truth, to academic integrity, to social justice, and to innovation and research [35]. Considering the socio-academic practices is an essential step toward the grant-writing socialization, known as the "process of learning the norms and expectations, associated with obtaining sponsored funding" [8, p. 315].

Sponsored funding can be from diverse sources and of different types: international and domestic, agencies, foundations, and corporations. The grant and contract marketplace comprises different sources of funding – individual giving, bequests, foundation grants, corporate giving, federal purchases for goods and services, non-defense non-compensatory procurement, grants-in-aid to state and local government, state and local non-compensatory procurement, federal, state, and local government accounts, corporate giving [33]. Among the diversity of different types and formats of funding, we are focusing on three most well-known international Anglo-American federal funders: the European Research Council grants (ERC), the National Science Foundation (NSF), the National Institutes of Health (NIH). All of them have their own mission and eligibility criteria.

As a classroom activity, we used the Yellow Pages approach when each PhD student is looking for the funder that best fits his discipline, goals, and eligibility criteria. The mission and evaluation criteria of each funder can be seen in specific cases of the grant competition titles and RFP (request for proposals) that may take the format of "Dear Colleagues" letter or a synopsis. The analysis of the Big Ideas of the NSF gives a clue to the frontier areas of science with "innovation" and "impact" to be the most frequent nouns that are telling about the mission of the funder – the intellectual merit and broader impacts.

The search for real-life grant opportunities do develop the digital literacy of students and could give an insight into the research topics and fundable ideas. The landscape of science funding comprises different R&D (research and development) global science strands: basic research that "seeks to gain more complete knowledge or understanding of the fundamental aspects of phenomena; applied research; and development, "directed toward the production of useful materials, devices, development of prototypes and processes" [36, p. 4-5]. According to Shahar Avin, "universities, colleges, and charities provide 27% of basic research funds" [37, n/p].

The type of research across these three categories is called "transformative research", defined by the United States National Science Board as "a range of endeavors which promise extraordinary outcomes, such as: revolutionizing entire disciplines; creating entirely new fields, or disrupting accepted theories and perspectives" [Cited in 37, n/p].

Thinking of the transformative research brings us to the necessity of planning your research which implies the knowledge of rhetorical norms and conventions of a grant proposal.

The readers of a grant proposal are a wide range of specialist and non-specialist audiences, including disciplinary researchers, interdisciplinary scholars, industry professionals, government bodies, media representatives, and the general public. All these audiences are considered while addressing the evaluation criteria of frontier knowledge – timeliness and risk, similarity and disciplinarity, interdisciplinarity and pasteuresqueness, which seeks both fundamental understanding and social benefit [38].

The crossroads of different funding opportunities with mission and evaluation criteria add up to the complexity of a grant proposal as a genre, which is the focus of the next section.

Critical Genre Analysis: Understanding discursive features (Stage 2)

This section deals with the textual production of the grant proposal, which has traditionally been the most frequent topic of both grant research and teaching practice [39].

A grant proposal is an umbrella term of several documents whose function is to reach the international collaboration as well as individual purposes. All these documents that constitute the grant proposal macrostructure can be divided into six types: "project contents; budget matters; personal statement; publication samples; ethical issues; evaluation matters" [39, p. 2256]. The first three types comprise the subgenres of a grant proposal: a narrative that consists of several sections: aims, background, preliminary studies, methods; abstract; budget table and narrative; biographical note (C.V.).The narrative, budget, and biographical note could illustrate the interdiscursivity, with the dialogue of science, journalism, and business discourses. The text genres are also in dialogue with each other (intertextuality), forming the genre system and at the same time having an independent role and function in this system.

Seeing the genre of a grant proposal as interdiscursive and intertextual, the introductory part helps students see a complex nature of the narrative. The task is to write an introductory part of a grant proposal that should consist of the following structural sections: the front matter (title and key words), the narrative, the back matter (references list). Drawing on Joshua Schimel's semantic moves, the introduction consists of the opening paragraph ("context"), the "background" which forms a transition from "They Say" to "I Say", as well as the "challenge" that states the aim and objectives of the research proposal. The introductory part reflects the hybrid nature of a proposal with its interdiscursivity principle. Its interdisursive nature is seen in the combination of the narrative and science, with science being about telling stories. While viewing this perspective, stickiness is what really matters for the audience. Stickiness is explained through the lens of simple, unexpected, concrete, emotion, story [40]. Simple and unexpected means a hook, concrete and credible implies convincing and citable, whereas emotion is about the emotional involvement of the audience.

Case Studies: Collecting and analyzing data (Stage 3)

The analysis of the student introductions demonstrates the following results. The materials are the 45 PhD student introductions of research projects in the following disciplines: 45 introductory sections across the disciplines:
- Higher-Spin Theory and String Theory (3)
- Computer Architecture and Vision (4)
- Plasma Studies (5)
- Theoretical Physics (5)
- Applied Mathematics (3)
- Biomedicine (8) and Genetics (2)
- Bioengineering (2)
- Machine Learning (6)
- Meteorology (2)
- Space Research and Aeroelasticity (5).

Although all the mistakes are important (see Table below), the genre-related and academic style sensitive errors are of more interest for our analysis.

A grant proposal is considered a high-stakes genre of academic and professional writing; however, for many Russian students it was their first encounter with this genre. Students substi-

tuted the genre of a grant proposal by a more familiar genre of a research paper (1) or a research paper abstract (2):

(1) *In this paper, a synthesized non-linear Vortex lattice method for various types of aircraft is proposed. The main advantages of this method are high computational speed, low computational cost and ability to solve equations for unsteady flow for non-linear case.*

(2) *As the core unit of the intelligent transportation system, the intelligent vehicle integrates various technologies such as automatic control, artificial intelligence and computer vision, and is a cross-integration product of computer science, pattern recognition and intelligent control and so on. At present, intelligent vehicles have become an important indicator of a country's scientific and technological strength and industrialization level and have become the focus in both civil and military fields. Environmental perception and motion control are the key technologies to realize intelligent driving. However, the complex and varied driving environment of intelligent vehicles, the high nonlinearity and time delay of the vehicle's own dynamic model make high-precision real-time environment perception and high-performance motion control in complex environments become a challenging problem. In recent years, deep learning (DL) and deep reinforcement learning (DRL) methods have provided a new technical approach to solve this problem. However, the existing DL and DRL methods usually perform parameter optimization based on gradient descent. There are often problems such as the difficulty in generalization and avoiding local minimum values, together with huge training costs due to a large number of search and optimization calculations. As a result, DL and DRL methods for intelligent vehicle perception and motion control have problems of insufficient adaptability and low efficiency. So, we focus on the environment perception and motion control of intelligent vehicles in complex environments, aiming at the research of fast and high-precision object recognition methods based on deep*

neural networks, and efficient online learning control method for continuous motion in large-scale state space. The ultimate goal is to reduce the training time cost while maintaining or improving the performance.

The excerpt (1) explicitly uses the noun "paper" while the excerpt (2) provides an abstract to the paper in the "context" paragraph.

The "context" paragraph in which students have to tell a story and engage the readers has become one of the most common pitfalls in writing. The students followed two strategies. First, there is oversimplification of the subject matter for the sake of the hook. While writing about exchange correlation effects in liquid metals and plasma at finite temperatures, the writer emphasized an "incredibly complex problem" of using supercomputer simulation set in the context of high technology world (3):

(3) *Today is the time of high technologies. Giant corporations and businesses strive to create the highest quality and irreplaceable devices to improve human life. However, any innovation always means a challenge to science, which should develop ways to implement it, provide economic benefits, take care of the environment, etc. No technology is complete without materials that must satisfy engineering criteria such as durability, electrical conductivity, refractoriness, redshift, or even superconductivity. Therefore, researchers are faced with the aim of discovering a material with suitable properties. An experimental study of such properties is extremely expensive and time-consuming. The most effective solution to this incredibly complex problem is the use of supercomputer simulation, which allows one to obtain the information of interest relatively quickly and cheaply. But here we are limited by theoretical concepts, mathematical implementation and computational capabilities. The development of first-principles or ab initio approaches is at the center of condensed matter physics and quantum chemistry nowadays.*

Another example. While introducing reinforcement learning and artificial agents, the student used a quote as a hook. The quote, words

Table

Grant Proposal: Introduction Section Criteria

Criterion	Excellent (4 pt)	Satisfactory (3 pt)	Needs work (2 pt)	Insufficient (1 pt)
Stickiness	Your introduction has all the features of a good and effective story: simple, unexpected, concrete, credible, emotion, story.	Your introduction has some of the features of a good story.	The interdiscursivity of the introduction is missing: the text is bound to either science or journalism or narrative.	There is no story at all.
Focus	Your introduction to a grant proposal has a layout of a well-planned project with a key idea that is innovative and supported by scientific argumentation.	Grant proposal has a project description supported by evidence; however, the idea could be not fundable or doesn't align with the mission of the funding agency.	Grant proposal seems to have no well-thought plan with no sufficient scientific argumentation.	Grant proposal doesn't have an arguable idea and often diverts from the topic of the application.
Context	The opening paragraph of your introduction sets the general context of the proposed research, with a setting and characters.	The opening paragraph of your introduction sets the context of the research field; however, the text has more than two characters.	The opening paragraph doesn't set the area of proposed research. The general context seems to be missing.	No context.
Background	Your text has a concise literature review (LR) that justifies the research problem. The in-text citations are in place.	Your text has an incomplete LR with sources that are obsolete or irrelevant.	There are no in-text citations.	Your text lacks LR.
Challenge	The text provides a research question, a hypothesis, a goal and objectives. They are clearly stated.	The text does have an implicit research question, not clearly stated. There is no logical transition from "They say" to "I say".	Some of the research components are missing.	No goal and objectives.
Organization	Your introduction has all the required constituent components: title, key words, the link to the funder, References list. All the sections are coherent and cohesive.	Your introduction has the majority of the required components, with some of them missing. The introduction lacks coherence as some of sections seem to have more weight than the others.	Your introduction doesn't have the majority of key components. The submitted work lacks coherence and cohesion.	The organization is poor.
Language and style	Proofreading and careful editing is done to improve correctness. Sentences vary in length and structure. The introduction demonstrates the rhetorical and stylistic awareness of the project narrative vs the scientific component.	Some proofreading is done. Some sentences vary in length and structure. The introduction is stylistically homogeneous and doesn't take the audience into account.	Almost no proofreading attempts. Sentences lack variety in length and structure. Language choices demonstrate the absence of the rhetorical awareness.	The introduction needs thorough proofreading. Mostly simple, choppy sentences.
Conventions	Punctuation and capitalization are correct. The References section follows consistently the given style.	There are some punctuation and capitalization issues; the referencing style is inconsistent.	There are several punctuation and capitalization mistakes; the proposal doesn't meet any referencing standards.	There are plenty of punctuation and capitalization mistakes. The proposal demonstrates the lack of referencing style awareness and needs thorough editing.

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said by the famous physicist Richard Feynman, links artificial agents to the fields of science – artificial intelligence and neurophysiology (4):

(4) *A defining aspect of intelligent behavior is the ability to actively adapt to changes in the adverse environment for survival and reproduction. Humans and other higher animals, as a result of natural selection, are exceptionally fit for this task. However, we still have a very limited understanding of the organization principles of these natural agents that lead to such a marvelous adaptability and autonomy. So no wonder, there are no artificial agents comparable in effectiveness to their natural counterparts until now. As Richard Feynman has said: "What I cannot create, I do not understand." In this case, the statement, likely, holds backwards too, since it took billions of years for blind natural selection to succeed in creating our brains. That's why artificial intelligence and neurophysiology should go hand in hand in order to make robust artificial agents–on the one side, and build a strong understanding of our minds–on the other.*

The hook can also be a definition of the main term. That brings us to the second strategy that is related to the disciplinary conventions. In biomedical proposals, the disease (leukemia) is contextualized and the key words are introduced: *leukemia-leukemic cells – stromal cells – bone marrow cells – bone marrow stromal and leukemic cells* (5):

(5) *Leukemia is a large group of blood diseases, including the most aggressive and common types of blood cancer, which are difficult to cure. Despite the development of modern therapeutic approaches, a huge number of patients faces a situation where the leukemic cells become resistant to classical drugs. As a result, 15–70% of patients with various types of leukemia have a relapse of the disease after the first course of chemotherapy. Leukemia starts in the bone marrow due to mutations in the genome of blood-forming cells. Thus, stromal cells, the main type of bone marrow cells, forms the environment and have a significant impact on the course of leukemia and the effec-*

tiveness of treatment. Therefore, an urgent task is to identify clear interactions among the bone marrow stromal and leukemic cells, which lead to leukemia drug resistance. This will improve therapies to prevent relapse before it becomes a serious danger to the patient.

Disciplinary conventions are an effective style guide in case of theoretical mathematics – "mirror symmetry" provides the context and introduces the key word, though the link between the context and "problems" is vague (6):

(6) *Mirror symmetry is an advanced modern mathematical theory that came from the physical theories of particles, namely from the topological string theory. There are still many open problems in this area that require deep mathematical analysis. One of the problems is the calculation of the so-called out to be rather complicated even in the case of relatively simple and seemingly understandable classes of spaces, such as Calabi-Yau toric hypersurfaces. On the one hand, there is a theory that allows us to reduce the calculation of some Hodge numbers in this case to combinatorics, on the other hand, the structure of these invariants remains mysterious and extremely nontrivial.*

The word "problem" is among the most frequently used ones in a proposal argument not without reason. The proposal argument consists of three constituent parts: description of the problem – proposed solution – justification. The description of the problem that should be set in the context of modern science often starts with the word "problem" (7):

(7) *The problem of developing a unified theory, encompassing both the Standard Model and a quantized theory of gravity, has seen little definitive progress since it was postulated more than a hundred years ago. That is not to say that no results have been achieved, as two parallel descriptions of such a theory were developed in the last 50 years. The string theory, proposing an elegant solution of substituting point particles for lengthy objects has been developed in multiple variations. All of them feature a spectrum of massive excitations, associated with particles. In the meantime, the higher spin the-*

ory, where the authors' scientific background lies, gave rise to a widely applicable mechanism of unfolded equations and allowed for effective perturbative analysis. Spectrum of this theory is nevertheless strictly massless. Hope remains that the two theories can be connected, with string theory being expressed as a spontaneously symmetry broken extension of the higher spin theory. Our work focuses on what this extension is, and the exact conditions, which the symmetry breaking should obey to, when it arrives at the correct masses.

Analyzing the most frequently used words, the results demonstrate the neglecting of the general academic vocabulary in the "challenge". Students either used the words *objective, aim, subtask* interchangeably or replaced *hypothesis* by *conjecture*. Our hypothesis is that many students do that subconsciously, acknowledging the lack of expertise. The excerpt (8) shows an attempt to make the Challenge part in a professional manner:

(8) *We are going to study GAM (geodesic acoustic mode) and, if seen, over counterparts of zonal flows and their interactions with turbulence using HIBP (heavy ion beam probe) and, whenever is possible, Langmuir probes. The HIBP setup for a Russian nuclear fusion research reactor T-15MD is specifically designed to study potential oscillations in most part of the plasma possible, considering high magnetic fields and powerful additional heating. All received data will be analyzed using Fourier, coherent and bispectral analysis, in order to provide the most complete information to our international crew. Then this data will be used to create a numerical model of plasmas, describing the interaction between zonal flows and broadband turbulence. We expect these model predictions to align with experimental results. The latter will be based on the already existing plasma codes, such as ASTRA.*

To achieve this ambitious goal, we need to go through several smaller steps. First of all, we should describe the frequency and radial structures of all observed zonal flows counterparts. Secondly, an important part of it is to show the correlation between the zonal flow parameters, such as frequency or amplitude, as well as turbulence intensity. Research focused on aligning all the above-mentioned parameters to non-machine-specific parameters, such as safety, energy lifetime and others, will also be useful for further modeling.*

The credibility and evidence that provide justification of the solution is one more difficulty for Russian students. The "background" that has to build credibility was often written in the narrative style. While providing a story of this or that phenomenon or theory, students used mainly the author-prominent citations (9):

(9) *A very interesting question arises about the origin of Moore-Rott-Sears point in viscous flows, the answer to which can be found in the article by Timoshin (1996). Timoshin considered the boundary layer on the surface moving downstream and under the effect of a given unfavourable pressure gradient of controlled intensity. For the analysis, Timoshin used the ideas of the marginal separation theory suggested by Ruban (1982) and Stewartson et al. (1982)*

At the same time students tend to retell the source they particularly liked (10):

(10) *A configuration is needed so that advantages of Reconfigurable intelligent surface (RIS) aided networks are realized. A work [3] contains a study of joint optimization transmit precoding and RIS elements phase shift. The goal is to find such a phase shift where a channel capacity, which directly relates to data rates, is maximum. Authors found that, when optimally configured, RIS substantially increases the channel capacity. Moreover, as results suggest, a complex configuration process is indeed essential since no configuration at all (random phase) almost cancels out the gain in the channel capacity. An important part of such an algorithm is input data, which is information about channels between RIS, base station and user device.*

Constructing the authorial identity is one more interesting issue that can be seen in the Background. In the excerpt (11), there is a ref-

erence to the article, which the author of the proposal has co-authored. At the same time an expression "our team" is used in order to refer to the research team that is involved in the current project they request funding:

(11) *We have found [8] that the process happens in a fundamentally different way − metal ions rigidly bound water as a ligand, blocking, as we think, the synthesis of Zundel cations (H_5O^+), but they also prevented the participation of bound water in the formation of mobile hydronium cations (H_3O^+) decreasing number of charge carriers in the system. However, our team has found that an addition of a strong chaotropic agent such as ethanol alcohol leads to an increase in conductivity for several orders under conditions of constant humidity.*

The academic identity which is unique and not collaborative is constructed with the help of the first-person narrative. The author is highlighting his personal contribution in excerpts (12) and (13):

(12) *The method I develop is based on the insertion of the oxygen-18 isotope label which includes two approaches: the first one is based on the mechanism of enzymatic oxidation of compounds with P450 cytochromes, which are the main metabolic enzymes [7].*

(13) *To date, I have conducted a number of experiments that have proven the effectiveness of the approach provided. Metabolism study of testosterone in $H_2^{18}O$ showed that each obtained metabolite contains one isotope label, which corresponds to the number of carbonyl groups. On the other hand, metabolism study of the local anesthetic bupivacaine using the second approach revealed more than 35 metabolites, with 20 new ones, which have not been previously described in the literature yet.*

The introduction helps students see a part as a whole: *context − background − challenge* moves can reveal both the potential and challenge of a grant proposal for Russian students. First, the set of documents under the umbrella term "Introduction" gives an opportunity to experience intertextuality and interdiscursivity in its cognitive and stylistic complexity.

Second, the task aligns the Critical Genre Analysis with the socio-rhetorical approaches, thus making the Genre Field Analysis at work. The Systemic Functional Linguistics approach helped us better organize the explicit teaching of the genre, deal with its sociocultural, rhetorical, and textual features, and produce the texts in accordance with them. At the same time, our researcher's task was to collect the introductory sections and, in light of the theory, focus on the genre-related errors. These errors are the inconsistency with the genre requirements and disciplinary conventions, difficulties in writing a literature review and formulating a research question.

Finally, the constructing of a first-person viewpoint could serve as an evidence of the reluctance to model the learning context of a collaborative grant proposal.

Discussion

Teaching academic writing is often considered to be dealing with primarily language issues. However, focusing on just linguistic issues neglects the fact that "developing an argument is the overarching requirement" [41] of academic writing. Our research has demonstrated that the sociocultural and rhetorical landscape of the genre of a grant proposal is also about the evaluation criteria which comprise rather diverse factors: from research skills and intellectual merit to style and textual features [24] and ability to work in a team [42].

The qualitative analysis of introductory sections of Russian grant proposals gives evidence that the most serious errors are from the lack of disciplinary expertise and research skills. First, students used the informational "all about writing" [43], an extended context paragraph. The challenge paragraph with a clearly formulated research question was not as clear, which signals the reluctance of students to use the problem-solution text. Second, the rewriting of bits and pieces of a research article or a research article abstract, we argue, could be the result of the students' acquaintance with the a posteriori writing, based on the obtained results, and the lack

of understanding of the promissory texts. On the whole such rewrites suggest a subconscious desire of students to hide their lack of interest in the research. Sadly, Russian PhD students like their American peers feel they "don't have anything original to say" [43, p. 226]; such a "vicious cycle of cynicism" is perhaps the major reason of their misperception of a grant proposal.

Neglecting of the genre conventions stem from the lack of generalized writing skills. For example, poorly written literature review (background paragraph) or the use of the first-person viewpoint is the result of poor system (or no system) of academic writing education at the university level. In the Anglo-American universities, the four-stage schema of students' development as writers has been suggested [44] and partially realized. It is aimed at the step-by-step academic writing acquisition, from nonacademic writing, generalized academic writing (first-year composition courses), novice approximations of particular disciplinary ways of making knowledge (early courses in the major) and, finally, expert, insider prose (advanced courses in the major).

Conclusion

Applying for a grant is considered to be a core professional research process [45]. In the modern research context of Russia, grants are getting to be an essential factor of the "effective science" in a research university. Being a real-life practice, applying for a grant and grantsmanship as well as the genre of a grant proposal is attracting more and more attention of PhD students and early-career scientists.

We share our own perspective how the course "Grant Writing" can contribute to the multitask objective: while putting a grant proposal in the Anglo-American rhetorical situation, build a learning context in which compos-

ing a grant proposal is more than just a writing task. In contrast to the majority of works that focus either on the sociocultural context of grantsmanship in a certain country or a certain funder, or purely language issues, we advocate a mixed-methods approach while considering the theoretical underpinnings (Critical Genre Analysis and Genre Field Analysis) as well as practical implications (Case Studies). As "professional discourse operates simultaneously at four rather distinct levels, i.e., text, genre, professional practice, and professional culture" [31, p. 9], we have found such a holistic approach to be the best one. Synthesizing the genre-based and process-based teaching, the SFL approach was proven to be the most helpful one in our classroom practice. The curriculum cycle managed to better organize the explicit teaching of the genre, see its sociocultural, rhetorical, and textual features, and produce the texts in accordance with them. At the same time, our researcher's task was to collect the introductory sections and focus on the genre-related errors.

The introduction has become a test for student preparation for research and disciplinary expertise. In line with R. Steiner, we claim that "most proposal failures can be directly linked to the absence of fundable problems, good ideas or achievable solutions" [33, p. 96]. The most common errors – substitution of one genre by another genre, the absence of the scientific argumentation realized in the poor research question, an insufficient literature review – could testify in favor of the lack of research background and systematic academic writing practice.

We hope that the course "Grant Writing" provides more possibilities than challenges for Russian students and teachers in their search for effective professional communication and the best method how to reach it.

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