



Интеграция гуманитарного курса на иностранном языке с целью развития лидерских качеств у студентов естественнонаучных специальностей

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АННОТАЦИЯ

Введение. Лидерство как предмет обучения стало неотъемлемой частью миссий многих высших учебных заведений в соответствии с политикой ООН, которая постулирует то, что эффективное и инклюзивное лидерство является важнейшим фактором успеха всех миротворческих операций. Однако при обучении студентов естественнонаучных специальностей лидерству часто возникает противоречие между целями и видением своей миссии самими обучающимися и гуманитарным контентом программы по дисциплине. Для разрешения данного противоречия был применен комплексный педагогический подход, интегрирующий изучение лидерства в курс по иностранному языку на основе социально-когнитивной теории.

Цель статьи – проектирование гуманитарного курса для повышения качества обучения лидерству студентов естественнонаучных специальностей с применением комплексного подхода.

Материалы и методы. Гуманитарный курс «Лидерство в науке, промышленности и образовании» был интегрирован в обучение иностранному языку Департаментом иностранных языков Московского физико-технического института (национального исследовательского университета).

Чтобы оценить влияние курса лидерства на восприятие студентами и их вовлеченность в процесс преподавания, был проведен опрос, в котором приняли участие 361 человек с применением метода описательной статистики, включающий среднее значение и среднеквадратическое отклонение результатов. Несмотря на то, что вопросы имеют довольно широкий диапазон оцениваемых параметров, средний балл остается высоким ($M=от\ 4,71\ до\ 3,17$; $SD=0,31$).

Результаты. Полученные результаты свидетельствуют о том, что слушатели курса высоко оценили учебную программу, поскольку все темы и мероприятия были тщательно подобраны, чтобы сделать задания достаточно сложными и интересными для развития творческих способностей студентов. Доступность учебных материалов и заданий составила 4,71%, баланс между устными и письменными заданиями - 4,51%, методы обучения - 4,44%, возможность получить полезную обратную связь - 4,43%. Даже наименее позитивное отношение участников – вызвал ли курс у них интерес и мотивацию стать лидерами – достаточно велико (3,17%), чтобы расценивать его как отрицательный результат.

Заключение. Комплексный педагогический подход, основанный на социально-когнитивной теории и концептуальной структуре курса лидерства, позволяет создать условия для расширения возможностей преподавателей и разработчиков образовательных программ интегрировать развитие коммуникативных навыков межличностного взаимодействия в обучение студентов естественнонаучных специальностей.

КЛЮЧЕВЫЕ СЛОВА

лидерство, естественнонаучная специальность, английский язык, независимые / интегрированные навыки, комплексный подход

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Integration of the “Leadership” course in STEM universities using a complex method

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ABSTRACT

Introduction. STEM graduates are currently in high demand as they are considered to be the driving force of innovation and development in all areas of the modern society. It fosters the necessity of not only highly-qualified specialists at the working places but effective leaders with essential leadership knowledge and skills. Leadership as a subject of study has become an integral part of the missions of many higher educational establishments in accordance with the UNO policy which postulates that effective and inclusive leadership is the most important factor in the success of all peacekeeping operations. The proposed complex method in teaching soft leadership skills to Master's degree students in foreign language classes increases the motivation of students ensuring the study of the discipline in a contextualized setting. The described integrated pedagogical approach, combining the study of language and humanitarian content within the framework of social-cognitive theory, is a successful solution for the formation of leadership qualities in students of natural sciences through (via) a foreign language.

The aim of the article is to contribute to improving the quality of leadership training for students of technical and fundamental sciences.

Materials and methods. Master's degree students at the Department of Foreign Languages of Moscow Institute of Physics and Technology (State Research University) were enrolled into the course “Leadership in Science, Industry and Education”. Being conducted exclusively in English, the course provides a wide range of different activities for practicing and refining the learners' B2-C1 language proficiency while acquiring leadership knowledge. By being continuously engaged in practical communication scenarios, they build the necessary competence to excel in academic, industrial and educational environments. The descriptive statistics method including the mean and sample standard deviation of the answers scores was used to summarize questionnaire responses of the conducted survey.

Results. The obtained results demonstrate significant necessity of introducing liberal arts education programs at STEM universities to make the students familiar with the current social cognitive principles. To measure the impact of the leadership course on students' perception and engagement in leadership efforts there was conducted a survey with 361 participants and 14 questions. Despite the fact that the questions have quite a diverse range of evaluated parameters the mean score is high ($M = \text{from } 4,71 \text{ to } 3,17; SD = 0,31$). The findings indicate the course learners highly evaluated the course curriculum as all topics and activities were thoroughly chosen to make the tasks quite challenging and sophisticated for arousing the students' interest and creativity. The course materials and assignments availability made up 4,71%, balance between speaking activities and writing tasks - 4,51%, teaching methods - 4,44%, ability to receive useful feedback on the performance - 4,43%. Even the least positive participants' attitude - if the course made the learners feel interested and motivated to become a leader – is quite high (3,17%) to consider it as a negative result.

Conclusion. The complex pedagogical approach based on social cognitive theory and conceptual framework of the leadership course offer a promising avenue for empowering teachers and course designers to foster the development of soft skills through leadership ideas in STEM students.

KEYWORDS

leadership, STEM, English language, independent/integrated skill, complex method

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INTRODUCTION

Leadership has become an outcome in mission statements of many higher educational institutions [1] in line with UN's policy, which states that effective and inclusive leadership is a critical factor in the success of peace operations.

In this respect, there is a call for exploration the landscape of leadership courses and understanding if graduates of these courses are truly prepared to perform leadership role in their professional environment. The research shows that this field demands significant work to do. The content analysis of existing leadership courses focuses primarily on personal leadership skills, following the subjective model of "great leaders" and identifying their pitfalls, instead of comparing leadership theories or facilitation skills [2]. The problem of "great leaders" approach lies in the discrepancy between "great leaders" challenges compared to those of an average person [3]. The question of what is taught and what should be covered in leadership postgraduate education programs has been referred to as not easily answered [4; 5]. As an example, researchers studied the topics covered in the coursework core units of postgraduate leadership programs for health and/or human services [6]. However, the engineering sector still remains a particularly challenging environment for leadership. The relevance of identifying and explaining the essential content components of a leadership course becomes more urgent in technical and engineering universities. **This currency** stems from the fact that initially the engineering sector is continuously developing, and its leaders have to adapt to those changes quickly [7]. Moreover, since the engineering sector has traditionally prioritize technical skills as the primary measure of success [8] engineers themselves generally focus on technical details and often overlook the broader picture [9]. Engineers are typically highly skilled and specialized professionals who are used to working independently [10]. This also hampers their motivation and inspiration to evolve as leaders [11]. As a result, students at engineering faculties see no sense in taking leadership as a separate course if the demand for professional specialists confidently outstrips the supply. Besides, engineering curriculums at many universities are so demanding technically that the students lack the time or inclination to pursue any additional business courses [9]. Here are some students' opinions on leadership at the beginning of the course at MIPT (Moscow Institute of Physics and Technology):

1) Leadership is not for everyone. It could be introduced, but only for a couple of groups, and maybe less. Whatever the intellect of the physicists, there are not so many people with the characters of leaders (and they do not strive for this). The course is aimed, as I understand, more at fostering leadership qualities, rather than studying and polishing skills in English. Leadership is impossible to teach since it evolves with the time of personality formation. Maybe it would be useful to 1% of students, but this is meaningless, or pure speculation.

2) Making no sense. There are two types of understanding, sensual and logical, If the purpose of the course is to foster leadership in the circles of Phys Tech, then for the people who are not interested (like most) it will be stupid speeches leading to nowhere, even with their logical understanding.

However, nowadays engineers are asked to do a lot more than just apply the scientific knowledge to solve practical problems. Moreover, a STEM (science, technology, engineering or mathematics) leader is supposed to be a good scientist [12]. It presupposes introducing students to core soft competencies: effective communication, collaboration and problem solving. The universal competence "teamwork and leadership" is interpreted in the Russian Federal State Educational Standard as a result of training in all bachelor's, specialist's and master's degree programs and is claimed to be in demand by the modern professional environment [13].

By investigating the impact of integrating leadership content in the English course, this study **aims to** contribute to the ongoing efforts to enhance the quality of leadership education in technical and fundamental science universities. The findings could suggest strategies for designing a Leadership course aimed at developing soft skills for STEM students using a comprehensive approach, combining liberal arts component with foreign language study.

The research question, which stems from abovementioned needs and challenges is the following: How should a leadership course be designed and organized to influence STEM student engagement and learning outcomes? By student engagement we understand how learners spend time in their academic courses, and how teachers encourage interaction and desirable learning [14].

METHODOLOGY

To reveal the peculiarities of teaching students-scientists leadership knowledge and skills understanding the concept of leadership in the current context is required. The key idea we take as a framework is that leadership as a phenomenon has evolved mainly from the transactional to transformational. Consequently, the STEM approach is marked by a paradigm shift in education, moving away from routine memorization and reproduction learning towards a dynamic and empowering model [15]. For example, in engineering sector previously the key skill was planning and organizing, to perform within a budget and adhere to quality standards. Actually, it relied on a simplistic understanding of leadership neglecting such vital aspects as organizational teamwork culture and ethical considerations [16].

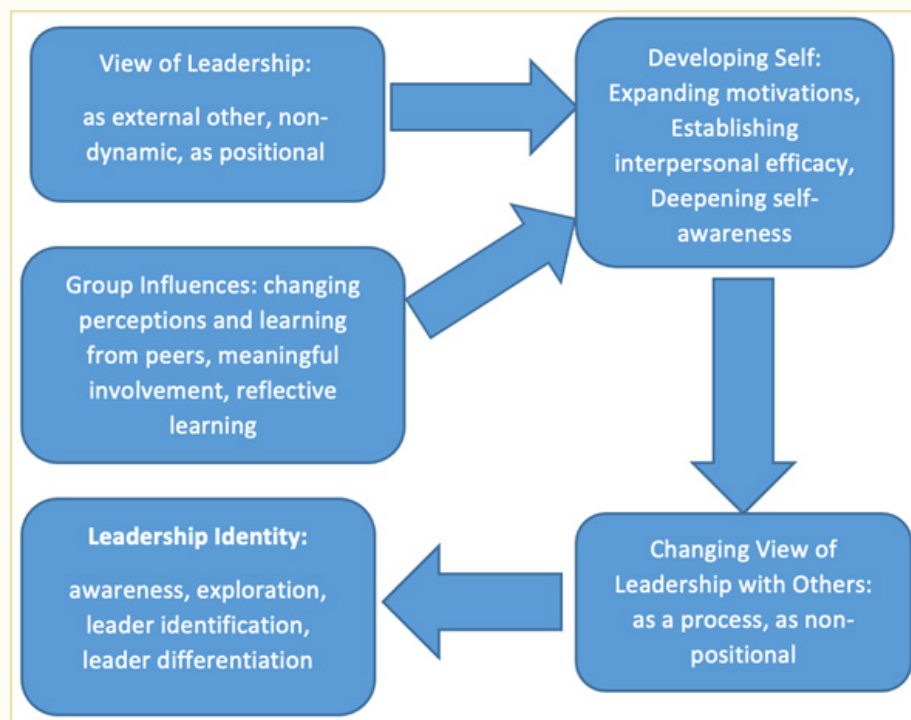
Nowadays the focus has shifted to effective leading and motivating engineering teams and other stakeholders who have invested in organization [10]. Recent studies reveal that teamwork, leadership, and interpersonal communication skills were the specific categories of communication skills, which are expected of recent engineering graduates as stated by prospective employers [17].

Active pedagogical approaches, such as active learning, group discussions, problem-solving activities were statistically proved as significant drivers for students' learning outcomes (academic performance, motivation, critical thinking skills) at a university level [18]. Additional creative thinking training in the form of fundamental visual storytelling experimentally revealed significant differences in the students' creative self-efficacy and project performance [19].

MIPT is a leader of the rating due to fundamental education, supported by powerful applied training therefore primarily didactic methods of instruction and learning experience, with lectures given by representatives from faculty are supposed meaningless for high-ability and gifted students. The research question, which arises here, is: What approaches and classroom-based acceleration practices are essential to employ for these learners? Some triggering event is obviously required to stimulate such students' cognitive engagement [20] in exploring a leadership concept through instruction and collaboration. The idea of learning in groups stems from the idea of leadership being a socially constructed phenomenon [21]. It is not only due to the fact that co-construction of knowledge with fellow learners enhances the individual learner's deeper comprehension of the world around them [22] but also to the definition of leading as coming in advance of others, being first. Taking in consideration people's natural tendency to compare themselves to others and identify role models [23] the Leadership course was created in accord with Social Cognitive Theory [24]. The crucial idea of the teaching process based on this theory is developing self-efficacy, which is an individual's self-confidence for the performance of certain irregular and uncertain tasks [25]. This development is motivated by a 'model person', probably a peer who is capable of successfully mastering a difficult situation, not a trivial "great leader" example listed in textbooks. Collaboration with others might encourage students to engage in more holistic conversations about leadership traits, behaviors, and practices. Through developing self-efficacy beliefs effective human functioning is regulated through cognitive, motivational, affective, and decisional processes [26].

Cognitive processes were initiated through reading (integrating challenging levels of course reading materials). Motivational and affective processes are realized through the resolution of conflicts between opposite modes of adaptation to the simulated working environment. Learning becomes a process of adaptation since knowledge is created through the transformation of previous experience. Students read or watch a video or film and analyze the message conveyed to the reader or viewer. Subsequently they present, debate, defend, discuss and criticize the analysis, with teachers and peers, in different ways, such as interaction in pairs, groups or contest sessions. Decisional processes allow the immersion of participants into quasi-realistic situations for making decisions. There was no opportunity given to practice leadership in a real-world scenario, a limitation expressed by the students participating. Suggested course interventions (advanced levels of reading, debate, formation of discussion group that provides a peer-group context) were aimed at transforming the students' vision of a leader from positional (position of power) to non-positional, flexible (non-hierarchical).

Conceptually, the transformation of students' leadership MIPT during the course may be represented as follows:



Picture 1 Transformation of leadership understanding during the course

As a result, transformational change was encouraged [27]. It embraces not only individual values but also group values, and social values, such as self-awareness, consistency, commitment, cooperation, common goals, and competing with courtesy [28].

This study used both quantitative and qualitative approaches to address the research questions. These methods included a questionnaire, and course framework and organization description relevant to the design and execution of leadership teaching strategy. Using a mixed-methods approach allowed for a comprehensive understanding of the subject matter of the research.

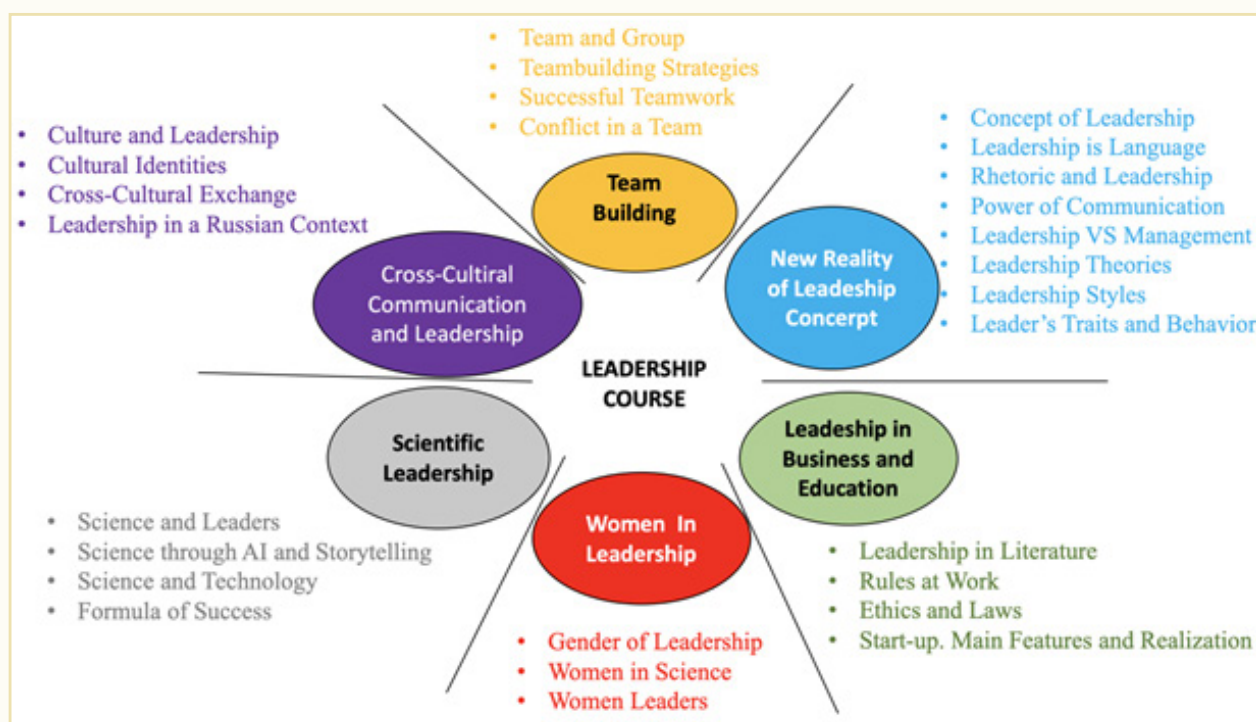
Instrument used for data collection in this study was a questionnaire. The poll was designed to accomplish two objectives: first, to determine how prospective scientists felt about the integration of leadership content in their first foreign language studies, and second, to determine possible paths for enhancing soft skills teaching in STEM context.

COURSE ORGANIZATION

Master's degree course "Leadership in Science, Industry and Education" was introduced into the curriculum of the Foreign Languages Department at MIPT (Moscow Institute of Physics and Technology (National Research University) in line with constructivist and social cognitive principles.

The course lasts for two semesters, with students meeting in-person once weekly for four academic hours. The primary aim of the course promoted by the one of the leading educational priorities was to train students to be lifelong leaders by challenging them to affect real change throughout the course. The course was designed to teach the fundamentals of successful leadership with a focus on developing effective change-makers who have the knowledge, skills, and ability to effectively communicate and lead groups and teams, including the stages of group development. To realize these objectives experiential learning was implemented by assigning learners to project teams in which they should apply leadership skills learned throughout the course to develop and produce a project of their own design. In-class simulations and learning thought-provoking exercises were aimed at driving a positive change in students' attitude towards leadership and professional involvement.

Despite the fact that the course included the themes related to the concept of leadership (e.g. teamwork, goals achievements, decision making, taking risks, success in life and professional sphere, etc.) that gives the graduates an invaluable opportunity to become well-rounded leaders in their respective fields, the most essential part of the course success is based on the teaching methods as all material is conducted in English and the language aspects are vital.



Picture 2 Course theme rubrics

The course is the combination of different teaching approaches to make it relevant for the students of B2-C1 level of English. At the same time, it is the final language training at educational process of the university, and, as it turns out, one of the most difficult courses taught at MIPT. Being offered to the students with the highest English level of B2-C1 through the thorough testing-selection process at the beginning of the year, the material is designed with outstanding complexity and creativity in requirements for the tasks fulfilment and completion to make the course challenging for the learners. The material is organized with respect to all language skills: reading listening, writing and speaking. Therefore, students participate both in independent and integrated activities with an emphasis on conversational practice in debates, competitions, projects and startups, where each student can develop their potential and leadership talent. By being actively engaged in these foreign language-intensive activities, each student improves their communication skills considerably. To satisfy the complexity of the students' level, teaching materials are taken from authentic literature and audio/video materials. When preparing assignments, teachers also use their own linguistic, methodological and translation experience, administrative, teaching and technical skills in domestic and foreign universities and companies, constantly improving their pedagogical skills in external and internal advanced training courses [29].

The average language group consists of 10-12 people, which significantly increases the efficiency of mastering the educational material and makes it possible to combine the forms of work (individual, pair work, work in small and large groups, the whole class work) in the classroom as much as possible [30]. Such a convenient size of an academic group alongside with the general requirements established on the curriculum at the Foreign Languages Department enable each student to get evaluated at every lesson for their "academic activity", i.e. participation in all activities and tasks.

The new evaluating parameter different from a traditional grading system was introduced in the course requirements. The purpose of academic activity assessment is to stimulate competition

among students, motivating them to work harder to get ahead of others during the whole course (especially in the classroom), without focusing on final gatekeeping assignments. It proved to reduce the amount of rating tasks during a lesson that makes the teacher's job easier, moreover, it lets each student earn points for successful completion of the course. Academic activity is rated from 0 to 2, with 0 - "very low", 0.5 - "low", 1 - "satisfactory", 1.5 - "good", 2 - "very good" and includes a number of requirements:

Table 1

Academic activity assessment

Description	Score
- no participation, no interest in class activities, busy with other irrelevant tasks - no homework	0
- low interest and participation - partially completed homework	0,5
- participating in pair and/or group activities and discussions - responding to the teacher's and class-mates' questions - completed homework	1
- initiating meaningful interaction with the teacher and class-mates - discussing and reacting to requests and questions - active engagement in class activities - thorough and completed homework	1,5
- submitting a complete academic assignment in class - active participation in all pair and/or group activities and tasks - taking a leading role in discussions and debates - giving constructive feedback on others' opinion - generating creative ideas while brainstorming - exceptional and completed homework	2

Thus, the grade on academic activity has become a very convenient way of controlling the progress of a student and tracing their general preparation and interest in the material conducted at each lesson.

COURSE STRATEGY

While designing the course one of the key criteria, alongside with the content, which determined the choice of methodological strategies and tools in teaching as well as the material variety was the definite level of English knowledge. In accordance with the standards of Common European Framework of Reference (CEFR) accepted for grading an individual's language proficiency students with B2 (Upper-Intermediate) and C1 (Advanced) levels were selected for the course.

As it is seen from the grading standards the two levels are really advanced and very close to each other in requirements – they both suppose the learners to deal with complex, authentic texts, including both discussions on social and academic purposes demonstrating language flexibly in clear and well-structured texts with a good stock of the vocabulary used.

Thus, planning the scope of appropriate content materials in both leadership and language arts for advanced learning is a difficult task. It must be recognized that a high-level student's need for advanced learning will extend beyond what a teacher can provide. To introduce an educational program which is fast-paced, enriching and well-organized strong enrichment of the basic curriculum was required. The following aspects were considered crucial for the course success:

- use of advanced reading materials and vocabulary;
- participation in an inquiry-based study;
- inclusion of a writing program that encourages the use of models for both reflective and scientific-narrative assignments;
- reading selected books and stories in the content areas (including subjects with multicultural issues);
- inclusion of experiences in leadership world knowledge;
- emphasis on the development and use of logic and critical thinking for a constructive dialogue;
- revision of grammar and usage competency;
- opportunities for interactive oral presentation and debate;
- encouragement to pursue free home-reading;
- strong enrichment of the basic curriculum.

All topics and activities were thoroughly chosen to make the tasks challenging. The activities to drill and master all types of skills (reading, listening, speaking and writing) during each lesson were included. Here are some examples to illustrate the variety of the tasks:

Example 1. Independent Analysis and Speaking on Visualizing Success Formula

Conduct an interview with a successful person in your scientific community or any other area of science, technology, business, education, industry. Sum up your findings and present this person's success formula in a 5-minute presentation to your groupmates. Create a formula to success using different symbols and explain it in class. You can use the following questionnaire to prepare for this analysis:

Questionnaire: A qualitative study of successful principal investigators:

1. What motivated you to pursue a career in research?
2. How would you describe the research that you do to a lay audience?
3. What are key ethical, compliance, and/or social issues that arise in your research? Factors contributing to the success and integrity of research exemplars.
4. How would you describe your research personality? What key traits do you have as a researcher? Do any other characteristics come to mind?
5. How do you think these traits have contributed to your success as a researcher and reputation for integrity? Can you speak to both success as a researcher and reputation for integrity?

One of the basic strategies, which proved to be effective, is storytelling or popularizing science. By incorporating fairy tales, anecdotes into leadership lessons for STEM students, educators may create educational environment where learners develop emotional connections to the subject matter, and develop deeper engagement in leadership [31]. When students learn how to connect their theoretical knowledge of scientific concepts to real-life situations clear to lay people, they improve their skills by switching from and to different genres. As a result, they become capable of conveying their ideas and messages to different audience beyond the narrow circle of their scientific community. Here is an example to illustrate students' work on improving the storytelling skill within the course:

Example 2. Independent Writing

Switch on all your imagination and create an amazing /crazy narration (200-250 words) based on any famous fairy tale or short story. Write it down in an academic style, using key terminology appropriate in your field of study. Add visuals if needed or possible.

This assignment breaks boundaries and broadens the students' horizons. They seem to be find difficulty in adapting their level of expertise to lay people's mindset. Overcoming a challenge of communicating ideas in different contexts is also a strategic move in developing leadership skills.

RESULTS

In 2023-2024 a survey was conducted, which aimed to gather valuable feedback from the Master's degree students regarding their experience within the course. To measure the impact of the course on students' perception and engagement in leadership efforts, there were offered 14 questions at the completion of the Leadership course. The survey was distributed in class at the final lesson and did not collect any personal or identifiable information and created total anonymity for the students completing it. There were 361 participants responded on a 5-point scale rated from 1 to 5, with 1 being 'poor' and 5 being 'excellent'.

Table 2

Survey results

Question	Grading					Mean	SD
	1	2	3	4	5		
1. Did the course cover the relevant topics?	25	46	66	95	129	3,71	0,25
2. Did the course content have enough variety?	33	41	72	101	114	3,61	0,25
3. Was the course content challenging and engaging?	38	47	91	96	89	3,42	0,26
4. How would you rate the quality of the course materials and resources provided?	14	24	74	130	119	3,88	0,26
5. Were the course materials and assignments available in a timely manner?	1	2	15	66	277	4,71	0,33
6. Did you feel that the teaching methods applied helped you learn general leadership concepts and improve your language proficiency?	10	18	58	98	177	4,15	0,27
7. Were the teaching methods interactive and engaging?	4	12	32	85	228	4,44	0,30
8. Was the balance between language and subject matter instruction appropriate?	11	12	51	99	188	4,22	0,28
9. Was the balance between speaking activities and writing tasks appropriate?	3	7	24	97	230	4,51	0,31
10. Were the assignments and assessments relevant to the course content?	1	14	52	116	178	4,26	0,28
11. Did you receive useful feedback on your performance?	8	13	24	85	231	4,43	0,30
12. Was the grading system fair and transparent?	16	18	45	98	184	4,15	0,27
13. Did the assessments help you understand your strengths and weaknesses in leadership and language?	37	28	86	103	107	3,60	0,26
14. Did the course make you feel interested and motivated to become a leader?	72	56	75	56	102	3,17	0,27

To calculate the survey results there was used mean and sample standard deviation of the answers scores.

As it is seen from Table 2 the maximum SD is 0,31, which does not demonstrate any dramatic deviation of the individual scores from the means. We will analyse the mean scores without referring to the SD statistics.

Thus, the findings indicate that the course learners enjoyed the most the following aspects of the course: materials and assignments availability (4,71%), balance between speaking activities and writing tasks (4,51%), teaching methods which were interactive and engaging (4,44%) and ability to receive useful feedback on the students' performance (4,43%).

The least positive participants' attitude was shown on the issue if the course made the learners feel interested and motivated to become a leader (3,17%), It could occur to a number of reasons and factors. First of all, in technology universities like MIPT there is a big emphasis on developing deep

technical knowledge and skills. Students may feel that leadership is not as relevant or important to their career as their areas of specialization where they study and work in technical, hands-on roles, which might feel more direct or impactful to them than managing a team. Thus, they prefer more to create and build products rather than lead people or organizations. Secondly, in the tech world students might view leadership as something only for "people-oriented" roles, such as management or HR. Also, they often have a demanding academic schedule: coursework, projects, internships and part-time jobs at their base departments and chairs leaves little space to take on extracurricular leadership opportunities. The lack of time or energy might discourage students from pursuing leadership roles [32].

DISCUSSION

The attempts to solve the problem of teaching Leadership students preparing for careers in STEM fields have been made and are being made by researchers (for example, the issue of overcoming the barriers to teaching STEM undergraduates teamwork) [33], developing teaching methods appropriate to the needs of students such as interactive learning tools, peer collaboration, and contextualized language learning experiences [34], or meeting unique challenges of STEM education making it more flexible to keep pace with globalization and cultivating adaptable and resilient STEM professionals [35; 36].

It is important to note that our findings prove the validity of the conclusions drawn by foreign researchers, emphasizing that leadership is inherently context-dependent and influenced by individual personality, organizational culture and external circumstances [37]. However, the focus of previous studies extended either to content or assessment issues in the STEM domain [38].

This research addresses this challenge by offering a comprehensive approach to teaching STEM students as a promising avenue for integrating natural science disciplines with disciplines of other subject cycles to enhance the quality of science education not only at the school level [39] but on the level of higher education as well.

This study also provides one more insight to the previous studies [40] regarding fostering self-awareness and adaptive leadership styles that align with each individual's unique strengths and context rather than emphasizing replicating traits of historically successful leaders.

CONCLUSION

The curriculum common to Leadership programs, which provides comprehensive and formalized training in core elements usually associated with successful leadership such as vision, motivation, team building, etc., seems unlikely to succeed due to the lack of understanding the idea and meaning of the concept. By integrating case studies, real-world problem solving, and reflective practices in English classes students could develop a deeper insight of leadership as a dynamic and evolving skill set.

The findings of this study may have significant implications for liberal arts education programs at STEM universities. The complex pedagogical approach based on Social Cognitive Theory prioritizes integrating various classroom activities aimed at students' transformation into leadership educational programs. Self-efficacy which is developed through language skills enhancement proved to enable Master's students with confidence to meet the challenges of the current job market and broaden their horizons. The conceptual framework of a leadership course offers a promising avenue for empowering teachers and course designers to foster the development of soft skills through leadership ideas in STEM universities. We believe that combining liberal arts, language and scientific components in one course may inspire educators to cultivate excellence culture. However, more work is required to differentiate and describe all the above-mentioned components in detail and their role in creating a STEM leader with perfect knowledge of English. Furthermore, the observations obtained helped to evaluate the effectiveness of teaching methods and techniques and to make necessary improvements in the future.

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All authors made an equal contribution to the development and planning the study.

CONFLICT OF INTEREST

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