



## Features of Teaching Medical Chemistry to Foreign Students

**Umurbek Gapurov<sup>1</sup>**

<sup>1,2</sup>Assistants of medical chemistry department of Bukhara state medical institute, Bukhara, Uzbekistan  
[umurbekgafurov@gmail.com](mailto:umurbekgafurov@gmail.com)

**Safarova Nafisa<sup>2</sup>**

<sup>1,2</sup>Assistants of medical chemistry department of Bukhara state medical institute, Bukhara, Uzbekistan  
[umurbekgafurov@gmail.com](mailto:umurbekgafurov@gmail.com)

ABSTRACT

The issues of teaching medical chemistry in English to foreign students studying at the Bukhara State Medical Institute have been examined in the article. The specificity of teaching medical chemistry is analysed and the department's experience in preventing emerging problems for the successful implementation of training is presented

**Keywords:**

Foreign students, medical chemistry, science, higher medical education, course, education, chemistry, lab skills

**Introduction.** It is known that the main goal of the reforms implemented in our country in recent years is, of course, to improve the living standards of the population, to create sufficient conditions for them to live in a healthy, free, peaceful and peaceful country. In this regard, the President of our country Sh. Mirziyoyev in his speech on December 24, 2016, dedicated to the 24th anniversary of the Constitution of the Republic of Uzbekistan said: "We consider it our priority to improve the activities of all links of the education system. We consider it our duty." [1]

Indeed, today in the process of globalization, which strengthens the process of integration between higher education institutions, the academic mobility of students and teachers, the training of competitive professionals is a topical issue. Today, the number and number of international students studying in higher education institutions is one of the factors determining the status of an institute or university. There are enough

opportunities and bases in this direction in the higher educational institutions of the republic. Decree No. DP-5847 sets a number of tasks to determine the priorities of the systemic reform of higher education in the Republic of Uzbekistan, the modernization of higher education, the development of the social sphere and the economy based on advanced educational technologies. [2]. For example, transforming Uzbekistan's higher education system into a "hub" for international education in Central Asia; increase the investment attractiveness of higher education, attract foreign educational and scientific technologies; Development of proposals for the harmonization of the higher education system of the republic with international educational standards, the adaptation of educational programs to the requirements of internationally recognized international standards based on in-depth study and analysis of best international practices; expansion of training activities on the basis of joint educational programs in

cooperation with foreign higher education institutions; to increase the share of foreign students to 15% by 2030. In recent years, a number of foreign higher education institutions and branches in the country, the opening of joint educational programs in local universities and the integration of foreign programs have significantly increased the share of foreign students.

**Method:** The increase in the number of international students raises a number of questions for universities: the availability of local staff who can teach in a foreign language, the availability and adequacy of infrastructure, the availability of appropriate textbooks, the level of preparation of staff for internationalization, and more. Studies on the adaptation of foreign students to the teaching environment, the use of different teaching methods and techniques, the use of special literature are presented in the works [3-13]. However, the specifics of teaching chemistry have not been sufficiently studied. To this end, the analysis of the difficulties that arise in the teaching of chemistry and their prevention is a topical issue today. The object of research is the process of teaching medical chemistry at the Bukhara State Medical Institute named after Abu Ali ibn Sino.

Today, more than 300 students from 10 countries study at the Foreign Faculty of the Bukhara State Medical Institute named after Abu Ali ibn Sino. At the same time, in 2019, the institute introduced MBBS (Bachelor of Medicine, Bachelor of Surgery), which is recognized in Pakistan and India. Medical chemistry is a fundamental subject taught in the first academic year, so socio-psychological problems related to the complexity of adaptation, not only in the new community, but also in an unfamiliar country, play an important role among the problems faced by students. There are differences in different traditions and lifestyles, languages and customs. This will undoubtedly affect not only the emotional state of the students, but also their attitude towards reading and the effectiveness of reading.

First of all, let's talk about the difficulties that arise as a result of the peculiar pronunciation of teachers and students in the

English language in which the lessons are conducted. These difficulties arise in the first month of the course process. It will be more difficult for the teacher and the student to understand each other. English-speaking foreign groups are usually formed by the dean's office in close proximity to each other. In doing so, members of the student body, who explain the most difficult issues in a science challenge, use their native language to help a student who is unable to master. This often happens to Indian and Pakistani students during practical classes. As a result of this mutual assistance, the situation will improve considerably by the second year.

The learning process is also complicated by the different levels of elementary education that students receive after school, college, or high school, primarily due to the different school curricula in different countries. This is primarily due to differences in the school curriculum. It is well-known that in today's developing world, science and technology are changing rapidly. The knowledge given to students today is rapidly becoming obsolete, which in turn requires future professionals to constantly improve their knowledge, skills and competencies [14]. However, the curriculum at the institute is the same for all students. The course of medical chemistry taught in medical universities is based on the knowledge of chemistry, physics and mathematics learned in school. Therefore, the topics included in the school chemistry course are much easier and faster to learn; Conversely, when the level of basic knowledge is insufficient, it is limited to discussing the main issues and types of problems. Perhaps the situation can be improved by allocating extra hours to master the basic concepts of chemistry.

Here are the specifics of teaching medical chemistry for international students: Differences in the formulas and quantities used in mathematical calculations. In determining the concentration of solutions, especially in the case of solutions, we encounter not only the structure of the formulas, but also the differences in size. Students use full words instead of abbreviated symbols when writing formulas (Table 1). In comparison, the average

Uzbek student spends 4-5 minutes solving simple concentration problems, while English students spend 2-2.5 times more time solving analog problems. Differences in the design of

practical and laboratory work and the writing of chemical formulas. It is important to familiarize students with the requirements at the beginning of the course to avoid such misunderstandings.

**Table 1.**

Differences in some formulas and sizes

No	The meaning of Formulas or units	In Uzbek literatures	In English literature
1	Molar concentration	$C_M$	M
2	Molyal konsentratsiya	$C_m$	m
3	Expression of parts, for example one thousandth part of a million	Not used	pcm ppm
4	Molar concentration The formula for finding the molar concentration	$C_M = \frac{n}{V}$	molarity = $\frac{\text{moles of solute}}{\text{liters of solution}}$

However, the terminology also poses serious challenges, as neither the teacher's nor the student's native language is English. To avoid such difficulties, this can be achieved by sending professors to short-term internships in chemistry teaching in public universities where English is the mother tongue. Besides it is known that currently at the institute wide range of bioactive compounds are being synthesized and studied their physic-chemical, pharmacological properties. [16-23]. Exchanging experience in teaching and to develop scientific lab skills with foreign universities like synthesis different bioactive compounds may result in develop in scientific collaborations which benefit also medical students to keep their knowledge with scientific novelties through experienced teacher's lectures.

**Discussion.** It should be noted that foreign students are actively involved in laboratory work, and their level of practical skills meets the necessary requirements. Controlling the knowledge of international students also requires an individual approach. Practical exercises are important. There may be different ways to do this type of activity, but in practice it is important to communicate with students orally. The student should be able to express himself / herself using chemical terms.

Therefore, it is important to talk to students orally [15].

**Conclusion.** In short, some of the features of the teaching of foreign students are specific to universities in different specialties, such as Uzbekistan, Russia and Kazakhstan. Some of them require correction, such as language difficulties in the learning process. Additional language training may be required to overcome them. The specifics of teaching chemistry require extra time, attention, and extra work from a teacher who teaches classes in groups of international students. Thus, the Department of Medical Chemistry has a multifaceted approach to teaching foreign students, based on the integrity of the pedagogical process, which includes an element of education and upbringing. This is achieved through the integrated use of modern science-intensive technologies in a developing educational environment. The professors and teachers of the department take a unique approach to planning the educational process, which in turn increases the practical orientation of education and stimulates a high level of motivation of students.

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## References

1. Report of the President of the Republic of Uzbekistan Sh. Mirziyoyev on December 7, 2016, dedicated to the 24th anniversary of the Constitution of the Republic of Uzbekistan. <https://www.gazeta.uz/uz/2016/12/07/speech/>
2. Decree of the President of the Republic of Uzbekistan dated October 8, 2019 No DP-5847 "On approval of the Concept of development of the higher education system of the Republic of Uzbekistan until 2030"
3. Artyukhina AI et al. Educational activities of foreign students in a new socio-cultural environment at the Department of Chemistry // Modern problems of science and education. - 2018. - No. 2. - S. 89-89.
4. Niyazov L., Brel A., G'apurov U. Xorijiy talabalarga tibbiy kimyo fanidan dars berishning o'ziga xosliklari //Pedagogik Mahorat. - 2021. - №. 3. - C. 224-226.
5. SAFAROVA, N., NIYAZOV, L., NIKOLAEV, E., & PETUNOVA, S. (2021). Application of Interactive Methods in Medical Education: Clustering Technique in Teaching of Heterocyclic Compounds. Proceedings of the 37th International Business Information Management Association (IBIMA), 30-31.
6. Kazakovich, K. C. (2021). Main factors for improving the national educational system. ACADEMICIA: An International Multidisciplinary Research Journal, 11(11), 227-232.
7. Ниязов, Л. Н. (2017). Метод кейс-стади и его применение в обучении химии. Научный вестник Бухарского государственного университета, (3), 67.
8. Syrovaya A.O., Makarov V.A., Andreeva S.V. Methodology for monitoring students' knowledge in the process of studying medicinal chemistry. - 2013.
9. Nechepurenko E.V. Features of teaching chemistry to foreign students // Innovations in the health of the nation. - 2019. -- P. 512-516.
10. Chen Y., Wang J. Discussions on teaching experiences for foreign medicine students [J] //Modern Medicine & Health. - 2007. - T. 9.
11. Ruyffelaert A. et al. Teaching scientific terminology in foreign language improves the performance of undergraduate medical students //International Congress on Education, Innovation and Learning Technologies (ICEILT 2015). - 2015. - C. 116-116.
12. Oludipe D., Awokoy J. O. Effect of cooperative learning teaching strategy on the reduction of students' anxiety for learning chemistry //Journal of Turkish science education. - 2010. - T. 7. - №. 1. - C. 30-36.
13. Chen R. et al. Practices on the English Teaching of Analytical Chemistry for the Foreign Students Majored in Pharmacy //Pharmaceutical Education. - 2016. - C. 04.
14. Niyazov L.N., Nikolayev Ye.L., Safarova N.S. Problems of application of case method in teaching chemistry in higher medical education / Monograph. - Bukhara. - 2020. - 128 p.
15. SAFAROVA, N., NIYAZOV, L., NIKOLAEV, E., & PETUNOVA, S. (2021). Application of Interactive Methods in Medical Education: Clustering Technique in Teaching of Heterocyclic Compounds. Proceedings of the 37th International Business Information Management Association (IBIMA), 30-31.
16. Ниязов Л. Н., Бахромов ХҚ Гапуров У. У. 4-Гидроксибензой кислотанинг баъзи аминокислоталар билан ҳосилалари квант-кимёвий хоссалари //Бухоро муҳандислик технология институту: Фан ва технологиялар тараққиёти илмий-техникавий журн. - 2020. - №. 4. - C. 74-78.

17. Kayumovich B. K., Nurkhonovich N. L. Synthesis of 4-hydroxybenzoic acid derivatives with amino acids and their potential pharmacological properties // Austrian Journal of Technical and Natural Sciences. – С. 24.
18. Гапуров Умурбек Улугбекович, Ниязов Лазиз Нурхонович Квантово-химические параметры и прогнозирование биологической активности производных п-аминобензойной кислоты // Universum: химия и биология. 2021. №11-2 (89). URL: <https://cyberleninka.ru/article/n/kvantovo-himicheskie-parametry-i-prognozirovanie-biologicheskoy-aktivnosti-proizvodnyh-p-aminobenzoynoy-kisloty> (дата обращения: 18.06.2022).
19. Каримов Жавохир Собирзода, Ниязов Лазиз Нурхонович Производные тиомочевины с гидроксibenзойными кислотами // Universum: химия и биология. 2021. №8 (86). URL: <https://cyberleninka.ru/article/n/proizvodnye-tiomocheviny-s-gidroksibenzoynymi-kislotami> (дата обращения: 18.06.2022).
20. Садуллаева Гулмира Гайбулла Кизи, Джумаева Махфуза Каюмовна Синтез, структура и свойства  $ni(ii)$  и  $zn(ii)$  комплексных соединений на основе альдегида бензоилуксуса // Universum: химия и биология. 2021. №12-2 (90). URL: <https://cyberleninka.ru/article/n/sintez-struktura-i-svoystva-ni-ii-i-zn-ii-kompleksnyh-soedineniy-na-osnove-aldegida-benzoiluksusa> (дата обращения: 18.06.2022).
21. Джумаева М. К. Механизм основных химических процессов в азотсодержащих соединениях при синтезе биологически активных веществ // Zamonaviy dunyoda tabiiy fanlar: Nazariy va amaliy izlanishlar. – 2022. – Т. 1. – №. 9. – С. 1-6.
22. Джумаева М. К. механизм основных химических процессов в азотсодержащих соединениях при синтезе биологически активных веществ // Zamonaviy dunyoda tabiiy fanlar: nazariy va amaliy izlanishlar. – 2022. – Т. 1. – №. 9. – с. 1-6.
23. Садуллаева Г. Г. К., Джумаева М. К. Синтез, структура и свойства  $Ni(II)$  и  $Zn(II)$  комплексных соединений на основе альдегида бензоилуксуса // Universum: химия и биология. – 2021. – №. 12-2 (90). – С. 14-17.