VILNIUS GEDIMINAS TECHNICAL UNIVERSITY

LITHUANIAN INSTITUTE OF AGRARIAN ECONOMICS

LJUBLJANA SCHOOL OF BUSINESS

ISIEME 2019

Proceedings of the 1st International Symposium

INTELLECTUAL ECONOMICS, MANAGEMENT AND EDUCATION

September 20, 2019

Vilnius- Ljubljana,
Lithuania 2019

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Proceedings of the 1st International Symposium on Intellectual Economics, Management and Education, September 20, 2019. Vilnius Gediminas Technical University. Vilnius: Vilnius Gediminas Technical University, 2019. 396 p.

ISBN 978-619-00-1036-4

Publisher: Publishing House FABER Ltd-Veliko Tarnovo, Bulgaria

All proceedings papers were reviewed by international reviewers.
Authors are responsible for the content and accuracy

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ANALYTICAL CHEMISTRY COURSE FOR FUTURE PHARMACISTS WITH USE OF INFORMATION TECHNOLOGIES

Tetiana Reva
Doctor of Pedagogical Sciences, Associate Professor,
Dean of the Faculty of Pharmacy
Oksana Chkhalo
Senior Lecturer of Department of Medical and General Chemistry,
Bogomolets National Medical University
Kiev, Ukraine

КУРС АНАЛІТИЧНОЇ ХІМІЇ ДЛЯ МАЙБУТНІХ ФАРМАЦЕВТІВ З ВИКОРИСТАННЯМ ІНФОРМАЦІЙНИХ ТЕХНОЛОГІЙ

Тетяня Рева
д.п.н., доцент,
декан фармацевтичного факультету
Оксана Чхало
старший викладач кафедри медичної та загальної хімії,
Національний медичний університет імені О.О. Богомольця
м. Київ, Україна

In the current context, informatization of the educational space is one of the leading trends in the world education development. Informational technologies have become widespread in all fields of human activity, including pharmacy. Training a modern specialist using informational technologies is a present-day requirement which becomes especially important in studying natural science disciplines through extensive use of computer networks. These disciplines also include analytical chemistry. Quality control of pharmaceutical products, synthesis and identification of new ones – all of these and other operations are impossible without knowledge of analytical chemistry. That's why IT, in this case, become both the goal (as the informatization of the future professional activity) and the means of learning (as the informatization of cognitive activity during the study of analytical chemistry). This approach will promote the preparation of competitive future pharmacy specialists and it seamlessly aligns with state and sectoral regulatory documents, such as the Laws of Ukraine «On Education», «On Higher Education», the Concept for the Development of the Digital Economy and Society of Ukraine for 2018–2020, Regulation on Electronic Educational Resources [1], Regulation on the National Educational Digital platform [2], etc.

In Ukraine, several medical and pharmaceutical higher educational establishments provide professionally-oriented IT for interactive use, in particular, electronic resources which, to some extent, are in accordance with the contemporary requirements of the information society and the development of the medical industry.

At the same time, despite available scientific research, the issue of creating and using subject based electronic educational resources (EER) and the corresponding learning environments to support the teaching of chemistry subjects at higher educational establishments and the issue of efficacy of this learning process have not been sufficiently studied.

Computer technologies in studying analytical chemistry at the Bogomolets National Medical University are used in various ways: materials for test control, lectures for teachers with the accompanying electronic material, electronic versions of lectures for students, methodological guidance for practical lessons in electronic form, workshops with multimedia accompaniment, modeling of chemical phenomena and processes, which are virtually impossible or harmful, educational films, electronic textbooks.

The results of the research conducted suggest the structure of the module analytical chemistry course, which meets the didactic requirements for the stages of the learning process and has the features of pedagogical technology. The components of the course as well as some technological and didactic features of the modules are described below.

Introduction. The introduction provides a brief description of the course, its purpose, knowledge and skills which are necessary for the successful mastering of the learning material, timetable, test work schedule and student counseling, EER terms of use, global links are provided as URL and QR codes. (*preliminary updating of basic knowledge and learning motivation are carried out, conditions are created for forming a frame of reference for planning and organizing the student's learning activities*)

Self-test questions (*input control of the initial preparedness level is conducted, conditions are created to reflect the level of studying preparedness*).

Theoretical material. The course material is separated into modules, the number and duration of which depend upon the syllabus (*students are provided with URL and QR links*). At the end of each module, self-test tasks are suggested (tests, assignments, questions, etc.) depending on the study direction of the course (*the content of the modules is selected in such a way as to make the module as a whole an aggregated didactic unit*).

Practical assignments the completion of which is necessary for mastering the analytical chemistry course successfully. At the admissions stage, the knowledge of theoretical material on analytical chemistry and safety rules is checked for admission to a certain type of activity (*this way one of the check-up stages of mastering the learning material is also conducted*).

Reference material on the subject field (*in multimedia and other, including traditional, formats, links to EER*).

Means of communication of the student with the teacher (tutor in the distant and mixed learning terminology) and other students (*means of interpersonal communication*), which provide for interactivity of learning, keeping with the didactic principle of active inclusion of all the subjects of learning in the educational and cognitive activity.

Links in the form of URL and QR codes, which are provided to students as sources of information during lesson preparation in the didactic technology «flipped classroom», and in solving educational tasks in the BYOD technology, do not only stimulate the learning activity but also facilitate the formation of professional competence.

The whole course is rounded off with an exam, which consists of the testing «Krok», questions on theory, calculation and situational tasks (*final control of the study goal accomplishment level is conducted)*.

The final stage of using the educational process model involved the students doing creative work out of the control-summarizing block, whose subject matter was suggested in such a way as to ensure systematization, deepening of knowledge, transferring it into a practically significant form, acquisition of primary skills of scientific and research activities by students in the course of the work.

An important advantage of the educational process organized in accordance with the suggested model is the availability of choice of learning activities and models of study objects which best suit the students' individual characteristics. The novelty of the suggested model lies in the possibility of simple implementation of the concept «Bring Your Own Device» and «mixed learning» in the educational process. The mentioned modification of the educational process model significantly improves its results. The experience of supplementing printed manuals with multimedia, reference und other materials available on the Internet combined with the use of the BYOD concept shows that this combination is possible and quite effective.

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