

## TO OPTIMIZATION OF THE INDEPENDENT KIND OF ACTIVITY OF STUDENTS OF A MEDICAL UNIVERSITY

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**Abstract**

It is proposed to develop an automated computer-based training system for self-integrated training of students of a medical university, based on: building a structural-functional system of synchronized differential connections of lectures and practical classes in the main disciplines of the Department of Biomedical Engineering, Informatics and Biophysics with the disciplines of natural science, general professional and clinical departments, respectively; defining and establishing sets of integration systems of these disciplines already implemented to date; creation of an integrated educational and methodological knowledge base and a database of these disciplines and a navigation system on it; creation of a functionally, task-oriented structural-logical system for the formation of the content of education, contributing to the comprehensive implementation of typical functions and tasks of the professional activity of a specialist in a medical university; the development of a new integration system of disciplines, taking into account the presented biomedical problem; development of a computer-teaching system for managing students' own educational activities and the educational process of the departments of a medical university; creation of a local interdepartmental network of links between the disciplines being taught; development of special software for information and communication technology of independent integrated teaching of students of a medical university.

**INTRODUCTION**

The expediency of integrated teaching of disciplines of mathematical, natural sciences, general professional and clinical departments of a medical university is beyond doubt. To date, in this area of research, there are various approaches and developments [1-6, etc.]. Recently, it has become obvious that interdisciplinary integration, the coordinated work of teachers of various disciplines to achieve the goals of the learning process is one of the most important factors in optimizing and modernizing the learning process at a university, including a medical one.

Interdisciplinary integration is the mutual complementation of the content of different academic disciplines through the use of various innovative methods, means and organizational forms of education. In psychology and pedagogy, the conclusion is substantiated that interdisciplinary integration is one of the important psychological and pedagogical conditions, and the principle of interdisciplinarity has recently become one of the leading didactic and methodological principles.

**METHODS**

Note that a functional map for a profession (specialty) is determined by the main key goal and a list of basic functions [5]. In this regard, when forming the content of training for the training of a specialist, the following normative sequence should be observed [2]:

(1) - determination of the main key goal of the profession (specialty) according to the qualification requirements of the educational direction of the bachelor's degree - for example, "Medical and biological business" - 5510900 [3];

(2) - on the basis of (1) determination of the list of main functions according to the qualification requirements of the educational direction;

(3) - based on (2) definition of a set of modules (actions) for each of the functions;

(4) - on the basis of (3) the definition of a set of skills for each of the modules;

(5) - based on (4) definition of a set of knowledge for each of the skills;

(6) - based on (5) the definition of a set of subject areas for each of the knowledge.

The basis of typical functions is: carrying out preventive, hygienic and anti-epidemic measures; analyze and evaluate the state of health of the population, the influence of environmental and industrial factors on it; provide medical and preventive care to the population; analyze and evaluate the quality of medical care; promote a healthy lifestyle and lifestyle, the importance of physical education for health, and a number of others.

The basis of typical tasks is: determination of the types of conditions of the examined, patients deviated from the norm (situations); determination of the bases (causes) of these deviant types of conditions of the examined, patients (situations); determination of complications caused by data deviant types of conditions of the examined, patients (risks of occurrence of other diseases) (situations); conducting medical and technological diagnostics of data of types of conditions of the examined, patients (situations) deviated from the norm; restoration (correct choice of restoration methods) of data of types of conditions of the examined, patients (situations) deviated from the norm; carrying out the process of restoring data of types of states

(situations) deviated from the norm of the examined, patients (the correct choice of methods for carrying out the restoration); assessment of the quality of the results obtained; correct determination and implementation of preventive measures to prevent the recurrence of these abnormal types of conditions (situations) of the examined patients; solve professional problems from medical practice using quantitative methods; work with specialized software, etc.

A schematic representation of the educational and methodological knowledge base and the database looks like (see Scheme 1):

Scheme 1.

Typical functions and tasks of professional activity	Action Modules	Skills	Knowledge	Subjects (No. of lectures, No. of laboratory works, No. of practical classes.)
1.				
2.				

**RESULTS AND DISCUSSION**

Taking into account all of the above, we propose the development of an information and communication system for ensuring the integrativity of the disciplines of the humanities and socio-economic, mathematical and medical sciences, natural sciences, general professional and clinical cycles of the departments of the medical university TMA, based on the construction of a structural and functional scheme for determining the correspondence of dark knowledge of disciplines departments: firstly, with typical functions and tasks of a specialist in - organizational - managerial; medical and social; research; scientific and pedagogical; medical and preventive activities; secondly, with the typical functions and tasks of a specialist in organizations of the healthcare system; clinical practice; experimental activities; medical statistics and forecasting; thirdly, the construction of an educational and methodological knowledge base and a database based on the formation of a functionally, task-oriented content of education. Taking into account the above, the general structural and functional scheme for the formation of an educational and methodological knowledge base and a database for the integration of disciplines of a medical university has the form (see Scheme 3). The task is, firstly, to determine and establish the correspondence of dark knowledge in blocks of subjects of the curriculum (table B) with the corresponding sections of tables A and C. Secondly, to determine the number of lectures, the number of laboratory works, the number of practical exercises and other types lessons in relevant subjects.

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Each subject area according to scheme 1 will consist of certain general professional (1st, 2nd directions), clinical cycles, mathematical and natural science disciplines.

According to our experience [2,3,4], and in our opinion, the optimization of the independent type of activity of university students can be ensured if an automated computer-training system (ACTS) for independent integrated student learning (IISL) of a medical university is developed and used. Results and discussion

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automated computer-training system for independent integrated student learning (ACTS IISL) of a medical university is developed and used.

The basis of this ACTS IISL is the general structural and functional diagram (GSFD) of the information and communication system (ICS) for the integration of disciplines (ID) of biophysics, information technology in medicine, mathematics, mathematical statistics, mathematical modeling with the disciplines of general professional and clinical departments for training of medical specialists, taking into account the biomedical task, educational and methodological research topic, practical tasks, etc. (See Diagram 2)

Taking into account the direction of study - bachelor's degree "Medical and biological business" - 5510900, general professional cycles of disciplines (1st direction) comprise 16 disciplines. General professional cycles of disciplines (2nd direction) comprise 13 disciplines. The disciplines of the department "Biomedical engineering, informatics and biophysics" are 12 units of disciplines. The clinical cycle of disciplines consists of 14 units of disciplines.

We note, firstly, each of the disciplines is represented by an independent file with the appropriate name and corresponding content (content: educational and methodological complex (EMC), electronic textbook (ET)).

Secondly, each of the disciplines is represented by an independent file with the corresponding name and corresponding content (filling: existing (possible) examples of integrations (scientific articles, scientific reports, developments, etc.).

The proposed development of an automated computer-training system for independent integrated training of students of a medical university is based on the following grounds:

- building a structural-functional system of synchronized differential connections of lectures and practical classes of the main disciplines of the Department of Biomedical Engineering, Informatics and Biophysics with the disciplines of natural sciences, general professional and clinical departments, respectively;

- definition and establishment of sets already implemented to date

- day of integration systems of these disciplines;

- creation of an integrated educational and methodological knowledge base and a database of these disciplines and a navigation system on it;

- creation of a functionally, task-oriented structural-logical system for the formation of the content of education, contributing to the integrated implementation of typical functions and tasks of the professional activity of a specialist in a medical university;

- development of a new integration system of disciplines, taking into account the biomedical task;

- development of a computer-training system for managing students' own educational activities and the educational process of departments of a medical university;

- creation of a local interdepartmental network of connections between the disciplines being taught;

- development of special ICT software for independent integrated training of medical students.

ACTS IISL consists of two main subsystems:

The first subsystem - "Development for teachers of an educational and methodological complex of integrated teaching of disciplines on the basis of functionally, task-oriented formation of the content of education";

The second subsystem - "Information and communication system of independent integrated training of students of a medical university."

The knowledge base and database of ACTS IISL is divided into two large sections.

The first section is presented by clinical disciplines, natural sciences and mathematics, general professional disciplines of the 1st direction (see: folder 1st section of the ICS IISL; folder 1st section Examples of integrations).

The second section is presented by clinical disciplines, natural military-scientific and mathematical disciplines, general professional disciplines of the 2nd direction (see: folder 2nd section of the ICS IISL; folder 2nd section Examples of integrations).

### CONCLUSION

Based on schemes 1, 2, 3, teachers should create an educational and methodological knowledge base and a database. Determine and establish the correspondence of the dark knowledge of the disciplines of the departments with the typical functions and tasks of a specialist.

Taking into account the general structural and functional scheme for the formation of an educational and methodological knowledge base and a database for the integration of disciplines of a medical university (see Diagram 3), the task of teachers is, firstly, to establish the correspondence of dark knowledge to blocks of curriculum subjects (Table B) with the corresponding sections of tables A and C according to scheme 3. Secondly, in the definition of the number of lectures, the number of laboratory work, the number of practical classes and other types of classes in the relevant subjects.

Each subject area according to scheme 1 will consist of certain general professional (1st, 2nd directions), clinical, mathematical and natural science cy-

cles of disciplines (see the following schemes 4-12).

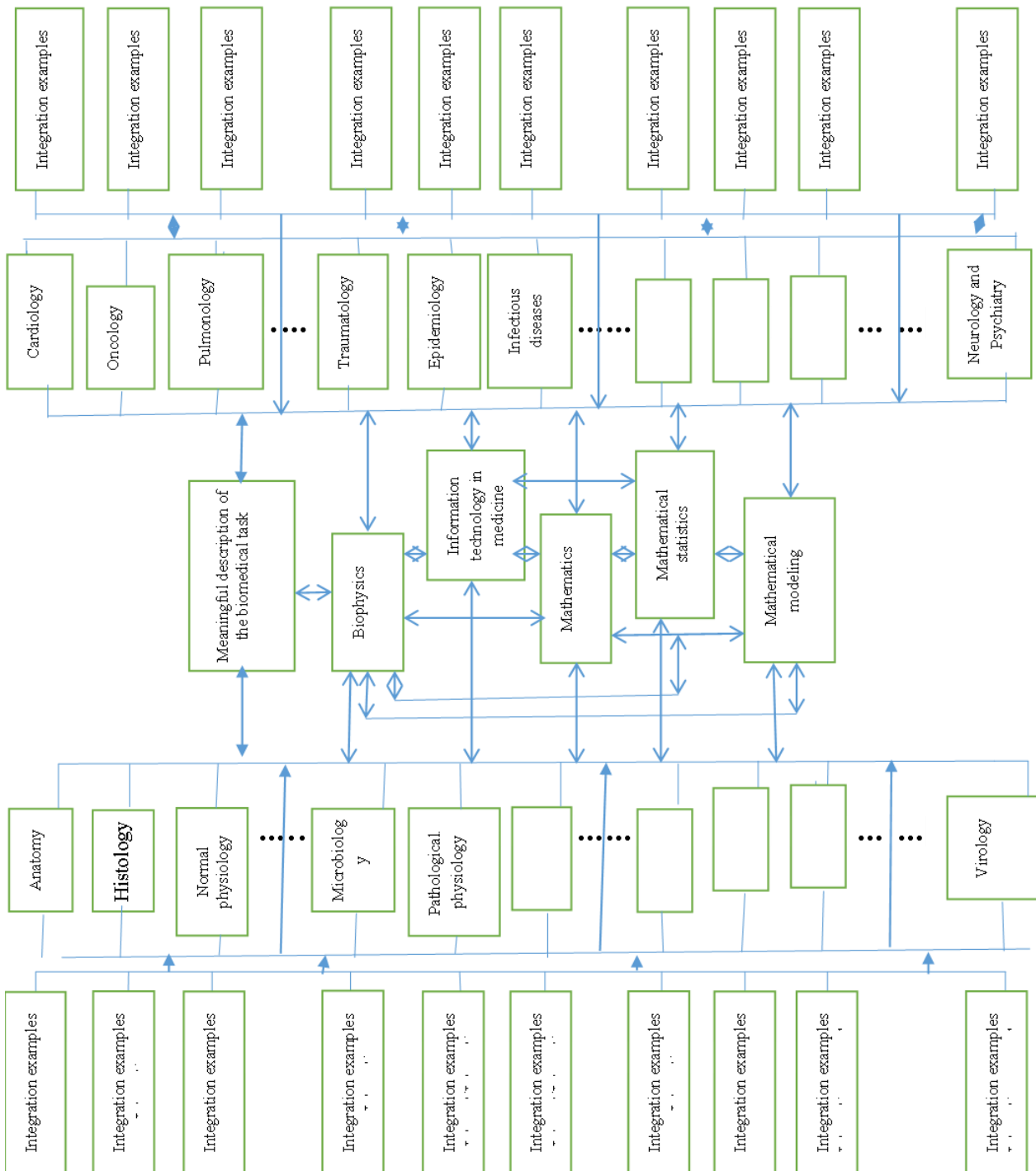
According to the topic of the independent task presented to the student, its constituent elements are determined - the names of the disciplines related to the topic and their examples of integration. With this in mind, the student turns to the folders of the 1st or 2nd section of the ICS IISL and finds the necessary disci-

pline files and examples of their integration. Based on them, he compiles his own folder of selected materials and implements the task on them. The ACTS IISL proposed by us will constitute an essential platform for the successful implementation of all kinds of independent activities of students of a medical university.

Scheme 2.

GSFD IKS ID of biophysics, information technologies in medicine, mathematics, mathematical statistics, mathematical modeling with disciplines of general professional and clinical departments

**Clinical departments**



General structural and functional schemes for the formation of the educational and methodological knowledge base and database for the training of specialists of a medical university (for example, “Medical and biological business”)

Table A		Table B		Table C	
№	Typical Professional Functions	№	By dark knowledge on blocks of objects	№	Typical Professional Functions
1	In organizational and management activities	1	Humanitarian and socio-economic subjects	1	In health care organizations
2	In medical and social activities	2	Mathematical and medical science subjects	2	In clinical practice
3	In research activities	3	General subjects	3	In experimental activity
4	In scientific and pedagogical activity	4	Special subjects	4	According to medical statistics and forecasting
5	In medical and prophylactic activities	5	Additional items		
		6	Elective items		

REFERENCES

1. Korshun N.S. Key aspects and problematic areas of implementation in the educational process of teaching methods for interdisciplinary technologies. <https://nsportal.ru/vuz/pedaqoqicheskie-nauki/library/2017/04/25/>
2. Marasulov A. F. On the problem of modeling the effective process of training a modern specialist. Bulletin of the University "Kainar". Almaty.No. 3. - 2014. - p. 57-61.
3. Marasulov A.F. Development of an information and communication system for integrated teaching of disciplines in mathematics, natural sciences, general professional and clinical departments for the training of medical specialists. . Bulletin of the National University of Uzbekistan. No. 6, 2020. - p.138-141.
4. Marasulov A.F. Methodological and theoretical support of the technology of independent integrated education of medical

- students. The current state and prospects for the use of digital technologies and artificial intelligence in management: reports of the republican scientific and technical conference, Tashkent, September 6-7, 2021: in 2 volumes. V. 1 / Research Institute for the Development of Digital Technologies and Artificial Intelligence. - Tashkent: Publishing House of the Research Institute of the RCTI, 2021. - p. 295-302.
5. 5510900 - Tibbium Biology Ishi Bachelor Ta'lim Yunalishining Malaka Talablari. ÝzR OvaÝMTV. Buyruk No. 355 - 25.08.2016
6. Curricula and plans for disciplines: mathematics, mathematical statistics, biophysics, mathematical modeling, information technology in medicine. TMA. Faculty of Medical Prevention. Department of Informatics and Biophysics. – 2020.