

Modern trends in design of
Higher educational institutions of Ukraine.
Tendencias modernas en el diseño de
Instituciones de educación superior de Ucrania.

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ABSTRACT

The article deals with the problems of architectural and town-planning issues when creating and building buildings of higher educational institutions (hereinafter -HEIs) of Ukraine. The approaches to construction of the functional structure of the external and internal environments of the HEI of the architectural and planning, educational and laboratory blocks, three-dimensional spatial resources are analyzed.

Keywords: town-planning, architecture, environment, higher education institutions.

RESUMEN

El artículo trata los problemas de arquitectura y urbanismo al crear y construir edificios de instituciones de educación superior (en adelante, HEI) de Ucrania. Se analizan las aproximaciones a la construcción de la estructura funcional de los ambientes externos e internos de la IES de los bloques arquitectónicos y urbanísticos, educativos y de laboratorio, recursos espaciales tridimensionales.

Palabras clave: urbanismo, arquitectura, medio ambiente, instituciones de educación superior.

INTRODUCTION

Higher education institutions have always played one of the main leading roles in the formation of the community centers and centers in the urban fabric of settlements and urban development, in the formation of the public centers, scientific and other important planning units. In today's conditions of the densely populated development, the role of the creation of the new university complexes of higher education institutions, as within the historically developed urban-type structure of a settlement (a range of works aimed at preserving existing historical buildings and new ones which create a comfortable environment for

educational the process of youth), as well as on the territories free from the development, the reconstruction of the restoration of historical ensembles, the creation of the new planning zones on the outskirts of cities according to increase of the architectural and the urban composition and the architectural qualities of the total urban environment specifically taken in the structure of the settlement.

Along with this, in the conditions of the formation of new socio-economic relations in Ukraine, the need of quality of the higher education has increased significantly which in turn determined the need for the optimization of the chain of higher educational institutions.

Creating of the comfortable educational environment becomes one of the priority tasks of the socio-economic and the urban development policy of the state. Reforming the education system on the basis of the principles of multivariate modeling of the subjects of learning objects, rehabilitation of higher educational institutions with the scientific and production institutions and organizations, other subjects of the objects of the social sphere, opens up the new possibilities for building a more flexible chain of the educational institutions, the rehabilitation and development the creation of the fundamentally new types of the associations that simultaneously accumulate educational, research and production and applied processes. This necessitates the improvement of the decisions of functional zoning and solutions of the main constituents of structural elements of buildings in the formation of the general architectural and planning structure of educational institutions of Higher education institutions.

In modern world practice the creation of the new or development of the existing material base of the higher educational institutions is the sufficient working set of many examples of peculiar architectural and urban-planning decision-making techniques that solve the problems of creating comfortable conditions for the implementation of educational process in these institutions, educational buildings. Universities of the third 3 millennium are characterized by the more complex but the intuitive functional structure, a variety of which is achieved, including through the construction of the different volumes, the architectural and planning spatial decision solutions, architectural and plastic elements. In aggregate, this ensures not only the formation of the accessible space, but also positively affects the psychological state and culture of the education of people who are temporarily or permanently within such complexes, expressive plastic facades, interesting architectural details.

It should be noted that the majority of universities in Ukraine is located within the bounds of consolidated historical development. The design of new university complexes is also influenced by the specificity of modern urban development, the density of the

development, especially in the central districts of the cities, while the limited territorial resources for the formation and development of new public areas for educational institutions zones.

The size of the territory for the construction of educational buildings depends on the size and profile of the definite educational institution.

CURRENT STATUS

Theoretical studies have been identified, and design and construction practice has confirmed that the larger the contingent of students, the more efficient use of the territory. For example, the educational institutions of the technical profile (the most common) with the contingent of 4 thousand students in accordance with the regulations require a plot of 6 hectares. for 1000 people, and with a capacity of 10 thousand and more - the territory is almost 1.5 times less - at the rate of 4 hectares per 1000 students. A similar pattern is characteristics for higher educational institutions of another profile.

The planning decisions of the universities or the higher education institutions of technical profile are significantly influenced by the need to create branched research units (according to the standards of 19-20 square meters per student), groups of premises of the corresponding departments and faculty units. Specialized research and production units with special technology are recommended to be allocated and placed in the peripheral areas of the educational institution.

Each of the marked areas, depending on the profile of the institution's educational establishment and the city-planning conditions, has its own peculiarities. The main structural element of the higher education institutions is the training area, which includes, in addition to the auditorium fund, as well as research sub-units of the unit. In the specific higher educational institutions of technical, agrarian, medical and other educational institutions, as a rule, a large group of research and teaching and production units is created. In this case, the independent educational, research and production and production area may be formed.

University buildings of Designing of a Future University will definitely focus on creating more compact and versatile, flexible complexes. Therefore, it is possible to predict that the surface of buildings of these complexes (within the compacted building) of buildings will increase, which is why the important zoning of the territory is considered as the principle of planning decisions of educational institutions by the important scientifically grounded and verified project practice. This zoning has already determined the need for the division of the territory. It is recommended that the section of higher educational establishments be divided into educational, sports, residential and economic zones.

The developed research units are typical for educational institutions in the construction industry and other industries.

At the same time, it should be noted that the functional and architectural and artistic qualities of the development of a higher educational institution depend not only on the planning structure of individual zones and buildings, but also to a large extent on the overall architectural and planning decision of the entire educational complex, complementary to the communication of the individual zones.

More effective in this regard can be considered the centric scheme for the formation of the master plan, which determines the formation of the compact community center or the kind of student forum, around which will focus all major areas. The centerpiece provides the complex of composite integrity and expressiveness.

When the training complex is located within the territories formed in the pre-formed part of the developed building or on the outskirts of the city. When there is a free territory for its rational further development in only one direction, it is expedient to apply the linear and mixed decision of the master plan. In this case, the sports area is located, as a rule, between the educational-scientific and the residential areas.

The linear system sometimes allows more flexible consideration of the possibility of a long-term development of the educational institution. Such a scheme causes the formation of a linear center and a linear system under the centers.

Thus, in designing of the new and reconstruction of existing educational institutions, the clear functional zoning of the territory is necessary to optimize the planning structure.

In the central districts of the large cities, it is expedient to consolidate the development of the territory of the institution of the higher education through the introduction of the effective teaching technologies and the improvement of the architectural and planning decisions of the educational buildings within each separate territory. Significant effects can be blocked and co-operated with educational institutions of different levels and profiles of education, the creation of educational complexes, centers, students' towns.

Therefore, it is possible to predict that the effective direction of the development of the training zones will be blocking in one or adjacent territories of the several educational establishments with the co-opted use of engineering transport communications, buildings of educational and teaching auxiliary purposes. Co-operation is especially effective in the profile proximity or the coherence of the homogeneity of the educational and production functions

of institutions of the higher education that form the complex. In many cases, this allows the organization of the unified system of public services, joint research and production centers.

For example, the subdivisions of the cultural and educational purposes (meeting and conference rooms, club rooms) should be combined into the single complex of the buildings and blocked with similar structures of other educational institutions that are the part of the training association as they are not depend on the profile of educational institutions.

Effective is the joint exploitation of the energy- intensive and the large-sized training laboratory blocks, the experimental equipment, etc. When co-operating should be used as intensively as homogeneous zones which makes it possible to slightly reduce the total size of the site of the educational institution in the comparison with the normative. Researches show that with the cooperation of educational zones it is possible to reduce the total area of the development area by 25%.

However, it should be noted that the importance of the question of the importance of the complementary also has a rational solution of transport links, engineering nets of communications, landscaping and landscaping of the territory, the decoration of the buildings and the structures.

In the context of the formation of a new generation higher education institution in Ukraine, one should note the issue of the fundamental change of their equipment and engineering equipment and educational equipment, the introduction of the new educational technologies, the widespread use of the computer, the IT equipment, the individualization of the educational process, the distributional forms of education, determines the need for a change in the functional structure of the educational buildings of the University, requiring the introduction of flexible for functional purposes, as well as architectural and planning three- dimensional construction solutions.

In addition, today's special attention is paid to the problems of energy saving, the creation of the comfortable sanitary and hygienic conditions in higher educational institutions, the preservation of the ecological balance of the surrounding natural and artificial environment.

During the period of Independence of Ukraine, the construction of several universities of higher educational institutions, in which advanced forms and methods of education had been implemented, designed and started, and effective information innovation technologies are being used. This, in turn, requires the formation and application of new approaches to the corresponding functional and planning solution not so much the complex of higher

educational institutions in general, but the internal space of its separate components of the educational buildings itself.

One of the examples of such approaches is the Open University of Human Development "Ukraine". The condensation of the building led to the increase in the height of educational buildings to 18-21 floors. Increasing the surface did not prevent the creation of all the necessary conditions for effective training of students including the people with disabilities. This is one of the few higher educational institutions in Ukraine that provides the comfortable training for specialists with disabilities.

In this context, the expanded and upgraded educational and material base of the National Technical University of Ukraine KPI "Kyiv Polytechnic Institute named after Igor Sikorsky" should be noted. For the high architectural qualities of the reconstructed educational institution, the author's team was awarded the State Prize of Ukraine in the field of architecture.

Within the framework of the project, the construction is planned. The project of the educational building of the Faculty of the Aviation and Space Systems has been developed, the construction of the complex of three 9-13-storey training blocks-modules, a 3-storied auditorium block, a conference hall and a two-storied block of the control systems of the aircrafts.

In the first and second blocks of the Faculty of Aviation and Space Systems there are located the Departments of Theoretical Mechanics, Instruments and Control Systems of Aircraft, the Research and Analytical Center, the auditoria for 100, 50 and 25 work places, the buffet, the administrative and auxiliary premises of the faculty.

The third unit is designed for the Medical Engineering Faculty. It provides for the placement of the Department of Medical Cybernetics and Telemedicine, the Educational-Scientific Medical-engineering Center and the administrative and office premises of the faculty. The fourth block is occupied by the main entrance group of premises, a conference hall for 500 positions with a variety, lobby-rooms and auditorium group of premises. In the fifth block there are located laboratories and warehouses of the Department of Instruments and Control Systems of Aircrafts, a two-light room for modeling aviation and spacecraft, technical premises.

CONCLUSION

The analysis of the world and national practice of formation of higher educational institutions has revealed the tendency of their consolidation by blocking objects as well as

different levels of education and directional learning. Blocking of the objects allows to save money both for realization and for their exploitation. A characteristic feature is the flexibility, the "openness", the planning decisions, which makes it possible to expand, change and reorganize the area for the possibility of multifunctional use.

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