Integrated Formation of Urban Environment

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Abstract. The article examines one of design architects training approaches, when it is necessary to form the skill of complex building of urban environment. The approach is based on the design study. Two aspects are considered: eco-design and constructing design-patterns. The aspect of eco-design aimed at introduction of principles of environment ecologization on the projects at the training stage through the latest techniques of introducing the aspect in question into design architects academic disciplines. This resulted in experimental models built on human interaction with air and aquatic environment, solar radiation and landscape. The aspect of constructing design-patterns aimed at investigating possibilities of modular and combinatorial approaches in designing objects of environmental design and small architecture. This resulted in modular system project satisfying the built-in requirements.

1. Introduction
The paradigm of comprehensive approach underlies design architects training in the FEFU School of Engineering. This very approach allows forming universalist principle generalizing various design approaches and design objectives. As Shimko V.T. states: “This is the so called specific environmental principle of typological differentiation of environmental beautification components – after the manner of their participation degree in its spatial complex formation”. [1 page 122]

The article presents only two aspects necessary to form comprehensive approach. But it is these two aspects that allow solving the problems of actual urban environment design, notably: environmental aspect and the aspect of objective filling.

2. Formulation of the problem
With the growth of cities the number of urban environmental problems is steadily increasing. The experts see the way out in acceptance and compliance with the global concept of sustainable development. This compliance is addressing to the innovative methods. A number of these methods investigate urban human ecology. Certain postulates of these methods have already been included in professional training of designers of architectural environment, architects, city planners, economists of municipal services.

Jan Gehl, an expert on the quality of urban environment, in his book “Cities for people” emphasizes safety, ecological compatibility and social focus of cities. He defines the primary aim as increment in social activity in cities. In his opinion, this will multiply the diversity of functions and capability of the society and have an effect on prosperity and psychological satisfaction [2].
Tetior A.N. examined complex socioecological principles of urban environment formation. He revealed the contemporary urban environment requirements of the society. These requirements touch upon the issues of urban harmony and beauty, human – environment interaction. He pointed out that untangling these problems opens the ways of solving environmental problems of cities integrally [5].

Today there are numerous studies on ecological perception. Ecological education programs have been developed and are being implemented in the processes of training at higher, comprehensive and even preschool levels.

Professor Mahkamov B.A. noted: “Forming ecological culture should be conducted in two ways: ecological education and environmental awareness. Ecological education implies acquiring specific knowledge about the environment and its processes. Environmental awareness is conscious understanding and acceptance of these processes and their significance” [4, page 97].

Professional education is of no less importance in forming ecological thinking. A professional will be able to create the environment meeting the requirements of sustainable development concept if he possesses ecological culture and acquainted with the categories of environment conservancy.

The second aspect will rescale the range of problems. Now let us examine how to implement the postulates stated above. The process of social rehabilitation of cities to a considerable degree depends on the quality of urban environment decoration. Professor Shimko V.T. points out, “Teaching to design similar design-patterns is imperative. They are able to create “design-space” as it were in the interiors of streets and public gardens of cities today. Similar design-patterns are able to “gather” separate fragments of the environment into integral compositions” [3 page 262].

Design ideas are derived from social life essentially nowadays. The primary aim of outdoor furniture is to help unroll social life in all its great diversity today… What are quality factors of design-pattern projected solution? It is capable of “shaping” and accompanying personal human experience and the joy of communication with friends and empathy of some cause in a team, community, subculture [3 page 121].

A graduate’s ability to design outdoor custom-made, separate goods is less valuable. A graduate should be able to design collections, ensembles and constellations of objects.

3. Method

Academics of Department of Architectural Environment and Interior Design suppose that forming ecologically and socially focused thinking in the professional sphere of a design architect is a priority. A student gets acquainted with a number of issues during training. These are the issues of general ecology and professional trade issues of environmental science.

These tasks are implemented with the aid of an instrument (practical methods). The aim of these methods is to transfer the ideas of sustainable development into educational and professional activity of a design architect. The methods help build interaction models of natural processes and human activity on local level. Environmental challenges revealed are used as a material for design creation.

All the material is structured into blocks of human – nature “interaction”. Consequently: human – air interaction is the necessity to decide the issues of windshield, aeration, wind energy. Human – aquatic environment interaction brings up issues of storm sewage collection, treatment and use. Human – solar radiation interaction open the issues of insolation, shadowing, reflection, use of solar energy. Human – ground surface interaction (landscape and soil-territorial environment) are the issues of relief preservation and biodiversity.

The second aspect is implemented by the following method. Senior students carry out the task which develops the ability to project small design objects. This is the study of possibilities of modular and combinatorial approaches for the objects of environmental design.

The scenario of developing the revealed processes of such and such events is created on the basis of human behaviour analysis. Further the scenario defines and suggests subject program (collection). The collection can have various purposes: decoration of an outdoor exhibition, supporting holiday or festival, adult relaxing ground design.
4. Results

The aspect of ecological design is implemented in the course of discipline “Composition” through carrying out research tasks. A student must take into account key features of composition: shape, mass, positioning, finish, texture. In the work an emphasis is placed on illumination: light - shade, dynamics, vibrations, transformations. It is the listed accents that can become the main conceptual idea of composition (Fig.1).

![Figure 1. Composition "Light-shadow": a – interior, b – volume, b – two planes.](image-url)

The project of modular system (MS) is the result of implementing the second aspect. A student fulfils the project within the discipline of “Objective filling of architectural environment”. Modular system has to meet a number of requirements. MS is capable of withstanding repeated seasonal outdoor service from May to October. MS represents a dismountable structure like a “toy construction set”. Such construction set can be transformed into 5-7 and more different objects. Thus, MS is a collection of multifunctional outdoor furniture, that is: different benches; shelters, arches and arcades; flowerpots and flower stands; information stands; galleries, espaliers and screens. MS is gathered from elements and details.

The elements have an origin – morphology of bars, flexible bars, hollow rods, plates, solid masses. Elements and details are kept by means of screw joints of diverse design. A special requirement is that
furniture assembly should be carried out without the aid of mechanization. Finishing decoration of the elements takes into account climatic environmental impacts (wind, hail, rain). Construction of elements relies on existing range of structural and finishing materials. Construction enables various materials, notably: plastics, low-density metal alloys, wood, veneer, USB-slabs, ceramics and other modern outdoor materials. The author offers colour harmony alternatives for colouring elements (Fig.2).

Figure 2. Modular systems.

5. Conclusion

For a student to understand the tasks of integrated formation of urban environment is possible only through introducing universalist principle into educational process. The universalist principle, in its turn, is practicable only through understanding ecological criteria and assessing social health of urban space.

Only in this case a design architect uses natural environment components as a full-value material to form new composition, colour, space-and-planning design ideas and concepts.

Even though the author faces the task of different scale, to create outdoor furniture objects, he first of all works on restoring human environment in cities. The author should in no way ignore people expectations and needs in beautiful, comfortable, safe, ecological and contemporary outdoor decoration. That is what can be called “outdoor dressing-up”.
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