Design Features of Furniture and Equipment for Entrance Areas of Kindergartens

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Abstract. The article describes the design of furniture and equipment for the entrance areas of kindergartens. The study examines the formation of the socio-technical environment and the objective filling of one of the types of public buildings - a kindergarten, using the example of the entrance zone. Projecting design process must be started with the essential characteristics, conditioned by the public purpose of the designed object, which are reflected in the socio-functional organization of the environment. The starting point of our research is the problem situation that is developing in real life in Russia. It, as a rule, contains the sharpest contradiction between some elements of the social process. After analysis and public conclusion, the researcher transfers the practical aspect of the problem situation into the rank of the cognitive problem, proves its insufficient research and validity, as well as the need for studying, i.e., satisfaction of the need for knowledge by solving this contradiction of social reality. The methods of research are based on a complex studying of theoretical and project materials of the design features of the entrance areas for kindergartens and their object filling with the support of the functional-structural methodology. In the course of a functional sociological studying, the main assessing criteria for kindergarten entrance areas were derived, and as a result of the pre-project analysis of the content and designation of the interior of the entrance zone of pre-school institutions, the basic requirements for furniture and equipment were determined. In our work we defined: the research model (where all methodological principles were fixed), the purpose and objectives, the hypothesis of the research and the ways of achieving them to obtain an effective result.

1. Introduction

In our studying, the formation question of the object-spatial environment and the interior filling of one typical public building is considered – in the example of children's educational institution No. 67, its entrance zone, in Magnitogorsk. The demand for entrance zones is especially observed in standard DOW, with groups of more than 20 people. The study of typical preschool institutions in the cities of Russia, confirmed the assumption that the furniture and equipment developed and presented on the Internet is not used in these institutions, which is explained not only by low funding, but also by a low level of management awareness of the latest developments in this field. The analysis of the location and visual examination of the internal space of the standard DPU of Magnitogorsk showed that most of them are located in separated houses within the block. The architectural and planning solution corresponds to the time of these structures building - the type of socialist era. We see runout of all forms of buildings and interiors of urban DOW, so there is a need to improve their object-spatial environment and furniture filling. The existing entrance areas of the DOW are, as a rule, faceless, with
a faded finish and arbitrarily chosen content, which does not correspond to modern trends, functional ergonomic requirements and visitors' needs. Nowadays the entrance areas do not fulfill their functional purpose, which leads to discomfort not only for children, but also for workers of the DOW and its adult visitors. In the course of the research, the following contradictions were revealed: 1) the need for visitors to operate the premises of the entrance zone and its absence in the standard DOW; 2) existing content and the existing need for specialized equipment; 3) the existing appearance of the entrance area and modern trends in the organization of interiors. In the course of the scientific research, the problem of non-compliance was identified: 1) the need to operate the entrance area of the kindergarten and the existing hall area (or its absence); 2) the existing object (furniture) filling conditions for the use of the entrance zone; 3) the appearance of the interior of the entrance zone to modern trends, the psychology of perception and the materials of decoration. Thus, the relevance of our work is conditioned by: 1) the inadequacy of the theoretical justification for the object filling of all functional areas of children's educational institutions; 2) weak implementation of design developments in the practice of the Dow. Contradictions and the urgency of the work, resulting from them, which determine the need to identify design features and functional conformity of modern entrance areas of children's institutions, allowed us to formulate the theme of our work. Theme: "Design features of furniture and equipment for entrance areas of kindergartens". The goal is to define and implement functional and ergonomic design features of furniture and equipment for the entrance areas of the DOW. The research tasks: 1) studying of scientific and specialized literature on the problem based on the study; 2) identification of functional and ergonomic features of designing furniture and equipment for entrance areas in a children's institution; 3) determination of the specifics of the object-spatial environment of the entrance zone; 4) studying of the conformity of the process of using the input zone with its object-spatial characteristics; 5) formulation of recommendations for subsequent design; 6) development of a project proposal for furniture and equipment for the entrance area of the kindergarten. The object of research is the object-spatial environment of the entrance area of the kindergarten. The subject of the study is a social group of consumers of the services of a preschool institution. The subject of the research is the operation of furniture and equipment of the entrance area of the kindergarten. Research Hypothesis: if design of the object-spatial environment of the input zone with functional-ergonomic features is taken into account, it will ensure the comfort and safety of visitors and children in the kindergarten. The conclusions and recommendations formulated as a result of scientific work can be used by designers in designing the entrance areas of typical public and private kindergartens, as well as various entrance areas for waiting for other children's institutions [7, Pp. 3-18].

2. Materials and methods of research

They are based on a comprehensive study of theoretical and project materials with the use of a functional ergonomic technique. Theoretical methods [8, Pp. 37-44], [9, Pp.141-142], are used for theoretical substantiation of the research stages: analysis and synthesis, classification, comparative typology, generalization and concretization. Experimental methods were used for experimental work: linear experiment: observation, measurement, ergonomic methods (somatography), diagnostic procedures, calculation and analytical methods, design and graphic modeling, see below in Table 1.

3. Discussion

We make the following provisions: 1. Functional-ergonomic features of designing furniture and equipment for entrance areas of kindergartens: a) location of standard DOW in separated buildings; b) absence of an entrance zone in typical buildings of the DOS of the 80s. 20 th century; c) lack of illumination of the entrance areas of the DOW (use of the tambour, a landing for the entrance zone); d) insufficient capacity of entrance zones. 2. Recommendations for the subsequent design of recreational kindergartens, were formulated from the following provisions: a) entrance zone is required to be divided into several parts, in accordance with specific social groups; b) The furniture design is required for every zone according to the children’s height, size and the figure size of their parents; c) It
is needed to increase illumination of the entrance area; d) determining the color solution of the interior, which positively influences the atmosphere of the room and the comfortable stay of the people in it. These recommendations help to ensure design at a higher and better quality. 3. The design proposal for the development of furniture [3, Pp. 45137-45141], and equipment for the entrance area of kindergarten No. 67 in Magnitogorsk, Figure 1 [10, Pp.232-234], [12, Pp.102-103], [13], shows the implementation of features of functional ergonomic conditions and reflecting the results of scientific research [11, Pp. 140-143].

**Table 1. Methods of collection and processing of information.**

| Theoretical | Sociological | Empirical (practical) | Methods of mat |
|-------------|--------------|-----------------------|----------------|
| - analysis of documents; | - conversation; | - confidence; | - statistical methods |
| -comparative analysis; | - interview; | - linear experiment; | (registration, ranking, |
| -ergonomic analysis; | - conforming; | - study of pedagogical | scaling, timing, average |
| -functional analysis; | - testing; | experience; | arithmetic sampling); |
| -synthesis; | - interview; | - examination of | - graphic methods |
| -classification; | - content analysis | experience in design- | (graphs, charts, diagrams, |
| -communication; | (statistical | design; | histograms); |
| -configuration; | calculation of the | - diagnostic procedures; | -mathematical (filling out |
| -construction of hypotheses; | frequency of the | - ergonomic | tables, counting data) |
| -project-graphic modeling; | data) | (somatography) | |

**Figure 1.** Project proposal for furniture and equipment for the entrance area for Dow No. 67. Methodical recommendations for the design of furniture and equipment for the entrance zone of the DOW have been developed. The conclusions and recommendations formulated as a result of the research can be used in the educational process in the direction of preparation "Design", the profiles "Furniture design", "Interior design", "Medium design" and "Interior and equipment".

**4. Literary Review**

In the theory of design, the general questions of the design of the object-spatial environment are widely covered. There are the following studies that cover various aspects of design: B.G. Barkhina, K.V. Kiyanenko, A.A. Pravotorova, K.K. Khachatryantsa, I.V. Shvetsova, A.S. Yuzbakova, Z.N. Jargin. Famous scientists, architects and designers reveal the typology of public buildings and structures, determine the factors shaping the environment [1, Pp. 271-276]. Also, the inclusion of equipment and subject matter into the environment has been sufficiently studied, with the aim of equipping it with a specific volume-spatial system in works by Shimko VT, Khasiyeva SA, Kim NN,
Tits AA Ergonomic requirements to the formation of the environment and its subject filling (B. Runge, Yu.P. Manusevich, V. Munipov, V. Shimko, etc.) are distinguished. The influence of the environment on the psychological and social characteristics of a person is defined (Stepanov AV, Ivanov IG, Ikonnikov AV, Nechaev NN). All these studies are more extensive and consider architecture and environment from the point of view of methodology. Theoretical aspects of the development of residential and social environment, taking into account social, ergonomic, constructive, bionic characteristics are laid down in the works of Grashina AA, Zmeula SG, Molchanova VM, Novikova EB If we consider scientific literature [2, Pp.43-49], [4, Pp.211-214], [5, P.148], [6], [14], [16, Pp.10-13], we can note a small number of sources on the design of the subject-spatial environment of preschool institutions.

5. Results
When analyzing the entrance zone, we considered the conditions aimed at the optimality and rationality of designing kindergarten halls: town-planning, socio-economic, functional-technological, socio-psychological, affecting the architectural and planning solution, socio-technical environment, functional zoning, furniture and furniture equipment. The criteria for estimating the input zones are derived. The histogram gives a complete visual representation of the comparative analysis of these criteria for typical kindergartens in Magnitogorsk, Figure 2.

![Figure 2](image_url)

Using the graph (Fig. 4), we have established Fig. 3, that the peak of the patency of the entrance zone from 7.20 - 8.30. The study allowed not only to determine the age groups of people, but also to reveal their needs (anthropometric, aesthetic, psychological) to the functional filling of the entrance area, to form and classify, the general requirements for the waiting area (hall).

![Figure 3](image_url)

Using the graph (Fig. 4), we have established Fig. 3, that the peak of the patency of the entrance zone from 7.20 - 8.30. The study allowed not only to determine the age groups of people, but also to reveal their needs (anthropometric, aesthetic, psychological) to the functional filling of the entrance area, to form and classify, the general requirements for the waiting area (hall).
As a result of the conducted research, we have revealed the features of the design of furniture and equipment for the entrance areas of the DOU that ensure the efficiency of their operation and function.

The given researches have defined recommendations to designing of furniture filling of a kindergarten: 1) zoning of an entrance zone is necessary to be divided into several parts, according to concrete social groups; 2) for each zone, the development of furniture and equipment corresponding to the growth, the size of children and the adults waiting for them is necessary; 3) the need to increase the amount of illumination of the entrance zone; 4) determining the color solution of the interior of the room positively affecting the atmosphere and the comfortable stay of the people in it. The implementation of these recommendations made it possible to rationally formulate the conceptual foundations of the artistic and imaginative solution and the implementation of the project. The findings and recommendations formulated as a result of the research can be used by designers in the design of entrance areas for typical public and private kindergartens, as well as various entry areas for waiting for other children's institutions.

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