

Psychological Features of the Architectural Formation of Dwelling for Students

Aleksey Popov, Aleksy Łapko



Abstract: *The article considers and summarizes the conclusions of modern psychologists concerning the interaction of students living in student dormitories. We analyzed the need for both communication and development, and solitude to rest from the social and psychological stress and for reflection. Based on the analysis of certain features, we proposed schemes of functional zoning, recommended for use in student accommodation units. The objects of the study are buildings and their complexes designed for college students' accommodation. The subject is the formation of comfortable architectural solutions of student dwelling, corresponding to the specifics of students' psychological development and academic work. The purpose of the study is to develop proposals for the formation of the architecture of objects designed to accommodate students, taking into account their psychological features. The objective of the study is to identify the functional aspects of optimizing the environment, to develop models for the formation of the architecture of college student accommodation buildings at the level of functional organization of their structural components, i.e. spaces of residential premises.*

Keywords : *dormitory, student campus, private space, psychological comfort, design of dormitories, life cycle engineering*

I. INTRODUCTION

A modern college is not only an institution of professional education, it is a powerful science-intensive and sociocultural center that forms the personnel of many public spheres, institutes, and institutions. Due to this, the requirements for the comprehensive arrangement of all components of its architectural and spatial environment are especially demanding today.

Traditionally, colleges are established in large cities or local city-forming centers that have a developed educational environment, an organized infrastructure, and relevant academic personnel. Many people are sent to such centers to obtain higher education and perform scientific work, which determines the need to create student accommodation units, the special long-term residential environment in their structure for non-residents [29-31].

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A. Functions of student accommodation units

Functions of student accommodation units are:

- residential functions,
- independent (home) learning,
- recreation,
- leisure,
- recreational and developing sociocultural activities.

This necessitates the formation of student accommodation facilities of colleges, as a multifunctional complex, which is a particular holistic entity with various functions, taking into account the specifics of work and the needs of students, as well as social, psychological, and emotional aspects of the life of young people who are forced to live apart from families for a long time. Student dwelling is a special, relatively independent space, structurally integrated into the architectural environment of colleges.

B. Russian student campuses

In Russia, the residential environment of colleges is traditionally represented by separate buildings of dormitories or their complexes, "student campuses." These are monofunctional objects representing residential buildings with bedroom-rooms, created to resemble traditional dwelling for factory workers, in which the size of rooms is critically reduced (6 m²/person according to the current standards). The basic structural unit is a shared room for 2~4 people. Also, the service rooms are as small as possible, and the rooms themselves are remote from residential rooms and are intended for a large number of users, which creates significant inconvenience and affects the household processes.

Such an organization adversely affects the quality of home learning, leisure and rest, and also leads to significant unproductive time outlays. In addition, now a nonresident student actually does not have any functional space for home learning. Existing dormitories are excessively communized: there are no isolated emotional and psychological spaces that are physically and psychologically necessary for personal rest and reflection. Such an organization of high school housing does not meet many vital needs of students, and also significantly reduces the effectiveness of education.

It seems that the buildings, complexes, and individual premises of the student dwelling in Russia in many respects do not correspond to the modern specifics of academic work, the learning tools, the psychological needs of students, and also the sociological features of the formation of the students' groups.

The present work is an attempt to form a residential unit of student dwelling taking into account the specific features of the psychological development of young people during their study at a college.

II. MATERIALS AND METHODS

The research methods include:

- a system analysis, which allows considering various factors in the formation and development of an object;
- a study and systematization of scientific publications on the subject, professional literature on architectural and structural design of student dwelling, materials of social research on the problem;
- the method for integrated assessment of design solutions.

III. LITERATURE REVIEW

Previously, architectural and planning aspects of the design of buildings and student accommodation complexes, as well as individual issues affecting the architectural solutions of the university complexes (psychological, sociological, etc.), were considered in the publications of the following researchers: Dianova-Klokov [6], Rubchevsky [37], Nartova-Bochaver [25], Nesterova [26], Kondratiev [15], Gorshkova [10, 11], Tivodar [46], Kropotova, [16], Bekker [1], Bystrova [3, 4], Rodionovskaya [35], Lagoida [18], Romm [36], Litskevich [20], Chernjak [5], Loban [21], Sergeev [41], Kalabin [14], Shcherbo [43], Yugova [45], Maslovskaya [24], Puchkov [32-34], Neverova [27], Semenova [38], Vereschagina [47], Gvozd' and Skopintsev [12], Dukhnovsky [7], Duryagin [8], Isaeva and Borisova [13], Shamionov [42].

The most ambitious research on this topic was carried out by the following scientists: Sorokin [44], Brandenburg [2], [17], Pisarenko [28], Lilueva [19], Lyakhova [22].

However, the formation of the student accommodation units in terms of the psychological development of the youth during the period of college study was not paid due attention in the above-mentioned studies; therefore, it seems appropriate to deal with the issue in this study.

Based on the research of modern psychologists [7, 11, 18, 21, 25, 46] regarding the organization of the residential environment for student youth, it can be argued that a person can only experience psychological comfort being both within a society, meeting the need for communication and development, and staying alone to rest from the social and psychological stress and for reflection [39, 40, 44, 48]. The optimal ratio of the time of being in a society and the time of solitude depends on many factors and is individual for each person; however, both of these states are necessary for a healthy and comfortable existence of a student.

IV. RESULTS

A typical feature of the existing Russian dormitories is the lack of private space and private territory, coercion to the society, the communization of many domestic processes. A student living in a modern Russian dormitory is deprived of the opportunity to freely dispose of the time, in view of the need to coordinate his actions, routine, and schedule with the roommates. The small psychological group formed in an

accommodation unit of the dormitory, apart from the positive aspects of promoting the integration of the individual into society, also suffers from the negative aspect of strangers' intrusion into the private space and territory of the individual, which he needs for psychological comfort.

A. Private space zones

Thus, it is possible to structure a private space, according to the acuity of stimuli perception, and identify the following zones (Fig. 1).



Fig. 1. Private space zones

1. *Intimate distance zone*: the space closer than 0.5 m to the person. When there are any people in the intimate zone, the individual experiences a strong psychological stress. Only close people can be admitted to this zone, and only for a relatively short period.

2. *Private distance zone*: the space at a distance between 0.5 and 1.5 m. The individual feels relatively comfortable for a long time, when close people only are in this zone. Well-known people, friends do not cause any discomfort by staying in this area only for a relatively short period of time.

3. *Social distance zone*: the space at a distance between 1.5 and 4 m. At a long-term stay of well-known people and short-term presence of strangers in this zone, an individual feel relatively relaxed.

4. *Public distance area*: from 4 m to the room frames. This is the most comfortable distance for little-known people staying in the same room. The presence of any people in this area or closer causes a psychological stress associated with maintaining the social roles of the individual.

According to the effective SP 118.13330.2012 "Public Buildings and Structures," par. 5.36, the area of a residential room should be at least 12 (10 for single person) m² and, according to par. 5.38, residential rooms for students of vocational schools should be provided for 2~3 people. The area is determined based on the standard of 6 m² per person, excluding the area of built-in cabinets. Rooms should be of non-walk-through type, at least 2.2 m wide, with access to the corridor directly or through the residential gateway. The recommendation in par. 5.38 to design twin or triple rooms seems an anachronism.

The presence of other people in the private space, even in the general area, reduces the ability to concentrate and leads to discomfort accumulation. This effect is the higher, the less the degree of familiarity with the person who has intruded the private space is, as well as the closer he is.

The psychological stress described above does not increase in direct proportion to the number of people in the private space, but rather in proportion to the number of relationships, social roles, between individuals and their group combinations. The number of relationships between individuals (Fig. 2) and their group combinations is determined by the formula (1) proposed by psychologists MacIver and Page [23]:

$$R = \frac{(3^I - 2^{I+1}) + 1}{2} \quad (1)$$

Where R – the number of relationships between individuals and their group combinations, I – the number of individuals in the group.

The number of unwanted contacts between the neighbors increases proportionally to the increase in the number of connections, which entails an increase in the probability of conflict situations. The probability of conflict situations is very high, for example, when one of the neighbors creates interference (through noises, movements, etc.) to the other person who is busy with something or is at rest.

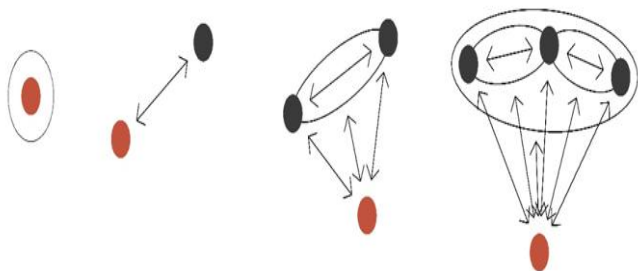


Fig. 2. A diagram illustrating the number of relationships between individuals and their group combinations (the considered individual is shown in red on the diagram, the other individuals related are shown in black)

B. Results of an analysis of the psychological characteristics of interaction of a person living with his/her neighbors

An important parameter of a person's psychological comfort is the opportunity to retire from the society for recreation and reflection, as well as the presence of a zone for indefeasible storage of personal belongings, the zone of personal control.

Thus, an analysis of the psychological characteristics of interaction of a person living with his/her neighbors, as well as an analytical identification of the probability of conflicts, show:

1. The importance for the psychological comfort of the individual's opportunity to respire alone from society and reflection, as well as the existence of a zone of indefeasible storage of personal belongings, personal control.
2. It is preferable to create private zones for the following functional processes: sleep, rest, home occupations, the area

for storing personal belongings; these zones should be in a separate room isolated from other premises (in an individual private room).

At the same time, as shown by the study of facilities in Russia and the CIS, the vast majority of the premises of student accommodation buildings (often all premises in the building) are designed for shared use [30, 31], which is partly reasonable in terms of reducing operational and construction costs, but to a certain extent affects the formation of a full-fledged personality of a society member and reduces the effectiveness of learning educational programs.

Based on the consideration of the psychological characteristics of students' interaction in the dormitory, it is suggested to refuse from the formation of residential rooms typical of the Russian and Soviet practice and implement the following proposed options for functional zoning (Fig. 3).

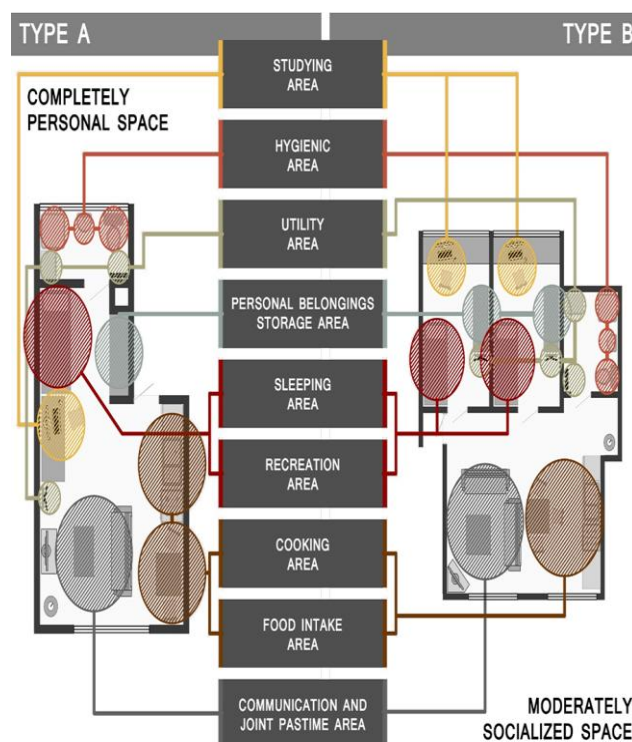


Fig. 3. Generalized diagram of living unit functional zoning recommended for use in a student dwelling

V. DISCUSSION

Summarizing the aforesaid, in order to create a psychologically comfortable environment and reduce the likelihood of conflict situations, it is particularly necessary to approach the formation of zones of the following functional processes in dormitories: sleep, rest, home occupations, the storage area of personal belongings, which should be in a separate room, isolated from others (an individual personal room) or, as a last resort, in a dedicated, visually restricted space.

Material existence forms consciousness and the quality of the living environment plays an essential role in the life of any person. Currently, students are forced to live in a low-quality environment for many years (from 4 to 7 and even longer). This period includes the age of 18 to 25 years, i.e.



the time of active conceptual socialization, in which an intensive formation of the personality takes place, and a person's worldview is finally formed, as well as the value and aesthetic landmarks are established, for which the life environment quality plays an important role.

It seems reasonable to amend paragraph 5.38 of SP 118.13330.2012 (the current version is as follows: "The residential rooms for students, including students of vocational schools, should be provided for 2~3 people. The area is determined based on the standard of 6 m² per person, excluding the area of built-in cabinets. Rooms should be of non-walk-through type, at least 2.2 m wide, with access to the corridor directly or through the residential gateway. For dormitories of primary vocational education institutions, the maximum number of students sharing a room is 4.") with the requirement to design rooms in student accommodation units for 1~2 people. It can be allowed to design rooms for 3 people in certain particular cases and should be forbidden to design rooms for 4 or more people. Having analyzed the functional processes in the student accommodation buildings, determined the necessary furniture and equipment, analyzed the ways for placing furniture and equipment, and based on the calculations of hygienically necessary volume of the air mass [31], we find it advisable to increase the minimum area per person to 7.5 m². The possible revision of paragraph 5.38 of SP 118.13330.2012 is as follows: "Residential rooms for students of vocational schools are recommended to be provided for 1~2 people. It is not allowed to provide rooms for students, including students of vocational schools, for more than 3 people. The area is determined based on the standard of 7.5 m² per person, excluding the area of built-in cabinets. Rooms should be of non-walk-through type, at least 2.2 m wide." In the future, it seems promising to shift to a completely individual residential space in student accommodation buildings.

It also seems reasonable, in accordance with the principle of individual private and learning space, to introduce in SP 118.13330.2012 the additional requirement to provide the student accommodation buildings with isolated rooms for independent studies, including those involving the use of computer equipment. As mentioned above, the existing organization of shared premises for independent learning is obsolete. The requirements of SP 2.1.2.2844-11 "Sanitary and Epidemiological Requirements for the Arrangement, Maintenance, and Equipment of Dormitories" are not relevant to the current situation in terms of regulating the list of shared use premises and their floor layout [9].

The Paragraph 3.1 of SP 2.1.2.2844-11 provides the following list of mandatory shared use premises [9]:

1. Toilets, washrooms, showers, hygiene rooms for girls, laundry, ironing, drying rooms, kitchens, facilities for processing and storing cleaning equipment. In multi-storer dormitories, the above-mentioned premises should be provided on each floor.

2. Storerooms for storing household equipment, laundry storage rooms (rooms for separate storage of clean and dirty laundry), rooms for drying clothes and shoes, personal belongings storage rooms, and other auxiliary rooms.

3. Rooms for self-study.

4. Rooms for rest and leisure.

5. Playrooms for children living in a family-type dormitory.

It is proposed to let architects feel less restricted with respect to the formation of functional zones, premises, and their interrelations, retaining only a list of functions necessary for the implementation. It is also necessary to provide a legal reasoning for the possibility of implementing the majority of functional needs in residential rooms and accommodation units. The most promising types of residential rooms are single rooms and twin rooms (for some categories of residents) with different furniture and equipment sets in (near) the residential room or in the residential block. It is advisable to amend the town-planning regulatory documents in terms of providing student accommodation buildings and complexes with maintenance infrastructure in accordance with the system of functional needs of their inhabitants and the principle of multifunctionality of the architectural and town-planning solution of the university campus.

VI. CONCLUSION

Thus, we propose some lines of improvement of the regulatory documents effective in the Russian Federation regulating the architectural formation of the student accommodation. The research performed has allowed to define the architectural solutions corresponding to the psychological features of formation of the personality and its integration into the society during the college study. It seems relevant to further expand the present study and take a deeper look at the issues of the sociological formation of the group of students in terms of the entire student accommodation building and the lines of improvement for the architectural environment of the dormitory buildings, with account of this issue.

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