

NEW OUTLOOK ON HIGHER EDUCATION FACILITIES. MODIFICATIONS OF THE ASSUMPTIONS FOR PROGRAMMING AND DESIGNING UNIVERSITY BUILDINGS AND CAMPUSES UNDER THE INFLUENCE OF CHANGING ORGANIZATIONAL AND BEHAVIORAL NEEDS

Dorota WINNICKA-JASŁOWSKA*

* Dr.; Faculty of Architecture, Silesian University of Technology, Akademicka 7, 44-100 Gliwice
E-mail address: dorota.winnicka-jaslowska@polsl.pl

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Abstract

The processes connected with education and research works have become more complex. The advancement of engineering and information technologies has influenced the modes of teaching and learning and modernized the supporting and aiding tools. Nowadays, science is interdisciplinary, which results in new relations and interactions in the space of buildings. The above mentioned assumptions require new perspective and a fresh approach to planning changes in higher education buildings and revitalization of student campuses.

Streszczenie

Ewolucja techniczna, zmiany organizacyjne i programowe studiów a także przemiany społeczne sprawiają, że przestrzeń i wyposażenie obiektów wyższych uczelni ulegają stopniowym zmianom w budynkach starszych a w obiektach nowych, w ciągu ostatnich lat, możemy zaobserwować rozwiązania projektowe, które wyznaczają nowe standardy techniczne i funkcjonalne. Procesy związane z dydaktyką i pracami badawczymi, stały się coraz bardziej złożone. Wraz z rozwojem techniki i informacji obserwujemy zmiany w sposobach prowadzenia zajęć dydaktycznych, ocen i prezentacji prac studenckich. Rozwój techniki i technologii informacyjnej wpłynął na nowe sposoby uczenia się oraz unowocześnił narzędzia do ich wspierania. Studenci poszukują większej współpracy i doświadczeń. Nauka wymaga obecnie interdyscyplinarnych badań naukowych. Potrzeba ta wymusza nowe relacje i interakcje w przestrzeni budynków. Sam proces zdobywania wiedzy przebiega w różnych miejscach, nie tylko w salach wykładowych, ale również w kontaktach społecznych drogą elektroniczną lub twarzą w twarz. Przy wsparciu i dzięki dostępowi do zasobów cyfrowych i urządzeń mobilnych, uczenie się może odbywać się wszędzie. Przemianom uległy sposoby komunikowania się, współpracy, podejmowania wspólnych działań i inicjatyw, a także sposoby organizowania życia studenckiego.

Keywords: Higher Education Buildings; HE facilities; Campus; Public space; Social needs.

1. INTRODUCTION

Technological evolution, revolution in the organization, curricula of studies, as well as social transformations have led to gradual changes in the space and furnishings of older university buildings, and as far as newly designed buildings are concerned, new design solutions have been applied in the last few years, setting new technical and functional standards. The processes connected with education and research works have become more complex. The advancement

of engineering and information technologies has influenced the modes of teaching and learning and modernized the supporting and aiding tools. Students look for broader cooperation and experience. Nowadays, science is interdisciplinary, which results in new relations and interactions in the space of buildings. The process of knowledge acquisition can take place anywhere, and it is not restricted to lecture rooms but it also entails social contacts by means of the internet or face-to-face contact. Thanks to the support and access

to digital resources and mobile equipment, the learning process can occur anywhere. The ways of communication, cooperation and undertaking joint decisions and initiatives have changed, as well as the ways of organizing student life.

According to the principles of the Bologna Process which stipulates the tasks leading to unify university education systems, up to 2010 The European Higher Education Zone should be created. The tasks include, among others: promotion of student, academic and administrative staff mobility, support of European cooperation in improving the quality of higher education, promotion of European university education, especially in terms of vocational development, integrated teaching curricula, trainings and research [1], [2]. Following the stipulated principles, the manner of educating students and their professional / vocational experience should change. Thus, there is a need for a new quality of university space and infrastructure of university buildings. In many European publications there are many proposals concerning studies of student campuses and HE facilities [3], [4]. Furthermore, methods of programming functions that university buildings should fulfill show changes in the manner of thinking of users of university facilities and the consequent spatial changes [5], [6].

2. MODERN TRENDS IN THE DESIGN OF HIGHER EDUCATION FACILITIES. SOCIAL SPACE

The above mentioned assumptions require new perspective and a fresh approach to planning changes in higher education buildings and revitalization of student campuses. One of the most popular worldwide trends of shaping higher education facilities is so called: "Learning Landscape". Its name and the main assumptions were laid down by DEGW (an international consulting and architectural design office, which has conducted quality analyses also in higher education facilities all over the world for 30 years. The starting point of all research studies are relations among people, users' needs and the improvement of the functionality of organizations and provision of comfort in the performance of buildings) [7].

According to DEGW, the main objective is to combine the functional zones of a building in a way that should encourage learning at every spot. Typical learning zones, such as lecture rooms or seminar rooms should be linked with zones of social contacts, because the latter also enhance knowledge acquisition. Nowadays academic and university space must

be utilised more effectively, pursuant to the new tasks that higher education institutions are supposed to fulfil, including:

- Changes in the organizational system, research works and teaching methods.
- The process of differentiating fields of study (specialization) at the concurrent interdisciplinary of sciences.
- Creation of the knowledge society with the use of information technologies.
- Encouragement to experiment, ask questions, unconventional and lateral thinking.
- Offering up to date educational services, supported by IT and enabling direct contact with other educational units located all over the world.
- Access to electronic databases and interactive educational methods.
- Cooperation with external specialists.
- Integration of scientific and research circles, creation of commonly shared culture, dialogue and partnership.[8]

Taczewski T. [9] indicates the new goals of universities too. He pointed also:

- Increased effectiveness for using space,
- Permanent education through the life,
- Need for specialized research space,
- Competitiveness of the education market.

The above mentioned principles pose a challenge for shaping academic space, both inside faculty buildings (in Poland the model of division into separate faculties is prevailing) and student campuses. For the last 30 years the need concerning the use of space in higher education facilities have changed, mainly due to dynamical development of technology, which influenced the modes of work, teaching methods and social relations. In the years of computerization and minimization of equipment, there have been changes in the demand for work floor area and interior public space (Fig. 1) In the course of the author's research work (in 2006-2009 focused on the needs concerning public space) carried out in university facilities it turned out that the biggest predicament of old generation buildings is the absence of sufficient and, in terms of functionality, suitably arranged public space[10]. They have minimal communication zones that constitute so called: "student area" ("student area" – such term was coined by students in the internet survey of architecture students in Poland in 2007) [11], which by no means fulfils the users' expecta-

tions, especially in terms of floor area. Nowadays commonly used public space includes: the main hall, horizontal and vertical communication tracks, cloak-room, reception combined with inquiries (previously janitor's stand), more space for leisure and waiting, eating, networking, social contacts, commercial and other functions. Up till now the main hall functioned only as representation zone, and vertical and horizontal communication routes were used for communication only. Thus, one of the negative solutions in old generation buildings, erected in the 1960s or 1970s, is excess cluttering of corridors, swarmed by students (in the quantity much bigger than the numbers assumed 40 years ago). Inadequate flexibility of university buildings does not enable any functional and spatial changes (Fig. 2, 3).

Currently, university halls and corridors have become student occupied zones used for social meetings, resting, waiting for classes and lectures, learning, networking, getting on-line, etc.

In the course of the author's studies on the needs of students of architecture at technical and technological universities in Poland, a model of student zone ("student area") was created as open and multi-functional space, where different types of activities in-between classes and lectures may be performed (Fig. 4). Nowadays HE buildings are characterised by smooth connections with the main hall zone which serves the functions of a canteen, library or electronic store files, as well as commercial and service functions.

The ease of communication by means of the internet or cellular phones did not diminish the need of personal contact among students. They still want to be together, cooperate and undertake commonly shared tasks. Moreover, the sense of belonging to a particular social group and the sense of identification with the student environment and professional study line has grown stronger in comparison with previous years [11]. Accordingly, students spend a lot of time in university facilities after or between classes and lectures and eagerly occupy spaces that are suitable for resting, conversations, eating, working with their laptops, etc. Hence, the solutions applied in many modern university buildings are focused on increasing the space that could serve the above mentioned functions., including corridors, which have nowadays become not only "passage ways" but places of gathering of students, for example, in front of lecture rooms.

3. OFFICE SPACE FOR RESEARCH AND TEACHING STAFF

For scores of years office rooms of research and teaching staff functioned in accordance with a certain similar scheme. They were mainly focused on individual work and not designed to ease contacts with co-workers and students. In the last few years the approach towards the design of office space has changed. Yet, it is difficult to define precisely when this process started and which direction it followed. Surely, the process of change in the design of offices depends on many economic, cultural and social factors. Starting with European corridor offices, through American open-space offices typical of the 1950s and 1960s, there was a trend to combine the two office design types. One of the reasons behind this was the advancement of technology and changes in the modes of work, resulting from the development of the means of work. The changes also affected university staff. A typical old generation solution was a corridor along which office rooms were located at both sides, which was a follow-up of the old office design tradition.[12] The office work of staff employed at institutions or universities was considered to have a similar character in the 1960s, as substantiated by higher education buildings which followed the prevailing office design pattern. But modern university offices have changed, mainly because of the growing awareness of the needs and special nature of the academic work of professors: acting as lecturers, teachers and research workers. Currently the workplace of research and teaching staff at universities must serve many different functions; the following conditions need to be provided for the task:

- Analytical and laborious research work
- Reflects the quality and importance of the organization,
- Provides staff with a sense of belonging,
- Act as a place for sharing knowledge with colleagues,
- Enables contacts with other team members and currently run tasks and projects,
- Enables attracting and sustaining new staff members,
- Facilitates interdisciplinary activities,
- Facilitates cooperation between the organization and external partners,
- Expresses the identity of the organization [13]

The analysis of the professional activity conducted in the academic offices in the Department of Civil and Building Law at the Loughborough University (2005)

indicated that, on the average, staff spend about 30 % of their working time on individually assigned tasks. The entire office work was divided into the following types of activity: 43% – work with the computer, 21% – paper work, 22% – meetings, 8% – telephone contacts, 6% – other organizational tasks [14].

Research conducted by DEGW referred to in this paper, indicated that in case of many university facilities the operational conditions should be improved, as they did not promote new forms of activity undertaken by research and teaching staff. According to the research results, staff members value the following factors in their work environment:

- Opportunities for formal and informal communication
- Privacy of work that requires concentration
- Acoustic insulation essential for the privacy of conversations
- Visual privacy
- High quality of the work environment, proper heating and ventilation systems
- Good aesthetics, modern interior design, comfortable furniture
- Place for relax and rest, distanced from the work desk, with the possibility of contact with other co-workers



Figure 1.
Academy of Music In Katowice. Atrium as an interior public space. Photo by D. Winnicka-Jasłowska

- Convenient place for storing materials within the reach of the work desk
- Individually accessible space for showing or projecting elaborated research and teaching materials. [13]

The characteristics of the research and teaching staff modes of work and their requirements concerning the work places are shown in Fig. 5. Nowadays the most commonly encountered types of offices for research and teaching staff are individual and closed rooms, combined offices, group rooms or time –



Figure 2.
Faculty of Mechanical Engineering, Silesian University of Technology – expanding corridor at the junction with the vertical communication. Photo by D. Winnicka-Jasłowska



Figure 3.
Faculty of Architecture, Silesian University of Technology – typical corridor in didactic zone. Photo by D. Winnicka-Jasłowska

bounded work stands in open-space rooms, for example, for visiting professors. The prevailing trends in the USA and Western Europe are combined offices, joining smaller individual work office rooms for one or two employees with bigger rooms destined for team work and contacts with other co-workers. Yet, in Poland, the corridor office model is still popular and there are few places destined for team work and informal contacts.

According to current trends, deans' offices that address different student affairs often have open

spaces for reception and enquiries, thanks to which students are served efficiently.

4. EDUCATIONAL FACILITIES

Educational facilities are also subject of change, especially as far as technical and technological equipment is concerned. Modern classrooms and seminar rooms should have flexible arrangement. On the grounds of a common module student instruction

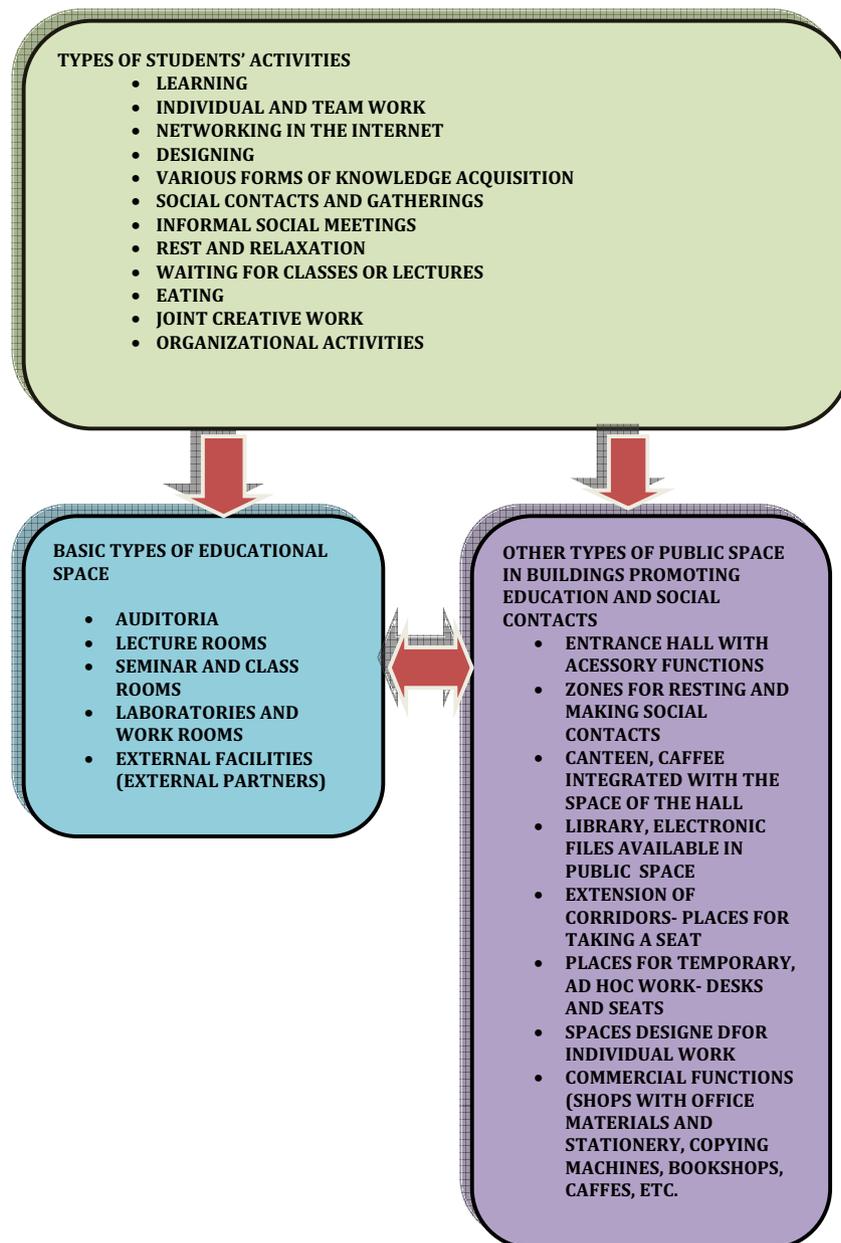


Figure 4. Types of students' activities performed in the space of a university building. Elaborated by D. Winnicka-Jasłowska

rooms are designed to enable free arrangement of space due to new modes of teaching. Lecture rooms and auditoria may be used for conferences, as they are frequently adjacent to the main and

biggest public zones such as the entrance hall, which may serve as the foyer for conferences. In case of HE buildings, a commercial approach is, at the same time, an approach providing economic solutions for maintaining and managing the building. Nowadays such approach is necessary, both for state and non-public universities. (Such conclusion was drawn from the author's own research and contacts with managers of university facilities, among others: Rybnik Engineering Teaching and Research Centre) (2011 – to date unpublished).

The old model of educational facilities has been subject of change, focused on the following prerequisites:

- Type of university and its study lines
- Elaborated modes of work with students
- Professor-student relations
- Use of practical methods of knowledge transfer (laboratory classes, technology workshops, external cooperation partners, etc. (The author's division of educational space in accordance with the results of the research)).

The above mentioned prerequisites exert an impact on rooms arrangement, their size, furnishings and location within the building.

In the programming phase it is essential to analyze options of solutions for specific zones of the building. Predominately, they are similar for all types of universities and faculties, but may differ by functions typical of a given study line. The relations among the

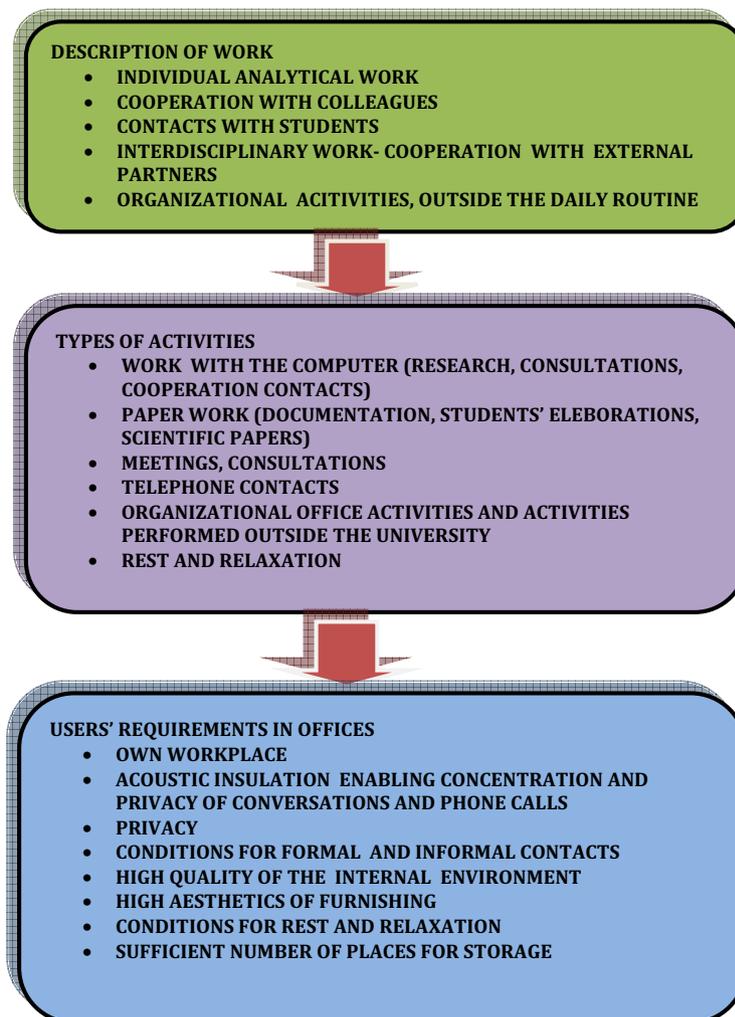


Figure 5.

Description of work profile and requirements of teaching and research staff in the work place . Elaborated by D. Winnicka-Jasłowska

zones depend on the planned functions that the building is to serve (for example: lease of some parts of the building, organization of conferences, exhibitions, etc.) and its life cycles (extension). Interconnections of the zones should be legible for all users. It is one of the elements of the way finding strategy. Thus, the best solutions involving functional comfort, ways of visual information, ease of comprehending spatial layout and moving around the building space should be proposed.

5. CHANGES WITHIN THE CAMPUS

The concept of the "Learning Landscape" devised by DEGW refers not only to university buildings but also to student campuses. The main assumption is to abandon a traditional attitude towards buildings and their functions, organized in units such as faculty, administration, etc. "Learning Landscape" defines the future of universities by recognizing the network of attractive sites and centres providing students with opportunities for activities through joining and grouping particular units or facilities. In academic quarters that were erected scores of years ago the nature of the main types of spatial zones must be altered. The division into traditional types of space has become less important and space as such less function-specific, resulting in combining and mixing different environments, which promotes interdisciplinary activities. Universities should operate in the 24/7 mode. The crucial challenge is to find the balance between formal and informal workplaces. Due to increased mobility and technological advancement students may choose the place and manner of learning. In view of different modern types of work and cooperation workplaces should be flexible.[15]

A modern university and research centre is usually located in a specific city district and labelled as campus. In western countries campuses are organizationally linked with industrial or business establishments, providing strong ties between theory and practice. Likewise, transport connections facilitate cooperation of several institutes and universities. In Poland the process of transforming campuses has just begun. The awareness of the need to develop at various levels has increased. The transformation process should be planned and implemented in stages in the next years. The amendments of the Law on Science and Higher Education introduced in 2011 will also influence the functional organization of universities and campuses.

6. CONCLUSIONS

Dynamic advancement of Information Technologies has transformed the manners and forms of teaching and learning. Traditional lecture and classrooms do not suffice any more. Being wired and having easy access to thousands of servers through the Internet have changed modern universities. Also, cooperation among different fields of science and growing awareness of the necessity of interdisciplinary research contribute to the evolution of research stands and change their profile and look.

The long-term process of transformation that Polish universities and research centers have to undergo is an opportunity for author's quality analyses of the existing facilities and the needs of their users [10][11]. By getting acquainted with worldwide trends in the development of campuses and universities, it is possible to compare and formulate objective conclusions for further studies on Polish university facilities.

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