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SPACE FOR UNIVERSITY STUDENTS: SPECIFIC REQUIREMENTS FOR "SELF-LEARNING" ENVIRONMENT – THEORETICAL APPROACH

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Abstract
The paper presents a humanistic approach in investigation of people-environment relations within university buildings. Architecture of the university buildings is considered to be a learning environment from the position of "critical pedagogy of place". It emphasizes the importance of the place itself expressed by the specific link between building and its location understood mainly in environmental terms – not only as a functional node but also as a vital element of cultural and also natural environment (sustainable development). It also presents some of the contemporary research on learning environment focused on the topic of students' engagement – influencing learning success, and its multiple relation with university building facilities and architecture. The theoretical considerations are illustrated by some examples of university buildings from US. The paper is a theoretical introduction to the following paper: "Students' assessment of environmental conditions in university buildings – the research report", which describes the method and results of research (by the same author) proceeded in a few Polish university buildings.

Keywords: **Architecture; Learning environment; Openness; Participation; Research; University buildings; Students' engagement.**

1. INTRODUCTION

University buildings and their immediate surroundings shape the physical context of learning. Students do not perceive them as mere buildings but rather as important places that enable learning and have a real influence on the quality of education and the social interactions (situations) that accompany this process. Moreover, they constitute a specific kind of places and situations that shape a significant part of people's life experience and make an important contribution to their identity. The relation between people and places is bidirectional; "people tend to reflect on their own <situationality> to the extent that they are challenged by it to act upon it" and they basically a.r.e "because they *are* in a situation and they *will be more*, the more they not only critically reflect upon their existence but critically act upon it" (Freire, 1995) [1:4].

The contemporary picture of the university environment is certainly influenced by the characteristic tendencies in modern education. Among them there are: a general increase in the number of learners in higher education, more equal participation of women in all fields of studies, and a growing importance of information technology. The last tendency is strongly emphasized by sociologist Anthony Giddens (2006); he stresses the significance of overcoming the lack of access to new technical solutions (which – in turn – can lead to "information poverty") together with the promotion of the idea of "lifelong learning" [2]. The technical, social and economic changes result in the general civilization shift that necessitates continuous improvement of qualifications and acquiring new knowledge throughout the entire working life. Since the early stage of XXI century, a significant growth is observable in the number and importance of jobs in the field of processing, distributing and commercializing information; people doing this type of jobs are

described as "knowledge workers" [3]. The concept of "lifelong learning" is more often understood as "learning in different contexts", which gradually replace the traditional formula of "<education> – meaning the orderly transfer of knowledge within the formal framework of institutions established for this purpose" [2]. Focusing on "learning" rather than "being educated" signifies a shift towards the learner's individual engagement and his or her taking some atypical "out-of-school" activities in order to gain knowledge. It requires some new skills in acquiring information, including use of interpersonal contacts and social media. Those types of learning activities are closely related to the new concepts of "outdoor education", "contextual education" and "place-based education" too [1].

The authors of the theory of a *critical pedagogy of place* challenge us "to read the texts of our own lives and to ask constantly what needs to be transformed and what needs to be conserved" [1:10]. The implementation of this postulate supports the notion of *engagement* – described as "*energy in action*, the connection between person and activity" (Russel et al., 2005) [4:428]. This new philosophical context clarifies the meaning of a well-known statement that says "we shape our buildings, and afterwards, our buildings shape us" (Winston Churchil). In this context, "shaping" takes place through a direct incentive to act – resulting from the spatial form. This is particularly important with reference to the learning environment: what we do, what we learn and how we learn determines our aspirations, our perception of the world and our modernity. Contemporary studies on educational processes show a growing interest in these issues, especially in the issue of student engagement (linked to successful learning in studies) – on the one hand, and the learning environment (including the physical, architectural environment) and its impact on learning outcomes – on the other. A specific correlation between these two factors – the student engagement and the architectural dimension of the learning environment – constitutes an interesting research area.

2. "OPENNESS" AS A GENARAL GUIDELINE FOR CREATING A MODERN LEARNING ENVIRONMENT

The architecture of historic universities such as Oxford and Cambridge was modeled on medieval monasteries. Their architectural form – a closed quadrilateral structure arranged around the inner courtyard – was to express their isolation from the external world and the internal integration of academic life. The historical universities were places for education but also for living together with other scholars. Slowly, caused by the pace of civilization changes, higher education institutions began to open up; not only in terms of the structure and form of their buildings, permeation of the external and internal world, but also in terms of the general access to education [5]. A clear example of dynamic development of the university environment is the architecture of North American universities, where a closed, compact building was replaced by the layout of buildings loosely scattered in the open green spaces called (after the Princeton University's example) a "campus". A number of these institutions resembled extensive park premises with nicely designed greenery, beautiful views and buildings resembling garden pavilions. This trend is still present in the design of the university environment around the world; however, contemporary designs place more emphasis on integrating the campus with the life of the city than on creating a separate landscaped enclave. The openness of contemporary universities is related to many different aspects of the educational process itself, the link between education and the economic system, but also openness in the sense of social, political and spatial relationships [5].

2.1. Connectedness with urban life and natural environment

The architectural dimension of the openness of modern educational institutions signifies primarily the link between university life and a local urban centre; its life and history. One of the most important elements of that link is building location. Nowadays, university buildings are located – more willingly than in the nearest past – within the city centre. Obviously, it is not always possible, especially in densely built over areas of modern metropolis; movement to the city outskirts is sometimes inevitable. However, problem of connectedness with urban life may be sometimes theorized, producing more symbolic link. This has been represented by Peter Eisenman's design for the *Wexner Center for the Visual Arts* – a part of the Ohio State University Campus in Columbus, opened in 1989. The institution was conceived as a research multidisciplinary and international laboratory for the exploration and advancement of contemporary arts. According to its founders, it was to act as a forum where artists' ideas can meet diverse audiences and in this way to participate in the city cultural life. The

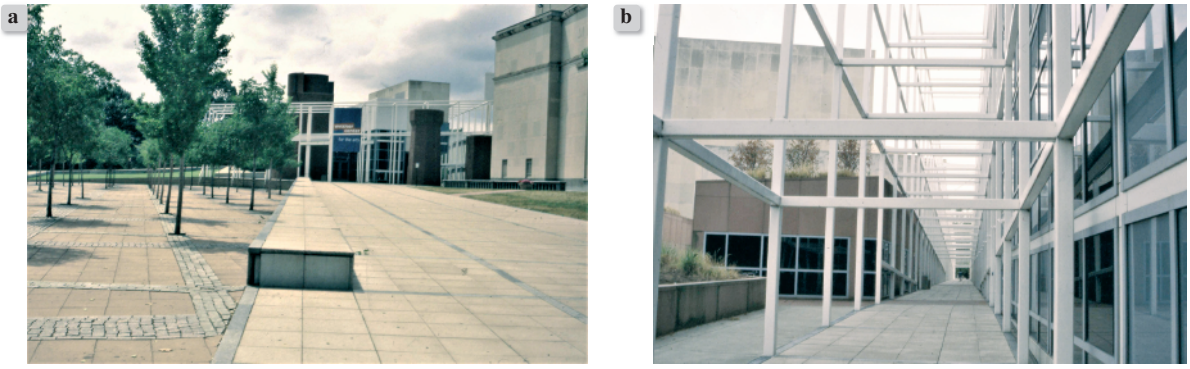

Figure 1.
Wexner Center for the Visual Arts **(Ohio State University) designed by Peter Eisenman (1989). (a) The grid of "historic" urban fabric superimposed on the plan to emphasize the pre-existing link between the city and the building. (b) The external public passage through the building (photos: AL-S, 1999)**

building was the first major public building designed by Peter Eisenman (primarily a teacher and theorist) who extended the functional program of the building by adding a lot of philosophical ideas to strengthen the link between the building and the city. An integral part of the design became the reference to the history of the place (real and re-invented) and the strategy of "mapping the past" through which the campus was to open the connection with the city (Fig. 1, 2) [6].

Referring to more pragmatic aspects of location within the city is another strategy. This was demonstrated in a very particular example of *Ewha Womans University* in Seoul (arch. D. Perrault, 2008), where the extended campus became interrelated with the trading area of the neighbouring district. The school buildings are located – much to one's surprise – very close to the district filled with fashion boutiques, shopping malls, nightclubs, theaters and cinemas. The names of the main streets in the area are meaningful and reflecting the specific atmosphere of this part of the town – *Ewha Womans University Shopping Street* and *Fashion Street*. The design creates a landscape that blends into an area of pre-existing parts of the campus and its sports facilities, forming together with a shopping zone a coherent whole [7].

A significant aspect of the modern strategy to "open up" the university is to make a vital functional connection. Contemporary, leading universities all over the world seem to invest more money and efforts into complex functional programmes of their new institutions which primarily serves the idea of promoting universities by dissemination through education and outreach. The new buildings which cover these programmes are usually independent from university campus and dispersed within the city fabric. They are easily accessible for everyone, inviting not only students and scholars but primarily – local inhabitants. Very important is their specific multi-functionality; they can hold libraries, classrooms, exhibit spaces and even restaurants. Very often they also serve the idea of lifelong learning and integration with local community. An interesting example of this type of building is *The Bullitt Center* building in Seattle (arch. Miller Hull Partnership & landscape arch. Berger Partnership, 2012), a division of the College of Built Environments, University of Washington (Fig. 3). The building was realized according to the *Living Building Pilot Program*, created together with the Department of Planning and Development in Seattle and many other public institutions. Its most important part is the *Center for Integrated Design* composed of *Design Lab* and the *Discovery Commons*, but it also holds some office spaces for rent. Its mission is "to build knowledge through discovery, advocacy and education about high performance built environments that better serve the health of people and the planet" [8]. Functionally, it works as a research centre but also a place of technical guidance (organising workshops and seminars) and education for non-academic publicity.

The Bullitt Center is also an interesting example of building a vital connections on a larger scale – by its reference to the natural and cultural environment. Like many other academic centres (another example is the *Centre for Interactive Research on Sustainability* – CIRS, University of British Columbia, Vancouver [9]) it is developing its base on the principles of sustainable development, respect for the existing ecosystem and protection of natural resources, but also on the basis of natural ways of designing spaces. The pro-ecological educational interpretation of the applied solutions is especially significant with refer-

Figure 3.
The Bullitt Center **(a division of the College of Built Environment, University of Washington) in Seattle. Public open space (main hall) in the building is easily accessible from local neighbourhood (seen through the windows). Space is occupied by the exhibition of the building construction process but is also a place of temporary events (photo: AL-S, 2014)**

ence to that type of building. It is demonstrated here by very refined technical solutions for protecting natural resources and energy through the extremely efficient use of rainwater and sunlight, but also by "organic" way of shaping building based on Christopher Alexander's idea of a "pattern language". The latter is represented by the use of windows' space and stairs which encourage to walk by offering nice views and plenty of natural light (Fig. 4–7). The "openness" of the building is also clearly demonstrated by "openness" to changes, adaptation, or even disposal of a building elements. The important part of the educative mission of the *Bullitt Center* is also created by the collective of people working here. They are trying to change bad habits into good ones by saving energy (instead of using lift they are encouraged to climb the stairs, reducing the use of artificial light) or by replacing cars with bicycles (the underground garage in the building was turned into the space for bicycles).

2.2. Social participation

The openness of modern academic centres consists also in matching the university to the needs of users. For this purpose, a number of detailed educational and design programmes are developed which support pro-democratic decision-making methods in terms of shaping the architecture of the university environment. As shown by research on this subject, the attractiveness of a given university – apart from the obvious prestige factor (expressed, *inter alia*, by occupying a particular place in various rankings) – is perceived inter-subjectively. There are a number of factors described by some researchers as *student-institution fit* that influence its assessment [10]. Matching university with a student profile is based on a certain consistency between the student's expectations and characteristics and the institution's ability to respond to these variables [5]. The first well-known manifestations of this trend (1970) were: a pilot participatory project led by Christopher Alexander (then principal architect of the *Berkeley Centre for Environmental Structure*) on the extension of Eugene State University (University of Oregon) [11] and Lucien

Figure 4-7.
The Bullitt Center in Seattle: **(4) constructed "wetland" for rainwater collecting; (5) a piece of public greenery and seats arranged in front of the main entrance; (6) the main staircase; (7) the sign encouraging building users to walk the stairs (photos: AL-S, 2014)**

Kroll's design for the halls of residence at Louvain University Faculty of Medicine implemented at about the same time (1970–71). In both cases, the aim was to establish a real dialogue with students and to engage them in the critical decision-making process on the formation of the university environment. Those participatory designed buildings represented "freedom, equality [...] independence from the typical architect and client relation" [12:148]. A number of contemporary academic centres (such as Princeton University, University of Oregon) include participatory strategies for decision-making in extending and adapting the institution to the contemporary needs of its users (including students). The dialogue with students, as well as academics and other groups of university environment users, is a helpful tool of collecting necessary information on users' needs and expectations for pre-design considerations. But the primary reason for dialog is equal treatment of different groups of interest. Students' participation allows to treat them not only as mere users but as the most important "client" of the university. Consulting university projects directly with students, draws attention to the fact that the university environment is something more than a school. It is a lively place of many interactions based in education; a place of students' individual and group work, a place of scientific research and a place for living (housing, food, cultural life, attractions). The privileged position of higher education institutions and science both in the hierarchy of education and in the individual and social life of man is also significant here.

3. RESEARCH ON THE LEARNING ENVIRONMENT

3.1. Students' engagement

Students' engagement in schools – as stressed by many scholars – is an important construct that has been associated with learning success. In the general sense, it means a "growth producing activity through which an individual allocates attention in active response to the environment" (Csikszentmihalyi, 1990) [13:67]. It reflects person's involvement in a task or activity which has been identified as a primary variable in understanding a gradual process operating in a student's life influencing improved academic performance. It can be viewed, thus, as a value associated with positive student's contribution. It is

suggested that students' engagement is multi-dimensional and is associated with several similar constructions such as "school connectedness" or "school bonding" [13:68]. A number of studies point to a strong and mutual relation between engagement and motivation. Motivation frequently precedes involvement; it is necessary but not sufficient; one can be motivated but not actively engaged.

Engagement is defined with use of many components including both indicators (such as affective, behavioural and cognitive) as well as facilitators (both personal and contextual factors). [13:68]. Each of those components is important to a complete understanding of students' active involvment. Speaking of facilitators of engagement one must consider both individual and environmental or contextual factors, such as: family, peers, school (including "school climate"). The last ones are constituted, *inter alia*, by school or university architecture (but also the relations between teacher and students and the teaching methods). It is also claimed that "engagement must not be disconnected from time, place and space" (Zyngier, 2007) [14:23]. The three-dimensional model of students' engagement in learning is composed of three subtypes which are its indicators; they are: (1) *affective/emotional*; (2) *behavioural* and (3) *cognitive* components [13]. Emotional component is expressed by identification with school, sense of belonging and appreciation for learning; it refers to student's feelings towards their school. Among many other items included in *The Student Engagement in School Questionnaire* (SESQ) measuring affective linking for school there are: "I like my school" (a11), "I am proud to be at this school" (a13) or "I am happy to be at this school" (a17) [13]. Behavioural component may be measured primarily through "participation" in school life; it includes observable students' actions, activities, attendance and work habits. Cognitive part of engagement reveals in students' perceptions and beliefs associated to school and learning. Primarily it shows up through investment in learning [13, 4].

3.2. The impact of learning environment features

There are three groups of variables that are significant in the process of evaluation and functioning of the learning environment. These are: (1) student characteristics (including goals, abilities, needs, interests and values); (2) characteristics of the learning environment (including: physical [architecture], academic and social characteristics of the environment); (3) student-environment interaction results [10]. Among the frequently mentioned factors influencing the students' evaluation of the learning environment, there are those relating to the practical aspects of university life – often neglected by authorities – such as location, housing conditions, socio-cultural and sporting attractions as well as dining service conditions. These elements are usually the most frequently criticized aspects of the university environment similarly to various types of services and facilities. Students also observe and criticise some environmental features such as overcrowding, social dimension of places, lighting, dining and split sites [10]. The results of the research conducted by the *Facilities Management Graduate Centre* (Sheffield Hallam University in Great Britain, in 2000 and 2001), on a big sample of about 2000 students, showed a classification of the significance of specific learning environment features from the students' point of view. These were: courses offered by university, computer availability, library, teachers' academic standing, availability of quiet places and individual work areas, quality of public transport, student-friendly attitude, food prices, cleanliness, land use, housing terms, quality of lecture rooms, quality of catering services on campus, union social facilities, availability and range of shops and other services [10, 5].

Those and other research results indicate a correlation between the quality of the educational environment – in the general sense – with the level of student engagement and the average academic performance. There are, certainly, different relations between individual sub-variables being given. This diversity concerns both the characteristic parameters describing the learning environment, such as: building age, building quality (including architectural design), building size and organization, cleanliness and ongoing maintenance (lockers), lighting, thermal comfort and indoor air quality, specific building features such as science laboratories and libraries, as well as bathroom and food facilities, and the specific learning outcomes. For instance, studies conducted in US high schools have shown a significant correlation between environmental conditions and the overall "school climate" ("defined in terms of teacher, student, and parent perceptions about self, student achievement, organizational rules and policies, and the facility itself" [15:60]), and this, in turn, has a direct impact on the specific learning outcomes (such as student achievement in English and mathematics). It is difficult, however, to clearly state to what extent environmental conditions affect the improvement in learning outcomes and what plays a key role here, mainly because they always constitute a set of unique, unre-

peatable factors related to other types of variables that are modified by "dynamic processes" associated with a given place [16].

The ability to make choices, including place selection stands out among the recognized relations. Places close to the teacher-lecturer are correlated with the sense of learner's satisfaction of being in school; close contact with the teacher helps one focus on content, invest in cognition; the hypothesis of visual contact and social integration plays an important role here [17]. From this point of view, the important factors supporting engagement in learning include: the size of school and the arrangement of space, the variables that are largely dependent on the architectural design. Not only does the right design allow a choice of place, but it also enables a pro-social arrangement, adjusts the level of control and privacy, and ensures an appropriate level of the environment's openness to adaptation and creative interpretation. For example, Janowska and Atlay (2008) explored the influence of a specifically designed "creative learning space" on students engagement with the learning process. On the basis of the analysis of participant students' responses to working in the designed spaces (described as "creative, positive, interactive, enjoyable, exciting, flexible, productive, engaging, involving, encouraging, inspiring, stimulating, fresh, functional, comfortable, relaxing, informal, [and] personal"), they concluded that the creative learning space had a positive influence on students' experience and their engagement with the learning process [14:23].

4. ARCHITECTURAL SOLUTIONS FOR "SELF-LEARNING" ENVIRONMENT

The most important thing in supporting a progress in education – as is suggested by many research results – is encouraging to use individual personalized learning tools and doing this within a friendly and satisfying school environment. The tools may differ from listening to lectures, co-operating with other students, meeting interesting people, reading books or simply net-searching to list some of the alternatives. The individual path of student's development could be better described as *self-learning* than "being educated". The self-learning requires motivation and engagement but also some space and time. And thus, the environment promoting the self-learning should connect freedom of choice represented – in terms of architecture – by open and flexible space (allowing temporary and spontaneous actions) with cosiness of private enclave. To describe this type of space some researchers use the expression of "learning landscape" [18]. It is a type of learning environment that conveniently connects functions of classrooms and lecture-rooms with open spaces allowing multiple situations and social contacts. It is claimed that this type of space should encourage learning almost in every place, and that the open public spaces are equally important as typical lecture-rooms. And thus, the characteristic contemporary trend in designing new university buildings is to put more emphasize on creating attractive, challenging open common space that integrates individual building spaces. Usually it is in the centre of composition relatively freely designed with an easy access from outside and possibly good connectivity with the exterior of the building. The other functions, typical for university buildings, such as classrooms, seminar-rooms or lecture-halls are more regular, usually modular and simple spaces. The important feature of this type of space arrangement is the use of two types of independent static structure: separately for public open space and for other spaces [19]. The positive effect of this type of arrangement is easiness of introducing necessary changes into the didactic rooms, without changing the heart and the landmark of the composition.

The simplicity and modularity of didactic rooms is a feature beneficial not only for the management of the building but also for individual users' adaptations of those rooms. Some schools, especially art studies (like architecture or fine arts), are inspired by the model of design studio that functions in many western universities, which both indicate and define the physical context of teaching as well as the subject of study. At a number of universities, this means assigning a specific, dedicated fragment of space to a specific group of students who decorate that space, making it their second home. In a space shaped like this (often filled with household goods such as refrigerators, sofas or players), students are "at home" and the teacher-lecturer is a "visitor" who provides corrections for the developing design concepts. Such situation is an educational experience *par excellence*; it teaches to interpret space and creates opportunities for the implementation of autonomous designs (Fig. 8–10). However, as western researchers show also this form of education is slowly becoming obsolete, it does not resonate with modern expectations. The assumption behind a workspace shaped this way (which is still an unattainable dream in a majority of Polish higher education institutions) is "reflective education", in which, as the critics of this method argue, one experiences the complexity of work

Figure 8–10.
Gould Hall **(arch. Gene Zema & Daniel Streissguth, 1971) – a seat of the Department of Architecture, University of Washington, Seattle. The early, modern example of very contemporary idea of shaping university building spaces. (8) Public open space – the core of the building; (9) fragment of "design studio" space – a semi-private space with windows opening to the street life; (10) seminar room belonging to one "module" – a room between open space (viewing that space) and the "design studio" (photos: AL-S, 2014)**

(design) in a group by imitation of real life [20]. Instead, contemporary students, want to live truly while studying, and they also expect this possibility from their buildings. Learning objectives can certainly be better accomplished in the environment which is more open to life and its changing needs.

5. FINAL REMARKS

The civilization progress observed nowadays provokes the necessity of changes in the learning environment. It is not only about technical tools; the expected changes are more profound – they should reflect the major shift in thinking of education and learning. The natural consequence of these expectations is the emphasize on more subjective treatment

of learners and the matching of educative institutions with their needs. For the benefit of education it is necessary to balance few components: (1) efforts and competence of teachers (university staff), (2) students and (3) efficiency of system (including teaching/learning methods and the quality of learning environment) [3]. Certainly, the quality of teaching (which stands beyond the frame of these considerations) is always the first reason of academic success. Nevertheless the role of the other components must not be diminish as factors of successive education. The specific aim of the study was to present the multi-dimensional nature of the mutual relation of students' engagement and environmental conditions of studying as seen from the learners' point of view.

However – as it has been presented – it is difficult to clearly state which aspects of environmental conditions play the most significant role in the learning success, and this is why it seems important to set a permanent dialogue between students and ones with a sense of responsibility for the education process. This should help finding an original answer to the problem of the unique space needed – in architectural, philosophical, social as well as political terms. The space in which students would feel free and motivated to learn and work. An important feature of that space seems to be its ability to allow more flexible working environment, free access to educational facilities, and the promotion of the school's connectivity to out-of-school life. Being crucial for effective functioning in a highly developed society, education is also intended to bring individual benefit for learners. It is not only a means for professional success but also an end in itself; learning enables personal development and serves self-understanding [5]. This is fundamentally "enlightenment" and humanistic idea which is evidenced by the growing popularity of lifelong learning – giving people who no longer have to learn the opportunity and freedom to develop their personal interests. And finally, differing perspectives of "education" and "learning" reveals the unspoken aspect of control and freedom which needs to be taken into account. As stated by Karl R. Popper (1962), a certain degree of "control" is necessary but only to save students from neglect, which would make them unable to defend their "freedom"; too much control – on contrary – is a massive danger, because it leads to indoctrination [21].

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