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# PROBLEM-BASED LEARNING AS A MEANS OF RESTORING SOCIAL FUNCTIONS TO GROUPS ALIENATED FROM THE URBAN SPACE

### PROBLEMOWE UCZENIE SIĘ JAKO ŚRODEK PRZYWRACANIA FUNKCJI SPOŁECZNYCH GRUPOM WYALIENOWANYM Z PRZESTRZENI MIEJSKIEJ

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ABSTRACT: The article refers to the process of creating a project by designers from two culturally different countries during the Erasmus project. The project, set in the centre of urban space, aims to limit the alienation of the homeless from the urban environment and to slowly restore their social functions. The aim of the cooperation was to create a space in which designers would use not only technical and compositional knowledge, but would consciously introduce information from social sciences, as well. This project for homeless people, is set in the city of Rzeszów, Poland. The inspiration to do this project was the nature and C2C theory. The structure of the project is based on a modular architecture which, if necessary in the future, can easily be modified, for example, by adding new elements and thus respond to the current needs of the residents. Self-sufficiency is another important part of the project. They are also eco-buildings made of straw bales or recycled materials such as plastic bottles. Thanks to these efforts, a project was created not only for the homeless but for all the residents of the city.

#### KEY WORDS: homeless people, eco-building, C2C, Rzeszów

ABSTRAKT: Artykuł odnosi się do procesu tworzenia projektu przez projektantów z dwóch różnych kulturowo krajów w ramach projektu Erasmus. Projekt, osadzony w centrum przestrzeni miejskiej, ma na celu ograniczenie wyobcowania bezdomnych ze środowiska miejskiego i powolne przywracanie im funkcji społecznych. Celem współpracy było stworzenie przestrzeni, w której projektanci wykorzystywaliby nie tylko wiedzę techniczną i tworzenia kompozycji, ale i świadomie wprowadzaliby informacje z nauk społecznych. Projekt dla bezdomnych zlokalizowany jest w Rzeszowie. Inspiracją do realizacji tego projektu była natura i teoria C2C. Architektura projektu opiera się na architekturze modułowej, która w razie potrzeby w przyszłości może być łatwo modyfikowana, np. poprzez dodawanie nowych elementów i tym samym odpowiadać na bieżące potrzeby mieszkańców. Inną ważną częścią projektu jest samowystarczalność. Są to również eko-budynki,

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zbudowane z bel słomy lub materiałów pochodzących z recyklingu, jak np. plastikowe butelki. Dzięki tym zabiegom powstał projekt nie tylko dla osób bezdomnych, ale i dla wszystkich mieszkańców miasta.

SŁOWA KLUCZOWE: bezdomni, budownictwo ekologiczne, C2C, Rzeszów

"Our goal is a delightfully diverse, safe, healthy and just world, with clean air, water, soil and power – economically, equitably, ecologically and elegantly enjoyed."

(McDonough 2005, as: Stouthuysen 2010, 8)

#### Introduction

The wide openness to many worlds of science driven by globalization and the electronic communication system make us live in an information society with new priorities. At present, we focus on creativity, inter- or even multidisciplinarity, but also – by the above-mentioned assumptions – independence and ability to work with others. Such requirements are set for university graduates who ought not to solely make use of their learned knowledge, but should also develop specific skills related to spheres remaining beyond the subject of their study. Skills acquired during their studies should make it easier for them to find themselves in a group of professionals who independently and creatively solve problems using a comprehensive knowledge not limited to one field.

As regards architecture, realization of these goals is possible through, among others, participation in multi-stage projects. While working on such projects, students practically analyze themes that are not only related to the technical and functional aspects of architectural work, but also have to deal with the humanities – multifaceted aspects related to social sciences such as sociology and psychology.

The aim of the article was to determine the possibility of building positive and lasting neighbourly relations between the inhabitants and underprivileged groups by means of proposing an appropriate spatial treatment. The study was conducted in the form of a case study of testing an alternative method of teaching architecture students, based on observing and solving authentic problems.

#### **Cooperation background**

The article draws on the experience of the Erasmus programme. First of all, Erasmus is a program that gives students the opportunity to gain experience of studying in other universities all over Europe. It is not only an experience for students themselves, but for academics who deal with the former, as well. Thus, students are an integral part of the programme when they pursue their educational adventure, still the host institutions that do their best to help them on the day-to-day basis play as much an important role.

The students who were involved in the project that is presented in this study are Gabin Peinado Paula of the University of Madrid and Garcia Gigato Alejandro of the University of Seville, Spain. They both were students of architecture who arrived in Rzeszów to start their 4<sup>th</sup> year of studies. The subjects they were working on in the

Technical University of Rzeszów were called: 'Urban planning and architecture' (Garcia Gigato Alejandro) and 'First step final project' (Gabin Peinado Paula). The objective of the subjects was to create a place for homeless people to live. The students could choose any location. The main idea was to focus on using cheap building materials and to take into account a limited space available for the dwelling. The main part of this project was that people from two different countries and representing different cultures, in this case natives of Poland and Spain, could be working together successfully. The subject they were working on was called 'First step final project', and as its title indicates, its outcome was meant to be a final architectural design.

The students' work began with holding discussions with their assigned tutor, concerning the leading topic of the project and defining its objectives. The scope of the search area was the issue of cooperation and coexistence between different social groups. The task was to focus on simulating the likely situation where an architectural object could be the beginning of building relationships between hostile social groups and enhancing their interpersonal relationships. During the conversations the students and the professor decided to try to create a place for the homeless to live. First, the students had to analyze the situation of the homeless in the city, the possibilities of their functioning and why they are excluded from the urban space.

# An outline of the situation of the homeless in urban space with a particular emphasis on Rzeszów

According to Garcia Gigato Alejandro, homeless people are not accepted in society for several reasons, for example: drug and alcohol addiction, misbehavior, conflicts with neighbours, littering streets. In the opinion of Gabin Peinado Paula, homeless people tend to be lonely and some of them do not want to share their space with anybody, only some of them are willing to stay together and share their lives with others.

The students' observations coincide to a large extent with the conclusions from analyses of literature concerning the problem of homelessness. Australian researcher M. Tudehope (2011) claimed that during the survey he had conducted the homeless mainly pointed to the balance of needs, providing protection from the elements, providing security (respondents pointed to the feeling of fear of violence and theft) and the lack of intimacy – they were constantly under the pressure of public observation. He also indicated that it is a definite mistake to think about the situation of the homeless mainly in terms of throwing them out of the space instead of regarding them as members of the community with full rights to this space. Throughout the world, however, there is a growing tendency to exclude homeless people from the public space and to strive for the state of hidden homelessness. As Petty (2016, 67-81) describes it, in cities we observe manifestations of 'hostile architecture', also known as 'defensive' or 'disciplinary', whose image is the installation of elements that exclude the use of space by certain social groups. In the case of homeless people, they can be, for example, spikes installed in places where they like to organize their resting places.

"Our cities must be places where human beings lead fulfilling lives in dignity, good health, safety, happiness and hope" (United Nations, 1996). The quotation from the declaration adopted at the UN conference Habitat II in Istanbul in 1996 emphasized the equal right to space for all users. This helped to activate the creative community in developing solutions addressed to the homeless. Initially, the answers were mainly dominated by mobile architecture perceived as the one that best fits the lifestyle of the homeless person. Projects of recognized artists, such as Basic House by Rakowitz, Snail House by Ion Sørvin, a multifunctional unit that serves as a place to sleep, eat, shelter and protect the accumulated property and assists users in their daily activities, such as collecting bottles designed by Krzysztof Wodiczko or The SR-Hab prototype (Socially Responsive Habitat) by Anna Rewakowicz (Rybka and Kozłowska 2016, 320). However, a deeper analysis of the existence of homeless people in the community leads to searching for cooperation and not transferring of the finished product. Solutions that involve the homeless in the construction of their homes, with the participation of social workers, administration and designers, of course, increase their self-esteem, creativity and are a good reason to break out of stagnation. More and more often social services stress that breaking out of the state of homelessness, especially the perpetuated homelessness, is extremely difficult if there is no idea of participation of the homeless in the creation, responsibility for the place and their own fate and is based only on being given ready-made products. Sharing responsibilities and meeting people are therapeutic by their nature, as Jerzy Łątka stresses. At the same time, this author puts forward the idea of creating helpful architecture as an alternative to this cooperation - easy to construct from properly developed paper construction elements (Łątka 2017). A perfect example is also the construction of a deep-sea ship by the homeless in Warsaw's Ursus, where the skills of the homeless were used to create a vessel to sail on long voyages (Kołodziejczyk 2009).

Undoubtedly, the most frequently chosen environment for homeless people is urban space. "The urban environment is becoming a vital niche to sustain the daily lives of the homeless. In the city, various elements come together: the destiny of the population, people offering financial help, free food, services and institutions supporting the homeless, and an abundant availability of recyclable material" (Rybka and Brudnicka 2018, 3). In Rzeszów, the city which the Spanish students chose to implement their projects in, the number of homeless people reported in 2017 was about 140 (Podkarpacki UW 2017). The main concentration of homeless people in this city takes place in the following two housing estates located in the city centre: Śródmieście Północ and Śródmieście Południe.

# Main targets of the project

In their works, the students decided to express their opposition to the tendency of excluding the homeless from the city space and striving for the state of hidden homelessness. They planned to introduce the homeless into the public space of the city of Rzeszów, of course, each of them proposed a different concept. An additional advantage of both concepts was the creation of architecture that could be built by the homeless with the use of recycled materials, mainly materials invented by themselves, which made the concept of both students economically viable. This behavior regarding respect for nature's patterns was inspired by the cradle to cradle theory (C2C) created by McDonough and Braungart. The basis of their ideas was a design based on the intelligence of natural systems. They assumed that cradle materials should become part of a biological or technological cycle of nutrients. This means that consumer materials should be biodegradable, applied to the natural life cycle of a product, or used in a closed-loop technology system and used indefinitely (Bakker 2010, 2-8; see also: Mcdonough 2005). Gabin Peinado Paula decided that it must be the place where everybody can share something and help the city to get better. Garcia Gigato Alejandro decided on the idea "A city into the city". Generally, this idea ensures that the homeless are adapted in society.

The next problem was selection of the location. The students' idea was to do a social project that must be in continuous relation with the people of the neighbourhood. The main idea was to generate a good relationship between neighbours and homeless people, as well as the process of rehabilitation for them by building their own place. They told theit tutor that if a market and some shops are built in the neighbourhood where homeless people are able to work, they will establish a good relationship with the local community. And at the same time, they will earn enough money to live a decent life. With the money and the house that they are helped to put up, they will start a new life. Thus, it is understandable that the students' point was to place their designs in an area with a lot of people around. Consequently, the tutor supported them in their taking the final decision in this respect and the place was agreed on.

In addition, the students chose sites that themselves required revitalizing: in the case of Paula's proposal, it was a mess left behind the former market, whose primary function Paula kept as a co-major subject. Alejandro chose a location in the center of the old town, namely a scarcely used small park. Both locations were selected in the neighbourhood of housing estates, in the proximity of health care centers and potential shelters for the homeless. In either case, these were newly-designed or nearby tags. Both locations were selected in the downtown area of Rzeszów and offered a very good access to public transport.

Each week the students came to their supervising professor to solve different problems that had occurred. They also brought some ideas into discussions with the tutor, concerning the best logical solution to the problems, such as the limited budget available for the project, being one of the most important ones. The buildings had to be very cheap, so together they came up with the idea of using some recycled materials. In addition, in order to as much as possible prevent the destruction of the building, its construction had to take into account a significant contribution to the process of creating it by its future users, that is the homeless who were not necessarily expert in building. So it had to be easy enough for the homeless to be able to create it under the right guidance and professional help. With their ideas and the professor's contribution, working together and supporting them in a good way in everything that they were doing, they managed to present a good project based on their initial ideas.

The above instance may serve as a good example to follow for all teachers in this field, namely if we support and help students to promote their ideas instead of changing everything, they are capable of creating amazing things. Students are the future and they must learn how to materialize a good idea, even if the idea looks impossible at the beginning. The main idea of Paula's project was to do something, using not very expensive materials, to find a place in the city and to design it in such a way that it should match the city and the kind of life that we have in here.

Accordingly, Paula carefully analyzed the modular architecture that allows constructing repetitive elements, which is relatively easy to learn. Paula's inspiration was nature. The pattern of its module was found in honeycomb, bubble raft and snowflakes. These examples have one feature in common – hexagonal cells (Fig. 1). Doing it like this, we obtain the possibility of creating a dwelling which is less material-consuming, more resistant, and can have more modules added to the project due to its form. The material chosen for the building was straw bales, currently rarely used in Poland. Still, the advantages of the straw-bale construction over conventional building systems include the renewable nature of straw, lower cost, easiness of availability, naturally fireretardant and high insulation values.

The main idea of Alejandro's project was to build a center for homeless people, using shipping containers (Fig. 2). The idea of such a construction is very interesting and around the world there are a lot of examples of shipping containers architecture. However, such a kind of construction means dealing with unique know-how issues, not typical of residential construction which makes use of traditional materials. The main problems are related to corrosion in the areas of welding containers together and in points of their contact with the foundation. To resolve this problem specialist welding is required. Thermal insulation also poses a problem that needs solving (apart from corrosion). It proves better to insulate shipping containers for accommodation purposes from the inside to avoid problems with condensation. Taking into account the material of which the structure will be built, there is the practical problem of hanging furniture (such as cabinets in the kitchen). They need designing already during the construction process.

The students' first idea was to start making an eco-building with straw-bale as the main material (as proposed by Paula), and doing a modular architecture by both. With these two ideas, both the students and the professor started their design with a lot of possibilities. It is interesting how the students approached the project on the urban space, neighborhood and architectural scale within the resort.

Paula's design varied in different parts, because, as we know, homeless people are typically lonely and some of them do not want to share their space with anybody else; nevertheless, some others can like to stay together and share the space with somebody.



Fig. 1. Scheme of the first floor, plan section-first floor, Elevation. Design by Gabin Peinado Paula Source: Gabin Peinado 2017.

Consequently, the main parts of Gabin Peinado Paula's design included the following (Fig. 1):

- the house: each homeless person would have a place to live, equipped with an individual bathroom and a small kitchen,

- the big building: we can explain this design, saying that it is divided into 4 main parts which are connected by a big building in the center. In this building we can find a place to share, where we can find tables, chairs, sofas, a bookcase and also a kitchen,

 the orchard: located in front of the houses, this part will help the homeless to be self-sufficient.

Paula focused heavily on the exterior of the building, she wanted a building that would be integrated in the environment, as far as possible, so it should be a space which the homeless and citizens of the town enjoy staying in. That is why the entire roof of the first floor is walkable. You can access that roof from 4 sides of the building sited in each part of the building. The stairs are always an open space with easy access, which means that you do not have to access the interior of the building you can simply walk over.

A similar approach to the performance of functions can be found in Garcia Gigato Alejandro's design. He also parted the homeless to provide privacy and designed common shared spaces. The whole urban structure is divided into the following zones (Fig. 2):

- the leisure zone for children, with some children's games,

a market and small shops,

 the residential zone for homeless people, located further away from the busiest area, which provides more privacy.

Combining ideas supplied by a professional teacher from Poland and a young student from Spain offered the opportunity to create something unimaginable. The student had



Fig. 2. Location plan – ground floor and residental section. Garcia Gigato Alejandro's design Source: Garcia Gigato 2017.

to visit the teacher at least once a week to check that everything was going in the right direction, with corrections such as: the students came with the idea of doing an orchard in some kind of geodesic dome, but the teacher's suggestion was to do it with plastic bottles filled with water to keep it warm during the cold weather and at night. With all this, including good cooperation between the student and the professor, we can make a big change, and it does not matter if the designers are from different countries and they have different ideas and notions of architecture.

If we encourage our students to do it in their way, but under the wise supervision as teachers, we can create amazing things and keep our students interested and creative, offering our help and experience whenever necessary. Combining thoughts coming from different countries can make a big difference. The creation of such a project would not be possible if the teacher imposed his own ideas on students. Working together and supporting each other contribute to suggesting new and fresh ideas; moreover, it always encourages students to do things better. Students can surprise us in many good ways.

#### Materials and technology

This can be a sustainable way of living and arranging for their own dwelling for the homeless in the South of Poland, since homeless people can build a miscanthus bale houses by their own hands. This ornamental grass is more and more often grown in home gardens in southern Poland. It also looks attractive in public green areas. The diversity of this grass and its growth rate gives architects a wide range of possibilities. Amongst this rich group of perennials, miscanthus giganteus attracts special attention. As one of the highest-growing grass species in the Polish climate, it looks great when planted alone or in compositions with other perennials (Helios 2017). Miscanthus gigantus was brought to the South of Europe from Southeast Asia around 1930 as an ornamental plant. The species appeared as a result of a natural cross between miscantus sinensis and miscantus sacchariflorus. Short rhizomes are the underground part of miscantus giganteus. Every year in spring, foliage, lush shoots grow from them, forming magnificent, dense clumps. The homeless will be living in temporary houses besides the construction site. They will have a large vegetable garden and public place where miscanthus will be cultivated. They will build a miscanthus bale house that is low cost and low tech investment, using natural materials: low cost - because they do not afford a mortgage; low tech – because they want to put it up themselves. A good example of such a technique is their wood splitter, logging wheels. During the building process they will not have to use a crane. The miscanthus bales will be placed in the walls and will be plastered outside. After completing this, there will be time to work inside: oiling round wood, plastering inner walls, fixing the root cellar. They will be very interested in learning to work with natural building materials. Because of fire hazard smoking will be not allowed on the premises.

The advantages of miscanthus bale construction are many (Lewandowski 2018):

1. Sustainability – a miscanthus bale is totally renewable material, waste product of green production, which absorbs CO2 during growth and locks it into the home construction. A comprehensive carbon trace analysis of miscanthus bale materials production, transport and use usually yield a significantly lower trace. In particular, transport in this case is really low.

2. Beauty – miscanthus bale walls are at least eighteen inches thick and this adds an aesthetic value to a home that is desirable but rare due to the expense it would incur with a conventional construction. This wall thickness provides beautiful and useful flat surfaces throughout the home while additionally helping to reflect sunlight and brighten rooms. It also means that every window can have a window seat or shelf, providing both an aesthetic and practical design element.

3. Easy to construct – the basics of a miscanthus bale construction are easily understood by even novice builders. With some supervision from an effective miscanthus bale project leader, a first time builder can be a part of the complete construction process and an expert to build with success.

4. Low cost – if they live in an area where miscanthus is grown, miscanthus bales will be easy to acquire and are definitely affordable.

5. Effective thermal insulator – the average miscanthus bale provides insulation values between R-35 and R-40 and U-values between 0.20 and 0.15  $W/m^2K$ . The thicker the bale, the higher the insulator value resulting in miscanthus bale as an essential comfort choice where heating is necessary.

6. Fire retardant – the density of miscanthus bales and common encasements like plasterboard make them resistant to fire.

7. Bio-degradable – miscanthus as the plant is normally bio-degradable. At the end of the constructed object's lifespan the material gracefully returns to the earth, without leaving toxins behind.

8. Noise insulation – the thickness and density of a miscantus bale construction makes walls good sound barriers.

9. Healthy – miscanthus bale walls provide an excellent foundation for an organic, voc-free and low-allergen living environment.

## Conclusions

The basic assumption behind the project was to apply a teaching method based on the observation of real problems. This method, according to Lubina (2005, 224-231), is a method that allows project participants to manage the process of acquiring skills, stimulating creativity, curiosity about the world and enables better social functioning. Of course, the success of the implementation depended on the creative potential of the participants. Moreover, the implementation of this project allowed students to personally face a real social problem and to build their own knowledge base, not acting in a way that uses only other people's experience. An important achievement was also the strengthening of the argumentation in favour of reorientation of the approach to the homeless and an attempt to change their perception by society only as spatial outsiders, especially in public spaces. Another value of the project was an attempt to create a solution that is technically feasible for the addressees of the project, i.e. the homeless in this case. This approach strengthens the sense of respect for the place and oneself, builds responsibility for one's own fate and the sense of belonging to a specific place. In addition, it was extremely important to take into account ecological apsects, using mainly materials that would allow to significantly reduce costs and the negative impact on the environment, including creation of technical recycling by, for example, using containers that are not suitable elsewhere. Summing up, the implementation of this method in the design of an architectural project was possible and led to the creation of two mature and analytical responses, where the intention was to build a place in which everyone can share something, help the city, feel better and follow the words of the creators of C2C theory to be "less bad" for the environment (Bakker 2010, 2-8).

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