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## PROBLEM-BASED LEARNING AS A MEAN FOR RESTORING SOCIAL FUNCTIONS TO GROUPS ALIENATED FROM 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. This project for homeless people, is sited in the city of Rzeszów, Poland. The inspiration to do this project was the nature and C2C theory. The architecture of the project is based on a modular architecture which, if necessary in the future, can be easily 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 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

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eko-budynki, zbudowane z bel słomy lub materiałów pochodzących z recyklingu jak np. plastikowe butelki. Dzięki tym zabiegom powstał projekt nie tylko dla osób bezdomnych ale 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, the electronic communication system make us live in an information society with new priorities. At present we focus on creativity, inter or even multidisciplinary, but also from the above assumptions independence and ability to work with others. Such requirements are set for university graduates who can not operate only learned knowledge, but should have developed specific skills related not only to the subject of study. Skills acquired during their studies should make it easier for them to find themselves in a group, to independently and creatively solve problems using a comprehensive knowledge not limited to one field.

In architecture, the realization of these goals is possible through, *inter alia*, multi-stage project work. At work, the student analyzes themes not only related to the technical and functional aspects of architectural work, but also to the humanities related to social sciences such as sociology and psychology.

The aim of the article is to determine the possibility of building positive and lasting neighbourly relations between the inhabitants and alienated groups by means of appropriate spatial treatments. The study is conducted in the form of a case study to test an alternative method of teaching architecture students based on observing real problems.

## Cooperation background

The article draws on the experience of the Erasmus programme. First of all, Erasmus is a program that gives to students the opportunity to study in other universities all over Europe. It is not only an experience for students, but also for professors, who deal with them as well. Students are part of their adventure and day-to-day we try to help them as much as we can. The students that we are going to talk about is Gabin Peinado Paula, from University of Madrid and Garcia Gigato Alejandro, from University of Seville, Spain. They both are studying architecture. Exchange Paula and Alejandro, arrive in Rzeszów to start their 4th year of study. The subjects they are working on in Technical University in Rzeszów are called ‘Urban planning and architecture’ by Garcia Gigato Alejandro and ‘First step final project’ by Gabin Peinado Paula. The objective of the subject is to create a place to live for homeless people. Students can choose any location.

The main idea is to focus on using cheap materials for building and also a reduced space for them. The main part of this project is that people from two different countries, in this case, Poland and Spain, are working together.

The subject we are working on is called 'First step final project', and as its title indicates, it is referred to a final project in architecture.

The students' work began with formulating discussions with the professor on the topic of the project and defining the passing of his objectives. The scope of the search area was the issue of cooperation and coexistence between different social groups. The topic was to focus on simulating the likely situation where an architectural object could be the beginning of building relationships between hostile social groups and building their interpersonal relationships.

During the conversation, the students and the professor decided to try to create a place to live for homeless people.

First, students had to analyze the situation of the homeless in the city, the possibilities of their existence and why they are excluded from the urban space.

### **Outline of the situation of the homeless in urban space with particular emphasis on Rzeszów**

According to Garcia Gigato Alejandro homeless people are not accepted in the society because of several reasons. For example: drugs and alcohol, misbehavior, fight with neighbours, dirty streets.

In the opinion of Gabin Peinado Paula, homeless people use to be lonely and some of them do not want to share their space with anybody, some others like to stay together and share a life with somebody.

The observations of the students coincide to a large extent with the conclusions from the analysis of literature concerning the problem of homelessness. Australian researcher Tudehope (2011) claims that during the survey 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 pointed out that it is a definite mistake to think about the situation of the homeless mainly in terms of throwing them out of the space, rather than considering them as members of the community with rights to this space. In the world, there is a growing tendency to exclude homeless people from the 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 quoted 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 the search for cooperation and not the transfer 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 the transfer of ready-made products. Sharing responsibilities, meeting people is therapeutic in nature, as Jerzy Łątka stresses. At the same time, Łątka gives as an alternative to this cooperation the idea of creating helpful architecture, easy to construct from properly developed paper construction elements. (Latka 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 unit to sail on a long voyage (Kołodziejczyk 2009).

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 students chose to implement their projects, the number of homeless people reported in 2017 is about 140 (Podkarpacki UW 2017). The main concentration of homeless people takes place in housing estates: Śródmieście Północ and Śródmieście Południe.

## **Main targets of projects**

In their works, students decided to express their opposition to the tendency to exclude the homeless from space and to strive for the state of hidden homelessness. They planned to introduce the homeless into the public spaces 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 them, which made the concept

of both students economically viable. This behavior regarding respect for nature's patterns was inspired by the theory from the cradle to the cradle (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 homeless are adapted in the society.

The next problem was selection of the location. 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 professor that, if they build a market and some shops for the neighbourhood where homeless people will be able to work, they will get a good relationship with neighbours. And at the same time they will earn enough money to live. With money and with the house that we give for them, they will start a new life.

Then we understood that their point was to locate the project in an area with a lot of people around. So professor supported them in their decision and the place was agreed.

In addition, students chose spaces that required healing themselves. In the case of Paula, it was a mess after the former market, whose primary function Paula kept as a co-major subject. Alejandro chose a location in the center of the old town, a poorly used small park. Both locations were selected in the neighbourhood with housing estates, proximity to medical care and potential homeless shelters. In either case, these were newly designed or nearby tags. Both locations were selected in the downtown area of Rzeszów and had very good access to public transport.

Each week students came to professor to solve different problems that occurred. They have been bringing some ideas and they have been discussing with professor about the best logical solution for the problems.

Other important problem was the limited budget for the project. The buildings had to be very cheap, so together we came up to the idea of using some recycle materials. In addition, in order to prevent as much as possible the destruction of the building, its construction had to take into account a significant contribution to the process of creating future users, that is the homeless. So it must have been easy enough for the homeless to be able to create it under the right guidance and professional help.

With their ideas and professor's contributions, working together and supporting them in a good way in everything that they were doing, they managed to do a good project from their initial ideas.

So this may be a good example to follow for all the teachers in this field. If we support and help students to promote their ideas instead of changing everything, they will

create amazing things. Students are the future and they must learn how to materialize a good idea, even if the idea looks impossible in the start.

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 way, which matches the city and kind of life that we have in here.

Paula have carefully analyzed the modular architecture that allows for the construction of repetitive elements that are 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 common feature – hexagonal cells (Fig. 1). Doing it like this we have the possibility of create a place with less material, more resistant and always can be add more modules to the project due to the form. The material from which the building was to be made of the building was chosen straw bales, currently rarely used in Poland. Advantages of straw – bale construction over conventional building systems include the renewable nature of straw, cost, easy availability, naturally fireretardant and high insulation value. The main idea of Alejandro's project was to build center for homeless people using shipping containers (Fig. 2). Idea of such construction is very interesting and around the world there is a lot of examples for shipping containers architecture. However such kind of construction is dealing with unique know-how issues, not usual for residential construction with traditional materials. The main problems are related to corrosion in areas of welding containers together and in points of contact with the foundation. To resolve such kind of problems special welding is required. Thermal insulation also has many issues (and corrosion). Shipping containers for accommodation purposes is better to insulate from inside to avoid problems with condensation. Taking into account the material of which the structure will be built there is practical problem with hanging furniture (such as cabinets in the kitchen). They need to design during the construction.

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

Paula's project is based in different parts, because, as we know, homeless people use to be lonely and some of them do not want to share their space with anybody, some others like to stay together and share a life with somebody.

Parts of Gabin Peinado Paula project (Fig. 1):

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

- the big building: we can explain this project saying that is divides in 4 main parts which are connected by a big building in the middle of them. In this building we can find a place to share, in here we can find tables, chairs, sofas, library and also a kitchen.

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

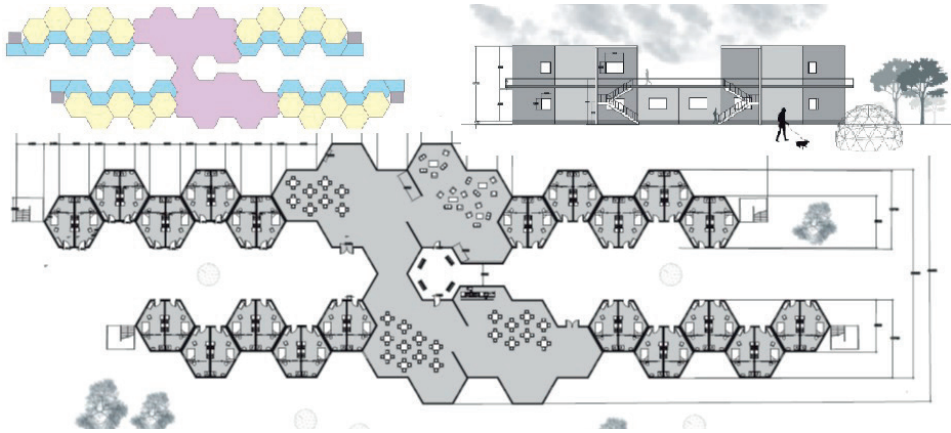


Fig. 1. Scheme of first floor, plan section-first floor, elevation

Source: Gabin Peinado 2017.

Paula was focused heavily on the exterior of the building, she wanted a building that was integrated in the environment, as far as possible, so it should be a space where homeless and citizens of the town enjoy, that's why the entire roof of the first floor is walkable. You can access that roof from 4 sites 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 performance of functions occurs in Garcia Gigato Alejandro project. He also parted privately and shared the homeless.

The whole urban structures divided into zones (Fig. 2):

- the leisure zone for children, with some child games,
- a market and little shops,
- the residential zone for homeless people. it is located further away from the busiest area, and we have got there more privacy.

Mixing ideas from a professional teacher from Poland and a young student from Spain give the opportunity to create something unimaginable. The student had to visit the teacher at least once a week to check that everything is going in a good way, with corrections such as:

- The student came with the idea of doing orchard in some kind of geodesic dome, but the teacher suggestion was doing it with plastic bottles filled with water to keep it warm during the cold weather and at night.

With all this, including a good work between a student and its professor we can make a big change, and it does not matter if they are from different countries and they have different ideas and notions of the architecture.

If we encourage our students to do it in their way but with our help as teacher we can create amazing things, keep them being free and create, with the help of an experienced teacher.



Fig. 2 Location plan – ground floor and residential section

Source: Garcia Gigato 2017.

Mixing thoughts 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 to students. Work together, help each other, suggest new ideas and always encourage students to do it better. Students can surprise you in many good ways.

## Materials and technology

This can be sustainable way of living on property for homeless in the South of Poland. Homeless can build a miscanthus bale houses by their own hands. This ornamental grasses are more and more often hosted in home gardens in South of Poland. It also appeals 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 pays special attention. As one of the highest-growing grass special in polish climate, it looks great when planted alone or in compositions with other perennials (Helios 2017). Miscanthus giganteus was brought to South Europe from Southeast Asia around 1930 as an ornamental plant. The species arose as a result of a natural cross between miscanthus sinensis and miscanthus sacchariflorus. Short rhizomes are the underground part of miscanthus giganteus. Every year in spring, foliage, lush shoots grow from them, forming magnificent, dense clumps. Homeless will be living in a temporary houses besides the building place. They will have a large vegetable garden and public place were miscanthus will be cultivated. They will be build a miscanthus bale house low cost, low tech, using natural materials. Low cost, because they do not want to have a mortgage, a low tech because they want to make things ourselves. A good example



of such technique is their wood splitter, logging wheels. During the building process they will have used no crane. The miscanthus bales will be placed in the walls and will be plastered outside. After this it be time to work at the interior: oiling round wood, plastering inner walls, fixing the root cellar. They will be very interested in to learn working with natural building materials. Because of fire risk smoking will be not allowed on this terrain.

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

1. Sustainability: miscanthus bale is totally renewable material, waste product of green production and absorbs CO<sub>2</sub> during growth and locks it into the home construction. A comprehensive carbon footprint analysis of miscanthus bale materials production, transport and use usually yields a significantly lower footprint. Specially 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 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 every window can have a window seat or shelf, providing both an aesthetic and practical design element.

3. Easy to construct: The basics of miscanthus bale construction are easy understood by even novice builders. With supervision by one effective miscanthus bale project lead. First time builder can be a part of the complete construction process and expert to build with success.

4. Low cost: If they live in an area where miscanthus is grown, miscanthus bales will be easy to acquired and 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<sup>2</sup>K. 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 good resistant to fire.

7. Bio-degradable: miscanthus as the plant is normally bio-degradable. At the end of the object lifespan the material gracefully returns to the earth and it not leaving toxins behind.

8. Noise isolation: The thickness and deccity of miscntus 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 of 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, stimulate creativity, curiosity about the world and enable better social functioning. Of course, the success of the implementation depends on the creative potential of the participants. Moreover, the implementation of this project allowed students in the face of a real social problem to build their own knowledge base and not to act 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 solutions, using mainly materials that would allow to significantly reduce costs and negative impact on the environment. Creating 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 is to build a place where everyone can share something and 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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