

SPACE THAT SPEAKS TO ALL.

UNIVERSAL DESIGN AS AN EMPATHY LABORATORY



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article

#universal design #social inclusion #empathy in design #project-based learning



Agata Anacik-Kryza, PhD



Anna Sieroń

Abstract

The article discusses the role of universal design as a tool for developing empathy and social responsibility in design education. It presents teaching experiences from a course for graphic design students that integrates methodology, design thinking and Project-Based Learning. The purpose of the classes is to prepare students for creation of inclusive and accessible solutions.

The evaluation conducted, based on mixed methodology, showed that the course had a positive impact on students' approach to design. As many as 65% of students who have completed the course declared a clear positive change in their approach. These changes included increased awareness of accessibility issues, better understanding of the meaning of empathy and appreciation of the role of research in the design process. Students emphasized that their designs focused on users' actual needs and not on their own creative preferences. They also noticed that designing with disabled persons in mind expanded accessibility for the entire society, including the elderly or parents with children.

A contemporary city may be perceived as a complex communication system – a set of signs, spaces and interactions which, like a book, requires careful reading. However, this metaphoric “page” can be turned over only when the space can actually be accessed by all of its residents – children, senior citizens, people with disabilities. Universal design, developed since 1970s by Ronald L. Mace, the author of the “Universal Design: Barrier Free Environments for Everyone” concept (1985), offers framework which allows one to think about space not as a common denominator for the “majority” but as a dynamic field of needs and possibilities. In this approach, the designer becomes a mediator between diverse bodies and the structure of the everyday world – and design gains an ethical and social dimension.

This article presents teaching experiences from the universal design course conducted in the field of graphic design in which the design thinking methodology and Project-Based Learning serve as tools for developing empathy, sensitivity to spatial exclusion and professional responsibility. This course has become a space for testing the inclusivity assumptions in the urban context – both through field research with the participation of users, and through prototyping and testing of solutions under real conditions. In the further parts of the article, we present theoretical assumptions, a description of the teaching process, evaluation results, and examples of three



student designs which illustrate how design can become a tool of social change.

Universal design is a fundamental paradigm in the field of design, aimed at creating artifacts, spaces and experiences in a way that ensures their optimal accessibility and functionality for the widest possible spectrum of users. It assumes an elimination of barriers resulting from age, diverse psychophysical abilities or individual preferences, aiming to achieve universal adaptability. The objective of this approach is to incorporate social inclusion, which corresponds with the contemporary understanding of disability that is increasingly perceived not as an inherent feature of an individual but as a consequence of the systemic environment not being adapted to the diverse needs. In the demographic perspective, universal design responds to the challenges of ageing societies which require adaptations of the infrastructure to the needs of elderly people. Moreover, universal design harmonises with the sustainable development principles, contributing to the reduction of social and economic disproportions through the stimulation of social cohesion and counteracting discrimination in the access to resources and services.

The beginnings of the idea of universal design date back to the 1970s, strongly associated with the figure of the American architect Ronald Mace. He was the author of the idea of “design for all”, which assumed the need to create architectural structures in a way that takes into account the needs of people with different motor, sensory and

cognitive abilities. His works were an impulse for the development of standards and norms in this field. In 1980s, the popularity of this perspective grew thanks to the publication by Victor Papanek entitled “Design for the Real World. Human Ecology and Social Change”, in which the author promoted the holistic design paradigm, prioritizing the well-being of humanity and the planet over pure aesthetics or commercial goals.

The 1990s brought about the diversification of the applications of universal design, which went beyond architecture, finding implementation in areas such as industrial design, education and the service sector. The breakthrough moment was the publication of the “Seven Principles of Universal Design” in 1997 by the Universal Design Center in North Carolina, which to this day constitute axioms of this philosophy. Currently, the principles of universal design are supplemented with additional criteria, such as the aesthetic integration with the environment and the support for real integration of people with different abilities, which corresponds to the concept of “perception of equality” formulated by Konrad Kaletsch (“Perception of Equality: Design for Inclusive Environments”, Springer, Berlin 2021), as well as the postulate put forward by Kat Holmes, the author of “Mismatch: How Inclusion Shapes Design” (MIT Press, Cambridge 2020), according to which a design should be sensitive to the cultural, linguistic and social context of its users for whom it is being created. Technological progress opens up new

opportunities with regard to the adaptation of solutions to users' diverse needs. Which is more, the adoption of an interdisciplinary approach to design, integrating the knowledge on ergonomics, psychology, sociology and other disciplines, allows the creation of more universal and effective solutions. The key element is also the participative inclusion into the design process of not only industry experts but first and foremost representatives of excluded and marginalised groups. Such approach guarantees that the products designed truly address their actual needs and aspirations. As Ezio Manzini notes in his book "Design, When Everybody Designs: An Introduction to Design for Social Innovation" (Cambridge – London Press, 2015), the future of social innovations in design lies in broad cooperation between both professionals and people from outside the design community. Universal design, as a holistic paradigm, has evolved from its initial "Design for All" concept to becoming an integral part of contemporary user-oriented design, which contributes to the systematic building of a more inclusive and accessible environment for the entire society.

Project-Based Learning: Integration of universal design with an active teaching approach

Project-Based Learning is a method which involves students in solving actual problems and developing skills useful in their professional life, such as critical thinking, cooperation and agency. Learning by doing, as John Dewey wrote, "is life itself" – not just preparation for life.

Universal design, in turn, is based on the creation of products, spaces and services accessible for all, without any need for adaptation. In education this means the planning of inclusive experiences already at the teaching process design stage. This framework, described by David H. Rose and Anne Meyer in their book "Teaching Every Student in the Digital Age" (Association for Supervision and Curriculum Development, Alexandria 2002), allows for the involvement of students with different needs and learning styles by offering many ways of expression and participation.

At our university, i.e. SWPS University, Kraków campus, the integration of these approaches is not an extra – it is the basis of the curriculum. Universal design is a mandatory teaching module in the field of applied graphics and multimedia. The classes are spread over two semesters: the

first one is devoted to empathy – students study the needs of different users and analyse existing barriers; the second one focuses on the generation of solutions and testing them. The whole course is provided in accordance with the design thinking methodology which supports iterative nature of the process and experience-based learning.

Students work in interdisciplinary teams, developing designs that address actual social needs – from public spaces to solutions supporting persons with functional limitations. The principles of universal design – such as equitable use, simple and intuitive use, flexibility in use, or tolerance for error – are applied consistently at each stage of the design work.

As Victor Papanek noted, designing is one of the most powerful tools for shaping the world. In our approach, we teach that this tool should be used responsibly – with the widest group of users in mind and with deep understanding of the social context.

Evaluation of universal design classes

The aim of the study was to comprehensively assess the effectiveness, teaching quality and declarative impact of classes on undertaken project activities, analyzed from the perspective of students, diploma candidates and graduates of the university. Particular emphasis was placed on identifying the extent to which the respondents and interviewees integrated the principles of universal design in their theses and everyday professional practice, which is a real measure of knowledge and skills transfer.

The classes were evaluated on the basis of the mixed methodology, combining quantitative and qualitative approaches, in accordance with the principles of triangulation in research described by Norman Denzin in his book "Sociological Methods: A Sourcebook" (Routledge, New York 2017). This combination allows not only for the verification of results from various sources, but also for obtaining a richer, more nuanced picture of the phenomenon analysed.

The quantitative study was population-based – the link to the survey was sent to two research groups: students who had completed universal design classes and those who were in the first semester of the subject.

Under the qualitative phase of the survey, 13 individual in-depth interviews were carried out



Fig. 1 Inclusive playground design. Authors: Justyna Senderek, Wiktoria Springer, Ewelina Wojas, Agnieszka Wojtanowska.

in total. Interview invitees included persons who consciously implemented the principles of universal design in their dissertation.

Nearly 57% of the students taking part in the survey declared that a clear positive change took place in their approach to design under the influence of the classes. Among the students who successfully completed the course, this percentage was even higher, reaching 65%. The positive changes observed in the approach to design included: significantly increased awareness of accessibility, in-depth understanding of the importance of empathy in the entire design process, adoption of the principles of inclusive design as an intrinsic work standard, better understanding of the complexity of how the design is received by various user groups, as well as appreciation of the key role of reliable research in design. The course effectively changes students' approach to design, which constitutes clear evidence of its long-term value in the education of future specialists in the field of design.

The graduates and diploma students implemented the principles of universal design in their

final works to varying degrees. For some of them, universal design constituted the central conceptual framework which determined and organised the entire creative process, whereas for others these principles constituted an important, though supplementary, element of their design methodology. However, all interviewees agreed that their projects were not focused on their own creative preferences, but on the real and diverse needs of the user, prioritizing usability and functionality over aesthetic values.

Respondents consistently stressed that designing with disabled persons in mind automatically expanded accessibility for the general public, including also such groups as the elderly or parents with small children. They also pointed out less obvious but just as important user groups, such as: children, people speaking languages other than the dominant one, or women who often are not included on a standard basis in the context of exclusion.

The most valuable elements in the curriculum, according to the interviewees, included: the opportunity to delve into the principles of universal design in detail and become aware of its critical importance for contemporary design, the importance of research experience, learning new techniques and analytical tools (and the possibility of their practical application in real projects), as well as a comprehensive analysis of accessibility and inclusivity through systematic observation of physical and digital spaces.

The interviewees clearly saw that learning universal design translated into more inclusive design thinking and deeper awareness of ensuring accessibility and functionality for all users. This knowledge constitutes for them a solid basis in the understanding of the full design cycle and shapes the ability to thoroughly analyse needs. It develops empathy and sensitivity to requirements of diverse user groups, which in consequence leads to the creation of design solutions that are more sustainable and ethical. The diploma students and graduates surveyed are aware that universal design addresses the growing needs of the contemporary world and provides them with a significant competitive advantage in the labour market.

Student design: universal playground

The design by students Justyna Senderek, Wiktoria Springer, Ewelina Wojas and Agnieszka Wojtanow-

ska constitutes an example of how design thinking is used in the designing of public space accessible for children with diverse developmental and functional needs (Illustration 1, universal design classes conducted by the authors of the article).

The starting point was the research conducted at the empathising stage – the students identified the needs and barriers encountered by children in the urban space. The inspiration for the diagnosis were previous design experiences, including the design safari exercise – an exploratory method consisting in the observation of space from the point of view of people at risk of exclusion, which made the students more sensitive to the absence of inclusive solutions in the urban infrastructure. Children of different ages participated in the research, which enabled the students to capture many perspectives.

Field studies were also an important element of the process, including observations and interviews with the children and their guardians, the results of which have been analysed and collated in a research plan encompassing the identification of users and the analysis of data collected. On their basis the students defined the most important user needs such as the need for diverse motor activity, sensory integration, rest, and spatial orientation.

The ideation stage resulted in numerous ideas, which were then verified in the prototyping phase. The universal playground model created included a multi-level climbing structure, a swing, a tunnel-slide, sensory musical elements, and a sand pit, as well as visually diverse surface with colourful forms playing the role of orientation points. Students realise that the chessboard layout does not meet the universal design requirements – it was used in the prototype solely to enable the authors to explain and visualize during usability tests how the substrate would work when it also took on an informational role.

The solutions proposed included:

- well-thought-out functional zones corresponding to different forms of activity (motor, sensory, social),
- visual and physical accessibility of play elements,
- leisure elements and introduction of greenery,
- clear and attractive spatial layout inspired by the need for exploration.

The design is an example of a socially sensitive approach to urban space and provides an excellent illustration for the application of the principles of universal design in educational practice. The students have designed a play area which does not segregate children according to their level of fitness but encourages shared activity and cooperation. The principles of equitable use, flexibility in use and size and space for approach and use are clearly being implemented. The sensory and visual diversity of elements supports orientation in space and social development of children. The inclusion of the social context also constitutes a significant value of the design – the playground has been designed as a place for integration, not rehabilitation, which is in line with the principle of cultural and linguistic sensitivity. Despite the very good level of attention to detail in the concept, the design could be developed further with regard to the principles of “tolerance for error” and “simple and intuitive use”, e.g. by developing safety markings or instructions for use in more detail. Despite these minor shortcomings, the concept is very mature and cohesive, showing that inclusivity could be the foundation of an aesthetic, accessible and socially meaningful design.

Assessment of the implementation of universal design principles: 7/8

The design constitutes an example of the practical application of the principles of universal design in design education, with the simultaneous development of soft competences, such as empathy, ability to cooperate and communicate. Thanks to the inclusion of actual users and the iterative nature of the work, the students have developed a solution which may be a starting point for the implementation, and at the same time fits into the didactic goals of educating empathetic designers and designers aware of the role of accessibility in public space.

Diploma design: universal design in the space of the Rakowicki Cemetery

Jakub Bartkowski's diploma work, carried out in the diploma studio of Oksana Shmygol and Julian Wierzychowski, is an example of implementation of the principles of universal design in public spaces of particular cultural and historical value. The topic of the project was to design a spatial

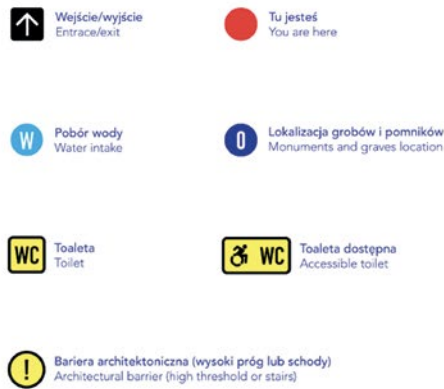


Fig. 2 Signage design for the Rakowicki Cemetery.
Author: Jakub Bartkowski.

information system and visual identification for the Rakowicki Cemetery in Kraków, taking into account the needs of people at risk of spatial exclusion, using an approach based on empathy and co-design with users with diverse functional needs, which is in line with the assumptions of universal design (Illustration 2).

The starting point was the analysis of public infrastructure accessibility barriers identified during an earlier design safari exercise. These observations initiated an in-depth identification of the needs of users – including persons in wheelchairs, the elderly, carers of children and people with sensory disabilities.

An important stage of the design process were research walks – a qualitative method enabling the researchers to directly experience the space and identify user problems. The diploma student, accompanying representatives of target groups, had an opportunity to directly experience challenges connected with moving around the cemetery. He noticed, among other things, the absence of information about accessible toilets – which for people with reduced mobility is a key aspect when planning a visit.

The field research was of exploratory and participative nature, which enabled the author of the

design to verify the project assumptions in the spirit of universal design in which the testing of hypotheses takes place through contacts with actual users and not solely through own assumptions. Simultaneously, a comparative analysis was conducted – of both digital and physical information systems in similar public spaces in other cities (Warsaw, Łódź). The conclusions indicated a lack of awareness of people with disabilities among cemetery managers, which reflects a broader phenomenon observed in many institutions where people with disabilities are not treated as equal users of space, which results in their marginalization in infrastructural projects.

The solutions proposed included:

- maps and boards with lists of graves, designed to meet various user needs (e.g. high-contrast versions for the elderly and visually impaired, translations for non-Polish speakers),
- signs indicating architectural barriers and accessible toilets have been developed taking into account the principles of information design, including appropriate contrast, content hierarchy, selection of icons, font size and availability of lighting, directional signs in Polish and English,



Fig. 3 Design of a guide book for the John Paul II Airport in Balice.
Author: Daria Łabędź.

- visual identification inspired by architectural details – stained glass windows from the cemetery chapel.

Jakub Bartkowski's diploma work deserves particular recognition due to the combination of cultural sensitivity with accessibility requirements. The author designed a spatial information and visual information system for the Rakowicki Cemetery by integrating functionality with reflection on user experience in the space of commemoration and sacrum. The design implements well the principles of equitable use, simple and intuitive use, perceptible information and cultural sensitivity – particularly through the use of high-contrast maps, pictograms, translations, and reference to the architectural details of the cemetery. The comparative analysis of solutions from other cities and the empirical identification of architectural barriers in the field also constitute

a big advantage. The design could also be developed with regard to the principles of “low physical effort” and “tolerance for error”, e.g. by designing rest areas or clearer marking of zones that are hard to access. Despite this, the work represents a high level of social sensitivity and professionalism, combining the functional dimension with the symbolic and cultural one.

Assessment of the implementation of universal design principles: 6,5/8.

The Public Transport Board in Kraków has evaluated the design positively and expressed its readiness to assume supervision over its implementation. This example shows how the universal design practice could be implemented effectively on the educational level through the contact with actual users and through inclusion of their experiences, which increases the chances for the solutions developed being implemented and un-

derscores the value of qualitative research in the educational process.

Diploma design: Neurodiversity-Friendly Airport

The diploma work by Daria Łabędź, prepared in the studio of Zuzanna Łazarewicz and Kinga Blaschke, constitutes an example of the application of universal design in an environment with a high level of stimuli and complex spatial organisation. The design concerned the creation of a system supporting the independence of adults with an autism spectrum disorder within the Kraków-Balice airport, using an approach based on empathy and co-design with users with different functional needs, which is in line with the assumptions of universal design. (Illustration 3).

The design was inspired by the cooperation with the Aviation Education Centre (Centrum Edukacji Lotniczej) and the personal experiences of the student as a highly sensitive person, as well as the involvement of target group representatives and their readiness to cooperate highlight the importance of the social rooting of the design process. At the first stage, a series of in-depth interviews with neurodiverse adults was conducted because this type of method allows the capture of nuances in the users' experiences, particularly in groups characterised by neurodiversity. The diploma student developed her own research scenario, focusing on clear language, open-ended questions and non-directive approach, in accordance with the assumptions of universal design which promotes a shift away from the designer's own beliefs towards work based on research data.

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Based on the material collected, a set of solutions was designed to support independent movement around the terminal, including:

- step-by-step instructions for the most frequent travel scenarios,
- information boards with a simplified structure,
- set of original graphic icons,
- the navigation system has been based on the principle of spatial stress reduction, as predic-

tability and limitation of stimuli are crucial for people with cognitive difficulties functioning in environments with a high level of sensory stimulation.

Each of these elements was subject to utility testing with representatives of the target group. The student tested physical mockups, analysing their understandability and functionality in a real context, because testing with users in the target environment significantly increases the relevance and usability of the designed solutions.

The work by Daria Łabędź stands out due to its deep empathy and understanding of contemporary challengers connected with neurodiversity. The design, addressed to adults on the autism spectrum, shows how universal design can support independence, reduce stress and improve the comfort of moving around in a space with high intensity of stimuli. The author implemented almost all the principles of universal design, in particular those relating to flexibility in use, simple and intuitive use, perceptible information as well as cultural and social sensitivity. The set of original icons, step-by-step instructions and simplified information boards has been tested with representatives of the target group, which confirms the effectiveness of the proposed solutions. The ethical dimension of the research also constitutes a high value of the project – it relies on empathy and trust-based relations. In the future, the aspect of the users' physical contact (e.g. reference to rest area, lighting, acoustics) could be developed in order to fully implement the principle of "low physical effort". The design is an example of a mature, empathetic and socially aware design in which visual communication becomes the tool of real inclusion.

Assessment of the implementation of universal design principles: 7,5/8.

In the research process, the student faced concerns related to communication – both her own and that of the respondents. As she admits, she had discovered many shared features with her interviewees, which enabled her to build empathy-based relationships. The stress-coping strategies described by the participants were a particular source of inspiration – unobvious but effective, such as looking at cheeses in a supermarket, drinking coffee "to calm down", or walking barefoot – they show that unobvious emotional regulation strategies can be inspiring

for the creation of low-threshold, empathetic design solutions.

The project has become for the student an opportunity to develop her research competences and reflect on the role of a designer in the social context. The activities completed show that design education may effectively support the building of social sensitivity, and solutions designed for one group may be useful for many because design education based on actual social challenges supports the development of the social sensitivity and design responsibility competences.

Summary

Universal design, as an interdisciplinary and evolving paradigm, combines ethical, social and aesthetic reflection in a single design process. Its development – from Ronald L. Mace's architectural initiatives, through Victor Papanek's postulates concerning the designer's responsibility towards the planet and society, to contemporary social practices described by Ezio Manzini – shows that, today, design is becoming a tool of developing a more equal and inclusive world. The addition of the eighth principle – cultural, linguistic and social sensitivity – widens this paradigm, emphasising the need to allow for various user contexts and to shift away from universalism towards empathic design pluralism.

In design teaching, universal design takes on special meaning as a tool for teaching social competences, empathy and professional responsibility. Combining it with the design thinking methodology and the Project-Based Learning approach enables the students to learn by doing, and, at the same time, understand design as a process based on research, reflection and co-creation. The course completed shows that interdisciplinary and iterative teaching approach develops both design skills and ethical attitudes – teaching students to listen, observe, test

and adjust their own assumptions in response to users' actual needs.

The results of evaluation of the universal design classes confirm their transformational impact on students' awareness. Both the quantitative and qualitative data show that the participation in the course lead to a permanent change in thinking about design – from individual expression towards a social goal. Students declared an increase in empathy, greater understanding of the meaning of accessibility, as well as perception of user studies as the key stage of the design process. In the opinion of the graduates and diploma students, universal design not only expands the workshop but also constitutes a distinctive competence in professional work and facilitates communication with various user groups.

The analysis of three student designs described – the inclusive playground, the spatial information system for the Rakowicki Cemetery, and the Neurodiversity-Friendly Airport design – shows that the universal design principles may be effectively applied in the designing of both physical spaces and visual communication systems. All three designs confirm that design based on co-operation with users leads to the creation of actually useful and ethically rooted solutions.

The playground (7/8) – combines cultural sensitivity with perceptible information, constituting an example of a balanced dialogue between the commemoration of a place and needs of contemporary users.

The Rakowicki Cemetery (6,5/8) – combines cultural sensitivity with perceptible information, constituting an example of a balanced dialogue between the commemoration of a place and needs of contemporary users.

The airport design (7,5/8) – develops the principles of simple use, predictability and stress reduction

by proposing solutions based on empathy and co-creation together with neurodiverse people.

Together, these designs show that the application of the eight principles of universal design promotes the creation of solutions which not only increase accessibility but also enrich the user's experience by building a space for shared participation and understanding. The common denominator of these activities is the conviction that universal design does not limit creativity – on the contrary, it becomes the source of innovation and reflection about the social role of design.

To sum up, teaching experiences and results of studies show that design education focused on uni-

versal design plays a transformative role – it changes the way students think about design, expands the scope of their empathy and develops ethical professional attitudes. It teaches responsibility for the shape of social and spatial environment in which we live. Universal design, transferred to the field of education, is not just a method – it becomes an attitude that makes it possible to build a more just, inclusive and empathetic world. ■

Agata Anacik-Kryza, PhD
Anna Sieroń

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