

Educational workshops as a teaching tool in the context of space accessibility

Sylwia Mochocka & Małgorzata Wijas

Kielce University of Technology
Kielce, Poland

ABSTRACT: In this article, the authors describe the role of workshops as a tool in educating school students about space and building accessibility. The aim of the research outlined in this article was to demonstrate that a properly selected workshop programme constitutes an effective tool in contemporary education at a high-school level. Within the *Accessibility Hub* project, workshop-based classes were held at Kielce University of Technology in Kielce, Poland, in a specialised laboratory dedicated to universal design. Each stage of the workshop is described in the article. A survey was conducted among young people aged 16-17, from high schools in Kielce, Poland to gauge their awareness of accessibility prior to, and after the workshop. Results from the workshop illustrate a significant increase in the knowledge of universal design, which demonstrates the effectiveness of the workshop's aims to enable participants to apply the theoretical knowledge gained into practice, increase their interest and engagement, support the absorption of new information and foster the drawing of individual conclusions.

INTRODUCTION

Disability is part of being human. An estimated 1.3 billion people - about 16% of the global population - currently experience significant disability. This number is increasing due in part to the aging of the population and an increase in the prevalence of noncommunicable diseases. Inaccessible environments create barriers that often hinder the full and effective participation of persons with disabilities in society on an equal basis with others [1]. In light of the above data, universal design measures aimed at increasing the accessibility of space appear to be highly significant as they markedly contribute to better living and functioning conditions, e.g. of aging communities [2].

The subject of design that considers the need of persons with disabilities has been present in the literature since the middle of the 20th Century [3]. With the establishment of the Center for Accessible Housing (in the late 1980s in the USA) and later the Center for Universal Design, also in the USA, the concept of universal design emerged and was developed in further research. The main idea is to improve the quality of life for all members of society, including persons with disabilities (PwD). The concept of universal design was created by American architect Ronald Mace (1941-1998), who formulated its definition and formulated the seven principles of universal design [4]. According to Mace, universal design involves, among other things, improving the accessibility of space and creating a physical environment that allows as many people as possible to use it independently and on an equal footing with other members of a community [4].

Universal design is associated with actions that are difficult to implement without proper public education - an education that aims to increase public awareness of the problems of people from vulnerable groups, and the need to create an environment that is open to people with severely restricted ability, not only physical, but also emotional and psychological. One such action is the education of young people in universal design, which involves raising their awareness and sensitising them to the aspect of how people from vulnerable groups function in society [5]. Introducing accessibility issues already at the level of school education involves selecting effective teaching methods, such as workshop-based classes that, considering the needs of contemporary young people, will optimally increase their involvement in the learning process and assist them in drawing individual conclusions.

The *Accessibility Hub - Centre for Practical Accessibility Learning (Hub)* project, undertaken in 2021 in partnership between Cracow University of Technology, Kraków, Poland and Kielce University of Technology, Poland, led by specialists from architecture programmes at both universities, was an initiative that implemented the above-mentioned actions. Within the framework of the project, a workshop was conducted at a specialised *accessibility knowledge laboratory* set up at Kielce University of Technology.

The goal of this article is to demonstrate that universal design education through workshop classes is effective in sensitising young people to the needs of vulnerable groups. The attitude and engagement of students during a workshop

are an important element that influence this process, as they strengthen the interest of the participants. The arguments presented here are grounded on extensive academic literature, as well as the results of applying a methodical form of accessibility education at a high-school level within the *Hub* project. Surveys and interviews were conducted to evaluate the effectiveness of the project. The results suggests that an effective, workshop-based course:

- a) facilitates the assimilation of knowledge;
- b) enables innovative learning and enhances the creativity of participants;
- c) improves one's sense of having an impact/effectiveness;
- d) is conducive to drawing individual conclusions;
- e) strengthens participant interest in and engagement with the topic;
- f) supports the absorption of information through experience;
- g) teaches teamwork.

EDUCATION IN THE FORM OF WORKSHOPS - A RESPONSE TO THE NEEDS OF CONTEMPORARY EDUCATION

The current education system in Poland includes general education (primary and junior high-school levels), general high schools, technical and vocational schools; and compulsory education lasts from the age of 7 to 18. Teaching quality assessments indicates that one of the problems of secondary schools is the negligible amount of practical (workshop) classes, with a predominance of theoretical classes, which are not listed among the methods of effective knowledge acquisition. Educating young people to not only enhance their knowledge, but to make them aware and sensitive to the functioning of persons with special needs is essential at every stage of education, and requires the selection of appropriate educational tools, using modern technology, practice- and experience-based teaching, and the selection of an appropriate curriculum [6].

One form of education that allows to increase the effectiveness of teaching, develop creativity, enhance the interest and engagement of participants, as well as to acquire teamwork skills, so much needed in many areas of life, is learning through workshops [7][8]. Workshop-based education beneficially impacts creative, non-standard thinking and enhances better understanding of certain aspects [9][10]. In her study, Haupt investigated the benefits of workshops in teaching primary-school students and those of university students who participated in the workshops [11]. The study answers the question of what skills are developed through this type of learning [11]. In the workshop method, the teacher's approach is important, as it helps in the pursuit of independently engaging students in successive activities, thus shaping their creative abilities. The ability to practically apply one's knowledge can be acquired through effective workshop-based education. Imparting knowledge in a way that allows one to practically *touch the subject* or take on a particular role is a future-oriented approach to education.

In the workshop method, work is often conducted in a *master-apprentice* arrangement, wherein the teacher acts as an expert and mentor [12]. This method helps the student become independent and make his/her own decisions. The teacher's role is to guide the student in mastering certain skills and to support him/her through observation and conversation. Teachers are important creators in education. Their competence and also their involvement in the teaching process are decisive in the effectiveness of that process, while the workshop method provides an opportunity for a closer student-teacher relationship and requires greater involvement of both sides. Working in small groups allows for full development of this relation. There are many studies that show the impact of the teacher-student relationship and its role in triggering creativity, which should be developed at every stage of education. Research on creativity in schools demonstrates that creativity can be applied to any field of knowledge and that it is strategically beneficial to encourage students to participate in activities that allow them to be creative [13].

Another advantage of the workshop format is engaging in teamwork, which allows an individual to make use of their strengths. A person who does not have all the knowledge of how to solve a problem can prove to be irreplaceable in a group and, together with other participants, work to solve a problem. Searching for and applying a diverse array of sources and ways to make the learning process more effective is a very important aspect of a teacher/educator's work. Effective teaching methods increase the mobilisation of participants and eliminate negative emotions, such as boredom, shame, low self-esteem and self-worth, which is possible by changing the relationship between the student and the teacher [14][15].

WORKSHOP PROGRAMME

As a part of the *Hub* project, a workshop conducted by specialists teaching architecture and urban design programmes was organised. The workshop was directed at young people, as a group for whom the problem of old age is so distant that they find it difficult to understand changes in the use of space. The workshop programme was chosen adequately for the age group under study, so the workshop tasks focused largely on practical and design elements, intended to strongly engage the target age group, thus contributing to better learning. The educational workshop was divided into five stages, during which the research was conducted. All participants took part in each stage. The research results for the different parts were collected and presented in the form of graphs, and then analysed in terms of the effectiveness of the workshop.

A total of 40 people took part in the workshop. The workshop was conducted in five-person groups, which enabled: better knowledge transfer, an individual approach of instructors to the participants, more frequent consultations during design tasks to discuss the solutions proposed on an ongoing basis, testing all simulators individually.

The workshop was divided into five parts:

- introduction - interview;
- theoretical part - multimedia presentation (Figure 1);
- practical part - testing simulators (Figure 2);
- design part (Figure 3);
- survey and quiz.

Each part of the workshop was the responsibility of a specific instructor who had the knowledge and competence to conduct it. In each part, appropriate tools were used to achieve specific results.

The workshop began with an interview, and every group was asked ten questions each. They were addressed to the general public and had an open form. The questions concerned, among others, familiarity with terminology and issues related to universal design and generally used solutions: What is universal design? Whom does it concern? For what purpose are varied surface textures used?, and were supported by illustrations depicting each issue. The interview served as a background check, as a reference point for further research.

The next part of the workshop included a lecture, in the form of a multimedia presentation (Figure 1). It constituted the theoretical part of the workshop, introducing the topic of universal design. The presentation was divided into several parts, including the general subject matter of the accessibility of each space.



Figure 1: Multimedia presentation - the theoretical part of the educational workshop. Photographs by the authors.

The practical part - the workshop experience entitled: *In the skin of a differently able person* - consisted of creating scenarios using various types of specialised simulators. Simulators, a wheelchair, a cane for the blind and orthopaedic crutches were used in pre-arranged scenes (Figure 2).



Figure 2: *In the skin of a differently able person* - practical part - workshop experience using specialised simulators. Photographs by the authors.

This included an old age simulator, which is a suit that simulates the effects of aging. Practical tasks in the form of arranged situations focused on the lives of people with different types of disabilities. Simulator testing involved experiencing the limitations of various disabilities that occur with a variety of health conditions of seniors, and experiencing architectural and urban barriers with simulated limited mobility.

The design part concerned a housing area. The design task was to propose functional solutions in an apartment (Figure 3). It was evaluated against the following criteria:

- correctly defining the needs of the user of a given space;
- identifying opportunities to eliminate barriers created/present in the space;
- applying functional solutions that meet the needs of a wheelchair-bound person;
- engaging participants in the design process.

The participants designed an entrance area, a bathroom, a living room with a kitchenette and a bedroom, in terms of ergonomics for a wheelchair user. The work was done on created in advance *physical* templates, prepared to scale and graphically adapted to the age group under consideration. Elements of the space and furnishings were chosen from pre-made blocks. During the task, the participants consulted with coordinators on an ongoing basis on proposed solutions, engaging in discussion and asking additional questions. The task was carried out in the form of group work. It was aimed at analysing the problem, drawing conclusions, simultaneously referring to the experience and practical measures, correctly defining the needs of the wheelchair user in the residential space, eliminating barriers and applying functional solutions that meet the needs of the person. The task involved applying the knowledge gained during the theoretical and practical parts, and provided a basis for verifying the knowledge gained during the previous two stages.



Figure 3: Design task - arrangement of a residential space designed for a wheelchair-bound person. Photographs by the authors.

The final stage of the workshop involved a survey and a quiz. This stage was dedicated to verifying the knowledge gained by the participants. Every participant took both the survey and the quiz. The survey consisted of ten closed-ended questions, with a *yes* or *no* option. The participants responded in writing, answering, among others, the following questions: Do you know what the term *universal design* means? Can you name architectural and urban planning barriers faced by wheelchair users? Because the survey questions were formulated in a general manner, and the answers to them could be subjective, control questions were introduced in the form of a quiz, which contained more specific questions. For example: What does universal design concern? Which of the following can we categorise as architectural barriers?, with two possible options to choose from. Both the quiz and the survey allowed for verification of the level of knowledge that resulted from participating in the workshop. The survey provided information on the percentage increase in the knowledge of universal design, while the quiz allowed for checking the level of knowledge gained based on the score achieved from the solved problems.

RESULTS

The results of each survey have been collected and are presented below in the form of bar graphs (Graph 1 - interview results, Graph 2 - survey results, Graph 3 - quiz results) along with a descriptive evaluation of the design task in terms of the specified criteria.

Graph 1 shows the results obtained from the interview in each of the eight groups. The results obtained in each group ranged between 20% and 40%. The collected data indicate that the level of knowledge of the surveyed social group about universal design was low. Although the answer was counted as correct based on at least one included vote, the different groups managed only an average of 30% correct answers.

Graph 2 shows the results obtained from the survey. The bars illustrate the average results from the surveys obtained in each group. Similar results were obtained in each of the eight groups, ranging from 80% to 96%, which was an average of 89% affirmative responses across all respondents.

Graph 3 shows the results of the quiz. The bars illustrate the average quiz scores obtained in each group. Similar results were obtained in each of the eight groups, ranging from 74% to 86%, with an average of 81% affirmative responses across all respondents.

It should be noted that the survey referred to the level of awareness concerning the knowledge acquired, based on a subjective self-report, while the quiz, which included detailed follow-up questions, confirmed its actual state. The charts illustrate how the level of knowledge changed (as it increased) at each stage of the workshop. A noticeable difference between the participants' knowledge at the beginning and at the end of the workshop was observed.

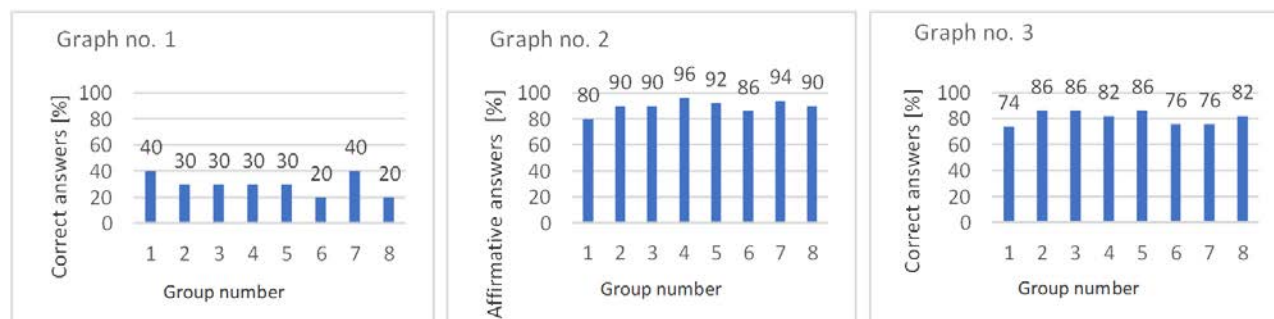


Figure 4: Bar graphs depicting the results of each survey, Graph 1 - interview results, Graph 2 - survey results, Graph 3 - quiz results.

Evaluation of the design task - a creative task, involving solving the problem discussed, related to the application of solutions to increase the accessibility of space. The participants took an interest in planning the apartment shown in Figure 3, and efficiently employed functional solutions tailored to the needs of the user given. Everyone was highly engaged, and demonstrated knowledge and creativity. The correctly solved project task showed that the knowledge transferred on the basis of a multimedia presentation and during simulations/experiences, has a greater carryover to engagement and supports better memorisation. The participants were able to correctly define the needs of a wheelchair user in a residential space, minimise or completely eliminate barriers, and appropriately apply functional solutions that meet the needs of a wheelchair user.

SUMMARY AND FINAL CONCLUSIONS

Universal design is becoming increasingly popular as society becomes more aware of equality, the increasing needs of persons with disabilities, seniors, and those related to the desire to participate in every aspect of social life. The topic is gaining in significance, as society is aging, and its needs, as well as its desire to fully participate in social life, are increasing. This does not necessarily concur with the awareness and acceptance of the healthy portion of society and appropriate living and working conditions for persons with disabilities. It is, therefore, worth educating about universal design, as this knowledge can sensitise people to the aspect of disability, shaping good practices.

Teaching universal design in the form of didactic workshops is an effective tool in architectural education. It facilitates memorisation, assimilation of knowledge and increases awareness with which one makes informed decisions. The workshop method makes it possible to select a curriculum suitable for a particular age group. The master-apprentice relationship enables in-depth conversations with students and insightful observations.

A workshop programme that includes a practical part with creative tasks, highly engages students in the activities performed, thus influencing the memorisation of the knowledge gained. This fosters the accumulation of experiences, encourages one's own reflections and individual conclusions. According to the interview conducted at the beginning of the workshop, the level of knowledge of the surveyed social group about universal design was low, and sensitivity to the problems faced by people from vulnerable groups was negligible. The selected workshop tasks made it possible to provide information on the existence of vulnerable groups in the community, the existence of architectural and urban barriers, and the use of solutions that promote the comfort of all users of residential space.

There was observable participant engagement in the practical part with the use of simulators, which was reflected in the correct solution of the design task. The results of the survey and quiz, attained by each group, allow to conclude that the training programme thus selected contributes to achieving the best possible results in the process of educating young people, and that educational workshops are an appropriate tool in education about accessibility. The workshop's participants developed their sensitivity to the problems of vulnerable groups in the housing environment. They acquired the skills to apply solutions that improve the comfort of a wheelchair user in a space. They drew conclusions based on personal experiences. They developed an attitude of tolerance towards people with functional, emotional and psychological limitations.

Based on the analysis of the collected data, a set of conclusions was formulated. Practical classes engage more than theoretical parts, force participants to be active, and fully capture participant attention, while the use of specialised

simulators intensifies interest and more effectively sensitises to problems encountered in the living space. This is evidenced by the involvement of the participants, noticeable through their individual participation in the various workshop parts, the initiation of discussions, inquisitiveness, asking questions, and in the results of the survey and quiz, which clearly illustrate a significant increase in their knowledge of the topic. The workshop tasks inspired and sustained cognitive curiosity to the end. Without this curiosity, learning is impossible, as it involves only momentary memorisation and leads to rapid forgetting of the learned material.

It is known that polysensory learning is much more effective, and learning about the world with all of one's senses is much more enjoyable, so the workshop featured the type of a task that releases creativity and allows one to come to individual conclusions. The presented example of a methodical form of implementing accessibility studies can be an interesting starting point for further discussions.

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