

The Role of Empathy in Designing Social Innovation For Blind and Visually Impaired People in Public Transportation in Poland

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Abstract: **Background:** The design thinking method is one way of modern service and product design. It encompasses various stages but places particular empathy. Trying to understand the customer's needs and "stepping into the shoes" of the product user is the key.

Research objectives: The article aims to present the process of developing a social innovation using the design thinking method with particular empathy. It also indicates methods for supporting blind and visually impaired people in public communication and presents the developed social innovation as a case study.

Research design and methods: The article presents a literature review on design thinking, empathy, and social innovation. The case study presents the process of creating a social innovation. Key research questions concern the impact of empathy in the process of creating a social innovation. The research component also included interviews with blind and visually impaired people and a bus driver.

Results: We conducted a literature review was conducted. Based on it, we described the process of social innovation creation and the developed diagram. We presented the developed and tested innovation, as well as conclusions from the implementation and guidance for business practice.

Conclusions: empathy plays a key role in the design of modern services and products.

Keywords: social innovation; design innovation; design thinking

JEL Codes: O31; O35; L3

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Introduction

Design thinking is becoming increasingly important in creating social innovations. Social innovations involve the development and implementation of new solutions to address social and environmental challenges, characterized by a creative approach to resolving complex social issues. The article highlights one of the key stages of design thinking, namely empathy. Empathy is the stage of finding emotional understanding by observing pain points in a live context around a stakeholder's problem. The innovation designer must focus on observing the user's living environment and thus gain insight and speculate on potential needs. The goal of social innovation is to bring about benefits, particularly for society. Moreover, through empa-

thy, social enterprises can better understand the needs and challenges of the communities they aim to serve. However, empathy is not an unambiguous concept. B. Azar distinguishes empathy as the emotional part, which involves empathy, and the rational part, which in turn allows one to understand the feelings of another person. There is also a distinction between empathy in the form of phenomena – taking another’s point of view as one’s own, compassion, and empathy understood as sympathy (Siemieniako, 2010). Design thinking focuses on users and their experiences, resulting in more effective and sustainable solutions. This helps social enterprises better meet community needs, enhancing their effectiveness and impact on improving quality of life. The article aims to identify the role of empathy in the creation of social innovations. We conducted the research in several stages. In the first stage, we conducted desk research. Then, we based the inference on qualitative research using the method of in-depth interviews. We based the research on the case of designing a social innovation within the framework of a project implemented at the Silesian Innovation Space incubator in partnership with the Cooperation Fund Foundation Center for the Development of Social Initiatives (CFFCDSI). The basis for starting the research grant was the preparation of an innovation card containing a proposal for a solution to the problem, as well as the solutions used to date. The article sheds light on understanding the inclusion of empathy, the involvement of representatives of the innovation audience, and attempts to identify with the target group in the context of innovation design. The research findings show that integrating empathy into the creation of social innovations helps accurately identify audience needs and design solutions that add value. The literature on the subject is poor in case studies on the use of the design thinking method in designing social innovations. When working on solving the problem, we focused on the knowledge acquired during training, while the literature on the subject provided only support. The article fits into the research gap by creating a theoretical base for those who want to implement social innovations or are scientifically engaged in empathy, social innovation, or the design thinking method.

Literature Review

The Theory of Social Innovation

The concept of social innovation began to develop in the 1990s when scholars noticed that traditional forms of addressing social problems were starting to fail, and new ones needed to be generated to prevent the deepening of existing social issues, such as unemployment, an aging society, climate change, inequality, or social exclusion (Wronka-Pośpiech, 2015). Despite the recent interest in social innovations, there is no single cohesive definition for them. This is mainly because it is a practical field, leading most definitions to emerge empirically (TEPSIE, 2014).

Most definitions share common elements at a fundamental level. Scholars assume that social innovation emerges to solve a social problem (also described as a challenge or social need) or to improve an existing solution to a social problem. Scholars also give attention to “increasing society’s capacity to act” (Schwarz, 2019), which is motivated by a desire to address a certain social need (Li & Bacete, 2022). Another common element is innovativeness. Every social innovation should be characterized by some innovative element, such as a product, process, technology, idea, principle, intervention, legislative or regulatory provision, or social movement (Sandu & Anghel, 2016). According to Schwarz (2019), only after implementation

can we classify a social innovation as such. Typically, socially oriented organizations disseminate and widely adopt it (Li & Bacete, 2022).

Differences arise when defining the adjective “social” in the expression “social innovations.” The Stanford Social Innovation Review and BEPA (2008, 2010) emphasize the added value obtained by society through social innovation. The Social Innovation Exchange and Murray et al. (2010) highlight the importance of societal needs. Gillwald (Neumeier, 2012) talks about the impact on society, particularly considering the consequences. Others also emphasize the well-being of individuals and the collective (CSTP, 2011; TEPSIE, 2014).

Another debate among theorists concerns the holistic of social innovations. The reductionist approach presents social innovation as a new idea aiming to achieve social goals, emphasizing the purposefulness and scalability of models (Mulgan et al., 2007), or as an innovative solution to a social problem that is more efficient, more sustainable, or more just than already existing solutions (Phills et al., 2008). On the other hand, the holistic approach presents social innovations from a broader perspective, emphasizing their three characteristics: meeting social needs, redefining social relations, and strengthening and empowering communities (Moulaert et al., 2013).

Another discrepancy lies in the level of objectivity when defining social innovation. The normative approach to social innovation assumes from the outset that they have a positive impact on the environment since the main goal of social innovations is to improve the living conditions of society. In this approach, it is also described how social innovations should look and what they should do, unlike the positive approach, which deals strictly with facts — how a given social innovation looks and what it does in practice. In this approach, there is no evaluation of whether the phenomenon positively or negatively affects the environment (TEPSIE, 2014).

The team defined social innovations within the Silesian Innovation Space project as solutions aimed at addressing social problems through innovative approaches on a national scale, with a strong focus on improving living conditions and meeting the specific needs of the target group. We adopted a holistic approach when designing the innovation. Due to the project’s nature, the implementation of the innovation was not required, and the focus remained on the testing phase.

Design Thinking as a Creative Method for Designing Social Innovations

In the field of social innovation, more people are using the creative problem-solving method known as design thinking. Originally, scholars associated this term exclusively with design in architecture, industrial production, urban planning, and craftsmanship. However, over time, the theory of design thinking has become more generalized, as scholars have recognized its multidirectional application in various fields (Cankurtaran & Beverland, 2020; Kimbell, 2009). Currently, design thinking is widely employed in business, public, cultural, and social spheres, resulting in innovative products, services, business strategies, and social and educational systems (Brown, 2013; Dunne, 2018; Liedtka, 2013; Pande & Bharathi, 2020). Broadly speaking, we can define design thinking as an open problem-solving process that utilizes both analytical and creative thinking processes along with intuition, while focusing on human beings and their real needs (Lockwood, 2009; Rudkin Ingle, 2013; Rösch et al., 2023).

Design thinking is characterized by flexibility, fluidity, and non-linearity. The entire process is based on several stages aimed at mobilizing creative and unconventional thinking, enabling the adoption of different perspectives, and leading to the discovery of new opportunities and

original solutions within the environment (Rudkin Ingle, 2015). The ability to consider different perspectives in understanding needs and problems was made possible through the application of heuristic methods at each stage of the process, as well as continuous collaboration in multidisciplinary teams (Baran & Bąk, 2017; Brown, 2013; Sobota & Szewczykowski, 2014). The design thinking process is iterative, driven by the consistent realization of newly formed ideas through prototyping and testing at each iteration (Arabasz & Sińczuch, 2016; Brown, 2013). A holistic approach to innovation is also employed in design thinking, which states that the key to success lies not only in creating a novel product or service but in developing a comprehensive and systemic solution that practically serves the innovation's recipients (Brown, 2013).

The concept of design thinking is based on four fundamental rules: the ambiguity rule, redesign rule, tangibility rule, and social (human) rule. By embracing the ambiguity rule, the design thinking method demonstrates a propensity for experimentation, adopting different perspectives, and shedding any mental barriers. The redesign rule emphasizes the importance of analyzing past solutions and consistently drawing conclusions from them. The tangibility rule asserts that visualizing proposed ideas in the form of solution prototypes is an essential element of the method. The social rule, which is the final and most significant one, asserts that designing innovations based on well-defined target group needs is the key factor in generating relevant innovations (Meinel & Leifer, 2011). However, the priority in making breakthrough discoveries lies not in recognizing well-known needs, but in identifying those that have not been previously identified (Brown, 2013).

The Role of Empathy in the Design Thinking Process

Design thinking encompasses three dimensions of innovation: inspiration, ideation, and implementation. Inspiration refers to the ability to accurately identify needs, problems, and opportunities in the environment. The ideation dimension allows for the transformation of observed phenomena into potential solution proposals. The best ideas undergo in-depth analysis and development during the implementation stage, aiming to create a final solution that will be implemented in the intended environment (Brown, 2008). The design thinking process is guided by the Stanford model, an iterative sequence of five key stages: empathy, problem definition, idea generation, prototyping, and testing (Arabasz & Sińczuch, 2016; Chomątowska et al., 2019; Meinel & Leifer, 2011; Rudkin Ingle, 2015).

The first and most crucial stage is empathizing. In other words, understanding or discovering is based on deepened recognition and understanding of the needs and problems of the recipient of the designed solution. This part of the process should be conducted in accordance with the principles of understanding, observation, and empathy (Brodnicki, 2015; Brown, 2013). It is not advisable to limit oneself solely to engaging specialists familiar with the target group's issues or conducting analyses based on previously gathered research data. What is far more important is making an effort to personally and emotionally identify with the recipient in their natural environment, recognizing their habits, experiences, motives, and ways of perceiving reality. The researcher's approach should be characterized by a high level of empathy, which involves "putting oneself in the user's shoes" and is demonstrated through active listening, attentive observation, direct interaction, and performing daily activities (Brown, 2013; Michalska-Dominiak & Grocholiński, 2019; Sońta-Drączkowska, 2020).

In conducting the empathy stage, it is recommended to utilize specific heuristic methods and techniques. Conducting a cognitive survey and ethnographic interviews may also be useful for acquiring relevant knowledge about potential users of the solution. Moreover, preparing

an empathy map and a persona can help organize the gathered information (Brodnicki, 2015; Chomątowska et al., 2019; Michalska-Dominiak & Grocholiński, 2019; Helman & Rosienkiewicz, 2016). An empathy map is a widely known and utilized method, particularly in designing business models, which helps researchers gain a deep understanding of the customer's perspective. As the name suggests, this method is based on getting to know the user with the highest level of emotional involvement and empathy (Ferreira et al., 2015). The map consists of six areas that allow for a comprehensive focus on understanding the research subject – see Figure 1.

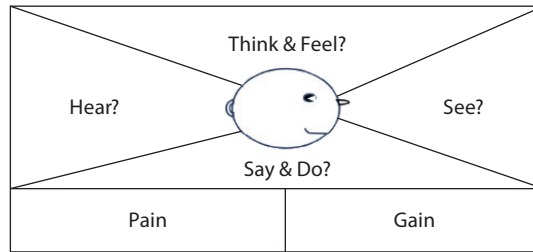


Figure 1. Empathy Map

Source: Ferreira et. al. (2015, p. 2).

The empathy map should include answers to the following four key questions:

- What does the user hear?
- What does the user see?
- What does the user think and feel?
- What does the user say and do?

In addition to these key questions, a complete understanding of the user should also consider their pain points (fears and frustrations) and their gains (needs and desires). Creating an effective empathy map hinges on providing detailed and precise answers to these questions. Supplementary guiding questions can be helpful in this process, as shown in Table 1.

Another useful technique used in the understanding stage is persona. It represents an archetype, which is a fictional character representing specific recipient groups in innovations, characterized by similar behavioral profiles. The persona description goes beyond obvious demographic information, socio-economic status, or occupation and includes details about life goals, motivations, and frustrations. Moreover, to create a realistic depiction of a user with a specific identity, a persona assumes a specific appearance and has a few most characteristic quotes associated with them. All the information is visually presented and often accompanies designers throughout the entire design thinking process. However, creating a persona should be based not on stereotypical assumptions but on actual research findings (Michalska-Dominiak & Grocholiński, 2019). Similarly to empathy map creation, the purpose of creating personas is to compile information collectively, enabling the researcher (designer) to empathize with the user and understand their real needs and problems. Scholars consider personas to be reference points that accompany designers at each subsequent stage of the process and facilitate making further design decisions (Dahiya & Kumar, 2018; Michalska-Dominiak & Grocholiński, 2019).

Table 1. Guiding Questions for the Empathy Map

| Field | Guiding Questions |
|-----------------------------------|--|
| Do | What is common for him/her to say? |
| | How does s/he normally act? |
| | What are his/her hobbies? |
| | What does he like to say? |
| | How is the world in which s/he lives? |
| | What do people around him/her do? |
| | Who are his/her friends? |
| | What is popular in his daily life? |
| | What people and ideas influence him/her? |
| | What do the important people in his/her life say? |
| | What are his/her favorite brands? |
| | Who are his/her idols? |
| Think | What are some important ideas that s/he thinks and does not say? |
| Feel | How does s/he feel about life? |
| | What bothers him/her lately? Why? |
| Pains (Difficulties/Frustrations) | What is s/he afraid of? |
| | What are his / her frustrations? |
| | What has disturbed him? |
| | What would s/he to change in his/her life? |
| Needs | What does s/he need to feel better? |
| | What is success? What does s/he want to achieve? |
| | What has s/he done to be happy? |
| | What would end his/her pain? |
| | What are some of his/her dreams? |

Source: Ferreira et. al. (2015, p. 2).

Research Method and Material

In the article, we posed the following research questions:

RQ1: Does empathy play a role in designing social innovations?

RQ2: How does incorporating the empathy stage impact the design of social innovations?

We aimed to identify the role of empathy in the creation of social innovations. Comparing the stages of designing social innovation, one involving empathizing, helped us to achieve the goal and answer the research questions. We designed social innovation within a project conducted in the Silesian Innovation Space (Śląska Przestrzeń Innowacji) incubator in collaboration with the Cooperation Fund Foundation (Fundacja Fundusz Współpracy – COFUND) and in partnership with the Social Initiatives Development Center (Centrum Rozwoju Inicjatyw Społecznych – CRIS).

We conducted the project in several stages outlined in Figure 2.

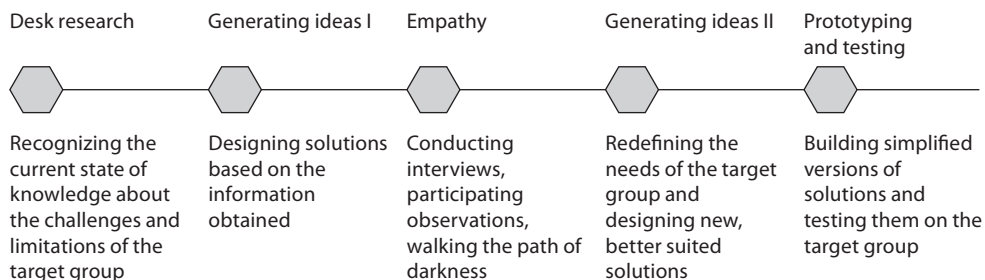


Figure 2. Stages of Project Implementation

Source: own elaboration.

The first part involved developing a social innovation idea in response to the challenge presented by the ordering organization within the project. The innovation idea served as the basis for preparing the innovation card. An expert panel conducted a two-level analysis of the submitted innovation card. Obtaining a positive opinion qualified the innovation card for receiving a grant to design a prototype of the social innovation. We conducted the second part of the project after the innovation card was approved for implementation. Upon receiving the grant, we tasked the innovation team with designing the actual prototype of the social innovation using design thinking.

We based the first part of the research on the desk research. It aimed to gather information on a less-known topic (Bednarowska, 2015). In this case, we used desk research to identify the specific requirements and needs of blind and visually impaired individuals in the process of using public transportation. The analysis aimed to recognize the current state of knowledge regarding the challenges and limitations faced by visually impaired individuals and to identify existing solutions adapted for this group in public transportation. At this stage, we utilized secondary data such as statistical data, press articles, literature, industry websites, and legal documents. The research began in April 2022. It lasted for a week and resulted in a collection of articles that underwent critical analysis. We used Google and Bing search engines. We employed keywords such as urban communication, the blind, the visually impaired, eyesight, train, bus, stop, city, and station. We reviewed the solutions in Polish and English.

In the second part, given its multidimensional subject, we employed a qualitative approach using individual in-depth interviews and observations. This method contributes to a better understanding of social realities, highlighting processes, and meaning patterns. Moreover, this approach is more open to the phenomena under investigation compared to other methods that rely on strictly standardized questionnaires (Flick et al., 2004). We made audio recordings of all interviews and transcribed them. After a detailed familiarization with the transcripts by all authors, we conducted content analysis. The analysis involved identifying recurring themes and potentially relevant fragments in the responses. In this research phase, we also compared the information obtained during desk research with the findings from the interviews. Therefore, the chosen research methods were appropriate for the established goal and research problem. The research scope in the second part included a group of blind and visually impaired individuals and bus drivers from ZTZ Rybnik. We conducted the research sampling using the snowball sampling method (Sęk, 2015). The research had a social nature and required selecting visually impaired individuals who expressed willingness to provide answers regarding their

limitations, needs, challenges, personal experiences, and feelings. Initially, we made contact with two blind individuals. We then asked them to recommend other participants. Because we conducted the research within the Silesian Innovation Space project, the territorial scope of the respondents primarily covered individuals from the Silesian Voivodeship. Seven individuals agreed to participate in the study. To select drivers from ZTZ Rybnik for interviews, we made contact with the person responsible for accessibility at ZTZ Rybnik. We also obtained contact with transport companies that operate routes for ZTZ Rybnik. We received interview consent from one driver appointed by the transport company he was employed in. To conduct individual in-depth interviews, the research team directly contacted the respondents who were blind and visually impaired individuals and a bus driver from ZTZ Rybnik. The team interviewed the respondents using two scenarios with one tailored for the group of blind and visually impaired individuals and the other for the bus driver. The individual interview scenarios consisted of open-ended questions, introductions, requests for recording consent, and metric questions. The team conducted face-to-face interviews with three participants and contacted four participants remotely using Google Meet, Skype, or telephone platforms. The team conducted interviews in a conversational format, as the flow of conversation largely depended on the respondent (Cope, 2011). The interviews lasted between 40 to 60 minutes and the team recorded the interviews for content analysis in the subsequent phase.

Results and Discussion

The team consisting of five individuals conducted the first part of the research during the preparation of the innovation card, while the second part, consisting of interviews, took place after the selection of the innovation card for implementation and involved four team members. We held the initial project meeting on December 21, 2021, with a representative from the Social Initiatives Development Center in Rybnik using the Google Meet platform. During the meeting, we presented the Silesian Innovation Space initiative and basic recruitment principles. Among the participants, three students and two academic employees expressed their willingness to participate in the program. Due to geographical distances between team members' locations and pandemic-related restrictions, we conducted subsequent meetings using the Google Meet platform. The first meeting of the five-member team took place on December 30, 2021. In the meeting, the team chose the challenge to focus on. The list of challenges included 23 problems assigned to seven categories: development of white job positions, development of green job positions, alleviation of social effects of energy poverty, low employment rate of people aged 50+, low employment rate of women, depopulation, and social revitalization of cities. A total of 15 entities submitted challenges. Using brainstorming methods, the team selected the following challenge: "How to help visually impaired individuals solve the accessibility problem related to public transportation schedules so that they can use public transport without additional difficulties and function normally in urban spaces?" Public Transport Authority (Zarząd Transportu Zbiorowego – ZTZ) in Rybnik submitted this challenge as a part of the "Social Revitalization of Cities" area. The selection of this topic was based on the team members' familiarity with urban transportation, two team members' knowledge of Rybnik's transportation issues, and one academic employee team member's experience in working with people with disabilities.

The first stage of the research, which lasted one week, involved desk research focused on reviewing articles related to visually impaired individuals in urban transportation and process improvements. Figure 3 illustrates the course of the first stage.

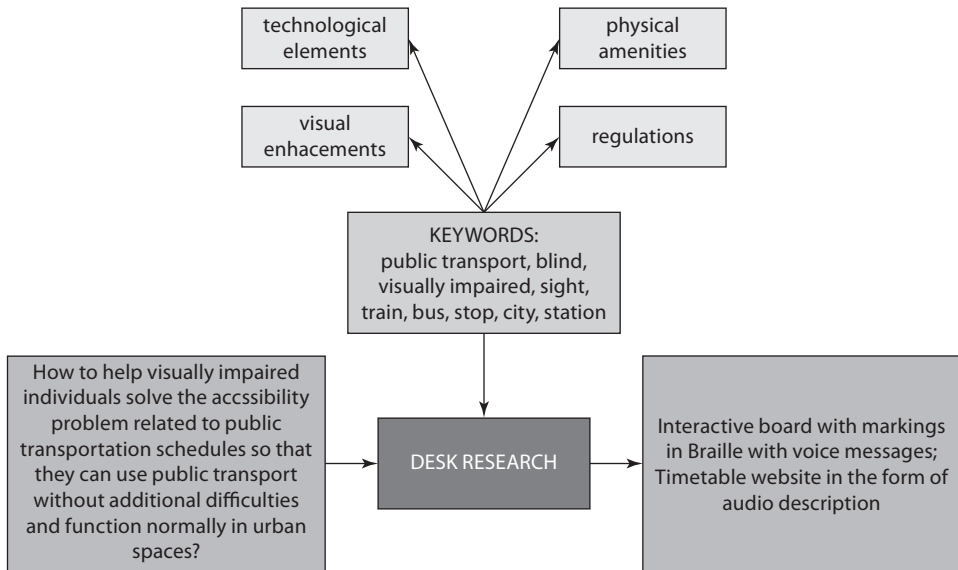


Figure 3. Implementation of the first stage

Source: own elaboration.

As indicated by Figure 3, after reviewing the materials, we identified the following solutions and grouped them into categories:

- Physical amenities: Braille signage on boards, tubes, and buttons; typhlographic markings on buses and at bus stops; creation of pathways between main points at stations.
- Regulatory measures: Driver obligation to stop at a bus stop where a visually impaired individual (person with a white cane) is waiting; requirement to approach the front edge of the bus stop; assistance for visually impaired individuals; automatic door opening.
- Visual enhancements: Orange bus pass wallet (identification informing the driver that a person is visually impaired); set of yellow bus hailers with bus numbers written in Braille (a blind person selects a bus number, flips the hailer to that number, and the driver, approaching the bus stop, sees that the person is waiting for that particular bus) and communication indicators held by visually impaired individuals at bus stops; use of contrasting colors in buses for visually impaired individuals; contrastive numbering of buses.
- Soft-skill elements: Training for drivers and fellow passengers.
- Technological elements: Audiovisual information system (stop sequence, departure times); loudspeakers; special remote controls connected to GPS.

After identifying these groups, the team focused on creating a solution that encompassed each type of solution. They developed a Comprehensive Support System for Public Transportation Travel for Visually Impaired Individuals, which incorporated solutions from each identified group into a cohesive whole. The team proposed an interactive board marked with the

Braille alphabet, connected to a website containing bus schedules; typhlographic markings at bus stops in distinct colors; voice announcements outside the bus; and bus driver training. On March 15, 2022, a commission composed of representatives from the Silesian Innovation Space and the ordering institution conducted a high-level content-related assessment of the innovation card and the team's presentation, qualifying the idea for implementation.

In the second part of the research, which took place from June to the end of July 2022, we conducted interviews with visually impaired individuals and a bus driver. The research included individual in-depth interviews, participation in a "Path of Darkness," and participant observation. The research tool consisted of two developed interview scenarios. The tools were consulted with experts collaborating with the Cooperation Fund Foundation and conducting workshops for the grant-winning teams. The first scenario directed at visually impaired individuals consisted of 11 questions regarding their experiences with traveling by public transportation. The questions inquired about the frequency of travel, purpose, independence, stages of the journey, challenges, driver behavior, familiarity with schedules, passenger behavior, attitudes towards assistance from third parties, and spatial orientation during travel. We conducted the interviews with seven blind or visually impaired individuals, yielding similar conclusions from each participant. Respondents highlighted three significant issues: technology, passenger behavior, and driver behavior. The research design, specifically the snowball sampling method, limited the selection of respondents, as all participants exhibited a high level of visual rehabilitation, and independence, and traveled independently. The conclusions regarding technology indicated that the research group was well-prepared to use public transportation due to the use of dedicated applications in most major Polish cities, the use of buttons on posts presenting schedule information (synthesized voice reading), and limitations if the solution was only limited to a single city. Regarding fellow passengers, respondents indicated a lack of awareness among traveling third parties about the needs of visually impaired individuals, their inability to assist, and confusing communication from such individuals. Respondents agreed that driver behavior varied depending on the individual and that drivers often lack knowledge or fail to exercise appropriate care. We conducted the interviews in a relaxed atmosphere, allowing respondents to express their opinions. Some respondents expressed interest in the solution proposed by the team, while others were negative towards the interactive board, claiming it was unnecessary and indicating that visually impaired individuals often do not understand Braille. The last interview was with the bus driver and consisted of 10 questions and two supplementary questions. The driver conducts courses for the ordering institution during work breaks. The questions pertained to regulations and training at ZTZ Rybnik, voice announcements on buses, driver behavior when transporting visually impaired individuals, how drivers react when they see someone with a white cane at a bus stop, whether they have experience transporting such individuals, whether they have such passengers on their routes, what the most challenging obstacle is when transporting visually impaired individuals, how they identify them at bus stops, whether the carrier provides training on serving individuals with visual impairments, and what is the biggest problem in providing services for visually impaired individuals. The conclusions from the interview indicated a lack of training and regulations, the absence of enabled announcements, and the fact that everything depends on the driver and their level of empathy, as indicated by the driver.

As part of the second stage, the research team utilized the "Path of Darkness" at the Important Place Foundation (Fundacja Ważne Miejsce) in Katowice to empathize with and better understand the target group. Walking along the "Path of Darkness" had the character of "step-

ping into the shoes” of people with visual impairments, as it took place in a completely darkened room, specially prepared for this purpose. Participation in the “Path of Darkness” had a cognitive character, increasing the level of empathy and preparing the team for participant observation, which took place in Rybnik on buses and at bus stops used by the ordering institution. It involved traveling by bus with a visually impaired individual who was accompanied by a guide dog. The public transportation journey included checking the bus schedule at the main station, finding the departing bus stop, boarding the bus, and making a transfer to another bus at Plac Wolności, which also required checking the departure time of the next bus and moving to the appropriate platform. The observation process resulted in recorded videos that we later discussed with representatives of ZTZ. Figure 4 presents the course of the second stage of the study, which involved empathy.

Figure 4 presents the conclusions from this stage. They allowed for a swift modification of some irregularities in serving blind and visually impaired individuals at ZTZ Rybnik.

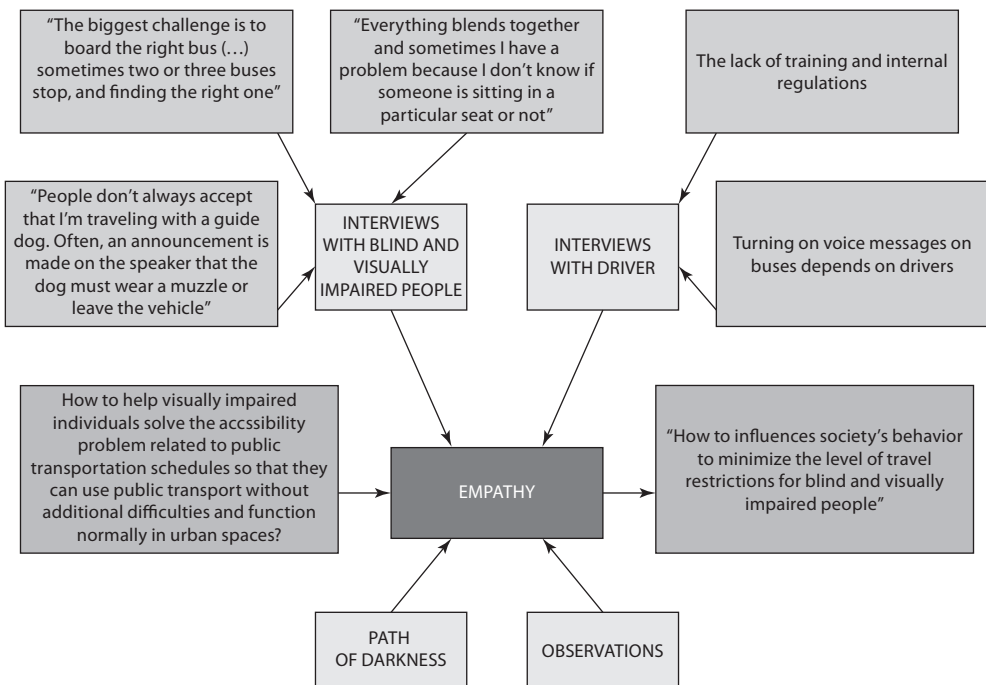


Figure 4. Implementation of the second stage

Source: own elaboration.

Based on the conducted research and the experience gained from the “Path of Darkness,” the team modified the solution in the second stage, focusing on driver training with elements of empathy and organizing a competition for the youth using the TikTok platform to engage them in raising awareness and sharing knowledge about assisting visually impaired individuals (as young people represent a group that frequently uses public transportation and have a great possibility of informing their parents and grandparents).

Based on the conducted research, we can conclude that the team designing the social innovation, relying solely on secondary data analysis in the first part of the project developed a solution that was based on an interactive board that would inform the blind and visually impaired individuals about the current bus schedule through voice messages. However, after conducting in-depth individual interviews with people with visual impairments, we reformulated the assumptions of the innovation and changed them because of the different needs of this group, which had emerged during the interviews. The interviews revealed statements such as: "The biggest challenge is to board the right bus (...) sometimes two or three buses stop, and finding the right one;" "Everything blends together, and sometimes I have a problem because I don't know if someone is sitting in a particular seat or not;" "People don't always accept that I'm traveling with a guide dog. Often, an announcement is made on the speaker that the dog must wear a muzzle or leave the vehicle;" "If there is no display board (...) the fastest way for me to find out the schedule is to ask people at the bus stop." The conclusions from the interviews showed that the lack of empathy and awareness among society – fellow passengers and drivers – on how to support and communicate with visually impaired individuals to facilitate their access to public transportation is the biggest challenge. Furthermore, the research revealed that bus drivers lack training or knowledge on how their work and practices affect the accessibility of public transportation. Participatory observations indicated that visually impaired individuals do not allow themselves to be spontaneous during public transportation trips. Applications that are common on the market allow them to plan routes, but they do not help in random situations or when the infrastructure of the bus stops does not meet the requirements of accessibility laws. During a public transportation trip at the Main Station in Rybnik, if there had not been any other passengers, a visually impaired person would not have been able to check the schedule, because it was only available in article form. Moreover, we observed a lack of reactions among fellow passengers and bus drivers when buses arrived at the stop where a visually impaired person was waiting.

Based on the created persona that emerged during the empathy stage in social innovation design and the newly defined needs, we significantly reformulated the solution project significantly reformulated. The innovation took the form of understanding the perspective of blind and visually impaired individuals. The innovation aimed to raise awareness among society – fellow passengers and drivers – on how to support them in bus travel. We based the innovation on evoking empathy and kindness. The innovation's products include training for drivers in the form of experiencing the perspective of a blind passenger and a competition regulation for young people to record a video showing support for blind and visually impaired individuals during bus travel and sharing it on TikTok. The direct recipients of the innovation were young people from Rybnik, Katowice, and the surrounding areas, as well as drivers. The effects of the innovation will indirectly impact blind and visually impaired individuals who use public transportation.

The conclusions from the conducted research allowed us to achieve the article's goal, namely to identify the role of empathy in creating social innovations and to obtain answers to the research questions. Based on the analysis of the described case of social innovation design, we can state that empathy plays a crucial role in this process. Adopting an active attitude of identifying with the users of social innovation by the research team enables them to understand their problems and challenges. Therefore, the empathy stage allowed us to design the social innovation by properly defining users' problems and needs.

Conclusions

Both in the scientific realm and in economic practice, the subject of empathy and social innovation is important and insufficiently explored, especially in Poland. According to the literature, designing social innovations should involve recognizing experiences, motivations, perceptions of reality, and the emotional connection between the innovation designer and its recipients. Empathy plays a significant role not only in the process of creating social innovations. Being a key element of the design thinking process used in various fields of economic practice, it should also effectively contribute to problem-solving in the business, public, or cultural spheres. Research indicates that incorporating the empathy stage is crucial in the context of the final product of social innovation. Adequate recognition of the real needs and limitations of social innovation recipients already at the design stage is essential, yet still not widespread. The high level of social rehabilitation of the subjects was also a limitation of the study. Therefore, to increase interest in the role of empathy in designing social innovation, further research in this area is necessary. However, the publication has its limitations. Above all, we conducted the study on a small sample which constitutes its limitation. However, it provided grounds for the validity of the research problem undertaken. Therefore, future research should aim at expanding the study to a larger number of recipients of social innovation. An intriguing direction for further research in this area may involve exploring the perspectives of experts and social innovators related to the incorporation of empathy into the design of social innovations. The article could contribute to innovation theory by highlighting issues that should be the focus of future research. The study results may also serve as a guide for economic practice, suggesting that a concentrated emphasis on and integration of empathy can significantly enhance the effectiveness and sustainability of projects by better understanding the actual needs of communities. The article can also serve as a guide for the implementation of research with the blind and visually impaired in the preparation of products and services.

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Conflict of Interest

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