Transforming our World through Universal Design for Human Development
I. Garofolo et al. (Eds.)

doi:10.3233/SHTI220830

360-Degree Films for Cognitive Inclusion at Workplaces

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Abstract. Persons with stress-related disorders, mental disorders and neuropsychiatric disabilities are in particular vulnerable to cognitive challenges at the workplace. The barriers faced by persons with communicative, social and cognitive disabilities are most often invisible to persons in the environment. The objective of the study presented in this paper is to develop and test a tool that increases awareness by inviting persons without disabilities to experience how cognitive barriers can look like in the workplace. Three 360-degree films were developed iteratively in close collaboration with users. Each film has one part highlighting difficulties and one part highlighting solutions. The films were evaluated with employers, employment experts, special support persons, HR staff and students. The results show that the films were realistic and useful for both supporting employment and for general awareness and insight.

Keywords. 360-degree films, cognitive inclusion, workplaces, empathy exercises

1. Introduction

Psychological causes are the top reason for prolonged absences from work in Sweden [1]. Studies have suggested that factors impacting the psychological well-being at work involves stress, cognitive load and mental challenges. Persons with stress-related disorders, mental disorders and neuropsychiatric disabilities are in particular vulnerable to cognitive challenges at the workplace [2].

The barriers faced by persons with communicative, social and cognitive disabilities whether permanent or temporary are manifested in internal experiences and therefore most often invisible to persons in the environment. Consequently, it is often difficult for managers and colleagues to identify and understand the needs in terms of cognitive inclusion, and therefore to be able to provide the support needed. In some cases, the lack of knowledge and understanding can lead to stereotyping and exclusion. There are reports that managers avoid hiring persons with cognitive disabilities because they assume that the obstacles are greater than they are in reality [3]. It has also proven difficult for the persons with cognitive disabilities to be the ones to disclose their needs, also for fear of stigmatization [4].

The objective of the study presented in this paper is to develop and test a tool that invites persons without disabilities to experience how cognitive barriers can look like in the workplace. The idea is that making the barriers experienced by persons with cognitive

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disabilities more visible to everyone will increase understanding and pave the way for higher inclusion.

The core methodology builds on the concept of empathy exercises which is a well-established method for gaining insights into how persons with disabilities experience certain situations and the barriers faced by persons with disabilities in the environment. Empathy exercises have been widely used in sensitivity training to create an understanding for the situation of persons with disabilities and induce empathy and a positive attitude with an objective of combating stereotypes, stigma and discrimination. The traditional empathy exercises often involve some type of simulation of a physical disability. However, invisible disabilities related to cognition are difficult to simulate due to two factors. Firstly, the way the disability manifest itself is internal, and thus cannot be shaped by temporary interventions to external senses.

Secondly, and more crucially, while visual and motor disabilities relate to the physical environment of the building, the manifestation of cognitive disabilities are mainly triggered by the social environment such as the organisation of everyday activities at work. Cognition is about processing information and sorting out impressions from the outside. In a calm environment there will be fewer barriers that triggers the cognitive challenges, whereas in a stressful environment the effect of the impairment will be more tangible. Cognitive barriers are thus intrinsically linked to specific situations and scenarios. There have been films aimed at increasing awareness of cognitive challenges that visualise how persons with cognitive disabilities react to a specific situation. However, most of these films or stories are narrated from an outside perspective, thus creating a distance between the viewer and the scene.

The core idea of empathy exercises is that the person doing the exercise should get the experience of having lived through the situation from the inside. The challenge of creating empathy exercises for cognitive disabilities is therefore to find the technical means to visualise realistic scenarios that both take into account the interrelation between inner factors (cognitive needs and challenges) and outer factors (cognitive barriers in the environment), and that also provides a believable simulated experience where the person participating in the exercise has the experience of being in the scenario themselves.

In the past few years, several research projects have used Virtual Reality (VR) techniques to create experiences that allows for perspective-taking and/or developing empathy. There is however still a gap in the literature on how VR exercises can be used to increase awareness of cognitive barriers in the work environment.

The objective of the project was firstly to develop VR 360-degree films that can be used to simulate experience of having an invisible cognitive disability at the workplace, and secondly to test whether these types of empathy exercises can provide insights that are useful in influencing attitudes of employers and employment agency workers to become more empathic and positive towards persons with cognitive disabilities.

The project was set up as a partnership between academic experts, specialists in accessibility, employers in the public sector and experts in supported employment.

2. Framework for co-creation and iterative development

The method for developing and testing the VR exercises was guided by the framework for user-centred design. The method used included five main steps, of which step 1, 2 and 5 are described in this paper: 1) Requirements gathering (chapter 3: a workshop with disability organisations and persons with disabilities, a literature review, and a short

survey to employers) 2) Concept and prototype design (chapter 4: development of scenarios and manuscripts, early feedback and producing a pilot film), 3) Testing the pilot film, 4) Refining the prototype and developing the rest of the films, and 5) Final evaluation of the three films (chapter 5). Each of the steps included the active participation of stakeholders, in accordance with the user-centred design method. In this case it was identified in the beginning that there are two types of users that have a stake in the VR exercises:

1. The intended audience of the films which include employers, employees, rehabilitation actors and other actors in the employment sector
2. Persons with cognitive disabilities who will not be the audience of the exercises but will be benefiting from their dissemination and use. The persons with cognitive disabilities are also the subject experts since their knowledge and experience guides the scenarios at the core of the empathy exercises.

The project methodology was therefore constructed in such a way that the two types of stakeholders were engaged throughout the project, at different levels.

3. Workshop with disability organisations, literature review, and short survey to employers

The consultation conducted in the first phase of the project had the objective of making sure that the scenarios and dialogues in the 360-degree films fully reflected the experiences of a broad variety of persons with different kinds of communicative, social and cognitive disabilities. The aim was both to explore common needs and experiences between groups with different characteristics, and to find specific examples of difficulties and solutions at the workplace that could be used as a basis for constructing the scenarios.

3.1. Method

A workshop was organised with 20 participants including persons with autism, ADHD, brain injury, bipolar disorder, dyslexia and aphasia. The participants were divided into smaller groups to discuss and present situations they experience difficulties at the workplace and proposed solutions for these difficulties out of their own experience.

The list of difficulties and solutions that came out of the workshop with users was compared to and complemented by a short literature review on cognitive accessibility at the workplace. The literature was used to identify topics raised by the user groups that had been subject of research in order to complement the views of the users with possible learnings from scientific studies. Furthermore, a short survey was sent out to employers in the public and private sector in Sweden about policies and practices, and what support they would prefer to see implemented at their workplace.

3.2. Results

As a result of the workshop and the literature review, a consolidated and annotated list of difficulties and solutions was drawn up as input to the work of creating scenarios for

the films. Table 1 shows the difficulties and suggestions for solutions that were implemented in the films.

Table 1. The list of difficulties and suggested solutions resulted from the workshop with disability organisations

Categorisation	Difficulties	Suggested solutions
Structure and clarity	Messy work environment Lack of structure, including in meetings Many things that happen at the same time Multitasking and shared attention Sudden changes Unclear expectations, roles and divisions of responsibilities Lack of access to information Not knowing why to do things Unclear instructions Social expectations and social interaction	Clear meeting structure Be prepared for what is going to happen Clear expectations Clear objectives Clear instructions in text and pictures
Understanding and support	Feeling of exclusion Fear of being perceived as strange Little understanding of the effect of the form of the day.	Leverage strengths and interests Listen to individual needs Conscious employees who can help To have a supervisor Planning aids (Calendar) Aids (such as Hearing Protection and To-Do List)
Peace and quiet	Time pressure Lots of noise, strong smells and impressions	Ample time Have time to decide Be able to plan their time and tasks Quiet and peaceful environment One person talking at a time Opportunity to leave Own fixed place at the workplace
Opportunity to influence	No opportunity to say no	Opportunity to say no

The workshop also resulted in a decision on which scenarios to focus on in the films. The team had originally thought about a meeting situation, and following comments of the participants in the workshop, a social situation and a job introduction situation were added. Participants in the workshop emphasized that well-thought-out workplace introductions are very important to avoid problems and conflicts that lead to the end of probationary employments. The few answers from the survey to employers indicated a need for support on both management and collegial levels, i.e. with and without a hierarchical dimension.

4. Development of scenarios and manuscripts for three 360-degree films, early feedback and producing a pilot film

The input from the workshop was used to develop scenarios and manuscripts for three 360-degree films. Three situations were chosen for the development of the scenarios, to include as many as possible of the difficulties and solutions and to increase the applicability of the films: a workplace meeting, a social situation (birthday party), and a workplace introduction for a new employee at an industrial pipe company. Two versions of each scenario were developed, respectfully highlighting difficulties and solutions.

A pilot film was produced and tested before the two other scenarios were filmed, to be able to try out the format of the films. The meeting situation was chosen for the pilot

film. The first part of the meeting situation included descriptions of difficulties in the structure and organisation of the meeting. There were also environmental distractions such as people talking simultaneously and distracting noise and visual effects.

The second part of the meeting situation included a clear meeting structure and helpful colleagues, and without distracting noise or visual effects.

4.1. Method

The draft manuscript and sketches for the pilot film were sent to the participants from the co-creation workshop, as well as to the employers and employment organisations among the project partners for further comments before the filming. A workshop with four persons from disability organisations was also held to get feedback of the manuscript.

The pilot film of the meeting situation was recorded with a 360-camera attached to a chair at the meeting table, to record the meeting situation from the viewer's perspective. Microphones were placed at the centre of the table and close to the main actors.

When editing the pilot film, some effects were added, including noise from the traffic outside and when a person eats crispbread and a red beating heart with changing frequency, indicating stress level. The film also included thought bubbles to visualise the thoughts of the person at the centre of the scenario.

4.2. Results

The comments to the preliminary manuscript for the meeting situation included reactions on the overall scenario as well as specific suggestions for improvements. For example, it was suggested not to exaggerate the meeting situation too much, so that the employer can say that this situation is not the case with us. Another suggestion was to remove sound to indicate concentration is lost.

5. Final evaluation of the three 360-degree films.

Two versions of each of the three scenarios were recorded: A workplace meeting, a social situation (birthday party), and a workplace introduction for a new employee at an industrial pipe company. One version highlighted difficulties and the other version highlighted solutions. The films can be viewed at https://inlevelsegerinsikt.se/.

5.1. Method

The films have been tested with:

- 20 employment experts and special support persons for introduction and follow-up, to ensure the usefulness of the films in discussions with employers when placing jobseekers with cognitive disabilities.
- 9 people from 7 employers in a wide range of industries from the construction industry to, the Church of Sweden, using simple VR glasses for mobile phones.
- 6 people from 5 employers in the IT, recruitment and real estate industry, in connection with a training where the empathy exercises are part of a larger material focused on communication and treatment. The test took place in a digital meeting where the films were shown together on a regular screen.

- 2 Human Resource people and a manager within a municipality. They used simple VR glasses for mobile phones.
- 42 industrial design and engineering students studying Universal Design and Rehabilitation Engineering. Most of them used their mobile phones or laptops for watching the films. Many of these students get a managerial role in their careers and thus have an opportunity to influence inclusion in working life.

5.2. Results

In all groups, the films were rated highly in terms of usefulness.

Figure 1 shows the result of supported employment experts' evaluation of the usefulness of each film.

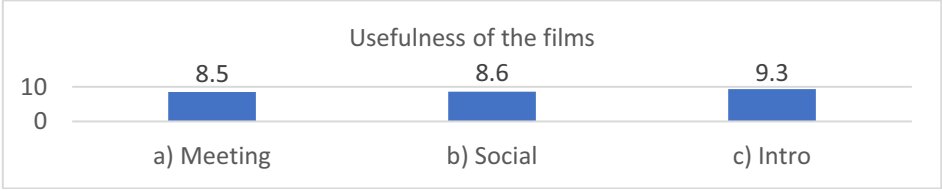

Figure 1. Usefulness of each of the three films according to 20 employment experts (0=Not useful at all, 10=Very useful). The films are a) A workplace meeting, 8.5 of 10 b) A social situation (birthday party), 8.6 of 10, and c) a workplace introduction for a new employee at an industrial pipe company, 9.3 of 10.

Similarly, eight of the nine employers answered the films will facilitate the process of receiving a new employee with an invisible disability. Most of the employers reported that the films had increased their understanding to some degree, see Figure 2.

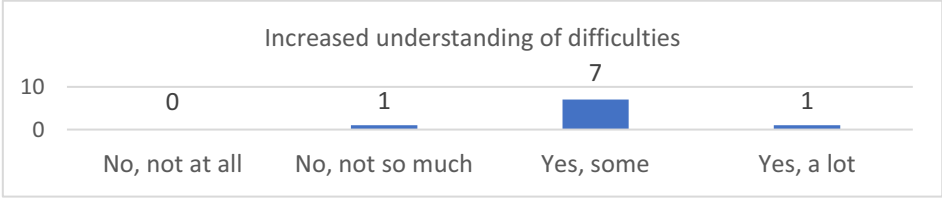

Figure 2. Increased understanding of difficulties people with invisible disabilities can face at a workplace

Regarding in what situations the films could be used, both supported employment specialists and employers reported that the films are useful in recruitment situations and as general awareness-raising. Some comments from the employment specialists:

- A good support to use before a possible employment as you can prepare the applicant and the employer to avoid misunderstandings and irritation.
- They can be used in all contexts in workplaces in general, to draw everyone's attention to how to think and act so that everyone becomes more included.

Some comments from the employers were:

- Good tool. Clear "feeling".
- I think these are very good films as information for many different functions. For example, I will work to ensure that our municipality's management/politicians can watch at least one of these films, to increase the understanding of our employees in the Labour Market Department.

Several of the employers who watched the films together with the connected education material reflected that the situations were realistic and reported that they had not previously thought about some of the concrete things in the meeting situation before, such as that it is disturbing to eat during a meeting.

The two Human Resource people and the manager within a municipality commented that it was good to have exaggerated situations in the films since that is what creates the dialogue after watching the films. But they also thought it needs to be described before that the films are just examples of how situations can look like. They thought that the films can both be used in consultation with the Swedish Public Employment Service when they help a person to get to work with the municipality, and with employees for a greater understanding of colleagues' or residents' possible disabilities.

The employment specialists were also asked about the difference between watching the films using VR glasses and a regular screen. They answered that they got more sense of vulnerability with VR and that the situation is more alive and real with VR glasses, even though the films also work without glasses. Two of the comments were:

- VR made it more real. You were the person who had difficulties. More empathy.
- With VR glasses, I experienced the situation from the inside, as if I were the person. The experience when I looked at the laptop screen became more of an outside perspective. I became an observer.

The industrial design and engineering students commented that the films created a feeling of stress and exclusion, that work introductions they have participated in have most closely resembled the version with difficulties. One student said: "The films made me understand that social codes and indirect communication can be very difficult for people" and "In my future I will ask for what I need to do a good job and ask others what they need".

Other spontaneous comments from the participants in the tests included remarks on the insights gained and the realism of the scenarios:

- As for the meeting situation, I was completely stressed myself./…/. Such a meeting cannot feel good for anyone involved.
- Feels realistic. Amazing how little it takes to make such a big difference.
- Can be an eye-opener – to experience a situation with several senses you otherwise try to explain in just words. It may be easier to have a discussion after this experience.

6. Discussion and conclusions

The tests of the 360-degree films have given very positive results among all test groups regarding usefulness of all three films and the insight they give.

Overall, the vast majority of those who have tested the films have been positively affected, which shows that the films really reach out to those who watch them and create thoughts that can lead to insights. The films were originally planned to be used specifically in connection with the Supported Employment method [5], as connecting a new technological tool to a well-known method for which there are networks and conferences will make the dissemination of the tool easier. However, the feedback from the special support persons for introduction and follow-up is generally that the films provide a good overview of specific difficulties and solutions and that they can

supplement information material in a broader context for increased awareness. Several of the companies have given feedback that specific difficulties/solutions shown in the films are good and provide concrete tips on adjustments that can be made. The students have also given feedback that the films have opened their eyes to how a situation can be perceived in different ways by people with different needs.

The positive results from these empathy exercises are in line with experiences of teachers in design education [6] but in contrast to an article about negative attitudes empathy exercises can create [7]. Possibly, the reason for creating a positive attitude from empathy exercises is dependent on the creative focus on how to design or change the environment, instead of focusing on how it would feel to have the difficulties yourself.

One aspect that was highlighted by the participants is that it can create a strong sense of empathy if the meeting leader gives a comment directly to you, for example: “You should prepare better for the next time. I had these expectations of you, but you did not live up to them.” And positively: "This was a really tough task, which you have done well." Furthermore, it was important not to mention the main person’s name or let the main person speak, as the empathy feeling would be lost for the viewer if the male/female voice of the main person is not compliant with the viewer’s voice or name. Another finding from the tests was that many of the employers and students without disabilities spontaneously remarked that they could identify with the barriers visualised in the films. [8]. It would therefore be interesting to explore further how these types of empathy-building exercises could have a potential to contribute to the design of psychosocial workplaces that are accessible and inclusive for all, regardless of ability.

Acknowledgments

We thank Sweden’s Innovation Agency VINNOVA for their project funding, all workshop participants helping us to make the 360-degree films relevant, and all test participants.

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