We Are Oulu: Exploring Situated Empathy through a Communal Virtual Reality Experience

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ABSTRACT

In this research, we explore and measure situated empathy. We focus on the hardships of an international community in a foreign country using a virtual reality experiment. Our aim is to facilitate a better understanding of an international community's quality of life and unique difficulties in a society. To this end, we designed a VR experiment with three main stages: data collection, a pre-experiment questionnaire and a post-experiment questionnaire with a concluding interview.

1 INTRODUCTION

Equality is one of the most critical aspects of social life in today's society [2]. Equality is an umbrella term, under which several different aspects can be considered. For instance, ethnic and gender equality are important topics [3]. In today's working life, one of the most striking equality issues has to do with the sometimes invisible borders between foreign and domestic workforce. This is an increasingly important issue to investigate especially in countries that wish to attract foreign talent to fill the needs of labour shortage. Finland is one of such countries.

In our ongoing project, *We Are Oulu*, we investigate the hardships international people encounter and attempt to make our community (higher education) as well as the broader society more aware of them. By disseminating the findings to relevant authorities and organizations, we hope to increase empathy and eventually improve the quality of life of the non-Finnish community. We hypothesize VR is one of the best technologies to help us to achieve our purposes since it has been proven that VR can be used to create excellent empathy tools and experiences [1].

We designed a study to collect examples of the hardships experienced by the international community and then showcase the collected data in a realistic VR environment. In the first step of the research, we, therefore, collect any harrowing experiences such as language and cultural barriers of the international community at the University of Oulu in Finland, including international students, staff, and other related persons to higher education during their lives or studies in Oulu, Finland. Then, we will recruit local (mostly Finnish) participants to learn about the hardships in a VR environment, where avatars are used to convey the exact experiences of the foreign community. Finally, we will conduct a post-experiment questionnaire and a concluding interview with the local participants to gauge if their empathetic response and awareness of hardships encountered by the foreigner community have increased.

2 PROPOSED RESEARCH

In this section, we propose our research in detail to demonstrate what exactly we would like to investigate and what our approach is.

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We implemented a website, namely *weareoulu.com*, for our project, first to put all the project's details and purposes and secondly collect our required data through the website as we explain further in the next section.

2.1 Data Collection

We have the data collection step as the first step to collect and employ true stories based on the hardships international members of the University of Oulu experienced. Engaging those experiences in the experiment has two critical aspects. First, it would reflect an accurate image of what international people experience during their lives in Oulu without any modification, exaggeration, or underestimation. Besides, the experiment could have a more substantial impact on participants and empathy when they realize those stories happened one day in one's daily life. We designed a survey by Google Forms and put its link on the project's website to let participants fill it anonymously with their consent and complete awareness of the project, its details and purposes. The form has two primary sections. In the first section, we collect participants' demographic data such as nationality, ethnicity, residence, Etc., and background information such as age, years of living outside the home country, Etc., to investigate any possible relations among them. For instance, we could understand there is a ratio between ethnicity and the number of hardships, or not. In the second section, we ask our participants to write down their above-mentioned experiences in the context of a story or bubble speech to let us describe their story as they would like in the experiment.

We started to advertise the data collection through social media channels such as *LinkedIn*, *Twitter*, email lists, etc. and onsite approaches by participating in international events at the university such as *Cafe Lingua* inviting people directly. At the time of writing this report, we have 17 responses (82.4% Male, 11.8% Female, and 5.9% Preferred not to say) from 9 different nationalities. The age range is 23 to 45 years old, and 47.1% of our participants have lived in another country other than Finland and their home country. Thus, we have 17 novel stories to showcase in the experiment for our participants. We have four primary ethnicity categories as 47.1% Asian, 35.3% White, 11.8% Black or African American, and 5.9% Hispanic or Latino orderly, which shows a good diversity among our participants. We have not stopped data collection and aim to create a valuable dataset besides the project implementation with as many participants as possible for further research. Further, as indicated in Fig 1, the majority (64.7% of participants) rated their quality of life more than average (4 and 5 points out of 5) compared to their home countries or other countries they have studied or lived there. It means they currently experience a relatively pleasant life, and if they would not experience their described hardships anymore, their quality of life would even further increase.

2.2 Experiment Design

The next step of our study is a VR experiment with pre- and post-questionnaires. The experiment is in the University of Oulu's virtual environment, where participants can walk freely and interact with several non-playable characters (NPCs) who would be symbolic avatars of our previous step's participants. Put differently, the ex-
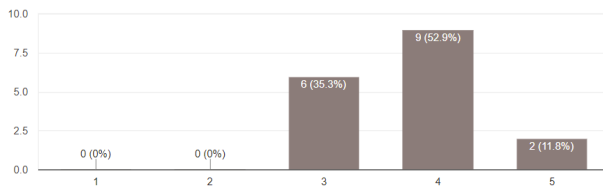
Figure 1: Participants' scores to their life quality in Finland compared to their home country or other countries they have lived.
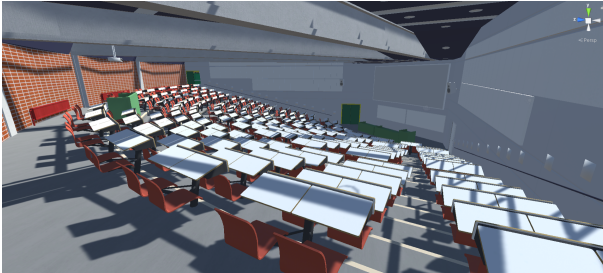

Figure 2: One of the lecture halls at the University of Oulu in the virtual environment.

periment's participants would use a head-mounted device (HMD) with controllers to feel they are at the university and face several random persons there who have hardships regarding different aspects of living or studying in Oulu. We use the collected experiences as NPCs' stories or convert them into different short stories to describe them during the experiment to our participants. We implement the project with the Unity engine for Oculus Quest 2 as the VR platform. Another research unit at the university designs the university model's textures and materials with Blender software and assembles them. We modify several parts of the environment, such as inner lighting, by utilizing spotlights in the engine to make it similar to the natural environment as much as possible, as one of the lecture halls at the university is shown as an instance in Fig 2. Employing the university's environment in the experiment would help participants believe the situation better. Also, since continuous transition (walking) in VR could cause dizziness or headache, we modified walking as short teleportation. The participant presses defined buttons, and then the camera moves in the same direction.

During the experiment, participants would walk around the environment and listen to NPCs' stories as a conversation to only be aware of those hardships. They would not witness or experience any hardship since, in this situation, emotion would play a vital role in the experiment. Also, we would like to measure situated empathy in this experiment, not sympathy [1]. The conversations between participants and NPCs would start whenever the participants would like since, in this case, listening to the story would be entirely on the participant's choice to not force any situation to participants. In more detail, when participants walk into the virtual environment, they would see several characters that are intractable. The interaction could begin when the participant would be in the NPC's box collider or, let us say, be close enough to the NPC. To direct participants to initiate the interaction with NPCs, we would set a fair number of conversations for participants as their mission in a session to avoid them only walking in the environment or talking with too many NPCs. In this case, all participants would listen to the same number of stories during the experiments. In Fig 3, one of the experiment scenes is indicated as the participant faced two NPCs at one of the university's stairs and could initiate the conversations with them. We use *mixamo.com* website to generate our NPCs' characters and animations properly for the Unity engine as Binary FBX files.
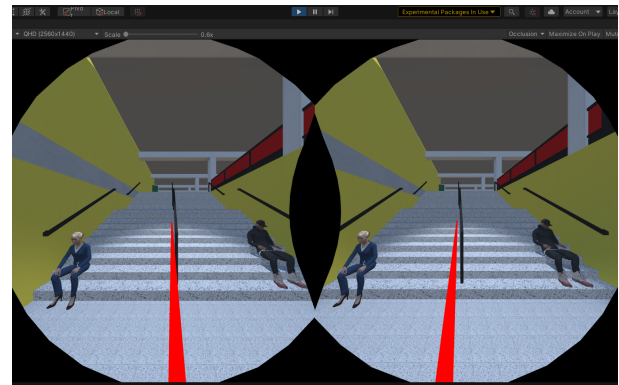

Figure 3: An instance scene of the experiment's environment, situation, and procedure.

This website has a wide range of free characters with animations that let us reuse and modify animations for other characters with desired frames per second and Keyframe reduction. Before and after each experiment session, we would ask participants to fill out questionnaires anonymously on the project's website to understand how the experiment affected them and measure the situated empathy. We would like to have the experiment on-campus and then organize a structured interview with participants after the experiment to ask them to describe what they have experienced. These two experiment's questionnaires and the structured interview would be designed further during the project development to be synced with the project purposes and flow.

3 FUTURE WORK AND CONCLUSION

We explore empathy through a VR experiment, aiming to understand the hardships of the international community of the University of Oulu. Next, we implement the final experiment environment and then improve it concerning both technical and non-technical aspects. For instance, we will employ different voices for NPCs and player characters to simulate a conversation, define a storyline to make the experiment similar for all participants, and put non-interactable characters to create a more realistic environment. Finally, we will conduct the experiment at the university with at least 100 participants.

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