



University of St Andrews

Practical 1: Qualitative Methods HCI Research
CS5040 HCI Principles and Methods
Matriculation ID: 230015450

Part1

In the context of this assigned task, online questionnaire was selected as opposed to a interview.

Reasons:

- Can be easily created and therefore analyzed if using primarily closed-ended questions, which can be used to ask both open-ended and closed-ended questions.
- Able to provide services to many potential respondents efficiently and at low cost, especially when designing an app, which may require a large amount of survey data as a basis. At this time, using interviews will consume a lot of manpower and material resources, and is not suitable for large-scale data collection.

Recruitment:

- Determining the target audience: Determine the age range of the target group, young people between 12-16 years old.
- Finding representative members of that audience: There are three methods here. The first is through personal recruitment, which is to find familiar people around you, such as family, friends, neighbors, etc. or through your own outreach activities. The second method is to promote through third-party service providers such as social networking sites and social emails that are popular among teenagers. The third method is to use the Commercial recruiters service to provide them with the corresponding standard agent recruitment。
- Convincing them to participate in your research: First, clearly explain the purpose and value of your research to your audience. Let them know how their participation is important to the research and how it can help solve specific problems. Second, providing incentives or rewards, such as receiving cash rewards for completing a questionnaire. Third, reassure audiences that their personal information will be protected, and data will be processed and stored in a secure environment. This helps build trust.

Screenener:

Target Audience: Amount of people: 150 teenagers

age range: 12-16

Specific requirements:

- Ensure participants are willing to comply with study regulations.
- Ensure that respondents have sufficient cognitive ability and language understanding to answer the research questions.
- For minor respondents, written consent from a parent or guardian must be obtained.

Questionnaire Grid:

Questions	Instructions	Answers	Reasons
1. Please tell us your age.	None	12 13 14 15 16	Researchers need to know the exact age of each participant
2. What is your gender?	None	Pop-up: 1.Male 2.Female 3.Prefer not to state	For comparison with different gender.
3. What are your main activities every day?	Please select up to three main activities that you do every day from the options below.	Pop-up: 1.Going to school 2. Extracurricular activities 3.Physical exercise 4.Homework 5.Social and leisure activities 6.Other (please specify)	This question helps researchers understand those teenagers' primary daily activities.
4.What emotion do you typically feel in the morning of the day?	Please choose one of the following options	Pop-up: 1.Happy 2.Anxious 3.Bored 4.Sad 5.Other (please specify)	This question can help you understand your morning emotional state, which may influence your teen's mood

			throughout the day.
5. Are you stressed or anxious at some point during the day?	Please answer yes or no.	1.Yes 2.No	This question helps us understand if you experience stress or anxiety during the day.
6.what kinds of things influenced your emotional states?	Check all that apply.	1.Peer relationships 2.Academic stress 3.Family issues 4.Bullying 5.Media and news 6.Physical health 7.Sleep Patterns 8.Nutrition and Diet 9.Other 10.Don't know	This question helps us understand the specific things that affect adolescents' emotions and is an extension of the last question.
7. What things in your daily life make you happy?	Please list the things that you think make you happy	Open-ended	This is an open question. Just knowing those happy things.
8. Rate using a health app to record your daily activities and emotional state for how interesting they are to you.	Please choose one of the following options	1.Very interesting 2.Somewhat interesting 3.Neutral 4.Somewhat boring 5.uninteresting	Understand how teenagers enjoy recording this data
9. What factors do you think would encourage you to regularly log your data using health apps?	Please choose one of the following options	1.Rewards or prizes 2.User-friendly app 3.Involvement of friends 3.Encouragement from family 4.Setting personal goals 5.Other (please specify)	This question explores your motivations and expectations for using the app.

10. Do you give your consent for the research team to use your data for research purposes while ensuring your privacy is protected?	Please answer yes or no	1.Yes 2.No	This question seeks your consent for the use of your data in research and guarantees privacy protection.
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Part2

Introduction

In recent years, the widespread application of virtual reality (VR) technology has triggered increasing attention to the impact of VR on all aspects of human life. Also, human sleep problems are also included. This article will discuss a research paper on the impact of VR on human sleep. It is mainly divided into the following parts: analyzing the research motivation, participant screening and recruitment methods, qualitative research method, main contributions, research results, Possible limitations of this study, and comparison of five papers.

Research Motivation

Based on past research that has considered improving sleep through virtual space technologies such as VR, Xiao and Yin (2023) found that there has been little research on how VR affects people's sleep, particularly outside of clinical trials. Therefore, they hope to discover the current challenges and future design development directions of VR in sleep by investigating the behavior of people who use VR to sleep.

Methods of participant screening and recruitment

The goal of the study is to recruit participants who have voluntary experience sleeping in virtual reality and must be 18 years of age or older. Conducted through multiple recruitment pathways. This includes the following:

- Personal Recruitment: Some researchers recruited active VR users through their own social connections.
- Online Recruitment: Recruitment posts were made on Reddit and on research institution paid research message boards.
- Snowball Sampling: Using the snowball sampling method, already recruited participants help introduce other possible participants.

During the recruitment process, participants were asked to fill out an initial screening questionnaire to answer questions about the frequency and duration of their general VR experiences, as well as their experiences sleeping in VR. Participants' legitimacy and true intentions were verified based on information from these screening questionnaires, as well as via email conversations. In addition, post hoc screening was performed by matching participants' interview responses to the screening questionnaire. Ultimately, 14 participants were recruited for interviews, and the sample spanned a variety of practices of sleeping in VR, ranging from those who slept in VR almost every day to those who performed this activity less frequently. Participants' ages ranged from 18 to 30, with an average age of 23. Among them, 8

participants self-reported as male, 2 as female, 1 as non-binary, 1 self-reported as gender fluid (born male), and 2 were unwilling to report their gender.

Qualitative research method

This study adopted the qualitative method of inductive thematic analysis, which is derived from Goodman et al (2012). This qualitative research focused on exploring and understanding the subjective experiences, opinions and views of participants, and then understanding the relationship between VR and sleep. In this study, semi-structured interviews (Kahn & Cannell, 1957) including remote video and telephone calls were used to collect relevant data. Participants signed their consent for the data collected and interview transcripts to be used in the study. The data collected and interview transcripts were coded and used to help the researcher analyze and conceptualize the data.

Research Results

The first finding is that the motivation of participants to wear VR devices to sleep is related to environmental factors and social factors. Participants wanted to sleep in their preferred environment or in a comfortable social atmosphere. The second finding is that the VR virtual environment can provide an emotional connection for people who fall asleep using VR, as well as a sense of confusion after waking up from the virtual environment and entering the real world. There are also self-reported reflections on sleep quality. The third finding is that related hardware and software functions still need to be improved, such as hardware comfort, software dimming functions, and noise prevention.

Main Contribution

This study Proposes that the underlying reason why people use VR to sleep is to transform sleep into a new experience that allows for customized environmental and social aspects, allowing this ordinary activity to be expanded. This autonomy allows them to freely control their environment. Apart from that, this paper also point out the social challenges of future VR development, such as safety issues caused by the participation of minors.

Flaws and Limitations

As stated in the paper, the flaw of inductive thematic analysis is that the sample size of this study is too small, and the results are difficult to be representative. The suggestion is that you should estimate the number of users to ask based on how diverse the population is (Goodman et al., 2020). Participants who slept in virtual

reality may already have a certain preference for this experience, so their reports may be biased in a positive direction. The study seems to be primarily centered on investigating the immediate, short-term effects of sleep within a virtual reality (VR) environment. However, it appears that the research may not have comprehensively explored the long-term implications and potential risks associated with prolonged exposure to VR-based sleep solutions.

Comparison

Similarly, these five articles all adopted a semi-structured interview format, and the conversations were transcribed and coded using thematic analysis. However, the difference is that the methods of recruiting participants are different. For example, Tam et al (2023) used social media to recruit and obtain data through a virtual chat room, while in another study on voice assistants, they recruited people with feelings about voice assistants. community-dwelling older adults (Karkera et al., 2023).

Reference

Yin, M. and Xiao, R., 2023, April. Drifting Off in Paradise: Why People Sleep in Virtual Reality. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (pp. 1-13). <http://doi:10.1145/3544548.3580947>

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Kahn, R. L., & Cannell, C. F. (1957). *The dynamics of interviewing; theory, technique, and cases*. John Wiley & Sons.

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Karkera, Y., Tandukar, B., Chandra, S. and Martin-Hammond, A., 2023, April. Building Community Capacity: Exploring Voice Assistants to Support Older Adults in an Independent Living Community. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (pp. 1-17). <https://doi.org/10.1145/3544548.3581561>