

IMPLEMENTATION RECREATIONAL GAMES OF VIRTUAL REALITY TOUR AND CARD GAMES AS A ELDERLY'S LEISURE ACTIVITY IN PREVENTING DEMENTIA (CASE STUDY: BUDI PERTIWI NURSING HOME, BANDUNG CITY)

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ABSTRACT

Virtual Tourism is one of the tourism activities that utilizes digital technology to carry out tourism activities to a destination. In this activity, virtual tourism is a tool and media used to become one of the leisure activities that are useful for elderly parents in preventing diseases, one of which is dementia. The 2019 World Alzheimer Report, around 1.8 million people in Indonesia suffer from Dementia, and this number is expected to increase to 7.5 million. Handling dementia sufferers can use pharmacological and non-pharmacological therapy, one of which is recreational therapy. The innovation carried out is to provide leisure activities to the elderly that are useful for preventing dementia through virtual tourism activities. The Partner is a non-profit organization engaged in the social sector, namely Panti Wredha Budi Pertiwi. This study method is quantitative method, and using questionnaires to collecting the data. By implementing design thinking starting from identifying problems, making products to their implementation. There are 5 design thinking processes, namely empathize, define, ideate, prototype and test where before we enter the define stage we must first empathize with our prospective resource persons, namely 22 elderly female participants aged >55 years. In this activity, it can be said that all activities can be followed smoothly by all participants and get a positive response. Further research is needed to show the effectiveness and significance of this activity in reducing the risk of dementia.

Keywords: Virtual Reality Tour, Card Games, Elderly Recreation, Dementia.

1.0 INTRODUCTION

Virtual Tourism is one of the tourism activities that utilizes digital technology to conduct tourism activities to a destination. In this activity, virtual tourism is a tool and media used to become one of the leisure activities that are beneficial for elderly parents in preventing diseases, one of which is dementia. VR (Virtual Reality) according to (Guttentag, 2010) is defined as the use of a computer-generated 3D environment - called a 'virtual environment' (Virtual Experiences) - that can be navigated and possibly interacted with by the user, which produces a real-time simulation of one or more of the user's five senses. Playing VR (Virtual Reality) in general can involve many activities, both physical and psychological (Gierres et al, 2008) so that it is beneficial for the development of the cognitive and brain side of its users. However, besides that, playing VR can also activate the five human senses from sight, smell, hearing,

touch if utilized optimally from a technological perspective. VR programs are also emerging as a promising therapeutic approach to enhancing the mental and emotional health, well-being, and overall quality of life for older adults, and when successful, the experience can be transformative for both researchers and participants (Larkin, 2023).

On the other hand, according to the 2019 World Alzheimer Report, around 1.8 million people in Indonesia suffer from Dementia, and this number is expected to increase to 7.5 million. Handling of dementia sufferers can use pharmacological and non-pharmacological therapy, one of which is recreational therapy (Irawan, 2014). These recreational activities can be activities that can involve more than one mental, physical and social component that are more beneficial than just one type of activity (Karp et al, 2006). It is hoped that this activity can be one of the innovations in preventing dementia through fun leisure activities.

Dementia is a disease related to a person's difficulty in maintaining their orientation related to place, people and time, as a result of this disease many lose connections and relationships with people and objects around them (Braddok & Phipps, 2009). In a study conducted by Zhang et. al (2019) it was stated that in preventing dementia there are several activities that can be done to prevent the disease, namely games that sharpen the brain. Some game activities that can be done according to Ning et.al (2020) are three, namely:

1. **Board Games:** This can help cognitive functions such as memory, communication, and emotional regulation.
2. **Video games:** Video games can be customized to directly target various cognitive abilities, such as memory and reasoning.
3. **Virtual Reality Games:** This can provide cognitive and physical reinforcement, depending on the type of game.

The innovation carried out is to provide leisure activities for the elderly which are useful for preventing dementia through virtual reality tourism activities. (Jansen et al., 2025) findings indicated that its implementation of immersive and non-interactive VR interventions in elderly populations relatively cost-effective, and that the majority of care recipients experienced no negative effects from VR exposure. A 360° virtual tour could help people who have mobility issues, like older people who are not able to take a long-distance trip can experience visiting a new place through technology (Yang et al., 2021). Virtual Reality Tourism is a tourism activity that utilizes VR technology to invite people to travel. Tourism is not only a tool to increase economic activity, but more than that, recreational activities in it can be useful and help build a community. (Mir et al., 2024) which in this case is the elderly community. In the new era of digital economy development, we should seize the opportunities presented by digital technology, in this case Virtual Reality, to promote the deep integration of Digital technology and Elderly Care Services to improve the quality of service to the elderly (He et al., 2025).

This study objective aims to see the response of the elderly to several games involving technology and also recreational games that can prevent dementia in the elderly. Therefore, in the activities carried out at the Wredha Social Home, the focus is on inviting the elderly to be active through Virtual Tour recreation and memory card games in preventing dementia. The location chosen for this service is the Budi Pertiwi Nursing Home, Bandung City. This location

was chosen because it is an active social home in Bandung City and has elderly members who can still be invited to do light physical activities.

2.0 METHODS

The research method in this study is a simple quantitative study where this study will look at the response of a case study of the application of recreational games for the elderly. In this study, the game was made in two ways, namely using data processing technology and 360 images, then the second games is a card game that design with the design thinking method. By applying design thinking starting from identifying problems, making products to their implementation. There are 5 design thinking processes, namely empathize, define, ideate, prototype and test where before we enter the define stage we must first empathize (empathy) with our prospective sources (Yulius et.a 2022).

This research was conducted at a social home for the Budi Pertiwi Nursing Home, Bandung City which has 22 elderly participants with female characteristics aged > 55 years. The data collection method was carried out by distributing questionnaires to the game participants. Then, the analysis method used is the descriptive statistical analysis method where the average and mode of the participants' responses will be seen after playing the game that has been designed by the researcher. This activity includes planning, preparation, implementation, evaluation which takes place from April to November with core activities carried out in August 2024.

3.0 RESULT

Playing a game can be one of the brain games stimulation methods for the elderly so that it can be one of the therapies in preventing dementia (Udjaja, 2021). The games designed can include several aspects of consideration such as in the selection of colors, shapes and game time. In this study, game creation will focus on the Virtual Tour game and Card Game. This game was chosen first because it wanted to develop technological innovation in games for the elderly and other games to choose simple but implementable games played by the elderly such as cards. Yong and Huxia (2025) said that in addition to playing, exposure to inclusive digital technology can improve mental health conditions, especially for the elderly who live alone. Digital technology and games can be tools for socializing and honing brain skills or brain gym. In this study, two core activities were made, namely card games and virtual tour games. These two games have different creation processes and approaches, but both have benefits for brain development.

3.1 Creating Virtual Tour

Virtual Tour technologies marks a move away from traditional image displays and interactive maps ho to experiences that provide comprehensive university exposure (Salim & KHalilvov S, 2024). Virtual Tourism has several benefits, (Sandeep, 2021) said that the benefits of virtual tourism include, time saving, better decision making, money saving, safe and uninterrupted experience, year round accessibility, non-perishable, historical places, marketing tools and environment friendly. A virtual campus tour using virtual reality and high-textured 3D modeling can provide a realistic experience for prospective and current students, while spreading awareness and promoting campus awareness is an example of the application of VR in education. In addition to education, VR can also be intended in various aspects, one of which

is for recreational games for the elderly. VR is also in the study (Jansen et al., 2025) found that VR helps facilitate the elderly in the caregiving process, but what type of VR is suitable, non-immersive VR can be a more applicable choice for everyone than immersive VR because of its ease for users. In the study, VR was designed more towards non-immersive VR which makes it easier for participants to only use touch screen devices to carry out their activities.

Based on a study from (Stappung et al., 2023) Virtual Reality creation can be utilized through several stages from planning to optimization. In creating virtual tours, several stages of the process are carried out, namely:

- a. **Initial planning and design:** at this stage, the locations and objects that will be included in the tour must be identified. At this stage, the Nepenthes Garden in the Bogor Botanical Gardens is one of the objects. The planning will start the tour from the entrance to going around the garden. This garden was chosen because it is not too large and has unique plant objects that can arouse the enthusiasm of participants to look around. This involves determining the number of locations and frames needed for the panoramas, as well as selecting and processing multimedia content such as text, animation, audio, and video (Sanchekeo, 2020)
- b. **Technology and Tools:** After the image capture process. The image will be processed using a VR modeling application. The application used in this study is VTC (Virtuals Tour Creator) The development of virtual tours often involves advanced technologies such as 3D modeling and virtual reality (VR).
- c. **Optimization:** In this process, a trial of the tour game is carried out. The virtual tour that is created is formed into a link that can be accessed by anyone. When tested, there are several adjustments such as changing the flow that is too long or too short, changing the naming of the connecting points between photos and so on.

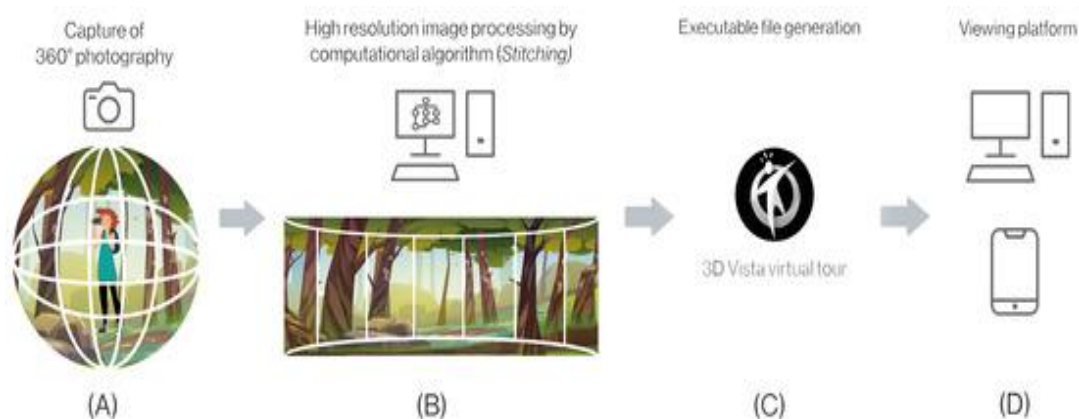


Figure I. Development Virtual Tour Procedure, Stappung (2023)

Photo creation using Insta360 X2 camera and a tripod. Photo taking in the Nepenthes Park area of Bogor Botanical Gardens. In the previous shooting process, planning and designing have been done at points where the shooting was carried out.

In one area of Nepenthes Park of ± 70 m² there are 15 shooting points assuming the distance between points is 3-4 meters.



Figure I. 360 Picture of Nephentes Park

The shooting was done by taking a complete 360o image, not using a 180o image. Although, both forms of virtual travel can be relaxing. However, it may be possible to stimulate brain activation while watching a 360-degree video on a smartphone or while using VR glasses to view either type of video (Wang et al., 2023).

3.2 Designing Cards Memory Games

In addition to technology, traditional games such as board games that specifically sharpen memory and strategy can be a tool for preventing dementia (Pozzi, 2023). Ning et.al (2020) said that card games are one of the games that can help cognitive functions such as memory, communication, and emotional regulation. Making memory cards begins with designing the number of cards, game time and the images to be selected. In this activity, a game with a short playing time of 5-20 minutes was chosen because the target of the players in the game are the elderly who have limitations in terms of physical and memory. The stages of making this card go through 5 (five) stages of Design Thinking from planning to implementation.

- **Empathize:** At this stage, researchers try to understand the needs, feelings, and perspectives of users, namely the elderly at the Budi Pertiwi Wredha Nursing Home. The elderly are aged 60 years and over to 92 years old, and are lower class people. This is done through observation, interviews, and direct interaction with the foundation's management to gain in-depth insight into the problems they face. It was found that the elderly tend to be happy to participate in any activity as long as they get a prize and are not too physically tiring.

- **Define (Determining the Problem):** After collecting insight data from the empathy stage, the next step is to summarize the findings and formulate a clear problem. The goal is to define the problem in a way that focuses on the user so that the resulting solution is more targeted. This identification gave birth to the fact that the number of games played should not be more than 20 minutes with a small number of cards, namely 10 types. The size of the image used must also be large so that it is easy to see. The colors used must have good contrast and clear shapes.

- **Ideate (Generating Ideas):** At this stage, the team begins to explore various solutions by brainstorming and thinking creatively. The card game designed is called the "MatchingKu" card, which means a game to find pairs of cards using a blind test.



Figure II Card Design

- **Prototype (Creating a Prototype):** The best ideas from the previous stage are transformed into real forms in the form of simple prototypes. This prototype can be a sketch, model, or simulation that is used to test the concept and get initial input from users.
- **Test (Testing the Prototype):** The prototype that has been created is tested by users to see if the solution offered is truly effective. Feedback from users is used to make improvements and refinements before the final solution is widely implemented. Testing is carried out by the team before implementation and is carried out again to the participants as an example before the next game begins.

This activity includes planning, preparation, implementation, evaluation which takes place from April to November. The peak of the activity was held on August 5, 2024, located at the Budi Pertiwi Nursing Home, Lengkong District, Bandung City. This activity was attended by 22 elderly people and 11 administrators of the Budi Pertiwi Wredha Social Home. The event lasted for 3 hours starting from 10.00-13.00 pm.

Before entering the main event, participants were invited to warm up or ice breaking. The warm-up carried out was brain gymnastics called Alzheimer's gymnastics. Doing Alzheimer's gymnastics at the beginning of the event gave the elderly an opportunity to warm up and feel more familiar with the event facilitators. It was found that after warming up, the participants were more relaxed and ready to enter the main event.



(a)



(b)

Figure III (a) Playing Virtual Tours, (b) Playing Memory Cards

4.0 DISCUSSION

The total event lasted for 3 hours and ended with filling out a questionnaire. During the game, the elderly were divided into several teams consisting of 4-5 people. Each must be accompanied by a companion who ensures that team members understand the game and actively participate in all games without anyone being left out.

The game went smoothly but had some notes. In the virtual tour game, participants were given a mission to find an object in the Nephantes Park, they were interested in joining the game, but there were some obstacles such as their unfamiliarity with using the devices provided.

Then in the card game in a team, this became an obstacle because the capacity of each team member turned out to have a very large gap, so if someone was too good at guessing cards, there were other members who had not finished processing the events that were happening so that in this case the companion worked extra to ensure the game ran fairly.

After the game was played, participants were given a questionnaire to see how they experienced the activity. Based on the pie chart shown in figure V, the level of focus of respondents in an activity varied. As many as 59.1% of respondents stated that they

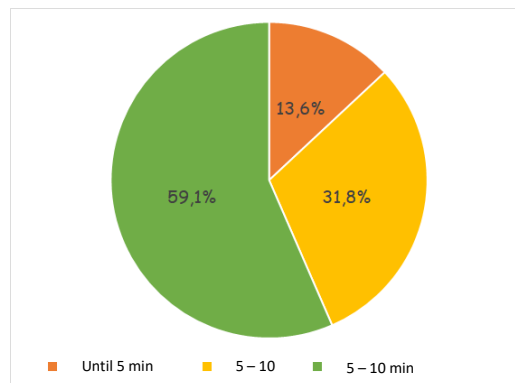
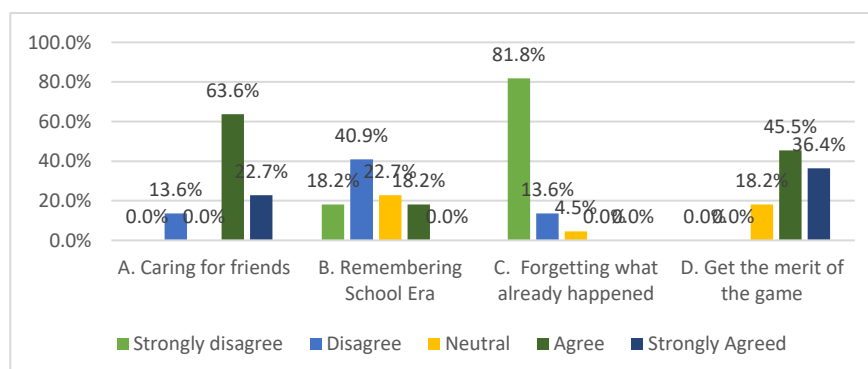


Figure IV Focus Ability

remained interested until the end, indicating that the majority had a high level of focus and were able to maintain attention for a long time.

Meanwhile, 31.8% of respondents were only able to focus for a period of 5 to 10 minutes, indicating a tendency to lose attention after the initial period. Meanwhile, 13.6% of respondents were only able to maintain focus for the first 5 minutes, indicating that a small number of participants had difficulty maintaining concentration for a longer duration.

Overall, these data indicate that although most respondents had fairly good focus, some had difficulty maintaining attention for a longer period of time. This can be a consideration in designing activities or learning methods to remain interesting and able to maintain participant engagement for a longer duration.



Based on the interest assessment, 95% of participants were happy and wanted to play again, and what they felt after playing was an increased sense of caring for friends. Based on the data displayed in the bar chart, the majority of respondents showed an attitude of caring for friends, with 63.6% agreeing and 20% strongly agreeing. On the other hand, only a small portion disagreed (13.6%) or were neutral (2.7%). In terms of remembering school lessons, the majority of respondents also had a positive tendency, where 40.9% agreed and 13.6% strongly agreed, while 27.3% were neutral, and 18.2% disagreed. Interestingly, in terms of forgetting events that have happened, the majority of respondents (81.8%) strongly disagreed that they often forget, while only 13.6% disagreed, and 4.5% were neutral. This shows that most respondents have a good memory of past experiences. Meanwhile, in terms of taking lessons from each game, most respondents have a positive view, with 45.5% agreeing and 36.4% strongly agreeing, indicating that they tend to be reflective of the experiences they go through. Thus, it can be concluded that respondents generally have a caring attitude, good memory skills, and a tendency to learn from experience.

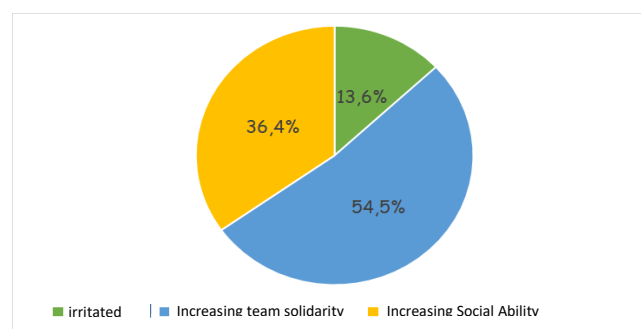


Figure V Feeling Respon After The Game

Based on the pie fig. VII, the respondents' feelings after playing the game varied. The majority of respondents, namely 54.5%, felt an increase in team solidarity, indicating that the game had a positive impact on strengthening cooperation and togetherness between players. In addition, 36.4% of respondents felt that playing the game helped improve their social abilities, indicating that the game also contributed to honing communication and social interaction skills. However, there were 13.6% of respondents who felt annoyed or frustrated after playing, which may have been caused by factors such as losing, intense competition, or imbalance in the game. These data indicate that most respondents gained social benefits from playing the game, both in terms of increasing team solidarity and social skills, although a small number experienced negative feelings afterwards.

5.0 CONCLUSION

Based on the results of the study, both games are suitable for the elderly and are applicable to be played by the elderly at the Budi Pertiwi Nursing Home. The COVID19 pandemic incident provides a lesson that feelings of isolation and loneliness for the elderly negatively affect mental health conditions, the need for solutions such as physical and social activities to prevent the physical effects of mental decline (Altug Turan & Malkoç True, 2023). Therefore, this game, which shows that closeness between members has increased, is expected to have a significant impact on feelings of loneliness and isolation as well as training the brains of elderly residents of nursing homes.

The experiential aspects of VR technology, such as the sense of control, active participation, and curiosity, primarily contribute to visitors' feeling of immersion within the virtual environment (Wei et al., 2019). Virtual tours serve as a valuable platform for travelers who prioritize environmental and social responsibility, as well as for individuals with disabilities or health conditions that restrict their ability to travel, allowing them to explore destinations and engage with others (Nautiyal & Polus, 2022). VR is also create a form of more accesible tourism activities for disabilities and elderly. Ensuring accessible management of tourist destinations is essential not only for the inclusion of individuals with disabilities but also for making these locations more navigable and understandable for everyone, especially in light of the world's aging population (Rubio-Escuderos et al., 2025). In addition, the creation of VR in national parks, apart from being an innovative new recreational facility, can also be an educational conservation tool for those who enjoy it. (Stappung et al., 2023). Virtual tourism also can be a potential turn- stile for the massive transition towards tech-based sustainable tourism (Verma et al., 2022). Although some benefits have been proven and may be potential, some obstacles felt when playing virtual tours are the familiarity of the elderly with the devices used is a problem, hands that often shake make them sometimes embarrassed to start the game, even though they are enthusiastic about playing it.

Card games are also simpler games compared to games that include technology such as virtual tours, but obstacles such as unequal abilities between team members in one group create unhealthy competition and dissatisfaction. This can be overcome by having a team companion who is able to control the situation. In both activities carried out, it was also found that the elderly can have characteristics like children who feel easily annoyed if there are events that they do not expect, such as playing time opportunities and prizes obtained by other participants.

This study also has limitations because it has only been applied to one institution with 22 participants and cannot see significantly whether this game prevents the risk of dementia by what percentage. Further research is needed to see the consistency of responses and conditions experienced by the elderly related to memory if this game is played regularly and for a long period of time.

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