Gamification of Elderly Life: The Impact of E-sports on Improving the Quality of Life of the Elderly

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Abstract

With the increasing trend of global population aging, it is particularly important to explore effective ways to improve the quality of life of the elderly. This study adopts a qualitative research method to deeply explore the integration of e-sports in the life of the elderly in China and its positive impact on the quality of life of the elderly. Through semi-structured interviews, observations and related case studies, the purpose of this study is to reveal how e-sports as a new form of game to meet the social, psychological and physiological needs of the elderly, and thus improve the quality of their daily life.

Keywords: e-sports, elderly, quality of life, gamification

1. Introduction

With the rapid development of society and the aggravation of population aging, China is facing major changes in population structure. The growth of the elderly population not only brings challenges to the social economy and the old-age service system, but also puts forward new requirements for the quality of life and spiritual and cultural needs of the elderly. In this context, it has become an important topic in social science research to explore how to improve the quality of life of the elderly through innovative ways. At the same time, China's elderly e-sports market also shows great potential. According to the '2021 China e-sports industry development report', the proportion of e-sports users aged 45 and over is 12.8 %. It is expected that the number of e-sports users over 50 years old will exceed 50 million in the next five years, which provides a broad development space for the combination of e-sports and the pension industry.

1.1 Research Background

China is the country with the largest elderly population in the world. According to the data of China 's National Bureau of Statistics, by 2023, China 's elderly population aged 60 and above has exceeded 250 million, accounting for nearly 18% of the total population. With the extension of average life expectancy and the increase of leisure time after retirement, the demand for health, social and recreational activities of the elderly is increasing. However, the traditional way of old-age care often ignores the spiritual and cultural life and personalized needs of the elderly, resulting in the dissatisfaction of the quality of life of the elderly. In recent years, e-sports, as a new form of entertainment, has developed rapidly around the world and has gradually penetrated into the lives of the elderly. E-sports not only provides a platform for young people to compete and socialize, but also opens up new entertainment and social channels for the elderly (Onishi, Yamasaki, Hara, Hirotomi, & Miyazaki, 2022).

1.2 Research Significance

This study focuses on the impact of e-sports on the quality of life of the elderly, which has important theoretical significance and practical value. In theory, incorporating e-sports into the gamification process of elderly life can enrich the connotation of active aging and gamification theory, and provide a new perspective and theoretical support for the study of the quality of life of the elderly. In practice, exploring how e-sports can meet the social, psychological and physiological needs of the elderly is helpful to develop e-sports products and services suitable for the elderly, improve the daily life experience of the elderly, and promote social participation and intergenerational communication of the elderly. In addition, this study has positive social significance for guiding the society to correctly understand the application of e-sports in the life of the elderly, eliminating prejudice and

misunderstanding of e-sports, and promoting the integration and development of e-sports and pension services.

2. Literature Review

With the vigorous development of the global e-sports industry, the academic community has conducted extensive research on its impact in different fields. In China, e-sports is not only regarded as an emerging sport, but also gradually integrated into the lives of the elderly and become a means to improve their quality of life.

2.1 The Connotation and Development of E-sports

E-sports is a new type of sports activity that combines electronic games and competitive sports. It originated from video games, but has developed into a competitive sports event with professional competition, rule fairness, and high social and cultural value (Felix, 2022). China 's e-sports industry has developed rapidly in recent years, which has been supported by policies and recognized by the society, showing a strong growth trend (Ziyuan, 2024).

2.2 The Life Needs and Quality of Life of the Elderly

The quality of life of the elderly depends not only on material conditions, but also on multiple dimensions such as health, family relationships, and social participation (Choi & Hwang, 2022). With the development of society, the elderly 's demand for spiritual and cultural life is increasing day by day. As pointed out in the "2019 China Elderly Quality of Life Development Report," they also pursue an active, healthy and participatory lifestyle. In China, some policies have begun to focus on how to meet the multi-level needs of the elderly by providing appropriate services. For example, in the relevant documents on strengthening the elderly in the new era, the Chinese government proposes to take the improvement of the happiness and security of the elderly as the development goal.

2.3 The Application and Effect of Gamification in the Elderly Life

Gamification, which applies game design elements and game principles to non-game scenarios, has been shown to improve the quality of life of the elderly. Studies have shown that digital games suitable for the elderly can be used as a tool to help them carry out cognitive training, improve social skills, and even prevent Alzheimer's disease (Liliana, Benedetta, Leonardo, Simone,... & Barbara, 2024). In addition, e-sports, as an emerging form of gaming, has begun to be used in the rehabilitation and social activities of older adults, demonstrating its potential to increase social engagement, alleviate loneliness, and promote intergenerational communication (Patrik, Anna, Tiny, & Leonie, 2024).

3. Theoretical Framework

The theoretical framework constructed in this study integrates the theories of multiple disciplines to comprehensively analyze the impact of e-sports on the quality of life of the elderly.

3.1 Gamification Theory

First of all, gamification theory is one of the core theories of this study. It believes that the application of game design elements and game principles to non-game environments can increase participants' participation and motivation (Alexandre, Cyril, Guillaume, Martine, & A ïna, 2024). Gamification can improve the fun of tasks, promote positive behavior change, and enhance the user experience (Joohun & Jaehoon, 2024). In the gamification of elderly life, the introduction of e-sports can stimulate the participation interest of the elderly, thus improving their quality of daily life (Liliana, Benedetta, Leonardo, Simone,... & Barbara, 2024).

3.2 Active Aging Theory

Secondly, the theory of active aging emphasizes that the elderly should actively participate in social activities, so as to maintain a high level of physical and mental health and social contribution (Sonja, Maria, Klaus, & Rainer, 2024). This theory reflects that by promoting the social participation and lifelong learning of the elderly, their quality of life can be improved and the overall well-being of society can be promoted. As a new form of social participation, e-sports provides a new learning and communication platform for the elderly, which helps to achieve the goal of active aging (Cannella, Villar, Serrat, & Tulle, 2021).

3.3 Socioemotional Selectivity Theory

From the Socioemotional Selectivity Theory proposed by Laura Carstensen, a psychologist at Stanford University, it can be seen that with the increase of age, individuals are more inclined to seek emotional satisfaction and social connection. As a social activity, e-sports can meet the needs of the elderly for emotional communication and social interaction, reduce loneliness and social isolation, and thus have a positive impact on their mental health (Shan, Xu, Liu, Zhang, Dai, Zheng,... & Dai, 2023).

3.4 Cognitive Stimulation Therapy

In addition, cognitive stimulation therapy, as a comprehensive intervention method, conveys the idea that continuous mental activity can promote brain health and delay cognitive decline. In this regard, e-sports can be used as a means of this intervention. For example, e-sports requires participants to think strategically, respond quickly, and make decisions. These cognitive challenges may help maintain and improve cognitive function in older adults (James, Nathan, Angela, Caleb, William, Nick,... & Sara, 2023).

4. Research Methods

This study uses qualitative research methods to explore how e-sports can be integrated into the life of the elderly and have an impact on their quality of life.

4.1 Research Design

The research design is based on the phenomenological method, focusing on the personal experience and feelings of the elderly when participating in e-sports activities. Through interviews and participation observations, samples of the elderly's cognition, emotional response and participation motivation for e-sports were collected. Before the interview, the interview outline is formulated in advance (see Appendix A), including the preliminary understanding of e-sports, participation motivation, participation experience, feelings and impact on quality of life. At the same time, choose a quiet and comfortable environment for interviews in advance to ensure that each participant can feel relaxed. And in the process of recording the interview, not only the language information of each participant was recorded, but also their non-verbal information such as body language or expression was recorded (all of the above recording methods and behaviors were carried out with the consent of each participant).

4.2 Sample Collection

In the process of data collection, this study used semi-structured interviews to conduct one-on-one interviews with six elderly e-sports participants. Each interview lasted about 45 minutes to 1 hour, aiming to collect the personal views and experiences of the elderly on e-sports. The purpose of the study is to collect the personal views and experiences of the elderly on e-sports, and to select the elderly who are 60 years old and above, and have different levels of e-sports participation experience as interviewees. Secondly, the performance of these six participants in related activities was observed separately, and their interactions and reactions at that time were recorded. In addition, through the analysis of relevant literature, relevant cases and news reports of other elderly e-sports players were collected to understand the general attitude of society towards elderly e-sports.

4.3 Sample Analysis

4.3.1 Semi-structured Interviews

First of all, by interviewing the six elderly e-sports players, the basic situation of these participants can be summarized as follows:

(1) Participants A (Granny Zhang, 72 years old, retired teacher):

Grandma Zhang is a warm and cheerful retired teacher. She is curious about new things. Since her grandson taught her to play e-sports games, she has found herself more active in social activities and closer to her grandson. She often said: 'E-sports makes me feel like I have no generation gap with young people, and we have a lot of common topics.'

(2) Participants B (Grandpa Li, 68 years old, retired engineer):

Grandpa Li was an engineer before retiring, with a natural sensitivity to technology and new things. He found that e-sports is not only interesting, but also a good way to keep the brain alive. He likes to say: 'In the world of e-sports, age is not the limit, I feel as agile as young people.'

(3) Participants C (Grandma Wang, 75 years old, housewife):

As a housewife, Grandma Wang spends most of her life around the family. After her exposure to e-sports, she feels that her vision of life has been greatly broadened and her connection with society has become closer. She often feels: 'E-sports makes me feel like I 'm still part of society, and I no longer feel disconnected from the times.'

(4) Participants D (Grandpa Zhao, 70 years old, retired bank clerk) :

Zhao Grandpa has been looking for activities that can stimulate vitality after retirement. E-sports has provided him with a new experience, making his mindset younger. He often said: 'Every time I play a game, I feel full of

vitality, and e-sports keep my mind young.'

(5) Participants F (Grandpa Liu, 71 years old, retired professor) :

Grandpa Liu is a retired professor who attaches great importance to brain health. E-sports became a way for him to keep his mind sharp. He often stressed: 'I find e-sports very useful for training the brain, it keeps my mind active.'

(6) Participants G (Grandma Wu, 69 years old, retired accountant) :

After retiring, Grandma Wu began to pay attention to her health. She found that e-sports was not only interesting, but also indirectly promoted physical health. She likes to tell: 'E-sports makes me realize the importance of health, I need to keep a good posture to enjoy the fun of the game.'

4.3.2 Participation in Observation

Subsequently, after the consent of the above five participants, we continued to make further observations on the five participants in the process of playing the game. The following is the interaction and reaction of the five elderly e-sports participants.

First of all, the first participant (Grandma Zhang, 72 years old, retired teacher) was very active and happy when she played games with her grandson. Although she couldn 't keep up with her grandson 's hand speed and reaction, she was always actively exploring, and finally her grandson praised her, which made her look more confident and happy.

The second observer (Grandpa Li, 68 years old, retired engineer) was particularly focused on playing e-sports games. He chose a strategy game and sat in front of the computer to carefully plan and perform in-game tasks. Despite some challenges in the game, he did not give up, but actively looking for solutions. His persistence and problem-solving skills, as well as his focus and determination, are admirable.

The third observation object (Grandma Wang, 75 years old, housewife) shows natural charm in the interaction with other elderly players. Her excellent performance in the game makes her a leader in the group. During the break, she also shares her family life and cooking experience with others, and her story and sense of humor make the people around her feel happy and relaxed.

A fourth observer (Grandpa Zhao, 70, a retired bank clerk) is very engaged in today 's esports game, and he chose a game that requires a quick reaction. Although he was nervous at first, he quickly adapted to the rhythm of the game. At the same time, his active performance in the game earned him the respect of his teammates. After the game, he also discussed the game strategy with other online players and said he was looking forward to playing together again next time.

The fifth observation object (Grandpa Liu, 71 years old, retired professor) is very confident when playing games. He chose a sports e-sports game, and his performance during the operation is also very flexible. Its rapid response is really commendable. The sixth observation object (Grandma Wu, 69 years old, retired accountant) made obvious progress in a team-based e-sports game. Although she was not well adapted at first, her skills were rapidly improved after practice.

4.3.3 Case Analysis

In addition to the cases of the above interviews, according to the relevant data, it can be seen that there are more elderly groups who are willing to try e-sports. For example, Lin Shao, a post-95 entrepreneur from Henan Province, China, introduced the e-sports room into his own nursing home (Figure 1), and formed an elderly team with an average age of over 70 years (Figure 2), and participated in competitions across the country. He also sent videos of old people playing games to the Internet, attracting many fans. This proves that it is completely feasible to build a nursing home that even young people dream of, and it also breaks the traditional impression of the elderly. Figure 3 shows that the two grandmothers of the old team are experiencing the offline competition as e-sports players.

As a country facing the challenge of aging, Japan has gradually integrated e-sports into the spiritual and cultural life of the elderly. In recent years, Akita Prefecture of Japan has established the first elderly e-sports team 'MATAGI SNIPERS' in Japan. The number of members has reached 14 in less than one month, all of whom are over 65 years old. This model has been promoted in many places in Japan. In addition, Japan has also promoted e-sports for the 60 to 90-year-old population, aiming to enable the elderly to enjoy games through computers and game consoles, while preventing diseases such as Alzheimer's disease. In order to reduce the incidence of Alzheimer 's disease, since October 2020, Meili Town, Japan has set up a number of e-sports venues for the elderly (Figure 4), and held an online game competition between the elderly and primary school students to

promote the communication between the elderly and the children. Some participants even found new life values.

In general, e-sports, as an emerging form of entertainment, provides new social channels and cognitive training opportunities for the elderly, which helps to improve their quality of life. With the continuous development of the e-sports industry and the improvement of aging, the elderly e-sports market is expected to become a new growth point in the future.
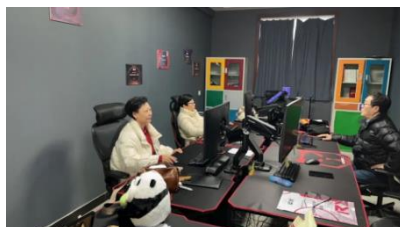

Figure 1. Older players in e-sports nursing homes

Figure 2. Elderly e-sports team

Figure 3. Two grandmothers are participating in an offline e-sports competition

Figure 4. Japanese elderly groups in e-sports venues

5. Research Results

This study reveals the multifaceted impact of e-sports on the lives of the elderly through qualitative analysis, with particular attention to its role in social, mental health and physical health.

5.1 The Role of E-sports in the Social Activities of the Elderly

The results show that e-sports, as an emerging activity, has become an important part of the social life of the elderly. The elderly who participate in e-sports report that it provides them with a new platform to communicate with people of different ages and backgrounds. The team nature of e-sports promotes cooperation and communication, helps the elderly build new friendships, and reduces the sense of social isolation. In addition, e-sports events and community activities provide opportunities for the elderly to participate in social activities and enhance their sense of social participation and belonging.

5.2 The Impact of E-sports on the Mental Health of the Elderly

In terms of mental health, the study found that e-sports have a positive impact on the elderly. The elderly who participated in e-sports showed higher life satisfaction and less loneliness. The challenge and interactivity of e-sports can provide cognitive stimulation, help maintain and improve the cognitive function of the elderly, and prevent cognitive decline. At the same time, the sense of achievement and fun brought by the successful completion of the game task helps to improve the self-efficacy and emotional state of the elderly.

5.3 The Relationship Between E-sports and Physical Health of the Elderly

Regarding physical health, studies have pointed out that e-sports also has a potential positive impact on the physical health of the elderly. Although e-sports activities are mainly carried out sitting, the rapid response and decision-making in the game require the coordination of various parts of the body, which can improve the neuromuscular coordination ability of the elderly to a certain extent. In addition, as an interesting leisure activity, e-sports can increase the physical activity of the elderly and play a positive role in improving sleep quality and reducing the occurrence of chronic diseases.

6. Discussion

The discussion part of this study aims to conduct an in-depth analysis of the research results, explain the research findings, and consider its significance to the existing theory and practice, while pointing out the limitations of the research and the direction of future research.

6.1 Explanation of the Findings

The study found that e-sports, as a new form of game, has a positive impact on the quality of life of the elderly. First of all, e-sports provides a platform for the elderly to communicate with different age groups, which helps to reduce their sense of social isolation and enhance social networks. Secondly, the participation of e-sports is positively correlated with the mental health of the elderly, which can improve their life satisfaction and emotional state. In addition, e-sports has a potentially positive effect on the cognitive function of the elderly, helping to maintain brain vitality and prevent cognitive decline. Finally, e-sports may also have indirect benefits for the physical health of the elderly, such as by increasing physical activity and improving sleep quality.

These findings are consistent with the existing literature that gamification can be used as an effective means to improve the quality of life of the elderly. At the same time, they also support the concept of active aging, that is, to promote the physical and mental health of the elderly by actively participating in social activities.

6.2 Research Limitations and Future Research Directions

Although this study provides insights into the impact of e-sports on the quality of life of older people, there are some limitations. First of all, due to the use of qualitative research methods, the universality of the research results is limited and may not be applicable to all elderly groups. Secondly, there may be selection bias in the research sample, because the participants are all voluntary and may be more inclined to individuals who have a positive attitude towards e-sports. In addition, the study failed to fully consider the impact of cultural, economic and educational backgrounds on e-sports participation and experience.

Future research can adopt quantitative methods to verify the qualitative findings of this study, and expand the sample size to improve the representativeness and universality of the research results. In addition, future research can explore the differences in the acceptance and experience of e-sports among the elderly with different backgrounds, as well as the long-term impact of e-sports on the quality of life of the elderly. It may also consider comparing e-sports with other types of games and activities to gain a more comprehensive understanding of its role and potential in the lives of older people.

Through further research, we can have a deeper understanding of the role of e-sports in the lives of the elderly, and provide a richer evidence base for relevant policy formulation and practice.

7. Conclusion

This study explores the role of e-sports in the life of the elderly and how it affects the quality of life of the elderly, and draws the following conclusions.

7.1 The Main Findings of the Study

The results of the study reveal the multi-faceted positive impact of e-sports on the lives of the elderly. First of all, as a social media, e-sports effectively reduces the sense of social isolation of the elderly, and enhances their sense of social participation and belonging. Secondly, participation in e-sports activities has significantly improved the life satisfaction and emotional state of the elderly, and has a positive impact on their mental health.

In addition, the cognitive challenge of e-sports has potential benefits for maintaining and improving the cognitive function of the elderly. Finally, e-sports may also indirectly promote the physical health of the elderly by increasing physical activity and improving sleep.

7.2 Enlightenment to Practice

The findings of this study provide several important implications for practice. First of all, pension service providers and policy makers should recognize the potential of e-sports in promoting the active aging of the elderly and consider incorporating it into the leisure activities of the elderly. Secondly, families and communities can encourage and support the participation of older people in e-sports activities as a way to promote social, psychological and physical health. In addition, the promotion of e-sports should take into account the needs and preferences of different elderly people, and provide a variety of game options and adaptive adjustments to ensure that all elderly people can enjoy the benefits of e-sports.

The e-sports industry should also respond positively to develop game content suitable for the elderly, as well as a safe and easy-to-use interactive interface, and organize e-sports activities and competitions suitable for the elderly to promote the participation and experience of the elderly. Finally, we should strengthen the publicity and education of the impact of e-sports on the quality of life of the elderly, and enhance the understanding and support of the society for the elderly e-sports participants.

Through these practical implications, this study hopes to promote the elderly to participate more actively in e-sports activities, thereby improving their overall quality of life and providing new solutions to cope with the challenges of population aging.

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Appendix A

	Interview outline
①Purpose of the interview:	To explore the elderly 's cognition, participation motivation, experience of e-sports and its impact on quality of life.
②Interviewees:	Elderly people aged 60 and over participating in e-sports.
③Interview form:	Semi-structured in-depth interviews
④Interview duration:	Estimated 45 minutes to 1 hour
⑤List of interview questions:	1. Introduction and background information Q: Hello, thank you for participating in this interview. Could you tell me your age and some hobbies? 2.Preliminary understanding of e-sports Q: Have you heard of 'e-sports ' ? What is your initial impression of e-sports? 3.E-sports contact experience Q: How did you first come into contact with e-sports? 4.Participation motivation and attitude Q1: What are the reasons for your participation in e-sports ? Q2: What are your family or friends ' attitudes towards your participation in e-sports? 5.E-sports participation experience Q1: How often do you participate in e-sports ? Who usually play with? Q2: Which e-sports game do you like best ? Why? 6.Emotional experience Q: What emotional experiences do you usually have when participating in e-sports ? Such as excitement, tension or other? 7. Social impact Q: Has e-sports changed your social activities ? How does it affect your social circle? 8. Impact of quality of life Q: What do you think the impact of participating in e-sports on your daily life? Q: Does e-sports bring you new challenges or changes? 9.Health and cognition Q1: What do you think of the impact of e-sports on your physical and mental health? Q2: Do you think e-sports can help keep your brain active? 10.Challenges and difficulties Q: What challenges or difficulties have you encountered in the process of participating in e-sports? 11. Expectations and recommendations Q: What are your expectations or suggestions for e-sports, especially for older players? 12. Future perspectives Q: How do you see the potential role of e-sports in the future life of the elderly? 13. Conclusion Q: Do you have any other experiences or ideas about e-sports that you want to share?
⑥End of the	Thank the participants for sharing and informing the follow-up on how to obtain

interview:	research results and ways to further communicate.
⑦Recording and collating:	Ensure that participants ' answers are recorded in detail during the interview. After the interview, the interview records were compiled immediately.
⑧Ethical considerations:	Ensure that the privacy and willingness of the participants are respected during the interview process, and all data will be strictly confidential.

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Authors contributions

Not applicable.

Competing interests

Not applicable.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.