Analysis of the Possible Effects of Computer Games on Young Children

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ABSTRACT

Whether computers or computer games are suitable for young children to learn or apply to early childhood education has been concerned by our society, which continues to lead to arguments on both positive and negative sides. But the fact that the integration of computers' using into early childhood teaching seems to be an irresistible trend of the times. At present, the focus of this issue is not only whether children should use computers, but also how to integrate and use information learning and games. This study attempts to focus on the positive and negative effects of computer games on young children, and tries to mention the educational thinking caused by them. It is expected that this article will lay a foundation for the knowledge of the impact of computer games on children's learning.

Keywords: Computer games, toddlers, kindergartens, games

1. INTRODUCTION

Playing is not only the nature of children, but also their main work, and children will continue to grow and develop in the process of game interaction. With the progress of science and technology and the vigorous development of society, the information equipment represented by mobile phones and computers, more and more steps into the school classroom and family daily, but also into the life world of young children. The use of information technology is gradually affecting the growth of young children, but also produced some learning psychological and family problems, and then widely aroused the attention of school teachers, parents and all walks of life.

This kind of information equipment, which combines acoustic-optic images with lifelike sound effects through advanced computer technology, and with rich and diverse game software, simulates the real or fantasy world in a lively way, and shows lifelike game scenes. It can attract children's attention to a considerable extent, so that preschool children can also skillfully use mobile phones or tablets to operate various functions. The strong force formed by it should not be underestimated. According to several studies cited by the Software and Information Industry Association, there is a positive correlation between computer use and children's academic achievement[1]. Although some studies have shown that computers can cause emotional, physical and developmental obstacles to children, it is suggested that people who like to play computer games are less patient, more irritable and they are easily prone to conflicts over trifles. Also Shen Caixia, Liu Rude, Zhang Jun, Wang Dan concluded that computer games make learning more rich and diverse, but also cause some harm[2].

The academic researchers often discuss the influence of computer games from the perspective of social learning theory and catharsis theory. Social learning theory holds that students will produce aggressive or prosocial behavior through observation, imitation and exemplary learning of various plots and social activities in the process of computer games. The catharsis theory shows that through aggressive or limb computer games, students vent the latent attack factors in their hearts, which has a cathartic effect on school children. Because computer games not only bring children many new feelings, new discoveries and new experiences, but also have adverse effects on children, more and more researchers have made a lot of theoretical and empirical studies on the effects of computer games on children or adolescents. This study also attempts to focus on the positive and negative effects of computer games on

young children, and mentions the educational thinking caused by computer games.

Before carrying out the discussion of this article, it is necessary to define the two nouns "toddler" and "computer game". The so-called young children generally refer to children over two years old to before their compulsory education (six to seven years old). However, many researchers suggest that children under three years old should be exposed to computers or use computers for a long time. Therefore, this paper defines the age of young children from three to the pre-school stage before entering primary education. As for computer games, this study defines computer games as games that can be executed by individuals on the computer, requiring players to track objects on the screen, remember or identify the location and location of the target, and respond to questions, or use the mouse and keyboard to accurately operate the target. These devices include video games, tablets, etc., but limited by children's cognitive development and online games which require higher-level skills. The scope of this study does not include online games.

2. DEVELOPMENT TRENDS AND CHARACTERISTICS OF COMPUTER GAMES

According to relevant scholars, computer games generally appeared around the 1980s, mainly based on stand-alone platform video games, combined with academic and commercial forms of super computer network, players could communicate with game centers by receiving and sending instructions each other. There were not many users at that time. With the rise of MUD (multi-user Dungeon) in the 1990s, role-playing games, virtual conference rooms and other forms have been gradually grown up from the online chat's development. In the past 10 or 20 years, with the rapid development of computer technology, the acoustic-optic effect and multi-performance of computer games have improved by leaps and bounds, which cannot be compared with the monotonous content when it just appeared.

Such has been the development of the game of oneness towards highly realistic simulation to the real world, and even many synchronizations can be used, that is to say, the current computer game players can use different methods to complete the task with no self-expression limitation, and the players may represent anything to create different results by trying making different choices. Another development trend of computer games is that they can accept more expectations and more profit purposes from software designers during the game process, that is, the purpose of education or business model. For example, Beijing some Software company develops a series of computer game software courses covering from preschool children to middle

school students. In addition, the development of game control devices, the improvement of sound, light and sound quality, and even the research and development of the display screen to reduce physical damage, all seems to be a growing trend for the future development.

The computer world attracts children or teenagers in part because of the "invisible confrontation" against the real world, but this statement clearly does not apply to developing children. According to Zeng Lingying's article, the main reason why computer games attract children is that the "activity" of computer games can meet their instinctive needs for playing [3]. For children, physical, simple and relaxing, entertaining and fun activities will be more popular. The training of computer games meets the needs of children's daily activities, while the virtual and regular computer games meet the needs of children's safety. Children can gain benefits through repeated operation and practice (such as getting gold coins by passing the barriers, etc.), thus increasing their sense of achievement. In addition, the plot and role-playing of computer games meet the needs of children's social and interpersonal interaction. In the process of playing, computer games embody a free, equal, independent opportunity for interpersonal interaction, which meets the needs of children's gradual self-development. To sum up, the characteristic that computer games attract children or teenagers lies in the challenge of "satisfying novelty and fantasy" and the pleasure of "immediate self-satisfaction and feedback".

As to whether the computer is suitable for young children or early childhood education, it has been concerned by all society, but there is no denying that the integration of computers into early childhood teaching seems to be an irresistible trend of the times. At present, the focus of this issue is not whether we should use it or not, but how we should integrate and use it between computer learning and games in a wise way. When the computer represents a valuable technology or equipment in the process of education, what we want to emphasize is the efficiency of the integration process, that is, what should we use the computer to help children do more efficiently? The following first discusses the impact of computer games on children's learning, and then further explains the possible positive and negative effects on children.

3. THE INFLUENCE OF COMPUTER GAMES ON STUDY

In the leisure activities of school-age children and teenagers, the computer games play an important role, but whether engaging in computer games may affect the academic achievement of school children or teenagers is indeed one of the issues of concern to many families and schools. However, because the subject of this paper focuses on young children, and the main development task in the preschool stage is related to children's self-care

ability and teaching security activities, less related to performance inspection or academic achievement evaluation. However, a large number of research results show that the impact of computer games on school children's academic achievement is quite complex, which is still necessary to mention here.

Some studies have pointed out that playing computer games may reduce the time students spend on homework, which in turn has a negative impact on academic achievement due to lack of learning time. However, some scholars believe that playing computer games does not necessarily reduce the allocation of homework, and the factors that affect students' academic achievement are quite complex. In addition to learning time, players are also affected by individual learning motivation, learning efficacy and strategies,or by family socio-economic status, school teachers' teaching methods and other factors [4].

And intelligent game is also one kind of expression form in computer games, and it is also one of the current trends in the development of educational technology. The impact of this kind of educational games on academic achievement is basically positive, but there is also a contrary argument. First of all, educational games simulate the actual situation in terms of content arrangement. Compared with traditional teaching methods, the knowledge learned through this kind of games is more likely to lead to learning transfer, which in turn helps students to focus their cognitive resources on understanding and application. Secondly, the learning content of educational games is interesting. Students often have to play a decision-making role in the face of challenges, try mistakes in the entire process, and get immediate feedback, which is helpful for students to improve their learning motivation. In addition, educational games can also adjust the difficulty of the game according to the level of school children, and can also cooperate with other peers to learn and communicate. This kind of educational games are very popular with school children, and because of these potential characteristics, such games can help to enhance the academic achievement of child.

However, not all games can actively promote learning. Some research results show that there is no significant difference in test results between puzzle games and traditional teaching methods in mathematics tests and students' cognitive awareness[5]. the author thinks that it may be that students are distracted by games and entertainment and fail to achieve their predetermined learning goals. However, the conclusions of the relevant research on children and teenagers addicted to computer games are quite consistent. This may be that these game-addicted children and teenagers often spend a lot of learning time on games, which greatly reduces their investment and persistence in their studies, and further affects their academic achievement performance, but the

learning stage of young children is less related to their academic achievement. At present, young children do not seem to have this kind of trouble.

4. POSSIBLE POSITIVE EFFECTS OF COMPUTER GAMES ON CHILDREN

4.1. Promote children's cognitive development

The computer game itself is a combination of cognitive responses and performance. Related studies have proved that good computer games can trigger children's brain development. Some games involve tracking screen objects and remembering the location and direction of targets, which is actually a selective memory exercise. Some games also involve hand-eye coordination, spatial perception, cognitive performance and computational reasoning. Related studies such as Green and Bavelier have found that video players have more attention resources and breadth than non-players, even better in response speed and stimulus discrimination[6]. Because computer games can enable children to learn in virtual situations, the knowledge they have learned may also help them transform into real situations. Just as the results of Sandbeg's research show that kindergarten teachers believe that children can understand computers to be like the tool to improve early childhood development[7]. To sum up, many studies still support that computer games contribute to children's cognitive development.

4.2. To Improve learning motivation and meet children's psychological needs

Computer games are novel, challenging and intelligent. It encourages players to try again and again to succeed in the end. Players strengthen and affirm their confidence again and again by breaking through the hurdles. Relevant studies have confirmed that playing computer games can keep children or teenagers away from academic or life problems, and even gain a sense of achievement that cannot be achieved in real life.

That is, computer games may create a kind of sense of fantasy which can arouse children's curiosity to make their own decisions, so that children can feel self-control. This makes children have a sense of both challenging and achievement.As Zeng Lingying indicated in his article, the main reason why computer games attract children is that computer games meet the instinctive needs of children's playing. For young children, the more physical, simple, relaxing, entertaining and playful activities can be attracting[8].

4.3. Computer games can improve social behavior and creativity

According to the general education and learning theory, computer games will affect children's social behaviors and social skills through cognitive and emotional dimensions, such as taking turns and waiting, strengthening communication and coordination, developing problem-solving methods, and so on. Therefore, often playing pro-social computer games will strengthen children's prosocial tendencies. Recent studies have confirmed that subjects who play prosocial games have lower aggressive responses than other groups through the experimental design of the control group[9].

In addition, related studies also show that the mental health status of teenagers who use computers to learn is normal, and the appropriate use cycle and intensity have a positive impact on the learning achievement and adaptability of most players. Just like Li Wei's research on the influence of computer games on the creativity of primary and middle school students, playing computer games will have a positive impact on the creative tendency of primary and middle school students[10].

5. POSSIBLE NEGATIVE EFFECTS OF COMPUTER GAMES ON CHILDREN

5.1. Affecting the development of eyesight is the most worrying aspect

Playing computer games for a long time means staring at the computer screen for a long time, which can easily lead to poor eyesight. Young children's eyes are in the stage of development, and staring at the screen for a long time, coupled with insufficient illumination or too bright display screen, may make the eyes dry or even myopic. According to Xue Ling, Heyinfang and Zhang Dongmei, we investigated whether long-term computer use affected the eyesight of teenagers. The results show that the myopia rate and the degree of myopia of students in computer class are significantly higher than those in non-computer class. The researchers conclude that long-term use of computers will harm the eyesight of teenagers[11]..

Some studies have also pointed out that continuous use of computers for 30 minutes can cause temporary myopia in children's diopter and intraocular pressure. These are the problems easily caused by users[12].

5.2. Some computer games may trigger children inappropriate behaviors through observation

Families, schools and society seem to be generally worried about playing computers. Violent games will strengthen the aggressive tendency of young children or children in real life. These studies show that young children and adolescents playing violent computer games are significantly associated with their social behavior and academic problems, including more hostility, worse relationships with teachers, more violence and lower academic achievement. Even longitudinal studies found the long-term effects of violent computer games on children's aggressive behavior, with children who played more violent computer games at the beginning of the school year becoming less altruistic and more aggressive at the end of the school year[13].

Generally speaking, the social learning theory is the main mechanism to explain the influence of computer violent games on children's aggression. According to this theory, young children are more likely to produce aggressive behavior by observing, imitating and learning about aggressive cognitive schemata, and even form beliefs and behaviors about aggression by constantly practicing and automating the cognitive process of violent games.

5.3. Some software does not take into account children's cognitive development.

For software developers, there may not be enough young children developing related knowledge, and they may teach children knowledge that is already known or beyond the reasonable scope. The content of computer games may be too difficult for young children, and the operation may be more tedious, or there may be inappropriate content. These are not suitable for the cognitive development of young children.

Children's excessive indulgence in computer games will also affect their basic cognitive function. Studies on material dependence have confirmed that the activation of brain regions is related to the craving state of material dependence, and young children who are too immersed in computer games will lead to their over-dependence on computer games. Craven also found that long-term addictive behavior can lead to the degeneration of nerve cells and brain structure, resulting in brain damage, which in turn affects its cognitive function[14]. some studies have also found that game addiction may lead to cognitive impairment such as the weakening of human sensory function and the degradation of attention function.

5.4. Reduce the opportunities to interact with peers and stay away from some life experience

Peer relationship is a dimension of children's social development. A few of studies found that playing computer games reduces the chances of interaction with peers, which in turn hinders the establishment of peer relationships. There is a longitudinal study of teenagers on the impact of online games, chat rooms and instant messaging groups (such as Wechat and QQ) on friendships and romantic relationships. The results show that playing online games and visiting chat rooms can

significantly predict the decline of the quality of friendship and romantic relationships with good friends in real life, while the frequent use of instant message groups can improve the quality of friendship and romantic relationships[15].

Playing computers or computer games will reduce children's chances of physical or free activities, or be less accessible to music, art and other valuable life experiences.

6. CONCLUSION: IMPLICATIONS FOR EDUCATION

For young children, playing is not only their nature and instinct, but also one of the ways to learn and grow. In the activity games, they can constantly interact and communicate with each others, know themselves and understand the environment. Therefore, every kind of game is a kind of experience and learning for young children, and it seems to be the same with computer games. Therefore, in the face of computer games, the author has five thoughts and suggestions:

6.1. It is also necessary to understand the priorities of early childhood development tasks besides the objectives of preschool education in China

The Education Law of the people's Republic of China stipulates that the most important goal of preschool education in China is to promote the normal physical and mental development of children, and to develop their ability to understand and use language to understand the surrounding environment, and to have good moral education and civilized hygiene habits and aesthetic concepts. This should be the most important learning tasks for young children at this stage.

When we know these tasks of preschool education, we can understand the priority of children's learning and upbringing according to this goal. Accordingly, it seems that we do not have to rush to drive young children to learn how to use computers. Children's cognition and physical and mental development have a certain order and direction. If we can predict the next stage of development according to this development model, we can be prepared in advance. Education should conform to nature, respect the order of development and individual differences, and do not act in haste, otherwise pushing young children to grow will be counterproductive.

Therefore, young children at this stage should focus on learning how to speak clearly, how to communicate with others, how to develop freely, and how to enhance their creativity and imagination, that is, to establish and tap their own potentials. In their spare time, they can use the computer or computer games timely and appropriately under the guidance of their parents and teachers.

6.2. Adults should have a correct understanding of children's playing computer games and set a positive example for children

As the saying goes, it is the responsibility of a father whose son is unfilial to him; So as of a teacher who is not strict with his students. We can see that since ancient times, children's education has been inseparable from their parents and teachers. Although whether computers are suitable for young children or whether they are used in early childhood education has always attracted attention from all over the world, under the trend of using computers, how can we use computers to help children grow up and face the future better?

It should be the first priority in the face of the trend of computer games that parents and teachers can understand the inner world of young children with dialectical and active thoughts. Children are curious, and the more forbidden they are, the more curious they are and the more they want to try. It may not be possible to ban it completely under the existing conditions. Instead of doing so, parents and teachers should not resist but guide their children's use of computer games, and teach their children to play games in a timely and disciplined way, to understand the contents of computers or computer games and related restrictions, and to study and play with young children. Secondly, learn to control the time of using the computers, adjust the brightness of the computer display screen, and pay attention to the distance between the eyes and the display screen, because using the display device for a long time will not only confuse the biological rhythm, but also harm the eyes. Only in this way can we reduce the damage of blue light to the eyes and the effect of radiation on the body.

Parents are also partly responsible for the use of computer games. People say that parents are the best role models for their children. If parents do not play with computer devices in front of their children, if parents can spend more time with their children, children will not easily feel lonely and will not use electronic devices as emotional sustenance. The feasible way is that parents and children can establish an equal dialogue and interdependent parent-child relationship, and when children encounter problems in life, they may take the initiative to communicate with their parents.

6.3. Paying attention to the deep meaning behind computer games, adults can try to play the role of the advisors and companions of young children while playing games

For computer games, we must focus on why children like to play computer games. Perhaps playing computer games is just children's shield against the interpersonal relationship problems. Is it because young children are bullied at school? Bad relationships? Not good at

expressing their needs? They often suffer from grievances and misunderstandings before they want to seek comfort from computer games. These are all possible reasons for parents and teachers to investigate. In fact, the younger children are, the more dependent they are on their parents' upbringing and the more willing they are to engage in different types of leisure activities with their parents. Although there are no interesting computer games, the company of parents always brings their children good sense of security, which can support children to face the reality better.

Playing computer games is a two-sided edge. If children play intellectual games under the supervision of adults, it is beneficial for young children to develop their intelligence, but if they play fighting games, from Bandura's social learning theory, it will increase children's tendency to violence. It is something that parents and teachers can do to instruct their children to control themselves and to be an advisor or companion for their children to play games.

When a child is engaged in computer puzzle games, it may help to develop the ability of daily life. For example, help children to learn to value the perseverance to the end in the face of short-term failure, not to be depressed, adhere to the end till win the final victory, and then cultivate children not to be afraid of setbacks.

6.4. Although computer games do not have the educational essence of behavior change, they have the advantage of carrying educational functions

Computer games allow young children to decide and control themselves. After continuous practice, some skills can be used to complete the task and achieve the goal. This kind of situation and mode which provides young children with free learning may be indeed better than some traditional learning ways. The way of learning and growing from the games is the ultimate manifestation of the teaching method of "teaching with pleasure". However, through the use of acoustic-optic technology, will print books and textbooks gradually lose young children's attention? Attention must be paid to the nature of behavior change in the process of teacher-student interaction, such as warm advice and timely feedback in interpersonal interaction, and whether qualitative changes will occur as a result of the intervention of computers.

In the "New Reform of basic Education Curriculum", the content is endowed with more and more rich and diverse connotations, which makes computer game teaching possible in the trend of curriculum content extension. Because children like objects with strong interests and many novel things, teachers can use them appropriately in children's learning according to this characteristic. In the process of computer game teaching,

teachers should highlight the educational significance of computer games themselves and guide children to shape good learning habits and learning methods, that is, computer games should pay attention to ethical and application problems in real life. Just like some scholars believe that human beings can carry out all kinds of practical activities in the virtual world, but if the virtual world lacks certain ethical norms, it will lead to irreparable consequences[16].

The application of games to kindergarten teaching can correspond to the psychological and physiological characteristics of young children. Moreover, computer games can transfer knowledge, skills and life ethics to young children in a relaxing and interesting way, and even make children change from passive learning to active learning, with a small amount of intervention.

6.5. Replacing interpersonal interaction or traditional games with computer games, the physical and mental development of young children will have a negative impact

Generally speaking, children before the age of 7 are thinking in a more abstract way to deal with information, and at the same time, their physiology and psychology are undergoing rapid development and changes. This age is the critical period for the formation of some core skills, during which young children should learn how to interact with others, take care of themselves, acquire language skills, and develop their imagination. If they fail to master these skills at this stage, it will be more difficult for them to master them later in life.

In other words, the main task of children's socialization is to lay the foundation for the development of life and learning in the future, which includes the cultivation of their core personality, the acquisition of language skills, and the norms and values of learning society, which is slightly different from other age socialization tasks. In addition, the way of socialization of young children is mainly achieved through reward and punishment, observation and imitation, and identification. Computer games also reward the players through the design mechanism of the software, understand the clearance skills through observation and imitation, and even have some identification with the game characters, which is socialized to some extent. However, if young children spend a lot of time in front of the computer screen, lack of physical activities as in traditional games, as well as dialogue and personality influence in the process of teacher-student interaction, these artificial computer games will deprive children of most of their key abilities-self-motivation, personality shaping and so on. In such important early years, children's language development and social skills may also be seriously hampered by spending too much time in front of the screen. Therefore, it is necessary for teachers and parents to make proper allocation of computer

activities with other game activities (especially physical activities), so as to facilitate the development of children's multiple abilities.

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