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The impact of spatial design to avoid gadget addiction children

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ABSTRACT

Technology plays an essential role in people's lives. These include smartphones, tablets, iPhones, television and others. In today's cultures, gadgets have become a trend for life and information, not just communication. All information and dailies, including shopping, payment and entertainment, are provided on this device. Users of gadgets are very heterogeneous, from older adults to the young child. Unfortunately, gadgets are also popular among children, bringing both positive and negative impacts for children. Excessive use of technology such as gadgets among children will cause a side effect for them. They spend large amounts of time doing these things while ignoring their body posture, screen brightness, and having a very near screen distance from their eyes, affecting their vision and health. Some parents use the gadget as an easy way to calm down their kids when they are in a tantrum. As a result, significant attention is required from socials and communities where children grow and develop, such as parents, caregivers, educators in early childhood education schools, and society as a whole, to reduce the adverse effects of gadgets on children.

Introduction

Technology and gadgets are now an essential part of our daily lives. It drives children forward and makes mundane tasks more efficient and reproducible. It also has assisted in the creation of the information revolution. With technological developments, devices have evolved to be robust and intelligent that it feels like holding a supercomputer.

Kids nowadays have an obsession with filling their free time with gadgets. When technology makes this possible, it is natural for it to become an expectation. Today's technology and children are undeniable. It seems common to see toddlers holding a gadget because, nowadays, parents use gadgets and electronic devices as entertainment and educational resources f or their children. Children have become addicted to new technological devices, and they use them all the time without worrying about the consequences. Both of these electrical devices have the potential to damage children's frontal cortex, which is the part of the brain that controls execution and impulses.

Furthermore, looking at screens raises dopamine levels, explaining why children become ecstatic when given an electronic device and instantly frustrated when it is taken away. Since electronic devices have developed a similar effect to cocaine, these devices can be referred to as "electronic cocaine" (Whybrow 1998). An average child spends about 8 hours a day watching electronic screens (Centres for Disease Control and Prevention 2018).

When children spend too much time on computers and not enough time with people, it hinders interaction and disrupts the growth of children's natural communication skills. Reported that 29% of the toddlers could easily use the gadgets and the remaining 70% are master by primary school age (Daily Mail 2013). In a family

setup, toddlers often fail to improve their communication with their parents since they surround themselves with inanimate objects.

Others imitate and inherit the ability to talk from television but struggle to socialise with others. Children who play many video games on their smartphones or spend most of their time online have a lower ability to focus than children who use gadgets sparingly.

Parents should know that an addiction to smart gadgets is terrible for their children. Parents should treat this issue in the early stage of children. Too much use of the gadget can influence the vision problem over the long term. Besides, children who spend approximately 8 hours a day on gadgets are more likely to develop myopia.

This research investigates how indoor activity can impact kids' sensory and social development and distracted the kids from using and get addicted to gadgets. This research also will study how texture and shapes can have an impact on kids' development. This research investigates the effects of spatial design on children to distract them from not using gadgets.

Literature review

Based on research Children using Learning Gadget Addiction, Can Traditional Games With "Berlian" Method as a Solution Increase the Social Skill? I. Iswinarti and Suminar (2019); R. F. Iswinarti (2019) to examine whether traditional games can improve children's social skills.

The traditional game consists of four games: Batu bata, Bentengan, Cublak-cublak Suweng, and Tokyo. Digital games have a negative impact on children (Nur Aisyah 2017).

According to the findings, traditional children's games can help children develop teamwork, adapt, communicate positively, regulate themselves, build empathy for friends, f ollow the rules, and value others. The research has been done at primary school. Based on the results of data analysis obtained by intervention in the field, the researcher can conclude that training with the BERLIAN method showed an increase in the score of social skills in the trainees between before and after obtaining treatment. Based on the research title Character Building in Early Childhood Through Traditional Games (Nur Aisyah 2017), traditional games could positively impact developing children's emotional and social skills (Nur Aisyah 2017) to the modern game through technology. It will affect children the other way around. That research aims to study children character building by traditional games.

Digital games have the potential to create a tense environment as well as intense violence. Computer games unintentionally shape children always to want to win and be frustrated or unable to accept defeat. The researcher said that school or parents should provide a proper place for children to play the traditional game to get the Impact rather than get affected by gadgets.

Based on the following research Avoiding Gadget Addiction in Children by Helping Children to Develop Talents and Interests (Zati et al. 2019). This study aims to avoid gadget addiction in children by developing their talents. Research shows that the lack of mutual interaction with other peoples and social activities is a direct consequence of social isolation. Gadgets make children spend most of their time playing games and living in their world rather than communicating and socialising with family or friends. It causes anti-social problems. Because of the solitary nature of most computer activities, concerns have been raised that children might form "electronic friendships" with the machine instead of friendships with their peers, hindering the development of interpersonal skills (Subrahmanyam et al. 2001). Parents have to provide positive activities for children, such as playing football or chess, drawing, colouring, reading books, playing the piano or sending them to play indoor activities.

As a result, parents should have the required tools, such as books to read, board games, art supplies, and sports equipment, so that their children have various activities to choose from during their leisure time. One of the reasons a child is playing with a gadget is that there is no fun activity to play with friends. In order for this to happen, parents need to ask children to play with their peers, inviting friends to play at home or to go to school for their friends. The children have a new activity with many friends and can ignore about the gadget. Hence, parents have an essential role to help children to divert children's attention from gadgets and direct them to do more positive activities. The most positive way is by assisting the children in discovering and gaining their talents and interest.

That is why parents should give children the freedom to choose, to play and to do their stuff. As long as it is still reasonable and has a positive impact, parents have to support it. Do not prohibit

children from doing something which can develop the talents of children.

However, suppose the activity harms the child. In that case, parents can provide a reasonable explanation and understanding so as not to continue this. Moreover, the majority of teachers know and understand the hidden talents of children as much as the time a child spends in a school environment. In addition, the class teacher also understands the weaknesses and strengths of the child's skills and talents.

From this research, A Thing of Beauty: Steering Behavior in an Interactive Playground (Moreno et al. 2013), When developing games that seek to encourage a specific type of behaviour, it's evident that controlling player behaviour is essential. This activity can be combined with the advent of accurate and inexpensive sensors, enabling immersive playgrounds to track and analyse player actions automatically. In immersive playgrounds, behaviour steering is mainly concerned with in-game changes in playing behaviour, such as gadget addiction. Within this scope, researchers have established various behaviour-steering techniques that have historically been used in embodied play studies. In the first, players are forced to take specific actions to maintain control over the game. They used the Parés et al. game as a result of their analysis. To make their interactive fountain emit a stream of water, players must stand in a ring. Players will not be able to play the game as planned if they do not take these steps. In the second approach, the game forces players to reward them based on game outcomes. Giving players powerups or incentives for taking specific actions in the game is a common strategy. The following method is to play the Moreno et al. (2013). game. During tag games, they require players to catch a powerup item that makes it easier for them to stop being tagged. This technique sometimes provides a good benefit feedback loop: players who are good at the game are often better at collecting the items, will improves their chance of doing well in the game, which encourages them to keep collecting items. A compensation scheme like this is inextricably linked to a game's primary game mechanic and win or loss state.

From this research, A Thing of Beauty: Steering Behavior in an Interactive Playground (Poppe et al. 2014), When developing games that seek to encourage a specific type of behaviour, it's evident that controlling player behaviour is essential. This activity can be combined with the advent of accurate and inexpensive sensors, enabling immersive playgrounds to track and analyse player actions automatically. In immersive playgrounds, behaviour steering is mainly concerned with in-game changes in playing behaviour, such as gadget addiction. Within this scope, researchers have established various behaviour-steering techniques that have historically been used in embodied play studies. In the first, players are forced to take specific actions to maintain control over the game. They used the Parés et al. game as a result of their analysis. To make their interactive fountain emit a stream of water, players must stand in a ring. Players will not be able to play the game as planned if they do not take these steps. In the second approach, the game forces players to reward them based on game outcomes. Giving players powerups or incentives for taking specific actions in the game is a common strategy. The following method is to play the Van Delden et al. game. During tag games, they require players to catch a powerup item that makes it easier for them to stop being tagged. This technique sometimes provides a good benefit feedback loop: players who are good at the game are often better at collecting the items, will improves their chance of doing well in the game, which encourages them to keep collecting items. A compensation scheme like this is inextricably linked to a game's primary game mechanic and win or loss state.

The researcher believes that these two strategies, needing and insisting, can have a strong influence on player behaviour. In the current research, they follow and investigate a third technique for directing activity in interactive playgrounds, one in which players are enticed to act rather than forced to do so by the game. This strategy's definition is similar to the concept of nudging. Nudges are a technique for changing conduct that is not linked to the us ers' economic benefits and does not confuse choices. In a game-like environment, they note that the other two strategies often depend on providing players with "in-game economic incentives."

In other words, the needing and insisting tactics use incentives or answers relevant to the primary game outcome, such as powerups, shields, extra lives, or achieving the primary target. In terms of game design, nudges are more analogous to the addition of secondary objectives and incentives, similar to how achievements function.

An attractive way to direct actions during play can be seen as an alternative to the more commonly used practical incentives. Activities in this engaging way of steering result in non-functional incentives that are not closely related to the core game goals. As an example of how this technique could be used, researchers looked at the proxemics of children playing a game in an Interactive Tag Playground. They discovered a substantial impact on proxemics in the desired direction: runners moved closer to the tagger on average, and runners moved closer to the tagger more frequently. As an example of a more appealing way of directing, this research showed that this intervention succeeded in our immersive playground. It is easier to evaluate steering with adaptive interventions since these interventions do not have to be closely related to main game rules but can be purely aesthetic. These games should make it easier to move these interventions to other playgrounds and allow us to turn them on and off as needed. This alternative steering method can be a lovely and valuable way to guide play activity in interactive playgrounds.

Method

The qualitative method by John Creswell has been using to study the Impact of spatial design to avoid gadget addiction among children. Creswell and Poth (2017) noted that qualitative research is the approach to data collection, analysis, and report writing. The data collection will extend and draws from a secondary data source such as a literature review and case study. The researcher will spend the time reading and analysing the secondary data and come out with their idea with the support of facts from article, newspaper, journalist interview or books.

Case study

Based on research Impact of Space and Color in The Physical Environment on Preschool Children's Cooperative Behavior wrote by Read, Sugawara, and Brandt (1999) was to investigate the impact of selected characteristics of the physical environment on preschool children's cooperative behaviour. Design elements such as lines, colours, shape, space, texture, typography, scales, dominance and emphasis, balance, and harmony can impact kids' cooperative behaviour and development.

Differentiation of ceiling height and wall colour was one of the physical environment characteristics. In physical environments with differentiated spaces, the researcher predicted that preschool children exhibit higher cooperative behaviour levels than in undifferentiated spaces. These results showed that when participants were in physical environments with different ceiling heights or wall colours, their cooperative behaviour ratings were higher than when they were in physical environments with the same ceiling height and wall colour. Ceiling height and wall colour were either undifferentiated or distinct. The researcher used a quantitative methodology to conclude this study. The researcher discovered that when participants were in physical environments with either differentiated ceiling height or differentiated wall colour, their cooperative behaviour scores were higher than when they were in physical environments with both undifferentiated and differentiated ceiling height and wall colour.

Based on Development of Children's Games with Interactive Concepts Playground (Baskoro and DRSAS 2015). Children's play is significant in their lives. It aids in their cognitive, social, and physical growth and provides entertaining and satisfying activities in and of itself. Like every other area of human endeavour, int eractive technology has enormous potential for shaping and improving play practices. This chapter looks at interactive playgrounds, including their aims and design considerations and how they can be made more engaging. By adopting the style of an interactive playground, this study aims to create a playground with an essential feature for a child's growth.

When the following three properties are taken into account in their design, the added use of technology in the playground allows for the enrichment of play: (1) understanding of the context, (2) personalisation, and (3) adaptability (Poppe et al. 2014). Context-awareness refers to recognising the situational context, which includes the players' positions and attitudes and their interactions with other players and the environment. Sensors and their subsequent processing are used to gain context-awareness. The tailoring and design of the play environment for the players is referred to as personalisation.

When controlling the game mechanics, the host should consider the players' skills, experience, and preferences. Furthermore, children's curiosity can be sparked by the use of

input adapted to their preferences. Finally, adaptability refers to how the game mechanics are adjusted to the current state of play and is closely linked to the playground's goals.

Room-sized interactive playgrounds, such as classrooms, corridors, or alleys, may be considered. This space size is small enough to facilitate social interactions while still being big enough to encourage physical activity. For the promotion and growth of social and physical skills, this interplay between face-to-face experiences and the prospect of physically active play is critical. Furthermore, these spaces can be outfitted with lights and sounds without relying on individual input, such as headphones and mobile screens. To help to play over a distance, some researchers have focused on remote, mediated interaction. For instance, Mueller et al. (2003) introduced playing soccer via a large interactive wall, with the remote player shown as a shadow to increase the feeling of being co-located.

Every children's activity must provide sensory experiences that inform and engage children of all abilities. According to studies, children who play outside are usually healthier, happier, and more likely to enjoy their surroundings (Baskoro and DRSAS 2015). A green and natural environment and sunlight and fresh air can help alleviate the symptoms of attention deficit hyperactivity disorder. Aside from enhancing academic performance, develop motor skills, strength, and coordination in children who are still in school. Interactive playgrounds combine the benefits of traditional playgrounds with technical innovations to create a unique experience. They are designed to enhance children's senses, learn, and adapt to their behaviour to provide rich and engaging game experiences. This playground facility, which can be indoors or outdoors, allows a wide area to be occupied by many children.

Furthermore, as a safety requirement for the children, the supporting equipment for this play facility is strong and durable. This interactive playground is typically found in schools or special children's playgrounds. Making this game attractive takes only a little imagination when playing. Children can explore the game with the help of appropriate technology. The existence of an interactive playground can help children overcome their gadget addiction. As a result, children would be more productive rather than wasting time with gadgets.

Result and discussion

Based on the literature review and case study that have been analysed, researcher notice that in the growth and development of children, they need so much help from their parents. The family is the basic foundation for the child to shape his personality, shape his mindset, and solve problems that are faced, even the school environment, the community environment and his family. However, parents are the prominent educators and especially for children. Parental control is vital according to the proportion of children and not the proportion of adults because the child does not want to be restrained. But parents nowadays are busy due to their life commitments. Hence, they can send their kids to a suitable place to fulfil their free time, rather than just using gadgets at home. One in three kids today have never climbed a tree, 7 out of 10 kids want to play freely more, and 6 in 10 kids enjoy more playtime (The Courier Mail 2016). Besides parents, the institutional sector also has to play its roles. They have to improvise their learning systems by following the trend. Kids nowadays are different from kids in the previous era.

Children's interaction design needs to evolve as well. Playing (games or activities) is essential as long as the participants have a positive experience. Playgrounds play an indispensable role in activities that are important to public health, such as social engagement and physical activity, by providing a safe environment for children and young people to play.

For many years, traditional playgrounds have been very popular in this region. On the other hand, traditional playgrounds have become obsolete and out of style in our new technological society. As a result, today's children and teenagers tend to stay at home and use gadgets and digital devices that have become widely accessible, such as television, computer games and videogame consoles, chatting apps, the Internet, and so on. This gadget addiction seems to be one of the reasons for the lack of physical activity.

Interactive playgrounds are designed to provide a fun and engaging game experience but can support other goals at the same time as well. These goals encourage positive, healthy behaviour for kids to develop and discourages them from negative activity such as addiction to gadgets. In addition, the automatic sensing of behaviour allows these playgrounds to be used as

diagnostic tools to identify developmental problems in children at an early stage.

Conclusion

Nowadays, gadgets addiction become a severe problem. It needs to be solved as soon as possible to avoid further negative effect in the future. Parents have an essential role to help children to divert children's attention from gadgets and direct them to do more positive activities. The easiest way to be implemented during this era is by exposing the children to the interactive playground. The traditional playground is not so valid anymore since it is so dull among children. Children nowadays are no attracted anymore to go to the old-school playground. Besides, the traditional playground is located outdoor. The place is not safe anymore since there is a high rate of crime.

Besides parents, private institutional also can implement interactive playground inside their place. So, the safety of the children will be the priority, and parents don't have to worry about their children. Once children feel safe and happy with the interactive playground, they will be busier and more joyful to spend their time rather than play with gadgets all day long. Exposing children to the interactive playground is also an effective way for parents to prevent gadget overuse by children. It can be a solution to prevent children from the negative impact of gadgets.

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Author(s) contribution

Syafiqah Binti Abd Samad contribute to the research concepts preparation and literature reviews, data analysis, of article drafts preparation and validation.

A. Syarmila Hany Haron contributed to the research concepts preparation, methodologies, investigations, data analysis, visualization, articles drafting and revisions.