

# Gadgets and Their Impact on Child Development <sup>†</sup>

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**Abstract:** Having gadgets for children can be beneficial, as children can be creative through mobile games or with a stimulus for their senses and imagination through some creative applications. However, the overuse of gadgets can make the children rely on them, and it also can lead to addiction if they use them without proper guidance from their parents. This paper aims to visualize the use of gadgets among children on their acceptance and the impacts on their development. A total of fifteen informants were selected among children, caretakers, parents, and teachers via face-to-face interviews. The findings show that the children accept the use of gadgets due to their usefulness and easiness. However, there were some negative impacts of gadget usage in terms of social life, health, speech delay, and children's cognitive skills, which also could affect their education in the long term.

**Keywords:** the gadget; child development

## 1. Introduction

Children nowadays or those who can be referred to as Generation Z, are born during the digital world and can also be described as Digital Natives [1]. Members of Generation Z are more tech savvy, and they are the ones who are going to explore new applications as if they are part of their lives. The author stated that members of Generation Z could not live a day without gadgets, as if that is one of their basic needs to get through the day. As time goes by, Generation Alpha has the potential to be occupied with gadgets since they are being influenced by the immersion of technology since birth. Hence, gadgets have been used by parents as a medium to control their children and get them to behave well in public. There are few factors that would lead to an excessive usage of gadgets such as the place where the children are growing up from either urban or rural areas. Parents always established the idea of having gadgets for their children as an obligation, parallel with modern life. However, parents forget about their responsibility to weigh the pros and cons of giving gadgets to their children as it can be harmful or beneficial depending on how they use them. Having gadgets for children can be beneficial as the children can be creative through mobile games or with a stimulus for their senses and imagination through some creative applications [2]. However, the overuse of gadgets can make their children rely on them and it also can lead to addiction as if they use them without proper guidance from the parents.

## 2. Past Studies on Related Subjects

This part begins with the overview of gadget usage among children, followed by discussion on effects of technology used among children.

### 2.1. Issue of Gadget Use among Children

Gadget usage among children is worrisome because the Malaysian Communications and Multimedia Commission (MCMC) found that 83.2 percent of Internet users are children between the ages of 5 to 17 years old [3]. To illustrate, 93 percent of Internet users are children using smartphones to access WhatsApp, Telegram, and any other applications



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that have a communication element. Furthermore, studies found that 75 percent of children do not get enough sleep in their daily activities, which would affect their development due to the impact of the use of gadgets [4]. In addition, findings from the Michael Cohen Group, which specializes in children's education, stated that 60 percent of parents that has a child aged 12 years old are also occupied with gadgets. To elaborate, 30 percent of them are using gadgets concurrently, while 36 percent of them did not know the long-term implication of using gadgets too much [5]. Referring to the scenario, this study aims to clarify the impact of gadgets on children's development and to identify parents' initiatives in controlling their children's usage of gadgets.

### *2.2. Technology and the Use of Gadgets among Children*

Technology is unavoidable, and everyone must adapt to it. Technology is now the main tool in not only administration but also in education, the health sector, and even trade and businesses. In the 21st century, gadgets and the Internet are not taboo in our society. The behavior relating to the use of gadgets among children can be explained through several theories, such as the Technology Acceptance Model (TAM) and the Theory of Reasoned Action (TRA). In TAM, two elements predict the acceptance of technology, which are perceived ease of use (PEOU) and perceived usefulness (PU) [6]. PEOU is the ratio of individuals who believe that using technology will make it easy for them to do any task. PU is a comparison of individuals who believe that using technology can increase their productivity. These two elements reflect the ideas in the TRA that explain the behavior of using technology. This theory explained that a person's attitude and subjective norms influenced the intensity of the behavior of using technology. All of these lead to the level of acceptance or usage regarding the human behavior of using technology in a certain context.

Many studies related to technology focus on the use of a system approach in dealing with daily work, but few studies touch on how the use of devices affects child development. The first study, which was conducted by the original scholar for this model, Davis featured lab experiments with emails and graphics and identified that with these technologies, work can be done very quickly, easily, and effectively and lead to high job performance [7]. In addition, emails and graphics are also easy to learn, controllable, flexible, and understandable [8]. A lab experiment with a word processor, which was conducted by Davis, Bagozzi, Warshaw, and Venkatesh, found that using the processor improved performance and enhanced the effectiveness of completing the task given [9,10]. The process of learning to operate the processor is also easy and allows an individual to become skillful in handling the system. Heijden in his study on the use of website technology, identified that the information on sites is very interesting and adds value to the performance [11]. It is easy to navigate around sites, and users can obtain information very quickly. The system is also easy to learn, flexible, clear, and understandable. Another study, which involved voicemail, also identified that this technology is very important when it comes to job performance and effective decision-making. It is easy to get voice mails to do what individuals want them to do, and they are very comfortable to use. To the best of the author's knowledge, no studies in which children's use of gadgets was utilized to measure PU and PEOU have been conducted, and all the previous studies discussed the usefulness and ease of the technology, but not the impact of gadget use on children.

### *2.3. The Future of Gadgets for Children*

Chiu [12] found that gadgets are most frequently used by people between 20 and 25 years old. However, as technology advances, the use of electronic gadgets by children is becoming a more important research topic, as some parents are very open with their children regarding the usage of gadgets. There are some benefits of gadget usage among children since technically it can improve their education because there is infinite information at their fingertips. However, gadget dependency can also arise when parents start to introduce gadgets to their children due to the rapid development of technology. Children use gadgets to do several things, such as listening to songs, online chatting, video gaming,

and browsing through the Internet. In other words, children rely on gadgets to be the source of their entertainment, use them to explore information on the Internet, and spend most of their time on gadgets [13]. Therefore, if the children are left without the supervision of any adults, they tend to self-neglect, causing unwanted consequences to their vision and health.

During the Covid-19 lockdown, the usage of gadgets among children has increased [14]. Children spend hours on gadgets, watching YouTube videos and movies, listening to music, and playing games. Hence, when children use gadgets for a long period of time, they tend to be aggressive, furious, and disrespectful most of the time because they are attached to the gadgets since they did not know what else to do while being in lockdown. Nor Azah Abdul Aziz stated that children as young as one year old are being surrounded by gadgets that become their incentive to behave well in public [15]. Parents are introducing their children to gadgets, and because children as young as one year old are full of curiosity, as time goes by, they get addicted. According to Naquiah Nahar, children in Malaysia spend 19 h a week on gadgets, which is abnormal for children without commitments such as working from home [16]. In Korea, as stated by Joo and Sang, most of the Korean people use gadgets because of the features provided by the developers, and they feel that the applications in the gadgets suit their needs [17]. This leads to more gadget addiction.

#### *2.4. The Impacts of Excessive Usage of Gadgets among Children*

The excessive usage of gadgets among children may affect their social skills. For example, they might become introverted and prefer being alone instead of talking to their friends. Moreover, when gadgets become part of their routine, it might also affect their health, causing joint pain, back pain, and eyestrain. Gadgets also might affect children's speech development if they just focus on videos rather than communicating with their peers verbally. On a side note, the excessive usage of gadgets could also affect the way children learn, write, and read, depending on their cognitive skills. When children are occupied with gadgets, they are reluctant to learn and to understand basic knowledge in school, which in turn can affect their cognitive skills. Chiu agrees that the effects of gadget addiction can lead to emotional stress and poor international relationships, as people who are addicted to gadgets tend to be very passive and alienated from their surroundings. Besides, Andreesen et al. also discussed that those who are addicted to gadgets, especially when it comes to video games, have increased stress and self-perception problems [18]. If they win the game, then they will continue to play, but if they lose, they become angry and rebellious, which affects their communication with other people. Jap said that those who always spend their time on gadgets suffer from a lack of sleep, escapism, mood disorders, aggression, physical injuries, and addiction [19]. Commonly, the effects can be categorized into social, health, communication, and knowledge effects.

##### *2.4.1. Effects on Socialization*

According to Mildayani Suhana, the excessive usage of gadgets leads children to become anti-social and lack emotional management, so they tend to have tantrums in public or in their own home [20]. Hence, they may become introverted, have lower self-esteem, and keep away from their peers. Even during family gatherings, they keep themselves occupied with gadgets. The researcher also emphasized the importance of parents managing their children's behavior through limiting the usage of gadgets. A child who has unrestricted screen time is more likely to have trouble communicating with their peers and even family [21]. This is because when they are too occupied with gadgets, they have a limited vocabulary; hence, it may lead to stuttering because they did not practice speaking in real life with actual people [22].

##### *2.4.2. Effects on Health*

Moreover, gadget dependency among children can cause hazardous health problems. The most obvious effect is that children who depend on gadgets tend to feel lazy and

weak and suffer malnutrition compared to those who do not. This is because children tend to sacrifice necessities such as sleep and food just to have their alone time playing with gadgets. As time goes by, this can affect their sleeping habits to the point where they only sleep for 3–4 h a day and can lead to insomnia and headaches. Consequently, children who do not undergo proper physical development are more prone to diseases involving the eyes, head, bones, joints, or back, in which they will experience tiredness and feel weak. Children who are too focused on their gadgets tend to suffer from sleep deprivation due to their addiction; hence, without them, they cannot go through their days like normal people. Moreover, children who are occupied with gadgets are more likely to have difficulty concentrating, which could affect their education while they are learning in school [23]. In addition, using gadgets can cause eye problems, and the blue light might negatively affect the brain and body.

#### 2.4.3. Effects on Speech Development

A child should be able to speak starting from as young as one year old, even if it is just babbling with the help of their parents. A child that is occupied with gadgets tends to respond slowly to any questions given, as if they cannot digest the question quickly. This also may affect their vocabulary, as they only know a few words in conjunction with repetitive words in cartoons and video games. Children who spend most of their time on electronic gadgets such as smartphones, tablets, and any other handheld devices are most likely to have delays in expressive speech. To elaborate, a study conducted by a pediatrician in Toronto, Canada found that children who play with gadgets for an additional 30 min each time could face the risk of speech delay by 49%. To adduce, when a child cannot express their needs verbally, they tend to express their frustration through movement, so they tend to get violent. This can be seen when a parent refuses to give a gadget to them, as they will throw a tantrum even though it is in public, which shows that a child who is too dependent on gadgets has no control over their emotions.

#### 2.4.4. Effects on Cognitive Skills

Cognitive skills are important for children to survive in education. If a child lacks in any cognitive skills, they will not be able to learn along with their peers. Cognitive skills can be referred to as how a child learns, writes, and gathers information. Children who are too dependent on gadgets are facing cognitive delays, as they do not communicate with their parents as often as needed [24]. A child needs their parents to practice communication skills, not gadgets; hence, this can affect their cognitive development, as their communication skills become stunted. Moreover, a child who depends on gadgets might face anxiety in which they worry about future events because they are not well-prepared and they may experience increased impulsivity [25]. The excessive use of gadgets may also lead to tantrums, fast heart rate, and shakiness. When children become too occupied with gadgets, they often cannot focus or multitask, which can cause lack of proactivity.

### 3. Methodology

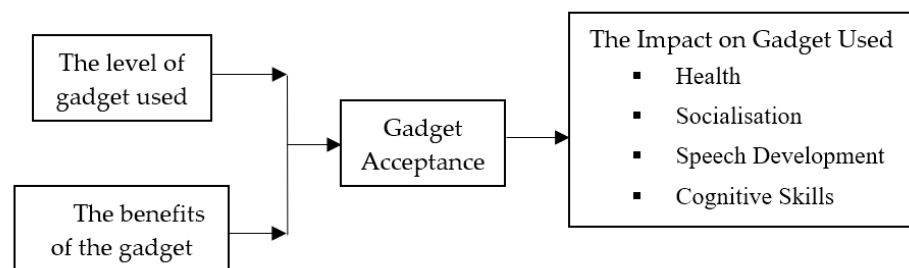
The purpose of this research is to study the issue of gadget dependency among children as well as the impact of the excessive usage of gadgets and whether it gives a positive or negative effect towards children's development. Hence, a qualitative method was used to achieve the objectives of this study. Informants were selected and interviewed through an open-ended questions session regarding the usage of gadgets among their children or children whom they take care of. To finalize the number of informants, the saturation points were identified where the trend of responses received was almost similar, so a total of fifteen informants were selected for this study. The informants consist of people who are the parents, caretakers, and teachers of children aged 10 to 14 years old who are being exposed to gadgets and live in the Seremban 3 area. To examine the responses of the informants, this study followed the suggestions made by Creswell and Poth on the data collecting techniques for interviews [26]. The data was analyzed using thematic analysis,

in which the initial step is to read the interview answers from respondents one by one. Before developing a code list, the researchers went through the text parts in the interview and the answer text from respondents. Then, texts in which respondents agreed with a code were circled. Lastly, the themes were developed. From the findings, the researchers developed the themes into levels of use, the benefits, and the impacts and finally provided the subthemes, as stated in Table 1 and Figure 1.

**Table 1.** The use and the impacts on gadget among the children.

Informants	The Use of Gadget *	The Benefits	The Impacts
I1 (caretaker)	Useful to get info, help to learn	Flexible	Speech delay
I2 (caretaker)	Can control playing time of the children	Controllable	Social, physical, and mental growth problem
I3 (caretaker)	Easy to monitor their study	Controllable and easy	Not being able to socialize with peers
I4 (teacher)	Easy for T&L, easy to explain	Easy to navigate the lesson plan	Attention disorder, slow cognitive development
I5 (teacher)	Help better understanding	Clear and understandable	Hinder to have high thinking skills
I6 (teacher)	Fast in sharing the info and pass the work	Easy to be used	Lazy to learns, write, and gather info
I7 (parents)	Speed up learning process	Easy to remember on how to perform the task given	Throw tantrums when separated from gadgets
I8 (parents)	Bait to control children’s behavior	No cost to get info	Lazy, weak and suffer malnutrition
I9 (parents)	Can control the children seen they are close to them	Easy to monitor	Keep themselves away from peoples
I10 (parents)	Easy to learn and very useful to get info	Comfortable for children	Rebellious
I11 (children)	Helpful to search info, easy to study, for leisure time	Easy to use, get info quick	Lead to insomnia and headache
I12 (children)	Easy to expose to new games or software	Not complicated and comfortable	Do not want to socialize with others
I13 (children)	Easy to do homework	Clear instruction and understandable	Has sleep deprivation
I14 (children)	Can explore more information and help to improve my quality of work	Easy to learn on how to be used or play with the gadgets	Difficult to concentrate to one thing
I15 (children)	Increase patience to learn something new via the searching	Flexible and easy to interact with	Cause addition, lessened the curiosity

\* The gadget refers to handphones, tablets, laptops and personal computers.



**Figure 1.** The framework on the gadget acceptance and its impact.

**4. Results**

Due to the pandemic, the whole system changed, including education and social life. The students from all levels (primary, secondary, and tertiary) who began studying online and their parents who began working from home used devices (gadgets such as handphone, tablet, laptop and personal computer) to perform their tasks. At this time, no one could resist this change. The participants’ feedback showed that gadgets help them so much when it comes to their daily activities. However, most of them were aware that the use of gadgets can have a negative impact on children’s development. The parents,

teachers and caretakers noticed that children tended to behave aggressively if they could not play with gadgets in a day.

Our findings show that children use gadgets as their main tools not only for studying but also for leisure. They believe that these gadgets benefit them greatly, especially during the pandemic, which increased their level of gadget acceptance and caused gadgets to become important items that are always by their sides. Losing or being away from their devices can make children lose their direction. However, the response from the informants also agreed that the overuse of devices can lead to several negative implications in terms of health, social life, speech development, and cognitive skills.

It has been proven that technology has a significant impact on social life. The use of technology helps facilitate most matters, including not only administration but also education, especially during the pandemic. This was shown that most students, especially children, used gadgets for learning. The technology is easy to use, and they can explore more information in just a second. The technology is also flexible, controllable, comfortable, and understandable. However, one must consider the consequences of technology addiction when it begins to harm children's health, leading to text claw, an unhealthy level of radiation, phantom vibration syndrome, speech delay, and the poor development of cognitive skills. These could be temporary, but if parents or those who are close to children just ignore these signs, they may cause permanent effects and ruin their lives.

## 5. Conclusions

Technology and gadgets make life easy. This study found the concentration and impact of gadgets used among children. Basically, children use gadgets for learning activities and entertainment because they are useful and convenient. However, the impacts of gadget usage must be considered. Even though children use gadgets for online learning or to gather information, the negative impacts still apply, especially in cases of continuous use. These impacts can be seen in terms of health, social, physical, and mental development as well as cognitive skills. It is very important for parents, caretakers, and even teacher to reduce gadget dependency among children by limiting their screen time or enrolling them in extra classes so they can do other social activities. This can enhance their cognitive, affective, and psychomotor domains. At the same time, it is the responsibility of the parents and guardians who are very close to them to monitor the children to ensure they are not too occupied with gadgets. It is time for the government to re-plan and re-frame the policies related to the issue of gadget dependency among children by having a focused discussion with related ministries such as the Ministry of Education and the Ministry of Women, Family, and Community.

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