Gadget Addictions:
Impact on Students' Wellbeing among the Secondary School Students

Rajendran Suparamanin

Project Paper Submitted in Partial Fulfillment of the Requirements
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DECLARATION

I hereby declare that the case study is based on my original work except for quotations and citations that have been duly acknowledged. I also declare it has not been previously or concurrently submitted for any other degree at Universiti Tun Abdul Razak (UNIRAZAK) or other institution.

Signature :

Name :

Date :

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Gadget Additions:
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By
Rajendran Suparamanin

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The electronic gadget and peripherals had become part of everyone's life. A simple transaction with current digital technology had pushed everyone to adopt gadget as unavoidable tool in our daily life. The advancement of digital world is one of the main factors which requires us to use gadget and other new big factor forcing people and students to use gadgets at maximum is the COVID-19 pandemics. The COVID-19 pandemic had contributed to movement control order (MCO) where this had forced people use gadgets at high rate for education and works. The present-day study was carried put to find out the secondary school students wellbeing due to high usage of gadgets. **Method**: 200 students selected as sample size. Students from age of 13 to 16 from Klang Valley secondary school targeted as respondents. A questionnaire survey was conducted among these students. The questionnaire assessed the overzealous use of electronic gadgets and their effects on student's wellbeing. **Results**: The analysis from data shows 41.5% students uses the gadgets for more than 6 hours in daily basis and 27.0% of students spending 2 to 4 hours in a day, this had contributed effects on their wellbeing. The over usage of gadgets had contributed the students facing stress, depression, anxiety, and relationship issues. **Conclusion:** It is confirmed the over usage and over exposure of gadgets usage had affected wellbeing of students badly.

Keywords: gadgets, wellbeing, longer hours

CHAPTER 1
INTRODUCTION

1.0 Overview

Chapter one provides overview of gadget usage in general as well the impact of the gadget to the population especially the younger generation. Introduction chapter also comprises of the different scopes of gadget usage such as time, purpose and types of gadgets. As such, readers' knowledge about impact of gadget will be deepened towards the impact to the wellbeing of younger generation. Through the compilation of gadget uses and gadget impacts, problem statement segment is produced to learn about the existing gap in understanding impact of gadget addiction towards student population's wellbeing. Readers will be communicated the way the current study will fill the gap in understanding gadget addition and students' wellbeing.

1.1 Background of the Study

Gadget usage had become more and more important to stay aligned with the information technology development in all the places and to fulfil the requirement of working and studying remotely (Looi, Wong, & Glahn, 2019). Many organizations are no longer operating with the use of personal computers and laptops alone but incorporated gadgets to perform efficiently. Most recently, educational institutes began intensive gadget application in teaching and learning due to the shift from face-to-face to online learning (Altınay, 2020).

Therefore, students' exposure to gadgets had increased since 2020. Therefore, it is important to understand the usage of gadget among students to discover whether the usage led to addiction and the way the wellbeing of students is impacted. The analysis of gadget uses has potential to enlighten parents, teachers and students to better manage students' gadget time and rectify the existing wellbeing issues among the students (Hunter, 2015). Thus, the study will help in the realization of better monitoring when gadgets are introduced to students and guide students to use gadgets in a way to balance their lifestyle.

Gadgets presently used by students are tablets, smartphone, laptops, gaming tools and personal computers. The trend of gadget usage by students started to increase when teaching and learning conducted via online method due to the pandemic COVID-19. Prior to the online learning, students had limited exposure to gadgets as the average time spent on school and extra-curricular activities are about 8 to 9 hours per day. However, the movement control order decreased the time students spend outside their homes (Khan, Ali, Umair, & Sajid, 2017).

Therefore, the gadget usage time increased with more exposure to gadgets when online classes attended by using tablets and smartphones. Besides using the gadgets to attend classes, homework and assignments too required gadget. The average time students spend on gadgets had become 8 to 9 hours when they needed to study from home. Convenient of having internet coverage on 24/7 basis intensified the gadget usage students able to do many other things after their classes. This includes playing online games, communicating with their social network and information search (Heyes, 2018).

Using gadgets made students tasks easier and this became one of the reasons gadget usages increased and caused addiction to some. A close example of replacing conventional tasks with gadget is using the dictionary. Numbers of students referring to single source or dual dictionaries decreased with the feature of google translate (Watters, 2021). Students find it convenient to answer worksheets using gadget because they can skip paper and pencil method that requires more effort and dedication from them (Pal, Cuong, & Nehru, 2020).

Various designs of gadgets available in the market provided wider choice for students to own their personal gadgets. Manufacturers of gadgets started to produce gadgets that can fulfil lower income families as well. Therefore, affordability is no longer obstacle for students to own gadgets. Table 1.1 below shows the statistics of gadget purchase in Malaysia for the past 3 years. The summary shows variation in the gadgets that can reach wider customer segments (Ruthmann & Mantie, 2017).

Table 1.1: Household Gadgets in Malaysia, 2019-2021

Gadgets (millions)	2019	2020	2021
Smartphones	21.76	22.38	23.14
Laptops	42.5	54.2	56.7
Tablets	34.5	37.8	45.3

(DOSM, 2021)

This implies most of the students' interaction occurs virtually such as exchanging texts or other forms of virtual communication. This created a gap in the communication skill among the students because they depend too much on the technological assistance. Therefore, without the gadget usage students become lost and unable to perform certain activities that they performed prior to gadget addiction (Marpaung & Hum, 2021).

Students become more affectionate towards gadget due to the innovative entertainment elements available through these gadgets. For example, access to television is no longer necessary when students have the option of watching movies and shows on their gadgets. Besides movies, students have plenty of entertainment via games that are highly interactive and able to keep them focused with the gadgets for a very long time. Students get to do their favourite activities by sitting at one place which results in increase duration of gadget uses.

Gadgets provided a relief in the time of movement control order for the younger generation because gadgets offer alternative ways for students to pass each day. The gadget usage among the youngsters is also appeared to be a relief for parents because it becomes easier for monitoring. Due to the intense gadget interest, students rarely leave their places to engage in other activities. However, the adverse effect of gadget usage is worth to be analysed in order to minimise consequences from the adverse effects.

Lack of control and balancing lead to gadget addiction whereby students tend to neglect the initial purpose of using gadget and only engaged in entertainment. Students' loss track of their main responsibilities and fall behind (Couch & Towne, 2018). Therefore, this study will focus on the impact of gadget addiction towards students' wellbeing among secondary school students in Klang Valley.

1.2 Problem Statement

Analysing the impact of gadget addiction among students needs to be done by understanding how much time students spending in gadgets. This type of analysis will indicate whether the time spent using gadget is appropriate per the need or too much time is wasted on gadgets. Studying the gadget usage in terms of time spent will reflect the time management capability of the students. Therefore, better guidance can be provided to help the students to balance their day-to-day activities (Nurhalima Tambunan, 2020).

However, most of the studies on the impact of gadget among students are focused on the accommodation provided by these gadgets towards students' learning experience. The present studies on gadget usage among the students also highlight the ease of conducting online classes due to the students' competency in using gadgets and their information technology knowledge.

Another important aspect to be studied is the different purposes gadgets are used by the students because this information will indicate if there is a gadget addiction or not. Research must be performed to analyse the features in the gadgets used by the students in order to conclude whether gadget usage bring benefit or misused by the students. This is because most of the student population own their personal gadget allowing them complete control over their gadgets. It is therefore becoming their sole decision to segregate gadget usage as per their convenience.

Comprehensive research is needed to summarise how students segregate their gadget usage time before concluding on the gadget addiction (Borisova, Vasbieva, Frolova, & Merzlikina, 2016). Nevertheless, there are no in-depth studies available in literature that shows different ways or purposes gadgets used by the student population. The existing studies are more focused on the usability of apps especially learning apps and learning resources available on the gadgets. Therefore, available research data is insufficient to decide on the gadget addiction condition among students.

Study on gadget addiction needs to focus on types of gadgets because students become more attached to gadgets that are highly innovative and entertaining. This could be the reason for becoming addicted in using gadgets. Technological development resulted in numerous improvements in gadgets. Thus, students' attraction towards gadget increased more than any other activities. By understanding types of gadgets students have access to, a valid conclusion may be achieved to explain the occurrence of gadget addiction (Kabakçı, Fırat, izmirli, & Kuzu, 2016). But literature studies rarely discussed the details of gadget types which limited the perspective on gadget addiction. The existing evidence on gadget usage only highlights increase in the usage without details such as types of gadgets and percentage of usage for each type (Macaraeg & Briones, 2020).

Since gadget addiction implies students spend lesser time to do more important activities, research must be done to know how gadget usage impacted overall students' wellbeing. There should be focus on whether students able to incorporate all their day-to-day activities while using gadgets for longer period than they should be using. Research on students' anxiety level and their coping mechanism in highly stressful situation could offer meaningful insights about the impact of gadget addiction among the students (Baglama, Yucesoy, & Demirok, 2018). Therefore, the present study will be done by looking into more details of gadget usage to understand the actual factors on gadget addiction and how the addiction impacting students' wellbeing.

1.3 Research Objectives

1. To study the level of gadget usage among secondary school students in Klang Valley.

2. To study the wellbeing of secondary school students in Klang Valley

3. To study the impact of gadget addiction on secondary school students' wellbeing in Klang Valley.

1.4 Research Questions

1 What is the level of gadget usage among secondary school students in Klang Valley?

2 What is the wellbeing of secondary school students in Klang Valley?

3 What is the impact of gadget addiction on secondary school students' wellbeing in Klang Valley?

1.5 Significance of the Study

Results from this research is expected to have significance on students' time management capability. Since the research will emphasise on the different scopes of gadget uses, results will show whether the students spending too much time and for unnecessary reasons while using gadgets. Therefore, the findings will be significant for students to better manage the gadget usage. For example, alternatives to gadget can be provided to the students by analysing the purposes of using gadgets. Different activities can be organised for the students to allow them spend quality time by identifying the amount of time they currently spend on using gadgets.

Research findings will be significant for parents since one of the research objectives will be identifying the general wellbeing of the students who are using gadgets. Parents will understand the mental state and psychological factors behind each behaviour displayed by their children. For example, learning about the anxiety level of their children will help parents to improve the way they approach the children in situations that needed confrontation. The findings will be significant

for parents to be aware of the changes in their children since impact of gadget will be assessed in the perspective of stress coping mechanism.

Gadget addiction awareness among the parents will enlighten parents about their roles in ensuring the children are not misusing gadgets or using gadgets in a harmful way. Findings will also be significant for teachers because learning from home is one of the reasons students use gadgets. Teachers could make a feasible teaching and learning plan such that students' exposure to gadgets will be kept minimal besides the live classes.

Results obtained through this research will be significant for the teachers to address special concern observed among their students such as lack of focus or engagement level with the lesson. This will help the teachers to make an early intervention to assist students impacted by their gadget addiction. The benefit is to create student population that are free from gadget addiction by channelling the time and effort into more meaningful activities.

1.6 Organization of the Study

The research comprises of five chapters starting from chapter one for introduction, chapter two for literature review, chapter three for research method, chapter four for data analysis and chapter five for conclusion. Presentation of chapter one showed background, problem statement, research objectives, research questions and significant of the study. Therefore, next chapter will summarise past studies that focused on gadget usage and measurement of student wellbeing.

The purpose is to compare how these variables measured in a different study setting and for different research objectives. Chapter three will inform on the research methodology, sampling and research instrument for the research data collection. Analysis of data and findings will be presented through chapter four. The final chapter of this research is chapter five which will contain overall conclusion, discussion of the findings, limitation of the study and recommendations for future studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Chapter two is aimed to understand gadget usage and wellbeing from the perspectives of other researchers. Therefore, presentation of chapter two will show the different ways gadget usage is studied and the different perspectives offered by the previous scholars. A theoretical foundation and conceptual framework are presented to guide the research and formulate research hypotheses.

2.2 Theoretical Foundation

2.2.1 Theory of Reasoned Action

The theory of reasoned action (TRA) is reviewed in this research to explain students' attitude and behaviour in using gadgets. Students' behaviour is predicted based on their attitude towards gadget usage and the intention of their behaviour. The students' decision to use gadget in a certain manner (too much time, unplanned or neglect of other activities) influenced by their expectation that time using gadget allows accelerates the time. TRA suggests relationship between gadget usage the consequences of it towards students' wellbeing (Gellman & Turner, 2019).

According to the perspectives of TRA, the behaviour in using gadgets can be explained by analysing the motivation to use the gadgets. Due to the motivation, intention to use gadget is created leading to the students actually using gadgets. The theory explains impact of normative component in the intention such as the students' surrounding. Students' behavioural intention to use gadget precedes their action. The behavioural intention strongly influenced by the students' beliefs in the gains they achieve by using gadgets. However, students' attitude will determine this behavioural intention.

For example, students' attitude in managing time, prioritising tasks or creating balance between the activities they perform each day. If these attitudes are positive oriented, then students' intention

to use gadget may be lesser and therefore they will spend less time using gadgets or only use gadgets for online lessons (Silva & Deflem, 2020).

2.2.2 Technology Acceptance Model

The technology acceptance modal (TAM) describes students' gadget use from the perspectives of perceived usefulness and perceived ease of use. In the context of students' life, the believe that the gadget will fulfil their emotional needs such as attention is the perceived usefulness of gadgets. At the same time, believing the gadgets is lesser effort than the other activities appeared to be the perceived ease of use. Similar to TRA, there is social influence supported by TAM in explaining students' behaviour towards gadget use. Thus, perceived usefulness and perceived ease of use are the attitudes that determined by the social influences towards gadget use. Theoretical framework from the perspective of TRA and TAM is illustrated in figure 2.1 below

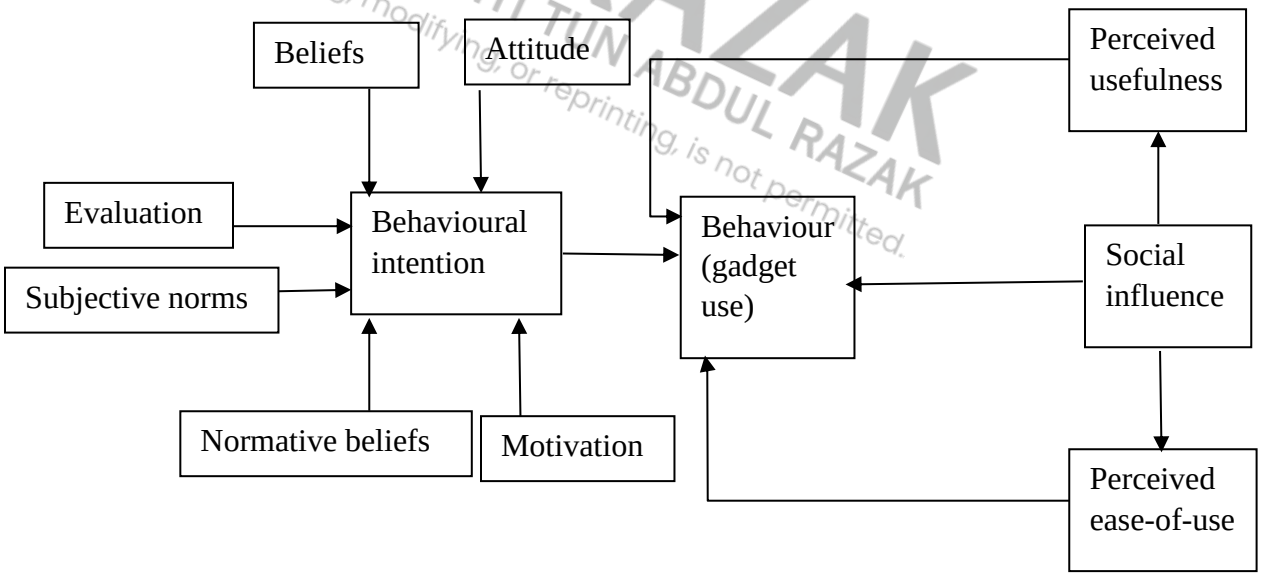

Figure 2.1: Theoretical Framework

2.3 Empirical Research

One of the themes found based on the literature review on the existing empirical researches about gadget usage and wellbeing is the time spent on using gadgets. Research by Wahyuni, Siahaan, Arfa, Alona, & Nerdy (2019) showed there is a significant relationship between time spent on gadgets and mental-emotional state of individuals. The research was conducted among students in the age group eight to 11 years old from both the public and elementary schools in Medan.

Measurement performed in the research were gadget types, frequency of gadget usage per week, duration of gadget usage per week and mental emotional state. Even though majority of the samples used gadgets 1 to 3 times per week and spent lesser than five hours per week, the percentage of samples with abnormal mental emotional state was still reported as high. The findings imply that more specific gadget usage time measurement is needed to make conclusion about the impact towards mental emotional condition.

Ng & Hassan (2017) conducted research on time spent in smartphone usage among students in one of the Malaysian's tertiary institutes. Their study measured hours and minutes spent on smartphone on daily basis. In this research, there was no options provided to group the time spent on smartphone. Research samples required to select the hours and minute from the scale 1 to 24 hours and 1 to 59 minutes. The final results of this research presented in the form of average minutes spent on gadget per week.

Highest average minute spent was 6337.37 among the administrative management students. This was followed by 6142.81 minute per week by the accounting students. Lowest average minute per week was 5001.98 among the computer science students. However, the average minute of smartphone usage was used to predict the samples' academic achievement. It showed increased time in smartphone usage decrease the semester grade of the tertiary students. Even though the study pointed adverse effect of longer smartphone usage, the study lacks in showing the impact towards wellbeing.

Kumar & Sherkhane (2018) assessed gadget addiction and its impact on the health of 200 undergraduates in the age group 18 to 28 years old. This was a cross sectional research utilising 5-pointer likert scale whereby the results were analysed using descriptive statistics and chi-square test. Based on the statistical analysis using the survey results, 80% of the students received own gadget from their family members. About 72.5% of these undergraduate students used their first gadget in between 16 to 20 years old.

Among the smartphone, gaming gadgets and computer, 90.5% of the students owned smartphone. Researchers segregated the time spent on gadgets into 1 to 2 hours, 3 to 4 hours, 5 to 6 hours and more than 7 hours whereby 50.2% of the undergraduate students used their gadgets more than 7 hours per day. Majority of the smartphone use was identified for social networking whereby none of them reported to be using smartphone for lessons. These results imply that the initial objective of bringing in gadget into education deviated due to the addiction to gadgets.

Based on the research conducted by Potas, et al. (2021), gadget addiction caused change in the attitude and behaviour of students in the age group 10 to 19 years old. The researchers compared gender differences in gadget usage and found that average time spent on gadget was 16.04 hours among the males and 4.90 hours among the females. With the increase in the hours spent on gadget, these students' behaviour and attitude in other aspects changed. According to the summary presented in the findings, reaction to social needs and attention to academic reduced among both the genders with the increase in the time spent on gadget use.

According to the study by (Pachiyappan, et al., 2021), increase of time spent on gadgets resulted in health issues. These findings were found in the investigation conducted among 348 college students. Time spent on gadget was analysed among the college students during the virtual classes in the movement control order period. The researchers' comparison of gadget usage time before and during the movement control order showed average hours per day increased from 4.75 to 11.36 hours per day.

Impacts of this increase reported in the study are headache, insomnia, restlessness, eye issues and tiredness. Nevertheless, issues such as time management, anxiety and stress were not addressed in this study which calls for a new study to fill this gap.

Research by (Wahyuningrum & Prameswari, 2018) showed there is a significant relationship between frequency, duration and type of gadgets used and visual acuity. The research was conducted among 95 elementary level students in Mojokerto. Measurement performed in the research were gadget types, frequency of gadget usage per day, duration of gadget usage per day and vision status using the instrument Snellen card.

While there is no impact between the type of gadgets and visual acuity, increase in the duration of gadget use and frequency of gadget use decreased the ratio of the students' visual acuity. The findings imply impact of gadget use should not be limited just to visual acuity or other physical impact but also impact towards non-physical conditions.

Naik (2018) conducted research on the average time children between 8 and 18 years old spend on gadgets in India. The daily minimum time spent was found to be 6 hours and 21 minutes among this group of children. Researcher discussed impact of more than 2 hours per day gadget exposure such as screen dependency disorder.

According to the researcher, abnormal time of gadget exposure could alter gene expression whereby the consequences to the developing brain are synaptic, functional and structural changes. Although the findings from this study close to mental disorder discussion, more information on the students' wellbeing analysis is needed to conclude about the impact of gadget usage.

Besides time spent on gadget, literature studies also grouped into the types of gadgets younger generation are exposed to. Majority of the studies highlighted various impact of smartphone as the

most widely used gadget among the school students. Study by Cha & Seo (2018) showed smartphone is the gadgets used most widely by the middle school students in South Korea.

However, the smartphone usage was identified for internet, games and social networking. Comparison between laptop, smartphone and tablets was made in the research by Rashid, et al., (2021). This research showed secondary school students in Bangladesh use smartphone the most while the least research samples use laptops whereby the uses of these gadgets were shown for watching cartoon or movies the most and for communicating the least.

According to the research conducted by Arumugam, Selvanayagam, & Sathiyasenan (2020), smartphones are used by students after 10 pm the most. In the category of less than an hour, an hour, two hours and three hours, 52.8% of the research samples uses smartphones for three hours after 10 pm. The research also showed such rate of smartphone usage caused majority of them sleepy condition on the next day.

Study by Darko-Adjei (2019) supported that smartphone is the most widely used gadget among students. However, this study was conducted among the students at the University of Ghana whereby most usage of smartphone was done as a learning tool and it benefited the students' teaching and learning.

Literature review able to identify studies that grouped a certain gadget usage pattern and behaviour as the addiction level. According to the research conducted by Surat, Govindaraj, Ramli, & Yusop (2021), 59.8% of the research samples use two types of gadgets while 23.7% use three types of gadgets. Analysis of the samples' wellbeing showed linear and positive correlation with sleep quality, depression, stress and anxiety. But the strongest impact of gadget addiction was shown on the samples' stress level.

Based on the research conducted by Othman, Kelana, & Jamaludin (2020), gadget addiction is detected among the samples that spend more than 6 hours on gadgets. In this research, 48.1% of the samples spend more than 6 hours per day using gadgets. The secondary school students surveyed in the research reported to have poor academic performance as the consequence of gadget addiction.

This conclusion is drawn because 57.5% of the secondary school students shown poor academic performance while 36.1% achieved average level. Only 6.4% of the students showed good academic performance. The findings imply that adverse effects from gadget usage is potential especially if the usage achieved addiction level. Therefore, study of the gadget usage impact on students' wellbeing could offer more insights.

Razak, Khairuldin, Reshad, Mat@Mohamad, & Anas (2021) quoted the statistics from World Internet Statistics to show that nearly 78.8% of the Malaysian population are extremely addicted to gadgets. The review also showed about 45% of the children in Malaysia in the age category seven to nine years old achieved internet proficiency. Researchers identified gadget addiction among the students is due to excessive time spent on gadgets along with absence of parental supervision.

Past researches on the gadget usage not only focused on adverse effects but also compared between the positive and negative effects as well as discussion on the factors negative effects occur. In the study conducted by Marpuah, Zahari, Kirin, Mahmudah, & Normawati (2021), using gadgets helped the students to find additional resources and information about their subjects. Students who used gadget in the information search process able to complete their assignments faster.

About 46% of the research samples from year one batch at Universiti Tun Hussein Onn Malaysia showed gadget addiction pattern whereby they spend most of the time using gadget for video

games and social media networking. Researchers concluded the implication of the findings as time management ability of the students in using the gadget for a purpose or for the gadget addiction.

The findings in this study in terms of negative impact of gadget was found to be similar to the research by Elias, Yuan, Mahidin, Hashim, & Abdullah (2021). Researchers' findings showed decline in the academic performance occurred to the addiction in using smart devices. This is due to the lack of advisable self-control among the students.

Studies of gadget usage in the literature review indicated the increased students' accessibility to gadgets. Most of the studies discussed the switch to online learning as the reason students started to use more gadgets and started exploring gadgets. According to the research presented by Bird, Castleman, & Lohner (2021), COVID-19 resulted in abrupt shift from face-to-face to remote learning.

Therefore, students were introduced to gadgets for learning while they have not figured out managing and balancing their time between learning and entertaining. Review done on the research by Beng, Tiatri, Lusiana, & Wangi (2020) showed the average gadget usage by students was in the range of 3 to 4 hour per day before the COVID-19 pandemic. But the survey conducted among 1277 vocational institution students during the pandemic showed there is a change in postulate boundary of gadget usage. Students are now using gadgets more than seven hours per day since they start the day with gadget for online learning. Furthermore, homework and assignments are uploaded in online learning portals making it difficult for parents to limit students' access to gadgets.

According to the research by Ramane, Devare, & V.Kapatkar (2021), unexpected pandemic outbreak perplexed the entire world and forced the education system to rely on gadgets to continue teaching and learning. Lack of personal interaction during learning and longer periods of using gadgets due to the online lessons caused the students to be distracted. Students tend to spend long day on gadgets to keep themselves engaged. From the perspective of the researcher (Sharma,

2020), gadget addiction among the students can be related to the crisis underwent by the education section after the lockdown.

Teaching and learning activities completely dependent on online resources and many students started to own personal gadgets. In fact, some students even receive subsidies to purchase gadget to allow them uninterrupted learning during the pandemic. This resulted in them having more control and accessibility to the gadgets. Research by T.Muthuprasad & K.Jhaa (2021) identified gadget addiction due online classes occurred because lack of preparedness, design and the effectiveness of e-learning. The study discussed impact of COVID-19 that caused schools worldwide closed down and shift of learning platform from physical to virtual.

Another factor of increased gadget accessibility among the students is the restricted movement and social activities due to the COVID-19 pandemic. Study by Pandya & Lodha (2021) showed screen time increased excessively during the lockdown period. The researchers concluded on the impact of lockdown on gadget using pattern based on the data collected from the databases PubMed, PsychINFO and Google Scholar in the period January 2020 until June 2021. Summary from their analysis showed overall gadget usage increased by five hours. The heavy usage of gadget was 17.5 hours per day while usage hours for non-heavy users was 4.3 hours per day. A separate analysis on youngsters' gadget usage indicated average of 8.8 hours per day. This average is higher than the prescribed gadget time given by American Academy of Child and Adolescent Psychiatry.

2.4 Conceptual Framework

The research will be conducted to identify impact of gadget addiction towards the wellbeing of secondary school students. Therefore, the independent variable of this research is gadget usage while the dependent variable is the students' wellbeing. Gadget usage is analysed from the aspects of time spent on gadget according to different duration categories, the purpose of using gadgets by the secondary school students and the type of gadgets the students use. In terms of students' wellbeing, this research will focus on time management capability, stress coping mechanism, anxiety, depression, sleep disturbances, empathy, harmonization, social cognition, relationship quality, productivity and thought processed. Figure 2.2 below shows the proposed conceptual framework for this research.

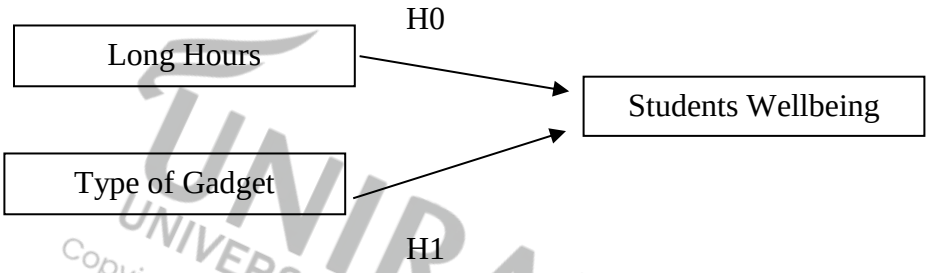

Figure 2.2: Conceptual Framework

2.5 Hypothesis

Hypotheses developed to predict the potential outcome when the independent and dependent variables are statistically tested. Therefore, the research hypothesis will propose predicted relationship between gadget use and students' wellbeing. There will be a null and an alternative hypothesis to be presented since at the relationship between research variables is in predicting stage.

Null hypothesis

H_0: Gadget usage for long hours impact students' wellbeing.

Alternative hypothesis

H_1: Type of gadget usage impact students' wellbeing.

2.6 Summary of Chapter Two

Chapter two begin with theoretical review which showed that theory of reasoned action and technology acceptance model (TAM) explain students' behaviour in using gadgets. Therefore, gadget at present is accepted as a necessity among the school students in Malaysia. Their belief that using gadget will provide benefit such as fulfilling their time motivate the students further. The findings from TRA and TAM resonated in many empirical findings. Some of the findings were presented in the empirical research section. These researches showed time spent on gadget is one of the issues that affecting students' lifestyles.

The severity in over using gadgets achieved more than 14 hours per day as shown by these studies. Most studies highlighted the recent shift to online learning as the factor students received huge expose to gadgets. It was also reported that students' accessibility to gadgets increased drastically after the worldwide lockdown due to COVID-19. These studies discussed the impact of gadget addiction toward academic performance but the gap in identifying impact to wellbeing remained. The present study is aimed to identify students' wellbeing as shown in the conceptual framework.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter of research methodology has important role to ensure successful completion of the research. All the elements in this chapter will enhance readers' understanding about research design and the related concepts. This is because there are multiple research approaches and the reason for selecting one particular research approach needs to be justified. This includes sampling techniques, sample size, data collection instrument, data collection approach as well as data analysis framework. Content of chapter three also includes comparison of available research methodologies to strengthen the argument for selecting one particular research method based on the researcher's best judgment.

3.2 Research Design

The phrase research design explains method and components integrated together to collect research data and analyse the research variables (Apuke, 2017). Thus, research design is a collective strategy that incorporates all the elements according to a coherent order in a most efficient way to answer research questions. Comparison was made between the quantitative, qualitative and mixed methodology before selecting the most suitable research design for this study.

Based on the comparison, researcher decided to proceed with the quantitative research design since the research intended to study gadget usage levels, student wellbeing status and the impact of gadget usage on students' wellbeing. This information is potential to be measured using likert scales to produce numerical representation. The quantitative research design also create opportunity to minimise impact of biased data and allows the finding to be generalised (Daniel, 2016).

Selection of quantitative research design is also based on the philosophy post-positivism. This research philosophy emphasises the effect occurring from a cause (Abutabenjeh & Jaradat, 2018). In this research, the aim is to identify the impact (cause) of gadget addiction towards students' wellbeing (effect). Therefore, gadget usage from various scopes will be identified first and will be correlated against the various factors of wellbeing (Wright, O'Brien, Nimmon, Law, & Maria, 2016).

Another reason to apply post-positivism in selecting the research design is the reduction concept explained in this philosophy. Gadget usage was studied from perspectives such as the benefits, developments and consequences before reducing to the concept of consequences since there is still a gap in this concept in the literature (Noyes, et al., 2019).

The views of post-positivism offer knowledge to the research problem through observation and measurement of the current real data available in the literature. Thus, the gadget uses and students' wellbeing are numerically measured which is the reason to select quantitative research design. Another view of post-positivism is that applying a research design guided by a theory. Since the research is based on theoretical perspective as well, thus post-positivism research philosophy is reflected in the design (Disman, Ali, & Barliana, 2017).

The elements incorporated into quantitative research design has a strong ground of post-positivism philosophy because the philosophy emphasises systematic study of research variables until a relationship is established (Parylo, 2012).

Among the branches of descriptive and exploratory designs available for quantitative design, the descriptive will be used for this research since the final objective is to establish relationship between gadget addiction and students' wellbeing. Descriptive design has the ability to test the hypothesis formed to assume the relationship between gadget use and students' wellbeing whether

to accept or reject the hypothesis However, the findings from this descriptive approach is a potential to start exploratory research to identify the causes of such relationship (Bloomfield & Fisher, 2019).

The present research will be done by using one of the primary methods among the causal comparative, experimental, survey and correlational. Survey method is identified as the most feasible method to conduct the present research. The advantages are multiple data collection options to be used through the survey option. For example, researcher has the options online poll, web-intercept, paper-based questionnaire or digital questionnaire. This method will be a great way to understand how students can self-assess their gadget usage pattern and wellbeing (Basias & Pollalis, 2018).

In the implementation of survey, it is possible to include high numbers of questions and its' variations while using huge sample size and all these findings can be presented in a summarised numeric and visual form. Survey is in fact a forerunner step regardless of which research method is being used. Therefore, it has a lot of possibilities to achieve successful research. The flexibility to conduct research at samples belong to one category or even multiple categories is also a factor to select survey method.

Secondary school students that will take part in this study belong to multiple demographic categories but the variation is not a barrier for data collection when survey method is used. By ensuring there is randomness in sample selection, survey method will provide high quality and non-biased data (Munđar, Matotek, & Jakus, 2018).

The periodical developments of the survey method motivated researcher to apply it in completing this research. Instead of having to meet the research samples face-to-face or communicating through telephone which consumes more time and cost, ICT development created advantage of

conducting survey with almost zero cost and time-efficiency. It is zero cost because no printing or mobility is required whereby without the need to be mobile, the approach is time-efficient (Parahoo, 2014).

Survey approach comprises of cross-sectional and longitudinal but the option best suits present research. This is because being an observational based study, data collection from the sample is only performed at a certain time period. Another factor for selecting cross-sectional study is due to the research requirement for academic submission. Therefore, researcher has a fixed time duration to complete the research. Further to this, cross-sectional research is selected because observing behavioural change is not required as the research objective (Mohajan, 2018).

When cross-sectional survey is used, researcher has the advantage to assess gadget usage and students' wellbeing both using a single research instrument. Other than this, the process of data gathering will be executed only among the secondary school students with online learning experience but will be able to provide varied responses according to their own experience. Varied responses from the secondary school students can be effectively analysed because the responses will be standardized on five pointer likert scale. But researcher is well aware of cross-section survey weakness and assured the significant of finding is not impacted by this weakness (Snyder, 2019).

3.3 Study Population and Sampling

Population is defined as the community inhabitants in a certain location. Therefore, population of a school comprises of teacher and student community functioning together through different roles (Erba, Ternes, Bobkowski, Logan, & Liu, 2018). Type of school considered for sample selection is a public secondary school in Klang Valley. Thus, population are the students studying in this school from form one to form five. Samples are the representation of a population whereby study conducted among the samples is sufficient to make conclusion about the population.

The school is led by a principal and 50 teachers with student population of 664. Research samples will be students from form one to form five. All the students are ensured to have participated in online learning session and therefore have been using gadgets. This step is included to ensure samples and aligned with the research objectives (Levy & Lemeshow, 2019). Since research objective is identifying gadget uses and its impact on students' wellbeing, students as the sample will be the most suitable selection. Research data will involve students' personal experience using gadgets and wellbeing status (Hulley, Cumming, & Browner, 2016).

Secondary school students will be required to understand the questions in the research instrument and choose the scale best represents their gadget usage and wellbeing independently. Therefore, right sampling will create a smooth data collection. Since the primary data is important to fill research gap, right sampling will provide accurate data to analyse existing gap.

In the context of this research, sampling technique is choosing subset of the school population so that the samples will be the correct representation of the population (Fuller, 2019). As such correct sampling technique needs to be equally accurate as selecting the correct instrument. However, criteria of suitable samples were considered during the sampling process to ensure the research instrument will be targeted to the right group. There are two categories of sampling techniques namely the probability and non-probability sampling. To ensure valid conclusion can be made from the samples' responses, sampling technique for this research was selected after comparing the available techniques (Podesva & Sharma, 2014).

Probability sampling technique defined as selecting samples on random basis to provide rating on the research variables. The non-probability category means there is no randomness involved in selecting samples. In contrast to the probability sampling category, convenience of researchers is considered in performing the non-probability sampling technique. These two sampling categories are also different in terms of data collection rate. Non-probability sampling allows data to be collected faster than the probability sampling (Dommermuth, 2018).

Comparison between the two types of sampling techniques showed that non-probability sampling type will be suitable to select the research samples. This is because the samples of this research have to volunteer to answer research instrument. Only the students who agreed to share their gadget usage and behavioural changes that they observed will be given the questionnaire. Therefore, voluntary sampling technique will be used to identify research samples.

Students and parents' information will be obtained from the school management whereby the list will be vetted by the school teachers as eligible students who can understand well questions given in English. Consent from the parents is acquired to identify the research samples. Data will be collected from the students that volunteer themselves to take part in the research (Epstein & Martin, 2014).

The subsequent crucial part of sampling is choosing the appropriate sample size or the numbers of students that will answer the survey. Selecting the sample size is a step performed after conforming the research design as the quantitative and qualitative research approaches require different sample sizes and each design flexible for certain sample size. Since quantitative research design involves numerical form of research data, it is relatively easier and faster to complete the research instrument.

Therefore, the research can be conducted with higher numbers of samples. Higher sample size needed for quantitative research because responses with outliers are possible in the process of choosing a number to represent perception or decision. Research samples could mark the numerical scale that is not their actual perception about the research variables. It is beyond the control of the researcher to make sure all the samples are reading the questions before selecting a scale. However, with higher sample size effect of outlier do not almost exist. Thus, statistical results will be more reliable even though some of the responses might deviate away from the average value (DePoy & Gitlin, 2018).

Margin of error can be reduced in quantitative research design by selecting high numbers of samples. The margin of error is proportion of research samples that are projected to be inconsistent in answering the research instrument. This value is computed by taking the ratio between 1 and square root of the sample numbers and multiply with 100. Thus, the higher the sample numbers the lower the margin of error. By considering the aspect this research is quantitative based and potential for margin of error, researcher fixed sample size to be 200 (Troidl, Spitzer, & McPeek, 2017).

3.4 Data Collection Method

Data collection in the research is when researchers gather, measure and study in-depth information related to the research variables via a particular technique. It supports the evaluation of research hypotheses by using the real data. Data collection is the most significant step in this research since the responses gathered from research samples will be the main source to answer research questions (Wang & Victor, 2018).

The process of data collection deepens knowledge of the researcher since more data will facilitate researcher to create better decision coupled with statistical evidence. Even though research problem is presented earlier in chapter one, the primary data is where the researcher can confirm existence of research problem. In the research of gadget addiction against students' wellbeing, primary data will highlight the aspects of gadget usage that causes more or less issues in students' wellbeing. Besides this, data will show the raw information of few different parts of students' wellbeing. Thus, data collection is a significant approach to reflect the actual problem exist in gadget usage by the secondary school students (Rose, McKinley, & Baffoe-Djan, 2019).

The available options for data collection are mail data, face-to-face, telephone or online. One of the most widely used data collection method in the past is face-to-face. It is accurate in screening the respondents and monitor thoroughly the data collection. The advantage is also avoiding inaccurate responses because researchers and samples will interact in person. As such, data

collected from face-to-face method is highly reliable and leading (Mertens, Pugliese, & Recker, 2016).

Another advantage of face-to-face method is ability to catch verbal and non-verbal cues from the samples. One example in able to predict if the respondents are facing difficult questions by observing their body language. The process of face-to-face data collection is highly focused and eventually lead to faster research completion. This is because through face-to-face data collection allows researchers to detect any issues earlier and rectify the issue before continuing the work to the subsequent stages (Groenland & Dana, 2019).

But the disadvantage of face-to-face data collection is the expenditure in terms of moving towards the samples' location and using paper-based questionnaire. Besides this, data collectors' competency and integrity are a challenging aspect to use face-to-face data collection. When this method of data collection is used, researcher performs extra task in manually entering data into the statistical analytical tool. It might also be difficult to convince more people to take part in the survey when face-to-face method is used (Albers, 2017).

Mail data collection is relatively cheaper than the face-to-face method since lesser workforce is needed to conduct the survey. In fact, it is possible to appoint just one individual to perform the task. Since it is less costly, mail data collection allows for large set of data to be collected. Another advantage of mail data collection is to stratify the samples according to different geographical segments.

Samples might be able to express their opinions about the research variables from honest perspective because they are facing the researcher. The surveys are answered from the convenient of the samples' places (Aryadoust & Raquel, 2019). Despite of having convenient of answering survey through mail, it is not an error-free option since some samples may not be reached fast through mail. Furthermore, mail surveys are completed under the monitoring of a data collected which requires careful design of the questionnaire to ensure the contents are understood clearly (Samoilenko & Osei-Bryson, 2021).

Among all the available data collection process, telephone survey allows researcher to reach samples faster and easier. Researcher able to gather deeper insights when engage in a live communication with the samples while not incurring cost of meeting the samples in person. Further probing can be made to the samples to justify their responses to a particular question. Computer-assisted telephone survey is a technological development that creates advantage for telephone data collection. In this method, data collection as well as entering the data can be performed at the same time (Humble, 2020).

But telephone data collection is not possible to be conducted in certain locations if there is no network coverage. The coverage depends hugely on the service providers thus researcher will not be able to control the quality of data collection process. Without meeting the samples in person, researcher may not be aware of the challenges faced by the samples in answering the research instrument. Phone data collection is higher in cost because it is only possible to be done after registering for a network (Martinson, 2018).

Researcher also considered online data collection prior to finalizing the method to be used. The online data collection method found to consist of more advantages than the previous discussed methods. Online data collection offers a faster option to collect more data. It is possible since researcher do not have to wait for samples to answer the survey and to collect the responses (Billups, 2019).

In terms of cost, researcher will not incur the costs of postage, resource or time. Another advantage of online data collection is error reduction in entering survey responses into analytical platform. This type of data collection method creates advantage of faster data analysis because collected data is in the spreadsheet format and ready for analysis. Online data collection creates real-time data that allows the researcher to conduct quicker analysis as well as present visualization with different types of charts (Bergin, 2018).

Online data collection is more convenient than the other methods since samples can decide time to answer the questionnaire. Regardless of the different times questionnaire is answered by the samples, data is updated automatically into the spreadsheet. This method increases researcher's productivity because there is no delay in transferring raw data into analytical platform used in this research, the SPSS version 20 (Miksza & Elpus, 2018).

3.5 Operationalisation and Measurement

This section will discuss about questionnaire development based on the existing questions in the literature. The research consists of one independent and one dependent variable. Therefore, there will be three segments in the questionnaire including segment A for samples' demographic information. Section B's questions are on the gadget uses while section C questions are on students' wellbeing. Both the sections B and C will consist of five pointer likert scale questions with 1 strongly disagree, 2 disagree, 3 neutral, 4 agree and 5 strongly agree.

The five pointer likert scale is selected to measure research variables since the aspects of gadget usage and wellbeing that are expressed will not be feasible for statistical analysis. But using a likert scale questions creates ease of interpreting the samples response rates. It is also advantageous to offer flexibility to the samples to rate the gadget use and students' wellbeing instead of allowing just yes or no. In fact, samples have the option to rate if they agree to a certain statement by stating strongly agree or agree (Beatty, Collins, & Kaye, 2019). The questions and sources are presented in table 3.1 and 3.2 for the variable's gadget use and student wellbeing respectively.

Table 3.1: Measurement of gadget use

	Measurement	Source
	Time	(Noor, Haseen, Tamal, & Noor, 2020)
1	Spending more than 5 hours on gadgets	
2	Search and explore new app almost everyday	
3	Gadget is a must on 24/7 basis	
4	More comfortable to use gadget while eating	
5	Gadget is a compulsory travel companion	
	Accessibility	(Asio, Gadia, Abarintos, Paguio, & Balce, 2021)
6	Multiple gadget access	
7	Availability of alternative gadgets	
8	Reliability of internet access	
9	Availability of audio/ video on gadgets	
10	Technology and troubleshoot support	
	Purposes	(Ali, Anuar, Mustafa, Halim, & Sivabalan, 2020)
11	Information search anytime	
12	Social media surfing	
13	Communication	
14	Online purchases	
15	Game and entertainment	
	Features	(Frahasini, Astuti, & Atmaja, 2018)
16	Longer battery span	
17	High storage capacity	
18	Portable and light	
19	Ergonomic from multiple user positions	
20	High navigation ease	

Table 3.2: Measurement of students' wellbeing

	Measurement	Source
	Stress	(Ismail & Shujaat, 2018)
1	Fatigue and tired even with adequate sleep	
2	Tendency of upset for unexpected occurrence	
3	Frequent feel of loss	
4	Frequent irrelevant thoughts	
5	Experiencing jaw clenching	
	Depression	(Pascoe, Hetrick, & Parker, 2020)
6	Self-confidence is hard to achieve	
7	Tendency to think of problems	
8	Abrupt change in appetite	
9	Unpredicted mood swings	
10	Lack of interest to hobbies outside house	
	Anxiety	(Wulanyan & Vembriati, 2017)
11	Time is always insufficient to complete all tasks	
12	Underestimation of time to complete tasks	
13	Feeling of too many works too little time	
14	Dependency on gadgets	
15	Restless condition appears during task	
	Relationship	(Pratama, Harinitha, & Indriani, 2020)
16	Get irritated or angry easily	
17	Easily annoyed by other people's actions	
18	Lack of interest in social circles	
19	Quick to judge and criticize others	
20	Unable to cooperate with others in decision making	

3.6 Data Analysis Framework

Data gathered from the primary research will be analysed using SPSS version 20 since this software allows huge set of data summarised into presentable format and easy viewing (Brownlee, 2016). The analysis will begin with reliability testing that will indicate the consistency level of the likert scale questions used in sections B and C.

With the reliability analysis, the internal consistency of all the questions is validated. This implies when the Cronbach's alfa is more than 0.7, all the questions in each section are consistent in measuring the variable. The analysis will be conducted among a pilot group of the samples to test the questionnaire reliability (Kolaczyk & Csárdi, 2020).

The subsequent analysis will be frequency analysis that will summarise responses for the entire questionnaire into separate tables and figures. Since there are three sections in the questionnaire and each section consists of a number of questions, samples responses will be simplified into a presentable format through the frequency analysis. Frequency analysis will indicate the distribution of the samples' demographic based on the responses in section A.

Bar chart or a pie chart will be used to visually represent the distribution according to frequency and percentage. For the responses in sections B and C, the findings will be reported in table format to communicate the distribution of samples' responses according to five pointer likert scale. Therefore, frequency analysis will show how many samples agree or disagree for each of the gadget usage pattern and wellbeing measure (Field, 2017).

Stage three analysis of the research data is the descriptive test. This analysis is only performed on the responses from section B and C. The aim of descriptive analysis is to explain overall samples' responses for each of the aspect by calculating mean and standard deviation of their responses. This part of the analysis is used to ensure outliers are detected and whether or not outliers are

affecting the measures of central tendency. Mean score is the single value that will represent all the responses for each question (Bhargava & Sharma, 2021).

Next will be the correlational analysis to test relationship between gadget usage and students' wellbeing. Correlational analysis creates two measures to allow researcher conclude on the relationship between the independent and dependent variables. The first measure is the Pearson's correlation coefficient that has the range from -1 to 1. The negative values of Pearson's correlation coefficient will indicate that the dependent variable moves in the opposite direction of the independent variable. For example, increase of gadget usage decrease the wellbeing issues faced by the students. The magnitude in the coefficient will indicate how fast or how slow the changes occur (Rai, Chaturvedi, & Bolia, 2020).

For the Pearson's correlation coefficient with positive value, there will be a positive relationship between the independent and dependent variables. When there is increase in gadget usage, there will be increase in the issues of students' wellbeing. Similar to the negative coefficient, positive coefficient too indicates different strengths in the relationship. Therefore, a range of Pearson's correlation coefficient is referred to make conclusion about the relationship (Jhangiani, Cuttler, & Chiang, 2019).

The last analysis will be the linear regression to identify the collective impact of the independent variable gadget use on the dependent variable students' wellbeing. The linear regression analysis is used to produce a linear mathematical model with unstandardized coefficients and a constant value. Analysis of linear regression is performed with all the five assumptions such that the outcomes will replicate actual situation to the closest possible. The linear regression model will provide summary of the coefficient, significant and adjusted R2 values (Holmes, Illowsky, & Dean, 2018).

3.7 Summary of Chapter Three

Chapter three presented a comprehensive research methodology to guide the data collection process. This includes the research design, sample selection, research instrument, data collection and data analysis framework. These components are expected to provide opportunity to the researcher to collect high quality data that will fit the data analysis framework. Findings from the analysis will be discussed in the next chapter.

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1 Introduction

Aim of this chapter is to communication results from the data analysis by using suitable table and graphics. Summary presented in this chapter is aligned with the sections of the research instrument used to gather the primary data of the research. The subsequent presentations of chapter four will communicate the findings from SPSS analysis.

4.2 Reliability Testing

Consistency of the likert scale questions determined using the reliability analysis. The analysis computes Cronbach's alpha value and the questions in a particular segment are concluded as highly reliable if the value exceeds 0.7. It is then confirmed the 20 questions each in sections B and C of the questionnaire measure gadget usage and students' wellbeing in the same direction.

4.2.1 Reliability of Gadget Use Measure

Table 4.1 shows the summary of reliability analysis of gadget use measures. The Cronbach's alpha value is 0.980 thus the questions measuring gadget use are reliable. These questions have high internal consistency resulting in the high Cronbach's alpha value. The table also shows comparison made if each question is removed from the reliability analysis. Removing any of the questions from the analysis will not increase the Cronbach's alpha value to be higher than 0.980 but will reduce the value. Therefore, all these questions were brought forward for subsequent analyses.

Table 4.1: Reliability Gadget Use

Cronbach's alpha	No	Question	*Cronbach's alpha if deleted*
0.980	1	Spending more than 5 hours on gadgets	0.979
	2	Search and explore new app almost everyday	0.979
	3	Gadget is a must on 24/7 basis	0.979
	4	More comfortable to use gadget while eating	0.978
	5	Gadget is a compulsory travel companion	0.979
	6	Multiple gadget access	0.978
	7	Availability of alternative gadgets	0.979
	8	Reliability of internet access	0.979
	9	Availability of audio/ video on gadgets	0.979
	10	Technology and troubleshoot support	0.979
	11	Information search anytime	0.979
	12	Social media surfing	0.979
	13	Communication	0.978
	14	Online purchases	0.979
	15	Game and entertainment	0.979
	16	Longer battery span	0.979
	17	High storage capacity	0.979
	18	Portable and light	0.980
	19	Ergonomic from multiple user positions	0.979
	20	High navigation ease	0.980

4.2.2 Reliability of Students' Wellbeing

Based on the summary shown in table 4.2, the questions assessed students' wellbeing found to have high internal consistency among each other. This is because the Cronbach's alpha value is 0.974 as shown in the table. This concludes all the 20 questions measured students' wellbeing in a consistent direction. Individual analysis on the Cronbach's level shows all the questions are highly reliable since removing any of these questions will pull the Cronbach's alpha value to be lower than the current Cronbach's alpha.

Table 4.2: Reliability Students' Wellbeing

Cronbach's alpha	No	Questions	Cronbach's Alpha if Item Deleted
0.974	1	Fatigue and tired even with adequate sleep	0.974
	2	Tendency of upset for unexpected occurrence	0.974
	3	Frequent feel of loss	0.972
	4	Frequent irrelevant thoughts	0.972
	5	Experiencing jaw clenching	0.972
	6	Self-confidence is hard to achieve	0.972
	7	Tendency to think of problems	0.971
	8	Abrupt change in appetite	0.972
	9	Unpredicted mood swings	0.972
	10	Lack of interest to hobbies outside house	0.972
	11	Time is always insufficient to complete all tasks	0.972

	12	Underestimation of time to complete tasks	0.973
	13	Feeling of too many works too little time	0.973
	14	Dependency on gadgets	0.973
	15	Restless condition appears during task	0.972
	16	Get irritated or angry easily	0.973
	17	Easily annoyed by other people's actions	0.972
	18	Lack of interest in social circles	0.971
	19	Quick to judge and criticize others	0.971
	20	Unable to cooperate with others in decision making	0.971

4.3 Frequency Analysis

Data from all the segments of the questionnaire analysed using frequency analysis. Output from frequency analysis communicates demographic information as well as the response categories for many aspects of gadget use and students' wellbeing.

Summary of the samples' gender distribution is presented in table 4.3. The values in the summary shows most of the students took part in this study are male students with 75% of them. The remaining 25% are female students. Visual form of this summary is depicted in figure 4.1.

Table 4.3: Students' Gender

Gender	Frequency	Percentage (%)
Males	150	75.0
Females	50	25.0

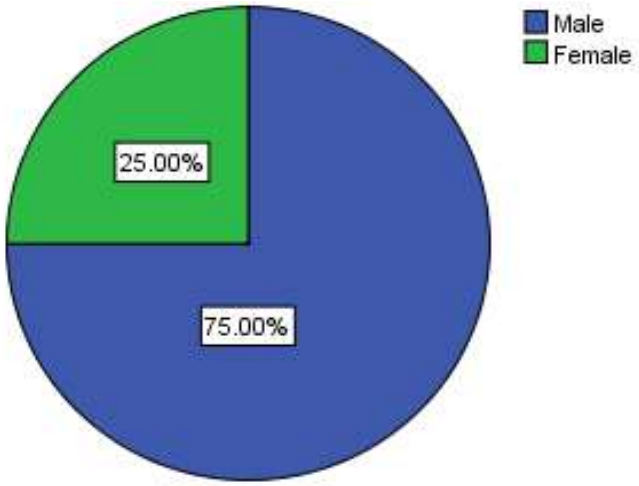

Figure 4.1: Students' Gender

Summary of the students' age categories is displayed in table 4.4 and the corresponding visual is displayed in figure 4.2. Most of the students participated in the study were fourteen years old and they consist of 43.5% of the samples. Thirteen years old students comprise 36.0% of the samples. Those in the age category fifteen years old makes up 14.0% of the samples while the least age category is sixteen years old and they consist of 6.5% of the total samples.

Table 4.4: Students' Age

Age	Frequency	Percentage (%)
Thirteen	72	36.0
Fourteen	87	43.5
Fifteen	28	14.0
Sixteen	13	6.5

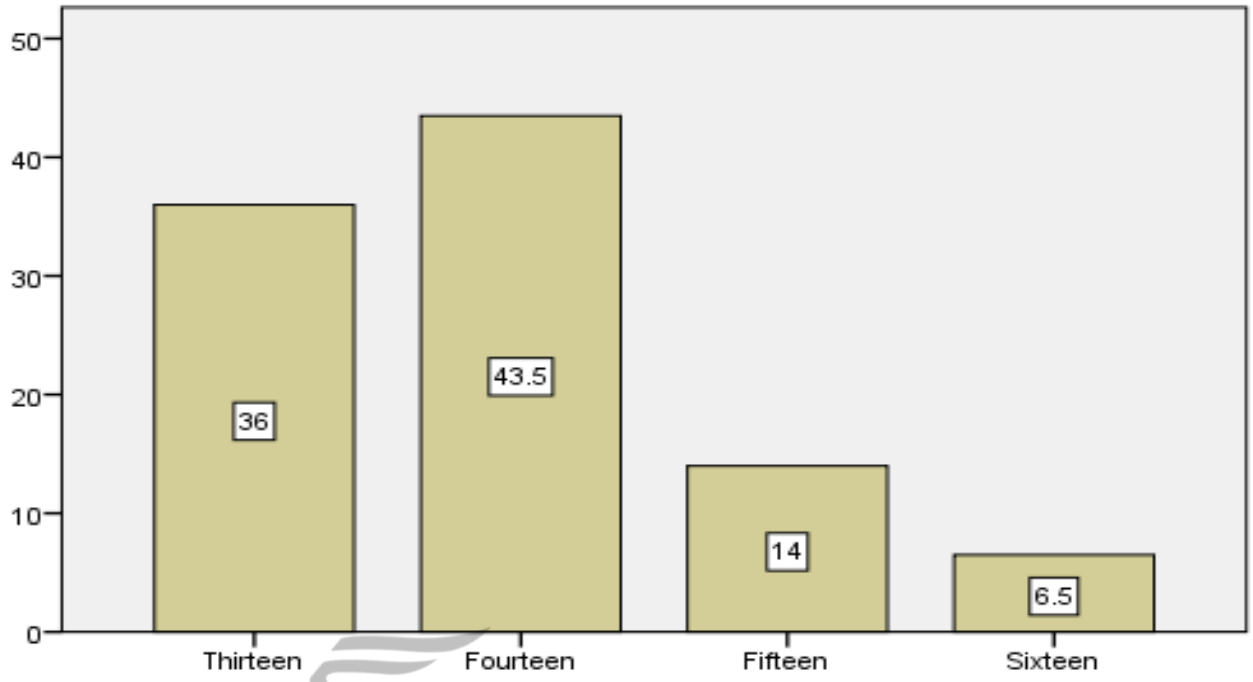

Figure 4.2: Students' Age

Information of the numbers of gadgets access distribution is presented in table 4.5. The values in the summary shows most of the students took part in this study has four gadgets with 27.0% of them. The next highest numbers of gadgets owned by the students is two and there are 24.5% of the total. Those that have access to three gadget is 23.5% while 21.5% of the samples own more than four gadgets are 21.5% of the total samples. Only 3.5% of the samples own one gadget. Visual form of this summary is depicted in figure 4.3.

Table 4.5: Gadget Access

Numbers of Gadgets	Frequency	Percentage (%)
One	7	3.5
Two	49	24.5
Three	47	23.5
Four	54	27.0
More than four	43	21.5

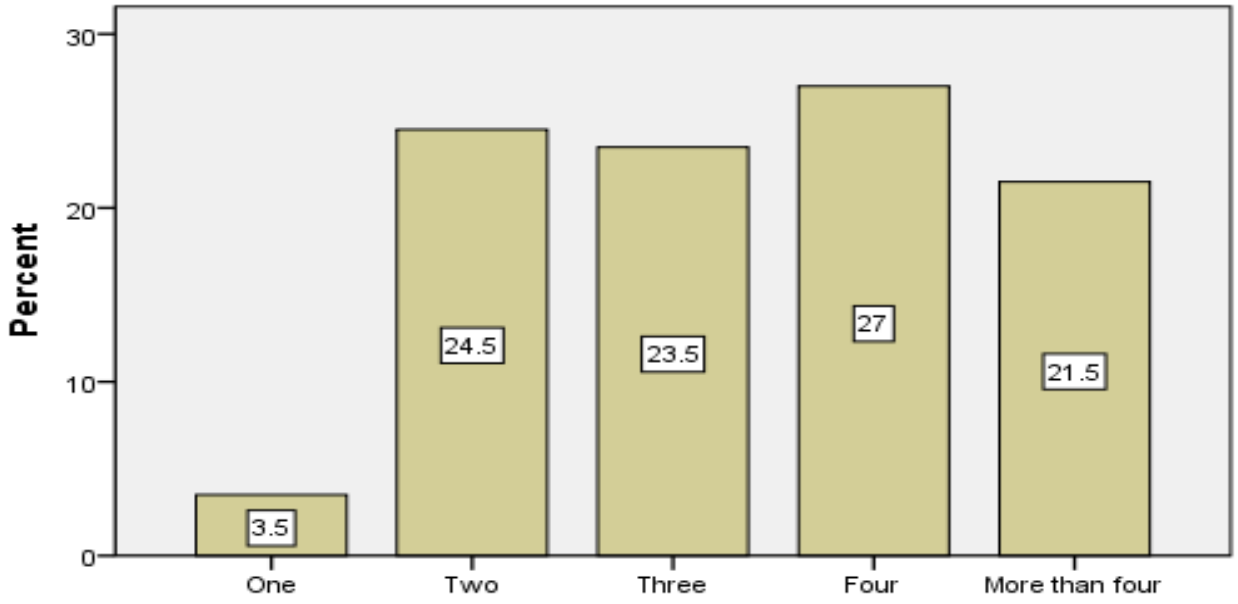

Figure 4.3: Gadget Access

According to the statistics presented in table 4.6 and figure 4.4, 58.5% of the students have more than 9 hours internet availability. The remaining 41.5% of the students have internet availability less than 9 hours. From this distribution, 19.5% able to access to internet from 6 to 9 hours, 11.5% have internet availability from 3 to 6 hours while 10.5% have internet availability less than 3 hours.

Table 4.6: Hours of Internet Availability

Hours	Frequency	Percentage (%)
Less than 3 hours	21	10.5
3 to 6 hours	23	11.5
6 to 9 hours	39	19.5
More than 9 hours	117	58.5

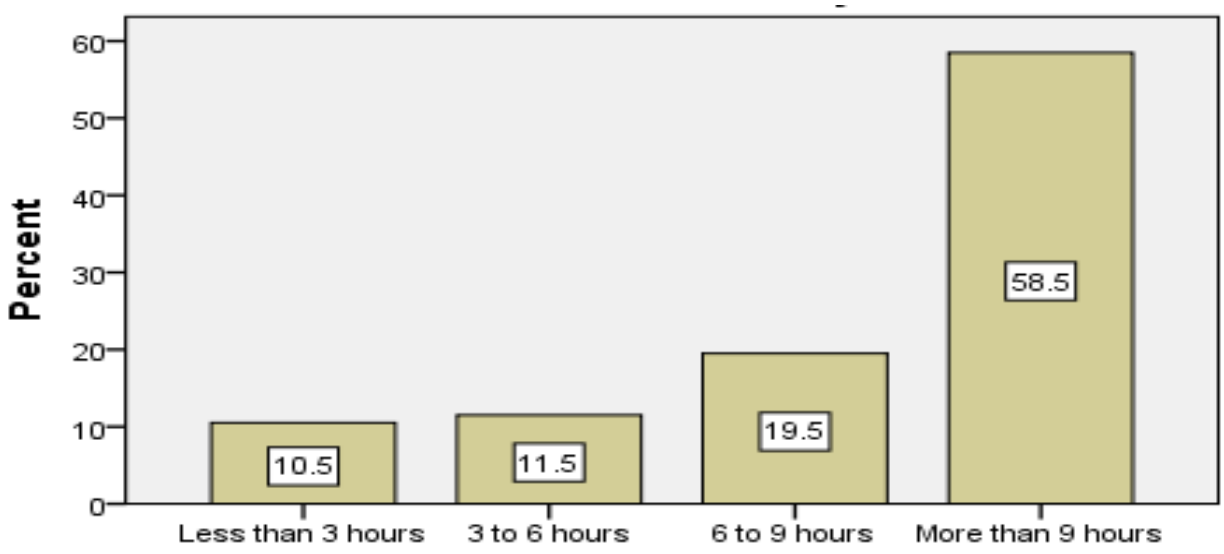

Figure 4.4: Hours of Internet Availability

The subsequent demographic feature in the frequency analysis is the numbers of games accessible by the students. This analysis showed that all the 200 students participated in this research engage in games in their gadgets. According to the data in table 4.7, 60% of the students has less than 20 games while the remaining 40% have more than 20 games. Pie chart in figure 4.5 shows the visual distribution of this analysis.

Table 4.7: Gadget Games

Numbers of Games	Frequency	Percentage (%)
Less than 20	120	60.0
20 and more	80	40.0

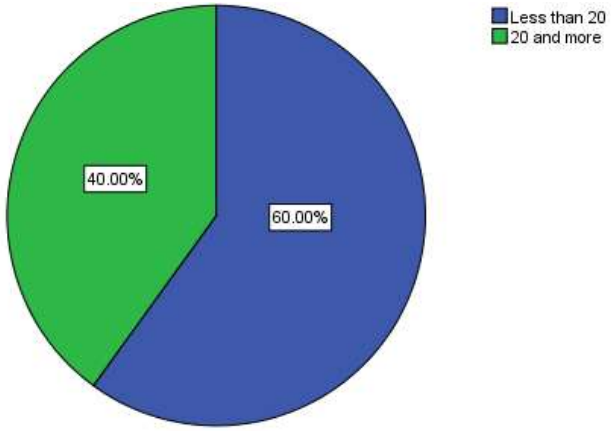

Figure 4.5: Gadget Games

Summary of the duration the students spend in using gadget is shown in table 4.8 and figure 4.6 with numeric and visual representations respectively. From the summary 41.5% of the students found to use gadgets for more than 6 hours. About 27.0% of the students use gadgets from 2 to 4 hours. The hours of gadget use of 18.5% of the students is less than 2 hours. Least proportion of the sample, 13.0% use gadgets from 4 to 6 hours.

Table 4.8: Gadget Duration

Hours using Gadget	Frequency	Percentage (%)
Less than 2 hours	27	18.5
2 to 4 hours	54	27.0
4 to 6 hours	26	13.0
More than 6 hours	83	41.5

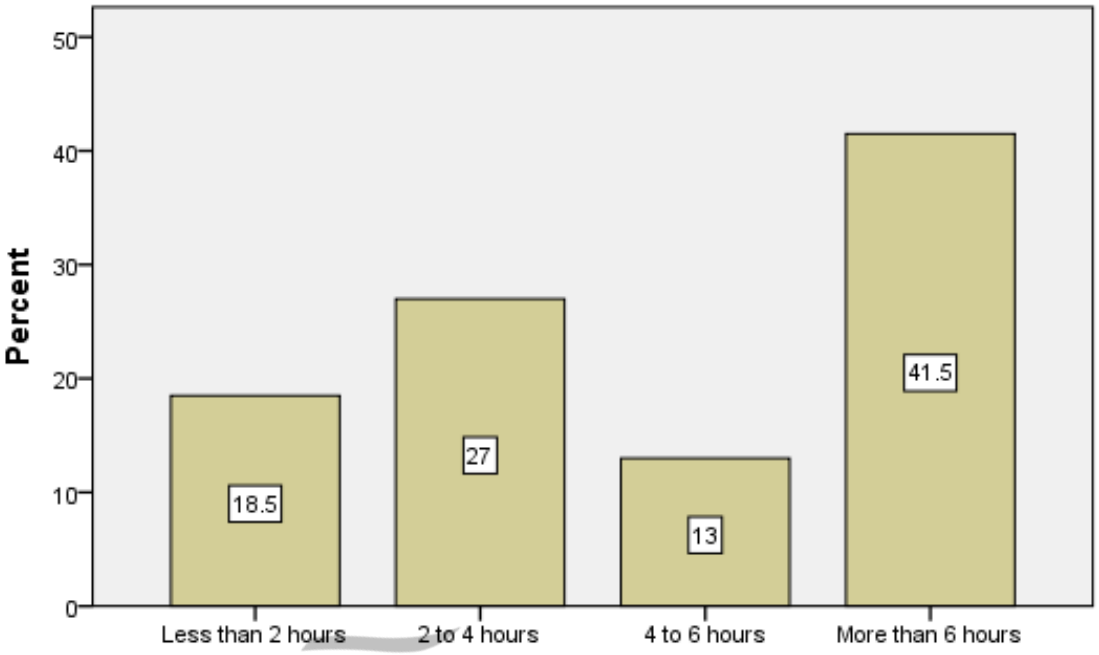

Figure 4.6: Gadget Duration

Findings of the students' response rate for the gadget use and students' wellbeing is summarised in tables 4.9 and 4.10 below. The terms and the descriptions are SD for strongly disagree, D for disagree, N for neutral, A for agree and SA for strongly agree. According to the pattern observed in these tables, the majority of the responses grouped under the scale agree. When the sum of agree and strongly agree is compared against the disagree and strongly disagree, it can be concluded that the students agree that they spend long time in using the gadget, have more access to gadgets and internet and the gadget features motivated them to use it more frequently. At the same time, students perceive that they do face issues such as stress, depression, anxiety and difficulty in managing relationship.

Table 4.9: Response Rate Gadget Use

No	Question	SD	D	N	A	SA
1	Spending more than 5 hours on gadgets	-	2.5	15.5	71.0	11.0
2	Search and explore new app almost everyday	-	2.5	18.0	68.5	11.0
3	Gadget is a must on 24/7 basis	-	1.5	21.5	67.0	10.0
4	More comfortable to use gadget while eating	-	2.5	20.5	66.5	10.5
5	Gadget is a compulsory travel companion	-	3.0	25.5	61.5	10.0
6	Multiple gadget access	-	1.5	26.0	62.0	10.5
7	Availability of alternative gadgets	-	2.0	28.0	56.5	13.5
8	Reliability of internet access	-	2.0	23.5	60.0	14.5
9	Availability of audio/ video on gadgets	-	2.5	24.5	56.5	16.5
10	Technology and troubleshoot support	-	2.0	27.0	58.0	13.0
11	Information search anytime	-	1.0	23.0	59.5	16.5
12	Social media surfing	-	0.5	26.5	61.5	11.5
13	Communication	-	2.5	26.0	58.0	13.5
14	Online purchases	-	1.0	29.5	57.0	12.5
15	Game and entertainment	-	3.0	31.5	55.5	10.0
16	Longer battery span	-	0.5	30.0	58.0	11.5
17	High storage capacity	-	0.5	30.5	56.0	13.0
18	Portable and light	-	1.5	27.0	56.5	15.0
19	Ergonomic from multiple user positions	-	0.5	27.5	57.0	15.0
20	High navigation ease	-	2.0	30.5	55.5	12.0

Table 4.10: Response Rate Students' Wellbeing

No	Question	SD	D	N	A	SA
1	Fatigue and tired even with adequate sleep	-	3.0	29.5	58.0	9.5
2	Tendency of upset for unexpected occurrence	-	1.5	34.5	55.5	8.5
3	Frequent feel of loss	-	2.0	34.0	56.5	7.5
4	Frequent irrelevant thoughts	-	1.5	32.0	61.0	5.5
5	Experiencing jaw clenching	-	2.0	31.5	56.5	10.0
6	Self-confidence is hard to achieve	-	5.5	22.0	57.0	15.5
7	Tendency to think of problems	0.5	6.5	20.0	58.0	15.0
8	Abrupt change in appetite	0.5	3.0	24.5	59.5	12.5
9	Unpredicted mood swings	0.5	6.5	27.0	55.5	10.5
10	Lack of interest to hobbies outside house	-	5.0	28.0	57.5	9.5
11	Time is always insufficient to complete all tasks	0.5	5.0	32.5	52.0	10.0
12	Underestimation of time to complete tasks	-	4.5	33.0	54.5	8.0
13	Feeling of too many works too little time	-	4.0	30.0	59.0	7.0
14	Dependency on gadgets	0.5	3.5	31.0	57.5	7.5
15	Restless condition appears during task	0.5	5.0	29.5	60.0	5.0
16	Get irritated or angry easily	2.0	3.0	13.0	67.0	15.0
17	Easily annoyed by other people's actions	3.0	7.0	11.0	65.0	14.0
18	Lack of interest in social circles	1.5	3.0	10.0	72.0	13.5
19	Quick to judge and criticize others	-	8.0	10.0	70.0	12.0
20	Unable to cooperate with others in decision making	-	1.5	32.0	57.0	8.5

4.4 Descriptive Analysis

The purpose of descriptive analysis is to understand the overall perceptions by using a simplified single value. Therefore, the mean and the corresponding standard deviation for the responses according to each segment of the questionnaire is calculated. Interpretation of the mean value according to the reference range shown in table 4.11 is used to decide whether the gadget usage and students' wellbeing issue is high, medium or low.

Table 4.11: Mean Score Scale

Mean value	Interpretation	Notes
1.00 – 2.33	Low	strongly disagree/ disagree/neutral
2.34 – 3.66	Medium	neutral/ agree
3.67 – 5.00	High	agree/ strongly agree

4.4.1 Gadget Use

Descriptive analysis of the independent variable is shown in table 4.12 below. Mean score of gadget use is 3.83 (s.d 0.441) indicating it is high. Gadget use was analysed from four different perspectives namely time, accessibility, purpose and features. Among these elements, the highest mean value is shown for time 3.86 (s.d 0.520). This is followed by the accessibility element with the mean value 3.84 (s.d 0.547). The elements' purpose and features of gadgets has the same mean value 3.82 (s.d 50.547).

Table 4.12: Descriptive of Gadget Use

Elements	Mean	Standard deviation	Level
Time	3.86	0.520	High
Accessibility	3.84	0.547	High
Purpose	3.82	0.547	High
Features	3.82	0.530	High
Overall gadget use	3.83	0.441	High

4.4.2 Students' Wellbeing

Based on the summary in table 4.13, the issues faced in achieving student wellbeing is high as the mean value for overall wellbeing is 3.77 (0.406). Among the four different elements tested in the student wellbeing, anxiety is identified as the highest occurring issue with the mean score 3.83 (s.d. 0.582). The subsequent highest occurring student wellbeing issue is stress showed by the mean score 3.75 (s.d. 0.485). Relationship is the next highest student wellbeing issue whereby the mean score for this issue is 3.77 (s.d. 0.504). Depression element of students' wellbeing has the lowest mean score, 3.72 (s.d. 0.519) which shows that depression is the lowest issue faced by the students that are actively using gadgets.

Table 4.13: Descriptive of Students' Wellbeing

Elements	Mean	Standard deviation	Level
Stress	3.75	0.485	High
Depression	3.72	0.519	High
Anxiety	3.83	0.582	High
Relationship	3.77	0.504	High
Overall Students' Wellbeing	3.77	0.406	High

4.5 Correlational Analysis

Aim of correlational testing is to view the association existing between the gadget use and students' wellbeing among the secondary school students. As such, outcomes from the analysis are utilised to conclude whether or not high gadget use by the students related to their wellbeing. Besides this, correlational testing is able to indicate the intensity of the connection between the gadget use and students' wellbeing. Standard range of Pearson's correlation coefficient as shown in table 4.14 below will be used to interpret findings from the research analysis.

Table 4.14: Pearson's Correlation Coefficient

Correlation coefficient range	Interpretation
±0.71 - ±1.00	Strong
±0.51 - ±0.70	Moderate
±0.01 - ±0.50	Weak

Results from the correlation analysis in SPSS is shown in table 4.15. The analysis showed Pearson's correlation coefficient between the research variables is positive. Therefore, the increase in gadget use will increase the issues of wellbeing among the students. But the impact of gadget use is moderate towards students' wellbeing because the value 0.635 is in the moderate category. Since the significant level (0.000) is lesser than 0.05, the relationship is the actual observed condition among the 95% of the sample.

Table 4.15: Correlation between Gadget Use and Students' Wellbeing

Correlation coefficient	Significant level
0.635	0.000

4.6 Regression Analysis

Analysis in the previous segment indicated increase in gadget use can increase the student wellbeing issues. Linear regression analysis in this segment will be used to discover the rate gadget use can increase the issues in student wellbeing. The analysis will generate linear model such that estimation of student wellbeing changes can be made by using the coefficient of the gadget use in the equation. Outcomes from the linear regression analysis is displayed in table 4.16 whereby the corresponding linear equation is:

Students' wellbeing = **0.584** Gadget Use + **1.525**.

Based on the linear equation above, every one-unit change in gadget use will create 1.525 + 0.584 changes in students' wellbeing. Since the constant value in the equation is 1.525, students' wellbeing issue might be present even without gadget use. However, the positive multiple of

gadget use shows, student wellbeing issue will be intensified with high gadget use. The model is capable of identifying students' wellbeing issue at the rate of 40.1% accuracy as shown by the R^2 value.

Table 4.16: Linear Regression Gadget Use – Students' Wellbeing

Variable	Coefficients	R^2
Constant	1.525	40.1%
Gadget Use	0.052	

4.7 Summary

Data from the survey was used to analyse sample students' background information and their self-assessment on gadget use as well as their wellbeing status. The descriptive analysis identified high level of gadget use and high issues of students' wellbeing. Through the correlation and linear regression analysis, researcher able to confirm moderate positive relationship between gadget use and students' wellbeing. These findings will be discussed in relation to the research objectives in the subsequent chapter of this thesis.

CHAPTER FIVE

DISCUSSION AND CONCLUSION

5.1 Introduction

The final chapter of this thesis will communicate summary of significant research aspects to draw an overall conclusion. This conclusion will indicate differences and similarities of the present findings compared to the past studies in the literature.

5.2 Discussion

5.2.1 Research Objective 1: To study the level of gadget usage among secondary school students in Klang Valley

Gadget use among the selected students performed in few aspects namely time spent on gadget, accessibility to the gadget, different purposes of using gadgets and the features of the gadget that motivates students to use it. In terms of time of using gadgets, students seemed to spend most of their time awake using gadgets as the findings showed they spend more than 5 hours per day. Their time in gadget includes searching for new app almost every day. Findings also indicated there is no day is passed without gadget use since students have to have gadget on 24 7 bases. Analysis showed gadget is part of the students' every activity such as eating or even used as travel companion. The finding is similar as reported by Wahyuni, Siahaan, Arfa, Alona, & Nerdy (2019), Potas, et al. (2021), Pachiyappan, et al. (2021) and Ng & Hassan (2017) which showed students spend most of their time using gadgets.

Findings showed accessibility to gadget is high among the students. These students have access to more than one gadget. There is also always an alternative gadget is available for their access. Based on the responses provided by the students, internet access is highly reliable thus there is no obstacle for the students to use gadgets. Besides this, the gadgets owned by these students are highly interactive as there are multiple audios, video aspects that the students can access. For example, voice commands while engaged in online games.

The students also able to find tech support and troubleshooting thus making the gadget accessibility high all the times. Comparison to the literature studies showed accessibility confirmed as the element leading students to increase gadget use. These were reported in the studies by Kumar & Sherkhane (2018) and Arumugam, Selvanayagam, & Sathiyasenan (2020).

High level of gadget use among the students is motivated by the multiple purposes such as ease of information search regardless of the time and place. By using gadgets, students responded that they can perform social media surfing and multiple social media platforms. Besides these, students' purpose of engaging in gadget on 24 7 basis was found to be communication ease, making online purchases as well as to entertain themselves with games. While the past studies in terms of the purpose of gadget was not specifically stated, some studies discussed smartphones as the most widely used gadget to play games most of the times. These studies are Darko-Adjei (2019) and Surat, Govindaraj, Ramli, & Yusop (2021).

One of the aspects analysed to identify level of gadget use among the secondary school students was the features of gadget itself. Responses showed students feel pleased to use gadget that comes with longer battery span. They are excited in using gadget with huge storage capacity since it creates no lagging experience while using gadgets. The feature of gadget that is light and portable allows the students to bring it anywhere they go. This feature increases the time students spend with gadgets. High numbers of students also responded that they are keen on using gadgets since there are ergonomic features and high navigation ease while using the current edition gadgets.

5.2.2 Research Objective 2: To study the wellbeing of secondary school students in Klang Valley

Based on the primary data analysis, the issues of students' wellbeing were found to be high. These issues were studied only from the mental health perspective whereby stress level was one of the measurements used. Students agreed that they experience fatigue similar to lack of sleep despite of having sufficient sleep.

Their emotional response is upset when things do not happen as their expectation. Most frequently students felt they at loss and indulge in irrelevant thoughts. Involuntary behaviour such as jaw clenching shared by the students who responded to the questionnaire.

Another measure used to evaluate the students' wellbeing in this research is depression indicators. Based on the responses given by the students, it is hard for them to believe in themselves whereby they mostly doubt themselves. Most of the time they are not engaged in the gadgets, they spend on thinking of problems. The students admitted appetite had been inconsistent along with unexpected change in their moods. It was hard for the students to keep their emotions under control. Responses from the students reflected they are not excited to pursue activities outside the house.

Based on the anxiety measures on the students' responses, students face weak wellbeing. According to their perceptions, the current time is not sufficient for them to accomplish all the tasks. The students also tend to make incorrect time estimation when completing their tasks. The feel of too many works to be done in too little time is always faced by the students. It appears that the students tend to depend on gadgets to manage their uncertain feelings. Tasks always seem chaos because the students are restless throughout a process of completing tasks.

Besides the stress, depression and anxiety, students' wellbeing level was also assessed in the way they interact with their social circle. Students' responses showed they tend to get angry or irritated with family members. Other members' actions are easy to provoke the students. Besides this, students who answered the questionnaire also admitted they rarely show interest in the changes or achievements of their social circle members. In contrast, students tend to judge or criticize them. Another relationship issue admitted by the students is the inability to cooperate with others when it comes to decision-making.

Many of the past researchers supported the notion that overuse of gadget to results in adverse effects. Razak, Khairuldin, Reshad, Mat@Mohamad, & Anas (2021) showed absence of parental

supervision resulted in gadget addiction. Elias, Yuan, Mahidin, Hashim, & Abdullah (2021) reported decline in the academic performance occurred as a consequence to the addiction in using smart devices.

5.2.3 Research Objective 3: To study the impact of gadget addiction on secondary school students' wellbeing in Klang Valley.

According to the correlation testing, research identified positive impact of gadget addiction towards the secondary school students' wellbeing. This implies gadget addiction will cause students' wellbeing will be affected. Since there are multiple elements of gadget use and students' wellbeing were used in the element, the positive result is projected to occur from the time spent in using gadgets and the anxiety score. These two elements were found to have the highest mean scores.

5.3 Implication of the Research

Findings from this research imply reduced gadget use can improve students' wellbeing. Data analysis showed that students at present experiencing issues in managing stress, facing depression, anxiety attack and poor relationship with their social circle. Findings imply that better time management can help students to overcome these wellbeing issues. Based on the factors causing gadget overuse, it is obvious that intervention from parents and teachers needed to manage the gadget use.

One of the interventions is ensuring students are following a schedule to perform all their activities in a day while still have the opportunity to use their gadgets. Current finding shows students spending more than five hours on gadget. Therefore, a schedule should incorporate lesser than 5 hours gadget time. Based on the time spent on gadget at present, the findings imply that students need awareness on prioritising their tasks such that the dependent to gadget will decline.

Findings from the research imply that access to internet one of the factors students could not manage gadget using time. Therefore, certain tasks must be created to be in offline mode and students need to train to follow offline tasks as well. In summation, gadgets are beneficial in

students' learning process. However, an effective schedule is needed such that students can still manage their time while not being behind in technological development.

5.4 Research Limitation

Quantitative research method is one of the research limitations since there is no opportunity to probe further the samples after the responses are recorded. Responses such as agree or disagree are not supported with further justifications or examples to strengthen the results. The samples have limited answering scope when quantitative research design is used. In using quantitative research method, there is a possibility of data inaccuracy. This is because research data is collected through a multiple-choice question survey. Researcher do not have control over the options selected by the student samples. The data collection was performed using online survey mode which limited the researcher's opportunity to meet the samples face-to-face. It is common behaviour of respondents to select the likert scale the do not represent the true situation or their true perception. Despite of having acceptable range reliability, the correlation may not be an actual value. With the difference in data accuracy, the correlation coefficient is possible to weaker or stronger than the current value.

The research also has sampling limitation whereby samples are selected from one particular geographic location. This decision limited generalisation of the study among a wider population. For example, the results from this study can be generalised to the students in Selangor but not suitable to be generalised to the entire Malaysian student population. Furthermore, attributes and gadget use behaviour of the students in Klang Valley schools will be different from the other schools in Malaysia due to the infrastructure development differences.

5.5 Recommendations

By referring to the limitations of this research, there are few feasible recommendations available to be followed if similar research is performed in future. Suggestion to utilise mixed method research is the first recommendation whereby mixed methodology refers to using more than one method for single research. This can be in the simplest form such as combining one method from quantitative and qualitative. With the integration of mixed research method, higher reliability and validity can be achieved in the findings. It is due to mixed method involving focus group discussion or interview on top of the survey method.

Interview method of data collection will allow the samples explain their responses with examples or state the reasons for their responses that will strengthen the research data. Since interview data collection method only requires 3 to 5 samples, more data can be collected with minimum time efforts. When qualitative research method mixed with quantitative research method, there is opportunity to use focus group discussion as a part of the data collection. This method involves letting 4 to 6 research samples discuss among themselves to provide their perceptions and argument.

Mixed research method is expected to increase data reliability and validity because the analysis will also include text and themes rather than just numbers on the likert scale. Therefore, the responses on the likert scale can be triangulated with the qualitative data to identify discrepancies. Another advantage of using qualitative approaches as the supplementary to the quantitative design is the open-ended questions used in qualitative data collection. This will generate genuine response from the samples and they will not be influenced by the guiding words in the likert scale questions.

Future research is recommended to be done among wider population and preferably a longitudinal study such that researchers can study gadget use behaviour for a longer period. This will provide more validity regarding student behaviour while using gadget.

5.6 Conclusion

The research purpose is to study the impact of gadget addiction towards students' wellbeing among the secondary school students in Klang Valley. The completion of the research reflects success in achieving research aim. This is because selection of the research design, samples and framework of data analysis matched the three research objectives. Furthermore, accuracy and consistency of the research instrument was ensured through the use of reliability test. Since the research aimed to study gadget addiction among the students, selection of the secondary school students as the sample ensured data source matches the research questions. The research tested impact of the independent variable on the dependent variable. Prior to the correlation testing, behaviour of both the research variables was done. The results confirmed the gadget use among the students is more than a regular period. Students had more time, accessibility, attraction and motivation to use gadget for longer period. At the same time, there were significant alerting behaviour identified through the students' self-assessment on their stress, depression, anxiety and relationship issues. As such, correlation between these two variables existed at moderate level. Based on these findings, further study is recommended to be done with a few suggestions to increase the quality of the research.

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APPROVAL PAGE

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NAME OF AUTHOR : RAJENDRAN SUPARAMANIN

The undersigned certify that the above candidate has fulfilled the conditions of the project paper prepared in partial fulfilment for the degree of Master of Business Administration.

SUPERVISOR

Signature : _____

Name :

Date :

ENDORSED BY

_____

Dean

Graduate School of Business