



**UNDERGRADUATE STUDENTS' MOTIVES ON BACKGROUND  
MEDIA USE AND ITS EFFECTS READING COMPREHENSION: A  
CASE STUDY ON MEDIA MULTITASKING**

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Masters

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**UNDERGRADUATE STUDENTS' MOTIVES ON BACKGROUND MEDIA USE  
AND ITS EFFECTS READING COMPREHENSION: A CASE STUDY ON MEDIA  
MULTITASKING**

LO YONG EN

This project is submitted  
In partial fulfilment of the requirements for a  
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## ABSTRACT

This study investigated students' motivations for media multitask while studying and the effects of the presence of different forms of background media on students' reading comprehension performance by adapting the case study design. This study had adopted the purposive sampling method to recruit 4 undergraduate students from UNIMAS who have the habit of studying with the presence of background media and have Band 4 and above for their MUET as participants. Students' motivations to study along with background media were determined through interviews. Besides, the present study also examined if the presence of background media affects reading comprehension performance and how different forms of background media affects reading comprehension performance. Participants were tested on their reading comprehension performance under 4 conditions: lyrical music, non-lyrical music, video, and silence conditions. The findings from the interview show that there are 5 motivations why students prefer to study with background media, which are habit, boredom alleviation, prevent distraction, satisfy emotional needs, and relieve tiredness. Moreover, the findings show that the presence of background media impaired reading comprehension performance. Playing videos in the background affected the reading comprehension performance the most; the performance of the participant in lyrical music condition was slightly worse than the participant in non-lyrical music condition. The findings imply that it is important to select carefully the form of background media to combine with studying tasks.

*Keywords:* media multitasking, reading comprehension, motivations to multitask with media, background media

## ABSTRAK

Kajian ini menyelidiki motivasi pelajar untuk terhadap berbilang-tugasan dengan media semasa belajar dan kesan kehadiran media latar belakang yang berbeza bentuk terhadap prestasi pemahaman membaca pelajar dengan menyesuaikan reka bentuk kajian kes. Kajian ini telah menggunakan kaedah persampelan bertujuan untuk merekrut 4 pelajar sarjana dari UNIMAS yang mempunyai kebiasaan belajar dengan kehadiran media latar belakang dan mempunyai Band 4 ke atas untuk MUET mereka sebagai peserta. Motivasi pelajar untuk belajar dengan kehadiran media latar belakang telah dikaji melalui temu ramah. Selain itu, kajian ini juga meneliti adakah kehadiran media latar belakang mempengaruhi prestasi pemahaman membaca dan bagaimana bentuk media latar belakang yang berbeza mempengaruhi prestasi pemahaman membaca. Peserta diuji prestasi pemahaman bacaan mereka dalam 4 keadaan: muzik dengan lirik, muzik tanpa lirik, video, dan keadaan senyap. Hasil kajian dari temu ramah menunjukkan bahawa terdapat 5 motivasi mengapa pelajar lebih suka belajar dengan kehadiran media latar belakang, iaitu kebiasaan, pengurangan kebosanan, mencegah gangguan, memuaskan keperluan emosi, dan menghilangkan rasa letih. Tambahan lagi, hasil kajian menunjukkan bahawa kehadiran media latar belakang mempengaruhi prestasi pemahaman membaca. Memainkan video di latar belakang mempengaruhi prestasi pemahaman membaca yang paling banyak. Prestasi peserta dalam keadaan muzik lirik sedikit lebih buruk daripada peserta dalam keadaan muzik bukan lirik. Hasil kajian mecadangkan bahawa ia adalah penting untuk memilih dengan teliti bentuk media latar belakang untuk digabungkan dengan tugas belajar.

*Kata kunci:* berbilang-tugasan dengan media, pemahaman membaca, motivasi untuk berbilang-tugas dengan media, media latar belakang

## **CHAPTER ONE**

### **INTRODUCTION**

Ever since the burgeoning prevalence of mobile media technologies, the availability and easy accessibility of these technologies bringing more convenience to life as it offers various ways to satisfy needs in information, communication, and entertainment. Among the Malaysian Internet users aged 16 to 64, 97% of them own smartphone, 72% own laptop or desktop computer, and 32% own tablet device; the top three most preferable online content activities by this age group of Internet users in Malaysia each month are watching online videos (98%), listening to music streaming services (70%), and listening to online audio stations (56%) (Kemp, 2020).

Since smartphones are so ready to use, it induces the media multitasking behavior (Oshidary, 2019). In this age of information explosion, people are having a variety of media options to access terabytes of content from the Internet but they have limited time and attention to process those content which they receive from multiple media sources daily, and hence, they often multitask (Kononova & Chiang, 2015). It is very common to see people listening to music while doing their work or watching videos while eating.

Nowadays, students of higher education are immersed in a deluge of digital media interactivity which has gradually become a part of their lifestyle (Patterson, 2017). The devices such as laptops, smartphones, and tablets have been used as a part of the learning tools. Students are expected to make good use of these devices to enhance their learning experiences. Besides, instructors are also encouraged to use these technologies to provide diversity in their teaching methods. Nevertheless, there are inconsistencies in research findings regarding the effectiveness of the technology use in education as some research

findings show that technology use promotes learning gains while others show that it leads to disruptions and learning losses.

Empirical evidence has shown that media multitasking is never a good practice when it comes to some cognitive activities such as studying and working (Kononova & Yuan, 2017). Students who are immersed in digital media use are especially vulnerable to the costs of media multitasking as their temptation to media multitask can be easily triggered even when in the classroom because smartphones and laptops are readily at hand (Oshidary, 2019). Studies showed that using media while doing non-media tasks (e.g., reading or doing homework) negatively affect memory and comprehension of both media content and performance on non-media tasks (Kononova & Yuan, 2017).

However, students believe MMT is essential during homework completion which is boring as it could satisfy their emotional needs by lowering their negative mood state and enhancing their positive mood state (Calderwood, Green, Joy-Gaba, & Moloney, 2016). The study by Ralph, Smith, Seli, and Smilek (2019) found that MMT could alleviate the boredom of doing homework and increase students' task-related motivation.

Since there is plenty of research that has been conducted separately on the motivations to media multitask and the effects of MMT on students' reading comprehension performance, there is scant work on the intersection between these two topics. Therefore, the present research attempts to examine students' underlying motives to media multitask and the effects of different forms of background media on students' reading comprehension performance.

### **Media Multitasking (MMT)**

Media multitasking (MMT) is best described as pursuing two or more independent tasks at the same time in which at least one of those tasks involves media (Xu, Wang, & David, 2016). Gazzaley and Rosen (2016) insisted that multitasking does not entail doing two

tasks simultaneously. Instead, when individuals deal with two or more tasks with different higher-order goals at the same time, the cognitive system within the brain do their best to switch rapidly between the tasks (Gazzaley & Rosen, 2016). MMT has also been defined as simultaneous engagement in multiple media forms (Baumgartner, Lemmens, Weeda, & Huizinga, 2017).

MMT occurs when a person: (1) using two or more types of devices simultaneously (Szumowska et al. 2018), for instance, checking Instagram while watching TV or answering phone call while working on the laptop; (2) performing multiple activities on one single device (van der Schuur, Baumgartner, Sumter, & Valkenburg, 2015), for instance, web surfing and watching videos on the laptop at the same time; (3) engaging in media while doing non-media activities (van der Schuur et al. 2015), for example, listening to radio while doing homework. According to Lang and Chrzan (2015), the tasks involved in MMT can either be performed simultaneously or by switching back and forth between the tasks.

The present study mainly focuses on the third type of MMT (i.e., engaging in media while doing non-media activity) since the purpose of this study is to investigate the effects of media use on non-media activity, specifically, students' reading comprehension.

### **Effects of Media Multitasking (MMT) In Daily Life**

MMT raises the risk of accidents. It is not unusual to see that people are using a smartphone to perform a secondary task while driving, such as talking on phone, texting, or checking their social media. Naturalistic studies found that secondary tasks that require drivers to look away from the road ahead increase the risk of accidents for young novice drivers (Klauer, Ensani, McGehee, & Manser, 2015). Among the distractions confronted by drivers, the most dangerous tasks are those that take the drivers' eyes off the road (Stavrinos,

Mosley, Wittig, Johnson, Decker, Sisiopiku, & Welburn, 2016) and those that increase their cognitive load (Strayer, Turrill, Coleman, Ortiz, & Cooper, 2014).

In addition, MMT causes sleep problems (van der Schuur, Baumgartner, Sumter, & Valkenburg, 2018). Several studies in adolescents demonstrated that the simultaneous use of multiple electronic devices leads to less night sleep and a greater degree of sleepiness during daytime (Owens, 2014). Mark, Wang, Niiya, and Reich (2016) found that with less sleep, people may feel more work pressure and get distracted easily. Hence, they tend to seek out a mental break from activities that requires less attentional resources, such as social media use (e.g., Facebook) while conducting work on the computer, which results in multitasking with social media (Mark, Wang, Niiya, & Reich, 2016). It will be an infinite loop that MMT causes less night sleep which eventually leads back to MMT behavior if there is no external force to break the loop. Chronic sleep loss is detrimental to academic success, safety, physical and mental health (Owens, 2014).

### **Effects of Media Multitasking (MMT) On Academic Performance**

MMT has been related to a myriad of negative outcomes to students, such as increased distraction, lowered productivity, and declining academic performance (Sana, Weston, & Cepeda, 2013). Frequent MMT was associated with poorer executive function ability, worse academic achievement, and a reduced growth mindset (Cain, Leonard, Gabrieli, Finn, 2016). Likewise, Martin-Perpina, Vinas Poch, and Malo Cerrato (2019) found that MMT is negatively related to adolescents' execution function and academic achievement in which the adolescents who media multitask more while doing homework are reported to have more dysexecutive problems. MMT during academic activities is also associated with an increase in subsequent academic attention problems (van der Schuur, Baumgartner, Sumter, & Valkenburg, 2020).

Studies showed that multitasking with social media is detrimental to academic performance. Junco (2015) found that multitasking with Facebook significantly negatively predicted the academic performance of freshmen, sophomores, and juniors. Lau (2017) found that using social media for academic purposes has no significant effects on academic performance, whereas using social media for non-academic purposes (e.g., video gaming) or multitasking with social media during schoolwork did show a significant negative effect on academic performance. Moreover, Patterson (2017) found that students with a low level of MMT (0-2 digital technologies used simultaneously while studying) significantly outperformed students with a high level of MMT (7 or more digital technologies used simultaneously while studying) on the exam. Study shows that MMT is associated with negative learning outcomes rather than mind wandering. (Wammes, Ralph, Mills, Bosch, Duncan, & Smilek, 2019).

MMT while doing non-media activities is problematic. The study by Kononova, Zazorina, Diveeva, Kokoeva, and Chelokyan (2014) demonstrated that doing homework is one of the most common non-media activities that paired with the use of media, such as television, smartphones, and the Internet. However, Kononova et al. (2014) also found that multitasking with electronic media while engaging in non-media activities such as doing homework might cause an issue in which the attention on the primary non-media task has to be diverted to media messages, which might lead to the rise in the cognitive demands for both media and non-media tasks. Although people know that MMT may reduce work efficiency, it is still an enjoyable behavior in which people would remain engaged with (Kononova & Yuan, 2017).

MMT appears to increase one's levels of motivation to complete a task. Ralph, et al., (2019) suggest that low task-related motivation might increase the tendency of engaging in task-unrelated MMT. They proposed that task-unrelated MMT might provide additional

stimulation to an under-stimulating situation, which might help to increase task-related motivation by alleviating boredom. They found that having the video continuously playing at the background did help to sustain one's motivation level in performing the primary focal task.

### **Listening to Music while Studying**

Kononova and Yuan (2017) have conducted an online survey to examine how frequently and what motivates college students to multitask with media while studying or working. They found that music was a prevalent media activity to combine with tasks related to studying or working, and was strongly motivated by efficiency, entertainment, and relaxation. The extend of music listening during a demanding task was found to be driven by the desire to stimulate oneself to perform better in that task, which was consistent with the findings from previous research by Schellenberg (2005) which students claimed that listening to music helped to sustain their concentration so that they could study or work longer.

Kumar, Wajidi, Chian, Vishroothi, Ravindra, and Aithal (2016) had researched medical undergraduate students to find out the effect of listening to music on students' concentration and academic performance. The findings suggested that students believe that music could help them to focus while studying, keeping their mind calm, and prevent sleepiness (Kumar, et al., 2016). Findings revealed that there was a high rate (75%) of correct answers while listening to soft music as compared with other fast track or instrumental music (Kumar, et al., 2016).

However, the study by Lehmann and Seufert (2017) found out that there was no mediation effect between background music and arousal or mood on learning performance in terms of recall and comprehension but there was an interaction between background music

and working memory (WM) capacity. They proposed that the students with higher WM capacity will learn better with background music.

### **Sensory Interference**

Sensory interference occurs when two information sources are competing for the same sensory channel. According to Kahneman's capacity model of attention (1973), the degree of information processing interruption could be varied by sensory interference. For instance, information processing for audio media involves ears while visual media involves eyes. Hence, the information processing for the combination of audio media and visual media is less likely to be disrupted as they do not fight for the same sensory channel. Thus, visual-audio multitasking will result in low sensory interference and the information processing is less likely to be interrupted. Nevertheless, the combination of two visual media will sure fight for the same sensory channel since of them involve eyes. Individuals have to share their visual attention to both visual media in order to process information from the two media simultaneously. Thus, visual-visual multitasking will result in high sensory interference and the information processing will be more likely to be disrupted. Task performance is more likely to be affected when there is a higher level of sensory interference (Hwang & Jeong, 2017).

An experiment was carried out by Pool, Koolstra, and van der Voort (2003) to examine the impact of different forms of background media on students' performance and time spent on two types of assignments (i.e., paper-and-pencil and memorization assignments). Four conditions were set up: soap opera, music videos, radio music, and no media in the background. The result shows that students in the soap opera conditions (visual-visual) are more distracted and performed worse significantly on both types of assignments as compared with those in other conditions. On the contrary, music in the background (visual-audio), whether music videos or radio music, were not found to have any effect on students'

performance to complete both paper-and-pencil and memorization assignments. This finding suggested that some media could be easier to multitask with as compared to others (Pool et al., 2003). It all depends on the level of sensory interference. According to Kahneman's capacity model of attention (1973), the cognitive load for soap opera which is in visual modality could be greater than the cognitive load for music videos and radio music which are in audio modality, resulting in a higher sensory interference level. This is because the narrative structure of the soap opera could be more complicated than music videos and radio music, and hence increases the cognitive load.

Jeong and Hwang (2015) found that the participants' performance to comprehend and recall a textual message in visual form was not reduced when the radio ads were used to convey the advertising messages in audio form. It resulted in a low level of sensory interference since it was visual-audio multitasking. However, the performance was significantly reduced when the print ads were used to present the advertising messages in visual form because visual-visual multitasking will lead to a high level of sensory interference. The findings suggested that task performance will be higher when the level of sensory interference is low while it will be lower when the level of sensory interference is high (Hwang & Jeong, 2017).

Lauer (2017) found that multitasking of Netflix negatively affecting reading comprehension. The participants in her study who multitasked by watching Netflix scored lower on their reading comprehension task as compared with those who did not watch Netflix. This finding suggested that the reading comprehension task and watching Netflix are competing for the same visual modality (i.e., visual-visual multitasking). Participants have to share their visual attention to both tasks. Both tasks are competing for the same cognitive resources and hence lead to a high sensory interference level.

In a nutshell, media multitasking behavior is not equally problematic on the information processing performance and it all depends on the sensory interference level of the media-task combinations. It is worth to find out which media-task combination will have a stronger effect on the students' reading comprehension performance.

## **Research Objectives**

In this study, there are three research objectives, which are to:

1. To find out the motivations that make students engage in background media use while studying.
2. To compare the students' reading comprehension performance in the conditions with and without background media.
3. To compare the students' reading comprehension performance in different background media conditions, such as lyrical music, non-lyrical music, and videos.

## **Research Questions**

Three research questions correspond with the research objectives:

1. What are the motivations that make students engage in background media use while studying?
2. In which condition, with or without background media, will the students have better reading comprehension performance?
3. In which form of media, lyrical music, non-lyrical music, and videos, will the students have better reading comprehension performance?

## CHAPTER TWO

### METHOD

#### Research Design

The case study design allows researchers to explore in-depth the nature of a particular group or individual by utilizing data from various sources such as interviews, documents, discussion groups, etc (Lin, Cranton, & Lee, 2019). Since students have always been reported to engage in concurrent media use, i.e., listening to music and watching videos while studying (Lehmann, Seufert; 2017; Ralph et al., 2019; Reed, 2019; Kumar et al., 2016), the present study had created a case which simulated the students' behavior in which they like to study with the presence of background media at the same time. The case study design was adopted to explore in-depth the motives why students to study along with the presence of background media effects of concurrent media use on students' reading comprehension performance (Lin, Cranton, & Lee, 2019).

The present study aimed to find out what motivates students to study along with the presence of background media through interviews. Besides, this study also aimed to examine if the presence of background media affects reading comprehension and also to examine between-subjects on how concurrent use of different forms of background media affects students' reading comprehension performance in terms of their scores and time consumed to finish the reading task.

The participants were tested on their reading comprehension performance under four conditions. There are three conditions with background media available and one condition with no background media while doing the reading comprehension task simultaneously. Condition 1 was listening to lyrical music. Condition 2 was listening to non-lyrical music.

Condition 3 was watching videos. Condition 4 was doing the reading comprehension task in silence (i.e., no background media).

The participants in the conditions where background media available were allowed to select their playlists from the Internet to simulate the scenario of how they usually study along with background media. The participants do not have any time limitations to finish the reading comprehension task. Their scores and time taken to finish the reading comprehension task were compared across the four conditions to find out how different forms of media use affects students' reading comprehension performance.

### **Participants**

The population of selection for this study was the undergraduate students from University Malaysia of Sarawak (UNIMAS). Four third-year Cognitive Science students aged 22 to 23 from the Faculty of Cognitive Sciences and Human Development were recruited by using the purposive sampling method to study in-depth the motives of why they prefer to study with background media and the effects of concurrent background media use on students' reading comprehension. The participants were recruited on the criteria that they must have the habit of engaging in background media use while studying and must have Band 4 and above for their MUET to make sure that they were capable to do the reading comprehension test.

Malaysian University English Test (MUET) is an English proficiency test administered by the Malaysian Examination Council (MEC) to measure pre-university students' English proficiency level before they enter local public universities (EduAdvisor, n.d.). Students will be evaluated on 4 components, which are listening, reading, writing, and speaking, with a total score of 300. Students' MUET Band will be determined by their total score across these 4 components, range from Band 1 (lowest proficiency) to Band 6 (highest

proficiency). Band 4 indicates that students should have satisfactory abilities in their understanding of language and context. The participants recruited must have Band 4 and above to make sure that they can understand the reading passage and able to answer the questions accordingly.

### **Instrument**

*Interview.* Participants were allowed to express their ideas, attitudes, and motives concerning their behavior of studying with the presence of background media.

*Background media (BGM).* The lyrical music, non-lyrical music, and the videos that the participants usually engaged in while studying.

*Reading comprehension test.* Participants were required to do a reading comprehension test regarding the history of perfume making, followed by multiple-choice questions. The questions required participants to identify the main idea of the reading passage, to link to different parts of the reading passage, and to draw inferences from the information provided in the reading passage.

*Laptop.* The laptop was used by the participants to take part in the research via Zoom and to do the reading comprehension test and to play the background media at the same time.

*Timer.* The timer was used to record the time taken for the participants to complete the reading comprehension task.

### **Data Collection**

This study was conducted via Zoom during this COVID-19 pandemic. The four participants were met one by one via Zoom to conduct the research. They were randomly assigned to the four conditions (i.e., lyrical music, non-lyrical music, video, and silence) respectively. The participants were explained about the study but did not specifically mention MMT as knowing the purpose of the study may influence their behavior.

Each of the participants had to complete a reading comprehension task under the condition assigned to them. A timer was used to record the time taken for each participant to complete the task. The participants were uninformed that their time taken to complete the task would be recorded as this may influence their behavior. After that, an interview was conducted with each participant to find out what motivates them to use media concurrently while studying.