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THE EFFECT OF SMART DEVICE USAGE AMONG THE UNDERGRADUATE'S TOWARDS ACADEMIC PERFORMANCE

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ABSTRACT

Almost all students at higher education institutions are now inseparably linked to their smart devices and have become increasingly reliant on them. So, the question of whether these devices can assist them to improve their academic performance or at least gain various benefits that improve the quality of learning through it arises. Therefore, the purpose of this study was to examine if there a relationship between smart device usage and academic performance among undergraduates' in Universiti Utara Malaysia. The study employed quantitative method with a cross sectional time horizon and online survey with Google forms. A total of 473 students involved in the study, and the data was analysed using statistical software. The findings reveal there was a relationship between students' use of smart gadgets and their academic performance. Among the examples of such relationships are, addiction to using smart devices causes academic performance can decline. While the sharing of information and communication among students through the utilization of smart devices on the other hand can improve academic performance. Consequently, there are still negative matters related to these smart devices if they are obsessed with it without advisable self-control. So, there may be programs that

can be organized by the university to manage this so as not to harm students' health, social relationships, and weakening their academic achievement.

Keywords: Academic performance, effect, undergraduates, smart devices

INTRODUCTION

Since the early 2000s, the application and utilization of smart devices in human life has undeniably and same time brought both advantages and disadvantages. In this study, smart devices can be defined as the usage of digital technology tools that linked to internet connectivity and application (Apps) such as smart telephones, phablets, tablets, and laptops. Presently, the rapid growth of smart devices development by companies such as Apple, Samsung, and Huawei have changed people lifestyle either working, shopping, and living. A study by Swamy (2020) confirmed that smart device likes smartphone technology has appeared as one of the most successful electronic devices for an instant communication. While Atas and Celik (2019), found that smart devices have been used widely and extensively among thousand of university students with and without a proper instructional setting. In addition, smart devices also gradually turned into a fascinating learning tool used to improve teaching and learning process either face-to-face or via distance mode of education (Darko-Adjei, 2019).

Agreeing to Broadband Search (2021), smart devices become super exciting tool because it makes people feel so convenience. That is why currently there about almost 10 billion of these electronic mobile devices be used worldwide to access the internet and particularly 3.5 billion of them are smart devices. At the same time a total of 96% who use these devices are those aged between 18 to 29 years. At this kind age of group, most of them are students studying at the primary, secondary, and university levels. And they are the group who spend the most time and energy using smart devices in learning and social interaction including communication (e.g., voice and texting). In the past decade, smart devices are the most electronic tool be used massively among secondary schools, college students as well as students at higher learning institutions (Tangmunkongvorakul et al., 2019). Unfortunately, it has been reviewed that these smart devices utilization can have beneficial and non-beneficial implications for students on their health (e.g., poor sleep quality), social interaction, communication, and academic performance (CNBC, 2021; Ng et al., 2017). The objective of the study is to examine the relationship of three matters; addiction, convenience of communication, and utilization of Apps that have influenced towards undergraduate students' academic performance in Universiti Utara Malaysia, Sintok, Kedah.

LITERATUR REVIEW

A study conducted by Alsayed (2020) in Saudi Arabia on a group of undergraduate students has found that 94.8% students always carry their phones intentionally whereas 92.6% of them check their phones as soon as they wake up in early morning. They also found that 77.8% of the students have documents regarding their assessments, group projects and others related to classess activities. Students also use smart devices to access information on the website (93.3%) more frequently reported in group study compared to individual study. In term of social communication, most of them are participate in WhatsApp (89.6%). And finally, they also notified that student make use the social media platforms for academic reasons by 85.2%. Among other findings say that students who use smart devices have assisted them a lot to get better marks in learning and at the same time obtain better results in academic performance. It is not mistaken to say that too many university students nowadays make use smart devices as part of their lifestyles while at the same time applying them for learning purposes both academically and co-curricular activities. Thus, some of them are really addicted to utilization and addiction towards smart devices which can be defined as a student who spend most of the time in scrolling, inspecting, remarking, liking, stalking, and chatting to their

friends through diverse smart devices to access internet and application (Barkley, 2015). On the other hand, a study has found out for those students who are addicted to smart devices are quiet ease and reduce their study pressures (Albarashdi, 2016). At the same time, smart devices availability including internet connectivity have triggered them to use it for self-expression - academic and maintaining their social relationships with friends and families (Hyeon-Jeong et al., 2019).

However, a study by Tangmunkongvorakul et al. (2019) in a largest university in Chiang Mai, Thailand among students aged 18 to 24 years, found that there was a negative association between excessive smart device use and the psychological well-being. Meanwhile, a lot of students also have misused the smart devices for non-academic purposes such as recording violence scene, browsing uncensored website, cyberbullying, gaming, entertainment, focus to artists and music which resulted to poor academic performances (Abi-Jaoude et al., 2020). Other effects from extremely engage in smart devices use and social media multitasking are chronic sleep deprivation, negative effects on cognitive control, academic performance, and socioemotional functioning (Mendoza et al., 2018; Ward et al., 2017).

This study also wants to see whether smart devices have an impact on communication among students and lecturers that finally will impact on their academic performance. Some studies found that students spend at least five hours a day using smart devices are connected negatively with self-reported happiness, life satisfaction and self-esteem. While for those who are less spending but have real activities such as in-person social interactions, sports or exercise, religious services) mostly correlated positively with psychological well-being (Twenge et al., 2018; Twenge et al., 2018a). Today, the wireless learning environment is also one of the factors in the utilization of smart devices to support the learning process of students at the university. This tool is not only used in classrooms or lectures but is widely used outside the classroom such as in student accommodation colleges and off campus. A study by Yao-Ting et al. (2016) at two universities in China among 321 undergraduate students, found that students are discussed the course contents with classmates (85%), consult with lecturers or lecturers' assistants regarding assignments and tutorials (90%), asking classmates on assessments questions (54%), answering lecturers or lecturers' assistants' assignments questions (90%), answering classmates questions (52%), exchanging reading materials and ideas with classmates (38%).

But presently, the social media Apps like WhatsApp has dominated the channels of communication (Hughes, 2021). This App is a multiplatform messaging that supports texting, document sharing, video, discussion forums, and voice calls and others via internet@Wi-Fi and free. Even in Malaysia, WhatsApp has more than 98.7% users from the total registered mobile phoner users in 2020 (Statista, 2021). In fact, this WhatsApp has made information sharing - sending and receiving more faster and can be flexible to almost all software platforms and works perfectly among university students (Mistar & Embi, 2016). They also found that WhatsApp has significantly improved the students in learning the English language and enhancing their proficiency as well. On the other hand, there was a negative impact from using the WhatsApp as confirmed by Irfan and Dhimmar (2019). They claimed that WhatsApp affected the students' education performance, behaviour, and routine lives in the university. They always do the checking on every beep of WhatsApp message call in despite engaging in studying, dining, or doing other thing.

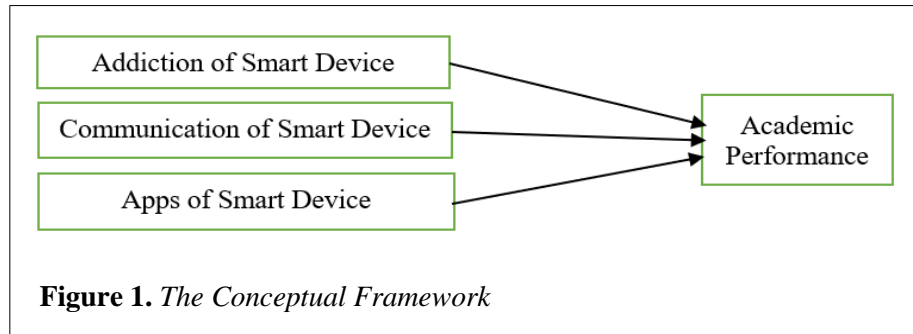
This study also investigated how the application or App that can be installed into the smart device which almost free can influence the students' academic performance. There are two biggest stores of Apps: Apple with 1.96 million and Google Play Store with more than 2.87 million Apps available to be downloaded. And average smart device users currently are using approximately ten Apps per day

and up to 30 Apps in a month (Buildfire, 2021). By using Apps, students can do cooperative learning, exploratory learning, and game-based learning and many more of innovative educational style as compared to traditional method. Students are likely to be more creative, enhance soft skills, and involve into a higher order thinking especially in group assessment or projects (OECD, 2016). One of the advantages of having Apps is it has multiple functions and uses which some of the features are categorise in term of portability, flexibility, low prices or even majority of them are absolute free, user friendly, and easy maintenancem (Ababa et al., 2021). As always, most students studying at the university need individual or self-learning skills as well as group learning. And they can do both of those things because there are many Apps that can support with the best methods. At the same time, by using education Apps it can be a new approach or an education way to promote more interest in topics or course contents that students might otherwise disregard. They can learn almost everything and at same time encourages collaboration between students and lecturers for examples by video (e.g., YouTube), voice (e.g., Podcasting), and interactive classroom (e.g., Google Classroom). At the same time, students will be having the chance to learn without a lecturer's direct influence and finally encourages students to value the independent study (Hans & Sidana, 2018). However, a study by Goleman (2021), shows there are worries of the technology application if too much even in the learning process, it will be affecting the ability of students to focus and may impact the emotional development. He also said that in future these students may not be able to develop necessary self-control and empathy for other people if they do not learn to pay attention in classes. As becomes a necessary, smart devices use in universities not only for classroom learning but also compulsory for remote learning and these cannot be avoided. And since not all students are effective at multi-tasking, thus more students will end up up distracted from their education (Aljraiwi, 2017). Another negative side effects are related to symptoms of overstimulation, where students are having such as difficulties in managing stress and controlling mood (Bush et al., 2019). In a specific, social media likes WhatsApp can reduces students' focus on study and rest time - quality sleep and finally impacted to their academic performance (Irfan & Dhimmar, 2019). They also noticed that students must take more time to study (self-studying) and drag to deferment related problems including lack of attention to lectures.

Academic performance is an important indicator that shows that a student can intensify the learning process at the university within a time. Perhaps academic performance refers specifically to the achievement of specific knowledge and skills demonstrated through completion of a program (e.g., Bachelor of Financial Management) (York et al., 2015). And this is translated in the form of CGPA at the end of his period of study at the university whether it is listed in the first class, second class and third-class categories. While the GPA is a measurement for academic performance usually for each semester. At the same time students' academic performance is now commonly taken as a vital factor for job recruitments, scholarships, and other financial aids (Mould & DeLoach, 2017). When the technology of smart devices began to receive attention and act as an instrument in the teaching and learning process, it may become a factor that either supports or not to the improvement of students' academic performance at the university (Apostolov & Milenkova, 2018). A study done by Ansari and Khan (2020), discovered that smart devices could have significant impact on students and lecturer's interactivity as well as other students. They also found (students) by engaging via Apps it was created an online knowledge sharing behaviour (e.g., notes, discussions, collaboration) has accelerated them to be more creative, dynamic, and research oriented that significantly impact on students' academic performance.

RESEARCH FRAMEWORK AND HYPOTHESES

The purpose of this study is to examine a relationship between smart device usage and academic performance among undergraduates' in Universiti Utara Malaysia. Based on literature review, there are three independent variables relate to usage of smart devices namely addiction, communication and Apps that have impact on the students' academic performance. Figure 1 shows the conceptual framework for the study.



Based on the study's conceptual framework, three hypotheses were developed as follows:

- H1: Is there a relationship between the addiction of smart devices and undergraduates' academic performance.
- H2: Is there a relationship between the communication of smart devices and undergraduates' academic performance.
- H3: Is there a relationship between the Apps of smart devices and undergraduates' academic performance.

RESEARCH METHODOLOGY

This study make use the quantitative technique and a cross sectional time of data collection. The respondents of the study are undergraduate students from a School of Technology Management and Logistics (STML), Universiti Utara Malaysia in Sintok, Kedah. There are about 1700 students registered in STML (Semester A202). The estimated sample size appropriate for the study was approximately 314 students (Raosoft, 2021). The study was used adoption method of the survey questionnaires from previous studies that related to the study's objective. A set of survey questionnaire then has been tested in a pilot study of 30 students and be validated by a few experts in UUM. There are five sections, section one is about the demographic ad the other four sections measured the independent and dependent variables. These four sections were measured by a Likert Scale that using five-point of agreement. Then, the final set questions transformed into Google Form and distributed by WhatsApp randomly to 1540 students (another 160 unreachable, perhaps the mobile numbers are not longer registered). All the data were collected within three weeks and analyzed by SPSS.

Data Analysis

The study has managed to get feedbacks from 473 respondents, and thus the rate of return was 30.71%. There are ten questions in section one - the demographic, such as gender, race, age, semester, program, CGPA, Android, iOS, number of smart devices, and installed Apps. Table 1 shows some of the relevant information on the demographic of the students.

Table 1

Demographic

Item	Results (No & Percent)	Item	Results (No & Percent)
Gender		Semester	
- Male	191 (40.38 %)	- 1 to 4	311 (65.75 %)
- Female	282 (59.62 %)	- 5 to 8	162 (34.25 %)
Age		CGPA	
- 19 to 21	236 (49.89 %)	- 2.00 to 2.99	38 (8.04 %)
- 22 to 24	184 (38.90 %)	- 3.00 to 3.49	257 (54.33 %)
- 25 and above	53 (11.21 %)	- 3.50 and above	178 (37.63 %)
Android	409 (86.47 %)	iOS (Apple)	64 (13.53 %)

The data has been calculated the internal consistency of reliability by Cronbach alpha coefficient. Items in the survey questionnaire went through the reliability analysis in accordance with the extracted four factors. The results of the analysis were presented in Table 2. Students voted the Apps as the most persuading factor that can influence a better results in academic performance with 0.877. The second place goes to communication with 0.842 and the third position was 0.825 which is addiction. The dependent factor took the lowest point with value of 0.770.

Table 2

Results of Reliability Analysis

Cronbach Apha	Factors & Number of Items
.770	Academic Performasnce & 4
.825	Addiction & 6
.842	Communication & 4
.877	Apps & 6

Based on Table 3, the results of Pearson Correlation Analysis of three factors (e.g., addiction, communication, and Apps) toward the academic performance are moderately positive correlation relationship as the values between 0.3 to 0.7 and more than 0.08 (on the Pearson's Correlation Table).

Table 3

Correlations of Dependent Variable and Independent Variables

		Performance	Addiction	Communication	Apps
Performance	Pearson Correlation	1	.767**	.664**	.534**
	Sig. (2-tailed)		.000	.000	.000
	N	473	473	473	473
Addiction	Pearson Correlation	.767**	1	.687**	.632**
	Sig. (2-tailed)	.000		.000	.000
	N	473	473	473	473
Communication	Pearson Correlation	.664**	.687**	1	.745**
	Sig. (2-tailed)	.000	.000		.000
	N	473	473	473	473
Apps	Pearson Correlation	.534**	.632**	.745**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	473	473	473	473

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4 provides the model summary results of R, R Square, Adjusted R Square, and the Standard Error of the Estimate. In this study, the value of R indicated of 0.792 which means there was a moderate positive relationship between the dependent variable and all the independent variables. Meanwhile the R Square was 0.627 which means there are approximately 62.7% of variability of dependent variable can be explained by the items in the independent variables. Perhaps other 37.3% might come from other factors that have possibility can contribute to the improvement in academic performance. While the adjusted R Square was 0.621. And finally, the Standard Error of the Estimate was indicated as 0.510.

Table 4

Multiple Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792a	.627	.621	.51014

a. Predictors: (Constant), Apps, Addiction, Communication

The objective of the study is to examine the relationships of the independent variables (e.g., addiction, communication, and Apps) and the dependent variable of academic performance. Therefore, the following tables are results based on analysis of variance (ANOVA). Thus, Table 5 shows the significant value of ANOVA analysis was below 0.05 which is 0.000. Then the result of ANOVA analysis indicated the null hypothesis of addiction to mobile devices that correlated to academic performance was rejected. Therefore, it was existed is a relationship between independent variable of addiction and dependent variable of academic performance.

Table 5

Multiple Regression Analysis - Academic Performance and Addiction

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	80.428	1	80.428	283.437	.000b
Residual	56.184		198.284		
Total	136.612	199			

a. Dependent Variable: Academic Performance

b. Predictors: (Constant), Addiction

At the same time, Table 6 shows that there was a significant value of ANOVA analysis which is below 0.05 that indicated value of 0.000. And the result indicated that the null hypothesis of communication was rejected. Therefore, there was a relationship between independent variable (communication) and dependent variable (academic performance). Interacting and socializing using smart devices generally makes it easier for students to communicate directly, quickly, and easily regardless of time and location.

Table 6

Multiple Regression Analysis - Academic Performance & Communication

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	60.282	1	60.282	156.370	.000b
Residual	76.330		198.386		
Total	136.612	199			

a. Dependent Variable: Academic Performance

b. Predictors: (Constant), Communication

Table 7 shows that the significant value of ANOVA analysis is below 0.05 which is 0.000. The result indicated that the null hypothesis of Apps of learning mobile towards academic performance was rejected. Therefore, there was a relationship between independent variables and dependent variable. This shows that the Apps used by students can help them in the learning process. Examples of popular Apps are Office Lens, StudyBlue, MyClass Schedule, EasyBib and Skyping.

Table 7

Multiple Regression Analysis - Academic Performance & Apps

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	39.004	1	39.004	79.119	.000b
Residual	97.609	198	.493		
Total	136.612	199			

a. Dependent Variable: Academic Performance

b. Predictors: (Constant), Apps

Finally, this study also provided the results of the correlation analysis. Table 8 presents the results of all three independent variables toward academic performance (dependent variable). This study takes t-value as a measurement on how many standard errors the coefficient is away from the zero. Commonly, any t-value greater than +2 or less than -2 is acceptable. Meaning that the higher the t-value, the greater confidence of the factors (independent variables) in the coefficient as a predictor. This study found the addiction has the strongest influence factor (t-value of 16.84) towards the academic performance.

For example, students tend to access on learning documents at anytime and at any place. The second place was the communication with t-value of 12.51. Many of them also make use smart devices to interact with course mates regarding assignments, group projects and other things necessary that finally contribute to improvement on grades. While the third place was the Apps with t-value of 8.89. They use a lot of Apps for online presentations, quizzes, and attending lectures.

Table 8

Correlation Analysis

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t-value	Sig.
1 (Constant)	-.257	.261		-.982	.327
Addiction	1.011	.060	.767	16.836	.000
(Constant)	.144	.319		.450	.653
Communication	.923	.074	.664	12.505	.000
(Constant)	.968	.355		2.725	.007
Apps	.713	.080	.534	8.895	.000

a. Dependent Variable: Academic Performance

CONCLUSION

The use of gadgets such as smart devices (e.g., smart phones and tablets) is something normal today especially among students at the university level. Students at the university now rely a lot on computer applications, internet, and WiFi during the whole studying in the lecture hall or outside the classroom or remote learning. Many studies have been done to see if there are implications of these smart devices on students' academic performance. What are the factors related to the use of these smart devices that

can affect their academic performance through CGPA? Therefore, specifically, this study was conducted in UUM on a group of students from STML who numbered 473 people. This study aimed to examine the three factors (e.g., independent variables) such as addiction, communication and Apps that are said to have a relationship with academic performance. This study was conducted with a quantitative method and using simple random technique in the distribution of online survey questionnaires through Google Forms and WhatsApps. Based on the data analysis done by SPSS, the study found out all those three independent variables namely addiction, communication and Apps have significant and positive relationship with the academic performance.

Based on the correlation analysis for examples, the addiction (t-value: 16.64) has strong and positive relationship with the academic performance and the lowest impact comes from the Apps with t-value of 8.89. Overall, the results of this study have been able to achieve its objectives with good analytical and rational results. To conclude the study, the results have many supports with some previous studies such as (a) students at the university do use smart devices to support the learning process either face to face or remote learning, they share notes and documents, and also doing assignments simultaneously, (b) addiction to using smart devices so far is not so obsessive and critical because they still can manage and control it well when studying alone or in a group, and (c) finally, students are make use a lot of application or Apps which have been widely downloaded and widely used in the learning process. Among the famous Apps for example are use for scanning, photographing, analyzing, and calculating. While popular Apps for sosial communication and interaction are WhatsApps and Telegram besides FB and Instagram.

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