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IMPACT OF SMARTPHONE USAGE ON ACADEMIC PERFORMANCE: A STUDY ON UNDERGRADUATES IN FMSC OF UNIVERSITY OF SRI JAYEWARDENEPURA, SRI LANKA

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Abstract

This Quantitative study is focused on investigating the impact of smartphone usage on academic performance of the undergraduates in Faculty of Management Studies and Commerce (FMSC) of University of Sri Jayewardenepura, Sri Lanka. Two hundred and twenty two (222) undergraduates who are currently studying in Faculty of Management Studies and Commerce of University of Sri Jayewardenepura were participated as the respondents of this study. Multiple linear regression analysis is used to investigate the relationship between the dependent variable (academic performance which is measured through GPA) and independent variables (Communicability with fellow students and lecturers, accessibility to study materials, influence on the student concentration, smartphone interaction on lecture engagement, and Student's lifestyle). The empirical results revealed that, the majority of the respondents have used their smartphones to access social media applications, and Web-browser is identified as the most frequently used mobile application for the study purposes. There is a positive significant impact of smartphone usage on academic performance of the respondents in terms of Communicability with fellow students and lecturers, and accessibility to study materials. And also there is a negative significant impact of smartphone usage on academic performance of the respondents in terms of student's concentration, and student's lifestyle related with smartphone.

Keywords: *Academic Performance, Smartphone Usage, Smartphones, Sri Lanka*

Introduction

The technology is playing a vital role in the contemporary society and the work context. The society and organizations are aware to be updated and trace the technological changes, and try to adapt with the rapidly changing dynamic technological environment in order to sustain the stability, existence, growth in order to grab the advantages which emerge through the technology. The mobile phone was invented in early 1940s and it is a device that flamingly evolved in a more advanced manner during last sixty years. Today it is widely spread throughout this society and it has become a key component in human day to day life. According to ICT Facts and Figures (2015) the number of mobile cellular network subscribers all over the world is expected to be seven billion in 2016. Also, the number of Internet users is known to reach 3.2 billion. In the modern society the mobile phone has become crucial as same as an element of the human body that accomplishes plenty of human activities and interactions. Mobile devices (digital, portable), and internet accessible devices such as smartphones and tablets have become an integral part of modern daily life with the potential to be used for varied educational and learning activities (Nankani & Ojalvo 2010). The mobile phone enables a series of advanced services which contribute to make the work and life more efficient and speed. According to Lefebvre (2009) mobile phones

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are now responsible for most of Internet connections around the world and further this form of technology has advanced with simple call and text messaging functions being replaced with functions such as Internet access, email, camera applications and multimedia services.Calling (voice/video), texting, access to web and social media, mobile gaming, mobile services (e.g. Mobile channeling, Mobile shopping, Mobile banking, Mobile ticketing… etc.) are frequently obtained services via mobile phones and on the other hand in work/business context the mobile services play a crucial role. The Internet, which is the result of information innovation, has changed the way individuals work together (e-commerce), the way individuals communicate (e-mail), the way individuals train or instruct (e-training), and the way individuals learn (e-learning). Electronic learning is viewed as the use of ICTs to enhance and support learning, teaching and research (Aboderin 2019).

Today's generation of teenagers, born in the late 1990s and after 2000s, aptly labeled the "iGeneration", are the most connected generation ever and these iGen teens are digital natives growing up in an era of a massive influx of technology (Kibona & Mgaya 2015). The members of this generation has not experienced a world does not exists the internet and easy access to the web. These iGens are the undergraduates in present higher education institutions in Sri Lanka. Therefore, the mobile phone is a familiar and general tool that they use in their day to day life and learning activities. Utilization of mobile phones for the education is simply called as "mobile learning". Mobile learning is a learning that happens when students are not on a fixed location, or a learning that happens when students use learning possibilities of mobile technologies (O'Malley 2004).Mobile devices and their features have been in the glare of publicity for educational purposes (Mbukusa 2018). As per Maiti andThripathy (2012) mobile technologies used in education include mobile phones, smartphones, PDAs, MP3/MP4 players, e-book readers (e.g. Kindle), netbooks, tablets (e.g. iPad, Galaxy Tab), hybrid tablet/smartphone gadgets (e.g. Galaxy Note) and specialist portable technologies used in science laboratories. According to Sharples, Taylor and Vavoula (2007) mobile phones are widely used as a platform for learning as it enables both educators and students with opportunities for inventive instruction. Mobile devices becoming increasing popular among students, setting out a new way to communicate, collaborate and learn (Shonola, Joy, Oyelere & Suhonen 2016). In the last two decades a great number of educational materials such as books, scientific researches, presentations, video tutorials, educational games etc. have become available via internet and with the emergence of social networks, online interaction among individuals and groups has been increased facilitating the learners to communicate and engage in collaborative discussions on educational topics as well and also the availability of learning management systems (LMSs) has facilitated to the embracement of modern technologies and e-learning environments in the educational institutions (Kljunić & Dijan 2015). The electronic books offer students, teachers and schools an additional medium or tool of instructions that can support or enhance the learning process (Embong et al. 2012). The applications including WhatsApp, Twitter and Facebook and some learning systems have emerged over the years and involve ubiquitous learning (u-learning), which is being powered by smartphone capabilities in the learning environment (Ifeanyi & Chukwuere 2018).

In this milieu, the smartphone has become a salient element of the academic related activities of the undergraduates and possible to make a considerable effect to the academic performance of them. This study is designed to find out the impact of smartphone usage on academic performance of the undergraduates in Faculty of Management Studies and Commerce (FMSC) of University of Sri Jayewardenepura, Sri Lanka.

Many studies have been conducted to analyse

the differences in behavioural patterns in youth generation because of the use of mobile phones. According to Jinadasa (2016), the penetration of mobile phones in Sri Lanka high compared to other countries in the south Asian region and in 2012 it was 101%. Further it has found that the new media culture originated through the use of mobile phones has sharply changed the behavior of youth. Learning modes and behaviors, taste of entertainment, socialization, attitudinal development, imagination of aesthetic creativity, inter-relationship, sexuality, use of information, social systems and life values are being changed drastically.

The objective of this study is to find out how this behavioral change of youth as a result of smartphones has influenced on their educational performances with special reference to university undergraduates in Sri Lanka.

Literature Review and Theoretical Background

The recent technological advancements, the innovation of computer and other discoveries in the field of information technology bring about the introduction of the mobile phone and its multi functions ranging from voice calls, messaging, data use, multimedia, games (both online and offline) and other social media services (Jackson, Zhao, Kolenic, Fityerald, Herold & Venoye 2008). The concept of mobile learning has emerged in conjunction with the use of mobile devices in learning and teaching activities (Demir & Akpinar 2018). Mobile learning is identified as a mode of e-learning which is performed through mobile devices (Quinn 2000). Mobile phone enables students to participate in lessons and access material, as well as the teacher, outside class hours, at any place and any time, makes mobile learning (m-learning) less obstructive than other forms of technology-enabled learning (Laurillard 2007). When it refers the contemporary literature basis on the 'modern technology and education' there are plenty of related topics that are widely considered in academic researching. The effect of mobile phone/smartphone usage in higher education has become a well-known topic and it can be seen significant amount of studies in global context though it is rare in Sri Lankan context. This study will fill the research gap of scarcity of studies in local context regarding the impact of smartphone usage on the academic performance of undergraduates.

According to Demir and Akpinar (2018) mobile learning may promote the academic achievements of the students and furthermore the students prefer in mobile learning as an approach that increase their motivation significantly. Howlett and Waemusa (2018) study indicates that the students who have the access to use mobile devices, and either agreed or strongly agreed that mobile devices increase their learning potential and satisfaction, suggesting they are ready for autonomous learning using mobile devices in partnership with their 21st century learning skills. Mbukuza (2018) is a Zimbabwe high school students based study revealed, amongst many, that WhatsApp (a social media application) can impact negatively on the performance of tertiary students, especially those who do not own smartphones. Raibu, Muhammed, Umaru and Ahmed (2016) investigated the influence of mobile phone usage on academic performance among secondary school students and the finding of the study revealed that mobile phone usage significantly positively influence academic performance among male and female senior secondary school students. Jairus (2017) study revealed that the use of mobile phone among secondary school students had the significant relationship with their academic performance and further recommends that the teachers should encourage students to take a more active role in the learning process and take an interest in using mobile phone technologies to improve educational experiences. Oyelere and Suhonen (2016) study indicates that the students use their portable devices to exchange education-related messages and academic files with classmates, search the internet and library databases for academic

materials, practice online quizzes or tests and hold discussions with classmates among others. Bere and Rambe (2019) study draws on the social embeddedness discourse and it examines the evidence of context-driven use and social embeddedness in student adoption of m-Learning using instant messaging in higher education and the study suggests the opportunities for collaborative learning manifested in knowledge sharing, development of academic communities, instant communication in ambivalent contexts plagued by networked connectivity costs, knowledge gaps and geographical barriers among interactants. Stollak, Vandenburg, Burklund and Weiss (2011) study examines grade differences among students at small, liberal arts college based on social media usage and the study found that younger students use Facebook longer as they are building their social connections, whereas older students already have a well-established network of friends and colleagues, Twitter and LinkedIn have more relevance to older students as they try to connect with others in their job search or find work.

Ng, Hassan, Nor and Malek (2017) is a study based on finding the relationship between smartphone usage and academic performance in a Malaysian tertiary institution and it was found that the more students utilized their smartphones for university learning activities, the lower their CGPA (the students' academic performance measurement). Kibona and Mgaya (2015) study examines on how smartphone effect on academic performance of higher learning students and the results reveal that the smartphone bring negative results or progression on students' performance academically. Ifeanyi and Chukwuere (2018) study found that most undergraduate students are using their smartphones to engage with fellow students and lecturers and on the other hand it was found that using smartphones distracts students from their studies in certain aspects and in contrast the results also showed the impact of using smartphones on students' academic capabilities and progression.

The literature exemplifies both positive and negative effects of smartphones for the academic performance of students. Based on the recent literature, the researcher identified the following factors which are potential to impact on academic performance of undergraduates due to smartphone usage.

Communicability with fellow students and lecturers

The technical infrastructure for M-Learning gives learners a platform to interact with each other outside a classroom setting (O'Malley, Vavoula, Glew, Taylor, & Sharples 2005). The use of smartphones is widely adopted by undergraduate students even as a learning aid in getting help from classmates by using their smartphones to reach their classmates for help with regard to their academics, meaning that smartphones are becoming academic-centric in developing countries (Ifeanyi & Chukwuere 2018). The communication on group projects and/or work given to the students by their lecturers is easily and conveniently carried out with the aid of smartphones (Mokoena 2012). Smartphones can provide students with collaborative learning opportunities through text messages and chatting (Oyelere & Suhonen 2016).Students use their smartphones to reach out to their lecturers for help in their academics (Ifeanyi & Chukwuere 2018).

Accessibility to study materials

Gowthami and Kumar (2016) states that the use of the internet is now a routine for people and also a medium that is used by the students to search for information at anytime and anywhere by using smartphones. Having course materials such as lecture slides and notes on a mobile device makes learning easier for the students, as they can use their device to study at anytime, anywhere and further it enables the students to engage in learning activities even when they are outside their classrooms and improves flexibility for self-study (Oyelere & Suhonen 2016).

Influence on the student concentration

Most undergraduate students do receive calls while in classroom on their smartphone and this can be a distraction to their attention, and also Undergraduate students reply to text messages while in class and, as a matter of fact, it can be a distraction to the students (Ifeanyi & Chukwuere 2018). Those who reported multitasking while doing homework spent more time spent studying outside of class, thereby contributing to inefficient study habits (Bellur, Nowak & Hull 2015).

Smartphone interaction on lecture engagement

The non-educational use of smartphones during the lectures is possible on distracting the students' engagement with the lesson (McCoy 2016). Night time usage of mobile phone is associated with difficulty in waking up, waking time tiredness, decline in study habits, difficulty in concentration, increase in missed classes, and going late for classes and further total time spent on mobile phones is associated with waking time tiredness and difficulty in waking up and decline in study habits, increase in missed classes, and going late for classes (Gupta, Garg & Arora 2019).

Student's lifestyle

According to Ifeanyi & Chukwuere (2018) the use of smartphones by the students deprives them of sleeping time and this can be quite detrimental to their study patterns or learning and not having an enough sleep can effect on the academic performance. The Pew Center's Internet and American Life Project suggests that college students are the most rapid adopters of cell phone technology and research is emerging which suggests high frequency cell phone use may be influencing their health and behaviour (Oyelere & Suhonen 2016). Besides the positive role of smartphone in our daily lives, its overuse presents negative impact on psychological health, sleep, and academic performance of students (Gupta, Garg & Arora 2019). The overuse of smartphones brings the negative concepts such as smartphone addiction, asocialization and social escape (Yildiz & Alkan 2019).

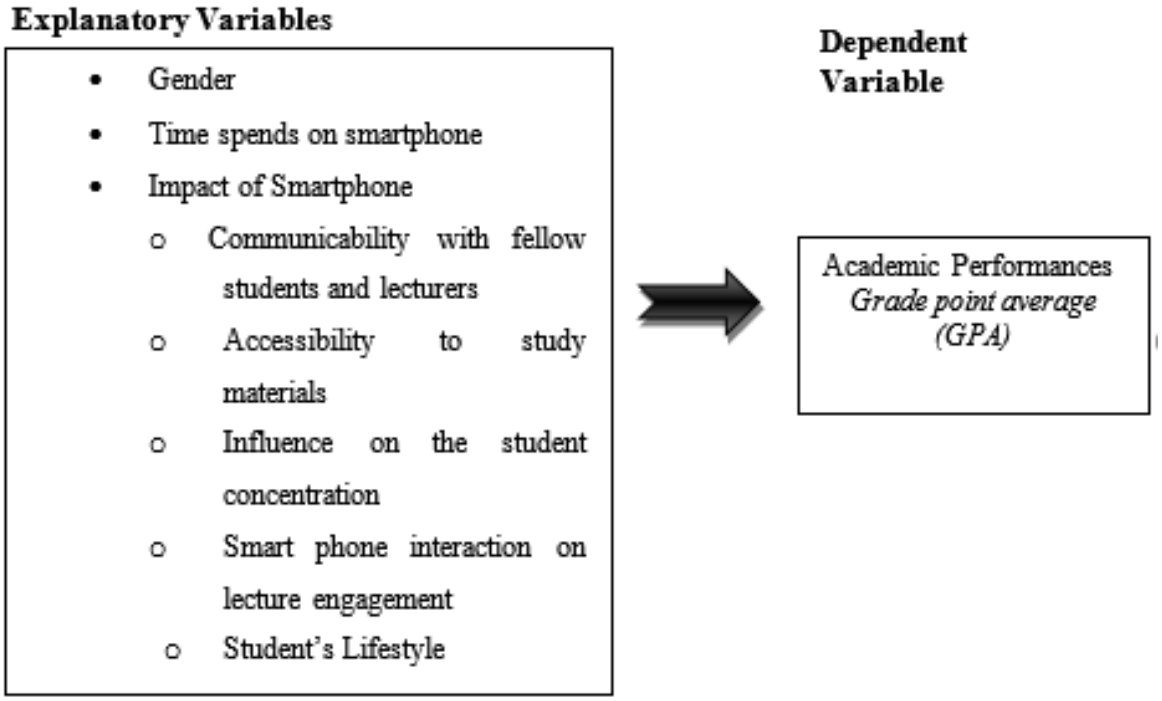
Methodology

This research is based on the quantitative method of researching. A quantitative approach to research is likely to be associated with the deductive approach to testing theory, often using number of fact and therefore a positivist or natural science model and an objectivist view of the objects studied (Greener 2008). Under the ontological stance this research is inspired by the objectivism which describes the social entities as independent social actors. This descriptive study is aligned with the positivism philosophy which is preferably working with an observable social reality and finally generalizing the end results. As the strategy of the research it was adapted the deductive approach in researching and the survey strategy was anticipated which is usually associated with deductive approach. The deductive approach which is dominantly used in the natural sciences where admit the basis of explanation, allow the anticipation of phenomena, predict their occurrence and therefore permit them to be controlled (Collis & Hussey 2003). Further the survey strategy enables to collect quantitative data which is able to analyse statistically by using descriptive and inferential statistics. Concerning the time horizon, the study is driven as a cross sectional study in the non-controlled natural settings. The population of this study is the undergraduates of the faculty of Management studies and Commerce of University of Sri Jayewardenepura. Also the recently passed out graduates of the faculty were also taken in to the account. There are only 5000 undergraduates who are currently studying in the faculty. The convenient sampling method is used based on the nature of the study to collect data and 222(n=222) of respondents contributed as the sample of the study. In primary data collection, an electronically designed (Google form) questionnaire was administered. The validity and reliability of the data collection instrument is assured through conducting a pilot survey, and reference of related literature. Cronbach's Alpha value ($\alpha > 0.7$) was counted to measure the reliability of the

items and variables.

In descriptive analysis, it was conducted a percentage analysis for the demographic items and mean value analysis for the variables. The multiple regression analysis was done to derive the results of hypothesis testing.The researchers concerned all the ethical considerations which should be preserved throughout the research process.The researcher highly considered about the privacy of the respondents. The data was collected through the voluntary participation of the respondents, and gathered data was used only for the research purpose. Also it was assured the confidentiality of the respondents attaching a declaration sheet at the beginning of the questionnaire.

Conceptual Framework



Source: Compiled by author

Figure 1: Conceptual Framework

Hypothesis

H1.1: There is a significant impact of the time spends on smartphone towards the academic performance of undergraduates.

H1.2: There is a significant impact of communicability with fellow students and lecturers via smartphone towards the academic performance of undergraduates.

H1.3: There is a significant impact of accessibility to study materials via smartphone towards the academic performance of undergraduates.

H1.4: There is a significant relationship between impact of smartphone usage on the student concentration and the academic performance of undergraduates.

H1.5: There is a significant relationship between smartphone interaction on lecture engagementand the academic performance of undergraduates.

H1.6: There is a significant relationship between smartphone Influence on student lifestyle and the academic performance of undergraduates.

Academic performance, the dependent variable of the model has been measure by the grade point average (GPA) of students. The Grade Point Average (GPA) is a numerical representation of a student's overall academic achievement. GPA is the quotient obtained by dividing the total number of grade points earned by the total number of credit hours in which a student receives a 'letter' grade. Decimals beyond two places are truncated, not rounded, in computing the grade point average (Prospectus FMSC, 2018).Thee maximum possible GPA is 4.00 while the minimum is 0. Table 1 illustrates the levels of GPA measured.

Table 1: Great Point Average (GPA)

Scale	Value	Class
Below 3.00	1	General
3.00 to 3.3	2	Second (Lower)

3.33 to 3.70	3	Second (Upper)
Above 3.70	4	First Class

Source: Compiled by author

Gender also identified as a nominal scale variable where it has two possible outcomes, 0 for male and 1 for female.Time spends on smartphone has been identified under four levels as Table 2.

Table 2: Time spends on smartphone

Hours (Per day)	Value
1 – 5	1
5 – 10	2
10 – 15	3
15 – 24	4

Source: Compiled by author

To measure the impact of smartphone usage, five variables has been used which are Communicability with fellow students and lecturers, accessibility to study materials, influence on the student concentration, smartphone interaction on lecture engagement and impact on student life style. Communicability with fellow students and lecturers and accessibility to study materials variables underline the positive/favorable impact of smartphone usage while influence on the student concentration, smartphone interaction on lecture engagement and impact on student life style represent negative impacts of smartphone usage. The variables and the respective questions which used in the questionnaire are shown in appendix 01.

Model Estimation

In order to assess the impact of smartphone usage on academic performance multiple regression tool has been used. Hypothesis of the model as follows.

H0: Smartphone usage has a significant impact towards academic performance
H1: Smartphone usage has no significant impact towards academic performance

Multiple regression model;

$$Y = \alpha + \beta1X1 + \beta2X2 + \beta3X3 + \beta4X4 + \beta6X6 \quad (1)$$

X1= Time spend on phone
X2= Communicability with fellow students and lecturers
X3= Accessibility to study materials
X4= Influence on the student concentration
X5= Smartphone interaction on lecture engagement
X6= Student's Lifestyle

Empirical Results

Descriptive Statistics

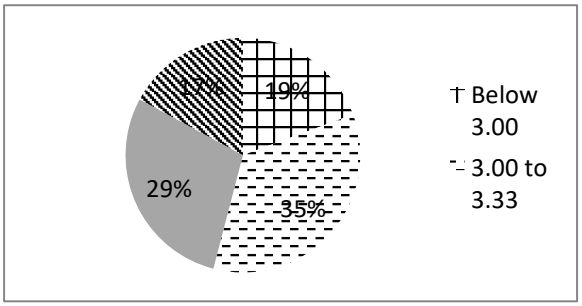
Descriptive Analysis- Demographic Data

Table 03 shows the gender composition of the sample. Out of total respondents, 139 were female and 83 were male which is 62.6% and 37.45% of the total respectively.

Table 03: Gender composition

Gender					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Female	139	62.6	62.6	62.6
	Male	83	37.4	37.4	100.0
	Total	222	100.0	100.0	

Moreover, the sample consists with 71% of respondents from year II while it is 3% and 12% from year I and year III respectively. Respondents from Year IV and immediate passed out batch consist 7% each from the total sample. The sample based on degree year is shown in figure 02.



Source: Survey Data

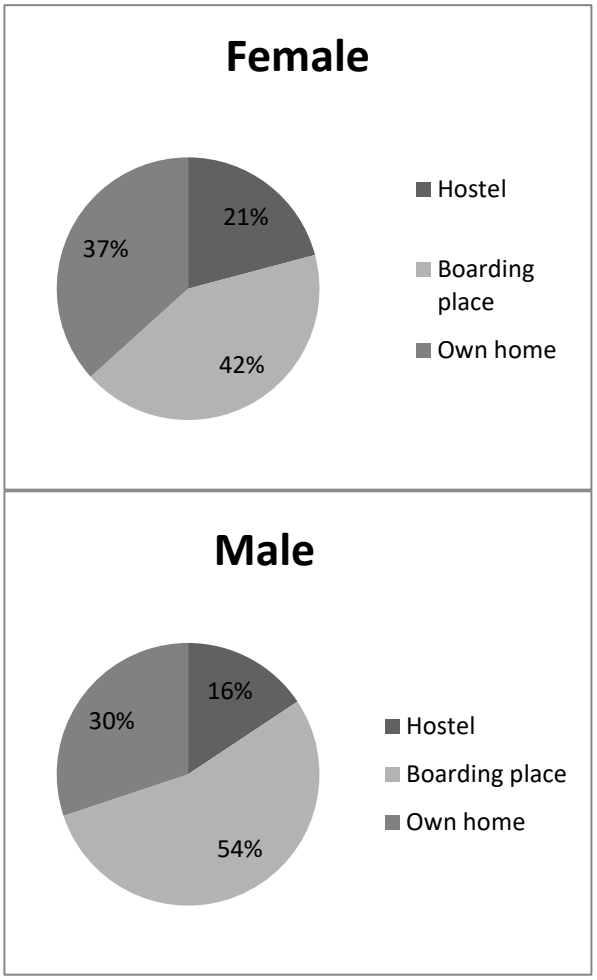
Figure 02: Degree Year Composition

When analyzing the student's academic performance based on Grade Point Averages (GPA), according to Figure 03, it shows that majority of the sample consist with respondents who are maintaining 3.00 to 3.33 GPA level. Thus majority of the respondents have enabled to maintain a second class (lower) division under their degree programme. Only 17% of the sample is having a GPA which is greater than 3.70.

Source: Survey Data

Figure 03: GPA

Figure 04 illustrates the residence of respondents separated by gender. As it shows, majority of respondents in both the gender type is residing at boarding places



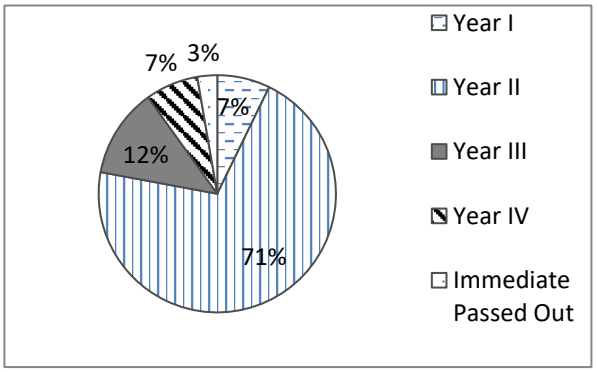
while only minority of students is using the university hostels as their residence. 54.2% of the total male and 42.45% of female respondents are living in boarding places while they are studying. Around 30% and 35% of male and female respondents are residing their own houses.

Source: Survey Data

Figure 04: Residence of respondents separated by gender

Descriptive analysis - Smartphone usage

Table 04: Smartphone usage



		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5 hours	122	55.0	55.0	55.0
	5-10 hours	69	31.1	31.1	86.0
	10-15 hours	26	11.7	11.7	97.7
	15-24 hours	5	2.3	2.3	100.0
	Total	222	100.0	100.0	

Source: Survey Data

According to Table 04, 55% of total respondents are using their smartphones 1 to 5 hours per day. And 31.1% of total sample are using the smartphone 5 to 10 hours per day while it is 11.7% for those who are using 10 -15 hours per day. Only 2.3% of the total sample is using their smartphone more than 15 hours per day

Table 05: Most frequently used mobile applications

Application	Percentage
Voice calls	100%
Text messaging	45.40%
Camera	80.40%
Calculator	5.80%
Calendar	3.80%
Clock	13.30%
Games	11.70%
Dictionary	37.90%
Email/web	33.80%
Audio Recording	15%
Radio	3.30%
Social Media	94.60%

Source: Survey Data

As Table 05 shows, apart from using the smartphone to take the voice calls, majority of the respondents have used their smartphone to access social media applications. It is accounted for 94.6% of the total sample. Only 3.3% of the total sample is using the smartphone to access radio while only 3.8% is accessed to calendar through the smartphone.

Table 06: Most frequently used mobile applications for study purposes

Application	Percentage
Dictionary	67.10%
Calculator	11.70%
Web-browser/s	86%
Document Reader	35.40%
Email	24.20%
Gallery	32.50%
Audio/Video recorder	33.30%

Social Media	29.20%

Source: Survey Data

As shown in the Table 06, 86% of the total sample used smartphone to access World Wide Web for study purposes. Thus most frequently used mobile application for study purposes is Web-browser. Moreover, it is evidenced that dictionary, document reader, Audio/video recorder and gallery are also being major applications that used by respondents for their studies. Only 11.7% of the sample is using smartphone to access calculator.

Mean Comparison

Table 07: Mean Comparison

	Communicability with fellow students and lecturers	**Accessibility to study materials**	**Influence on the student concentration**	**smartphone interaction on lecture engagement**	**Student's Lifestyle**
Mean	3.99	4.42	3.64	2.75	2.54

Note: Five-point Likert scale was used (1- Strongly Disagree; 5- Strongly Agree)
Source: Survey Data

The table 07 demonstrates the mean comparison between the independent variables which have taken in the study. If the mean value is closure to 1, it indicates strongly disagree and if closure to 5, it indicates strongly agree. First three variables in the table which are Communicability with fellow students and lecturers, Accessibility to study materials and Influence on the student concentration represents the positive side of usage of smartphones on academic performances. The rest of variables which are smartphones interaction on lecture engagement and impact on student's life cycle represent negative impact from smartphone usage on academic performances. According to the mean comparison, Communicability with fellow students and lecturers, Accessibility to study materials and Influence on the student concentration has the highest mean value compared to the mean values of smartphones interaction on lecture engagement and impact on student's life cycle.

Reliability Test

Table 08: Reliability Statistics

Variable	**Cronbach's Alpha**	**Cronbach's Alpha Based on Standardized Items**	**Number of Items**
Communicability with fellow students and lecturers	.607	.611	3
Accessibility to study materials	.835	.836	4
Influence on the student concentration	.728	.721	3
Smartphone interaction on lecture engagement	.733	.725	5
Student's lifestyle	.823	.823	4

Source: Survey Data

Cronbach's Alpha statistic has been used to test the reliability of the selected variables. According to the analysis, except the variable of "Communicability with fellow students and lecturers", all other variables show higher degree of reliability with having Cronbach's Alpha value higher than 0.7 which satisfies the rule of thumb. The variable of "Accessibility to Study Materials" has the highest reliability with a Cronbach's Alpha value of 0.835 (Table 08). Although the Cronbach's Alpha value is less than 0.7 (which is the rule of thumb in testing reliability), the variable "Communicability with fellow students and lecturers" has a Cronbach's Alpha value of 0.607 (closer to 0.7)(Table 09) which we can conclude that the variable "Communicability with fellow students and lecturers " has a satisfactory level of reliability. According to Hinton, Brownlow, McMurray and Cozens (2004) 0.5- 0.7 Cronbach's Alpha value shows moderate reliability and even this is not a high reliability, this could be an acceptable score and the researcher can proceed with this.

Correlation Analysis

Correlation analysis has been conducted to identify relationship between dependent variable (academic performance which is measured through GPA) and independent variables (Communicability with fellow students and lecturers, accessibility to study materials, influence on the student concentration, and smartphone interaction on lecture engagement) and Student's lifestyle.

Table 09: Correlation

		GPA	**Time spent**	**Communicability with fellow students and lecturers**	**Accessibility to study materials**	**Influence on the student concentration**	**Smartphone interaction on lecture engagement**	**Student's Lifestyle**
GPA	Pearson Correlation	1	-.061	.032	.275**	.141*	-.261**	-.298**
	Sig. (2-tailed)		.365	.639	.000	.036	.000	.000
	N	222	222	222	222	222	222	222

Source: Survey Data

As Table 09 illustrates, there is a weak negative (0.32) but insignificant relationship (p=0.639) between GPA and Communicability with fellow students and lecturers. Accessibility to study materials has a significant by week positive relationship with GPA. Further, correlation analysis shows the variables which are influence on the student concentration, smartphone interaction on lecture engagement and impact of smartphone usage on student's life style have a weak negative but significance relationship with GPA.

Multiple regression analysis

Table 10: Coefficient of Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.451[a]	.204	.181	.896

b. Dependent Variable: GPA

Source: Survey Data

Table 11: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	44.110	6	7.352	9.163*	.000
	Residual	172.507	215	.802		
	Total	216.617	221			

*Note: *, **, *** denotes rejection of the hypothesis at 10%, 5% and 1%*
Source: Survey Data

Table 12: Parameter Testing

Model		Coefficients	t	Sig.
1	(Constant)		2.896	.004
	Time spends	.050	.783	.435
	Communicability with fellow students and lecturers	-.138	-1.965*	.051
	Accessibility to study materials	.268	3.738***	.000
	Influence on the student concentration	.198	3.104**	.002
	Smartphone interaction on lecture engagement	-.112	-1.517	.131
	Student's lifestyle	-.271	-3.619***	.000

Goodness of fit test

According to the multiple linear regression analysis carried, the model Adjusted R^2 is 0.18, which shows 18.1% of the variations in dependent variable has been explained by the variations in the independent variables. Therefore it is able to conclude that, since the explanatory power of the model is low, the explanatory power of the selected model is also less.

Overall significance of the Model

Overall significance of the model is tested using ANOVA F-test. The hypothesis for ANOVA test is,

H0: None of the independent variables affect the academic performance of undergraduates.
H1: At least one independent variable affects academic performance of undergraduates.
The p value of the F statistic is 0.000 which is lower than the significance level of 0.05.

Accordingly, we reject the null hypothesis. Therefore, it is to be concluded that at least one independent variable is affected on the dependent variable, academic performance of the students. The overall model is significant under 5% significance level.

Significance of the Model Parameters

H1.1: There is a significant impact of the time spends on smartphone towards the academic performance of undergraduates.

According to the Table 12, the P-value of the variable "time spends on smartphone towards", 0.435 is greater than the significant level of 0.05. Therefore the null hypothesis is accepted and it is to be concluded that there is no significant impact of time spends on smartphone on the academic performance of undergraduates.

H1.2: There is a significant impact of communicability with fellow students and lecturers via smartphone towards the academic performance of undergraduates.

According to the Table 12, the P-value of the variable, 0.051 is lower than the significant level of 0.1. Therefore the null hypothesis is rejected and it is to be concluded that there is a significant impact of communicability with fellow students and lecturers via smartphone on the academic performance of undergraduates.

H1.3: There is a significant impact of accessibility to study materials via smartphone towards the academic performance of undergraduates.

As Table 12 demonstrates, the P-value of the variable, 0.000 is lower than the significant level of 0.05. Therefore the null hypothesis is rejected and it is to be concluded that there is a significant impact of accessibility to study materials via smartphone on the academic performance of undergraduates.

H1.4: There is a significant relationship between impact of smartphone usage on the student concentration and the academic performance of undergraduates.

As Table 13 shows, the P-value of the variable, 0.02 is lower than the significant level of 0.05. Therefore the null hypothesis is rejected and it is to be concluded that there is a relationship between the smartphone usage impact on the student concentration and the academic performance of undergraduates.

H1.5: There is a significant relationship between smartphone interaction on lecture engagementand the academic performance of undergraduates.

According to the Table 12, the P-value of the variable, 0.131 is greater than the significant level of 0.05. Therefore the null hypothesis is accepted and it is to be concluded that there is no significant relationship between smartphone interaction on lecture engagement and the academic performance of undergraduates.

H1.6: There is a significant relationship between smartphone Influence on student lifestyle and the academic performance of undergraduates.

According to the Table 12, the P-value of the variable, 0.000 is lower than the significant level of 0.05. Therefore the null hypothesis is rejected and it is to be concluded that there is a significant relationship between smartphone Influence on student lifestyle and the academic performance of undergraduates.

Regression Model

GPA= 0.211 CM + 0.407 SM – 0.292 SC – 0.387 LS

CM = Communicability with fellow students and lecturers
SM = Accessibility to study materials
SC = Influence on the student concentration
LS = Student's life style

Conclusion

The objective of this study is to investigate whether there is any impact of smartphone usage on academic performance of undergraduates of Faculty of Management Studies and Commerce (FMSC), University of Sri Jayewardenepura. As per the results, it is found that there is a significant impact of smartphone usage on academic performance.

The result shows that there is a significant impact of Communicability with fellow students and lecturers via smartphones on the academic performance of undergraduates. The students use the smartphones to communicate with their fellow students and lectures for their study purposes. According to the results, the positive coefficient explains that when the smartphone facilitates the communication with fellow students and lecturers, it increases the academic performance of the undergraduates. The same explanation has been brought by Mokoena(2012), Oyelere and Suhonen (2016), Ifeanyi and Chukwuere (2018). Also since smartphone usage increases the accessibility of study materials, it creates a positive impact on the academic performance of undergraduates. As undergraduates use smartphone to read, download and share study materials, and to interact with LMS, it facilities academic needs and enhances the academic performance of them. Through the studies of Embong et al. (2012) and Kljunić and Dijan (2015) it has empirically identified the use of smartphones increases the

accessibility to study materials.

Further, the result demonstrates that there is a significant negative relationship between the influences of smartphone on the student concentration and the academic performance of undergraduates. Since the students get disturbed from calls/ messages/ social media notifications while studying, it has negatively affected on the academic performance of them. Several previous studies have identified the same argument emphasizing it as a drawback of smartphone usage. Among those Ifeanyi and Chukwuere (2018), Bellur, Nowak and Hull (2015), McCoy (2016) are few those studies. Moreover there is a significant impact of the influence of smartphone on student's Lifestyle towards the academic performance of undergraduates. From the responses, it is able to say that some students have been advised to reduce the smartphone usage by their parents while some perceive that they have addicted to use the smartphone. This transformation of student life style because of smartphone usage has negatively affected on the academic performance of them. From the literature it is found the same results which explains the negative influence of smartphone usage on students life style and there by academic performances. Oyelere and Suhonen (2016) found the use of mobile phones influencing their health and behaviour of students. Yildiz and Alkan (2019) emphasized there are negative consequences such as smartphone addiction, isolation and social escape from using smartphones among undergraduates.

Further the results reveal that the time spent on smartphone and the smartphone interaction on lecture engagement do not show any significant impact on the academic performance of undergraduates. From the coefficient values taken through the regression analysis, it can be concluded that the academic performances of undergraduate's are highly influenced by accessibility to study materials and it creates a positive impact on academic performances.

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Appendix

Appendix 01: Variables

Variable	Questions
Communicability with fellow students and lecturers	I can easily contact the teachers for study purposes using smartphone
	I can easily contact classmates to get help in studies
	We have created groups via social media applications for study purposes
Accessibility to study materials	I use the smartphone to read and download study materials
	I use the smartphone to log in to Learning Management System (LMS) whenever needed
	It is easy to share and receive study materials using smartphones
	I use internet via smartphone to search study related articles/pictures/videos/news etc
Influence on the student concentration	Use of smartphone interfere my learning in class
	The calls/messages received while in the class impact on my ability to concentrate?
	The social media notifications(Facebook/messenger/whatssap/viberet c) receiving while in the class make an impact on my ability to concentrate?
Smartphone interaction on lecture engagement	I waste my time sending SMS during class work
	I waste my time using social media during class work
	I waste my time using mobile games during class work
	Sometimes I skip lectures and use that time with my smartphone
	Use of social media via smartphone reduce my time available for studies
Student's lifestyle	I have been advised to reduce smartphone usage by my parents frequently
	I feel like I have addicted to use smartphone
	Smartphone is responsible for my low academic performance
	I could obtain a higher academic performance if I hadn't had a smartphone