UTILIZATION OF SMARTPHONES AND ACADEMIC PERFORMANCE AMONG COMPUTER ENGINEERING STUDENTS

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ABSTRACT

The objective of this study was to determine the level of utilization of smartphones among Computer Engineering students in terms of academic performance, interaction competency, smartphone self-efficacy, behavioral intention to use smartphone in Sulu State College, Jolo, Sulu. Three research questions and one hypothesis guided the study. Descriptive-research design was used in this research. Quota sampling technique was used to select (150) Computer Engineering students but only 149 students who participated and returned the answered questionnaire. A checklist research questionnaire was used and administered in the Computer Engineering Department, Sulu State College. The data gathered were treated with the use of frequency distribution, percentage, mean, T-test and ANOVA. The result showed that the computed weighted mean has made the Computer Engineering students response "Agree" to the level of smartphone utilization in terms of Academic purposes, Behavioral intention, Interaction competency, and Self-efficacy. Generally, the results of the overall weighted mean for the responses of Computer Engineering Student on level of their smartphone utilization in terms of Academic purposes, Behavioral intention, Interaction competency and Self-efficacy falls under AGREE level. The general average for the academic performance of the Computer Engineering Student-respondents is in the "Satisfactory" level. There is no significant difference in the level of smartphone utilization when data are grouped according to their sex, age, year level, and social-economic status and there is no significant relationship exist between level of smartphone utilization and academic performance of the Computer Engineering Student-respondents.

KEYWORDS*: *Smartphone, Academic Performance, Interaction Competencies, Self-Efficacy, Behavioral Intention

INTRODUCTION

Smartphone was today an important part of most students' pastime and increasingly an important part of their daily life as a whole in the new normal. In the past few years, walkie talkie radio and keypad cellphones had been dismissed as a distraction from more 'worthy' activities, such as homework or school requirements. Today, however, researchers, teachers and designers of learning resources were begun to ask how this powerful new medium might be used to support children's learning. Mukhdoomi, A. et al. (2020) opined, a smart phone is an advanced mobile phone device which is designed to solve daily accessibility problems. Smartphones provide so many features and allow more than make phone calls and send text messages. Smartphones have become a device highly in demand due to its power to perform basic and advanced computer functions. Any problem can be solved through one touch nowadays. That is why in modern life style, people can't live without it, and they have become the necessity in life. The use of smartphones provides high quality performance and quick access to information and entertainment, such as mobile audio and video calls, mobile teleconferencing, sending and receiving emails, and easy access to the internet for different kinds of people, including students. One more usage of it is entertainment and social media. It is a source of all kinds of social connectivity and fun. Because of which, people especially students get addicted to it, which in turn influence their studies, moral values and mental & physical health (Raza et al., 2020).

Increased accessibility of learning was one of the most important things smartphones had done for student. Using smartphone to facilitate student learning had come with

many positive benefits to academic performance. Students could pick and choose what mediums they preferred to learn content and maximize their study time. Students had immediate accessed to anything they do not understand or want to learn more about. Students were not totally dependent on teachers, parents, or other educated people to be their only source of information. Students were in charge of their own learning and smartphone had leveled the playing field in many ways Cindi (2018).

On the other hand, there were two sides to every story. According to Hawi and Samaha (2018) investigated the relationship between Academic performance and Smartphone usage among the students of Notre Dame University, Lebanon and the results showed negative relationship between Smartphone usage and Academic performance (GPA) of male and female students.

While the positive far outweighs the negative, the downside of smartphone still exists. Misinformation had been around in the social media. But despite of these negative effects, smartphone would increase motivation and self-esteem of the learners leading to good academic performance Cindi (2018).

However, when this smartphone was used in education as classroom through online, google research, social media, etc., it is required to have consistent and complete research of whether Smartphone utilization is beneficial for the Computer Engineering students or does it influence negatively on their Academic performance and its impact must be determined as this was an essential component for evaluation. It was on this premised that the smartphone utilization was assessed and its impact to academic performance of the students.

METHOD

Descriptive research design was used in this study and quota sampling technique was used to choose 150 Computer Engineering students in Sulu State College, Jolo, Sulu. Survey Questionnaire was the main instruments used to gather data needed in the study which is patterned and adopted from worked of Mukhdoomi, A. et al (2020) and was conducted at the College of Computer Engineering, Sulu State College Jolo, Sulu. Before the administration of the questionnaire, the researchers oriented the respondents on the direction and explained clearly some items so that correct and honest responses maybe obtain. Computer Engineering respondent was the one to determine the level of smartphone utilization in terms of; Academic purposes, Behavioral intention, Interaction competency, and Self-efficacy to him or her (see Appendix A). When the task was duly accomplished, the questionnaire was retrieved, tabulated and will be treated accordingly. It will be submitted to the analysis of data, assuming the collected data is normal, then it will be interpreted and recommended based on the findings.

Research Design

The aimed of this study was to ascertained the utilization of smartphones and academic performance among Computer Engineering students this SY 2022-2023. Specifically, the study attempted to answer the following questions:

1.What is the level of smartphone utilization of the respondents in terms of;
1.1. Academic purposes,
1.2. Behavioral intention,
1.3. Interaction competency, and
1.4. Self-efficacy.
2.What is the academic performance of the respondents?
3.Is there a significant difference in the level of smartphone utilization when data are grouped according to their sex, age, year level and social economic status?
4.Is there a significant relationship between the level of smartphone utilization and academic performance of the respondents?

Research Locale

There is no significant difference in the level of smartphones utilization among Radiologic Technology students' academic performance when data are grouped according to their sex, age, year level and social economic status. There is no significant relationship between the level of smartphone utilization and academic performance of the respondents.

Respondents of the Study

The target respondents for this study were consisted of 50 Computer Engineering students per year level in the College of Computer Science Information Technology and Engineering (CSITE), Sulu State College, Jolo, Sulu.

This research employed quota sampling technique in the selection of 50 Computer Engineering student per year level. This means, the researchers allocated 50 Computer Engineering students from 1st year college, 50 Computer Engineering students from 2nd year college, and 50 Computer Engineering students from 3rd year college. But only 49 respondents returned the answered questionnaire in the first-year college students. 4th year Computer Engineering students were excluded.

Data Gathering Procedure

This research employed quota sampling technique in the selection of 50 Computer Engineering student per year level. This means, the researchers allocated 50 Computer Engineering students from 1st year college, 50 Computer Engineering students from 2nd year college, and 50 Computer Engineering students from 3rd year college. But

only 49 respondents returned the answered questionnaire in the first-year college students. 4th year Computer Engineering students were excluded.

Research Instrument

Table 1 shows the demographic profile of the respondents in terms of sex, age and year level. Based on the data in the table, majority of the respondents are female with the frequency of 86 or 57.7% and 63 or 42.3% are male. Ages 21-above have the highest frequency consisting of 95 respondents or 63.8%, followed by 19 years old with the frequency of 26 or 17.4%, and 18 years old with the frequency of 23 or 15.4 % and the ages 20 years old have the lowest frequency of 5 or 3.4%.

The population of all enrolled Computer Engineering students is 466 for S.Y 2022-2023. The quota was to gathered 50 respondents in each year level hence, having and equal number of respondents per year level for a total of 150 respondents. However, one respondent withdraws from 1st year college students that made a total of 149 respondents.

Table 1 Demographic Profile of the Computer Engineering Students' Respondents

Sex	f	%
Female	86	57.7
Male	63	42.3
Total	**149**	**100%**
Age		
18 years old	23	15.4
19 – 20 years old	26	17.4
21 – 23 years old	5	3.4
23 years old & above	95	63.8
Total	**149**	**100%**
Year Level		
First	49	32.9
Second	50	33.6
Third	50	33.6
Total	**149**	**100%**

Validity and Reliability

According to the study Mukhdoomi, A. et al. (2020) that investigates the impact of smartphone addiction on academic performance of higher education students, result shows there is a strong significant positive impact of behavioral intention of smartphones on the Academic performance of students.

Statistical Treatment of Data

Is there a significant difference in the level of smartphone utilization when data are grouped according to their sex, age, year level, and social-economic status?

3.1 – According to sex

Table 3.1. Significant difference in the level of smartphone utilization when data are grouped according to their sex

Profile		Mean Response	t-value	p-value	Decision on Ho	Interpretation
Sex	Male	4.0622	1.272	0.206	Accept Ho	Not Significant
	Female	3.9080				

Table 3.1 reveals that t-computed value is 1.272 and p-value is 0.206 at 0.05 level of significance. This shows that p-value is greater than the level of significance. Therefore, the null hypothesis is accepted. This means that there is no significant difference in the level of smartphone utilization among Computer Engineering Student-respondents when data are grouped according to their sex. Finding means that both male and female are almost same level of using smartphone for their academic purposes.

3.2 – According to age

Table 3.2. Significant difference in the level of smartphone utilization when data are grouped according to their age

Profile		Mean Response	F-value	p-value	Decision on Ho	Interpretation
Age	18-19	3.4000	1.890	0.157	Accept Ho	Not Significant
	20-21	4.0702				
	Above 21	3.9670				

Table 3.2 presents the significant difference in the level of smartphone utilization among Computer Engineering Student-respondents when data are grouped according to their age. Here, we can see that p-value of 0.157 is greater than alpha level selected at 0.05, therefore, we have evidence to accept the null hypothesis and say that there is no significant difference in the level of smartphone utilization among Computer Engineering Student-respondents when data are grouped according to their age.

3.3 – According to year level

Table 3.3. Significant difference in the level of smartphone utilization when data are grouped according to their year level

Profile		Mean Response	F-value	p-value	Decision on Ho	Interpretation
Year Level	1st Year	3.9132	0.331	0.719	Accept Ho	Not Significant
	2nd Year	4.0588				
	3rd Year	3.9670				

Table 3.3 presents the significant difference in the level of smartphone utilization among Computer Engineering Student-respondents when data are grouped according to their year level. Since, p-value of 0.719 is greater than the level of significance at 0.05, we therefore accept the null hypothesis. Result means that all ages of the Computer Engineering Student -respondents included in the study almost have same level of smartphone utilization.

3.4 – According to Socio-Economic Status

Table 3.4. Significant difference in the level of smartphone utilization when data are grouped according to their socio-economic status

Profile		Mean Response	F-value	p-value	Decision on Ho	Interpretation
Socioeconomic status	below 5,000	3.9541	0.354	0.906	Accept Ho	Not Significant
	5,001 – 10,000	4.0227				
	10,001 – 15,000	3.9413				
	15,001 – 20,000	4.0500				
	20,001 – 25,000	4.2125				
	25,001 – 30,000	3.4000				
	30,000 above	4.1500				

Table 13 reveal that there is NO significant difference on the level of smartphone utilization among Computer Engineering Student-respondents when data are grouped according to their parent/s socio-economic status. Since p-value of 0.906 is greater than alpha level selected (0.05), the null hypothesis is accepted. This implies that the level of smartphone utilization among Computer Engineering Student-respondents, whether the parent/s income below P5,000 to ₱30,000 above per month, is just almost the same at 5 percent level of significance.

Problem 4: Is there a significant relationship between the level of smartphone utilization and academic performance of the respondents?

Table 4. Significant relationship between the level of smartphone utilization and academic performance of the respondents

X	y	r-value	Verbal Description	P-value	Decision on Ho	Interpretation
Level of smartphone utilization	Academic performance	0.068	Negligible Correlation	0.506	Accept Ho	Not Significant

Correlation Coefficient (For Homogenous) is significant at alpha .05
Correlation Coefficient Scales Adopted from https://www.excel-easy.com/example/excel-file/correlation.xlsx
.000 to .199 =Negligible; .200 to .399 =Low correlated; .400 to .599 =Moderately correlated .600 to .799 =Substantial correlated; .800 to 1.00 =High correlated

Table 4 shows the Pearson correlation coefficient. The significant value 0.068 described a there is no significant relationship exist between level of smartphone utilization and academi performance of the Computer Engineering Student-respondents. This finding coincides with th study of Samaha & Hawi (2018) who investigated the relationship of the impact of Smartphon addiction on Academic performance on college students and found that Smartphone addiction doe have positive influence on satisfaction in life but negative impact on Academic performance.

1) For research problem number two 2, mean and standard deviation will be employed to determine the extent of engagement and performance of Faculties;
2) For research problem number 3, t-test for independent samples will be employed to determine the significant differences in the extent of engagement and performance when data are grouped according to gender; and One-way Analysis of Variance (ANOVA) will be employed to determine the significant differences when data are grouped according to age, status of appointment and educational attainment.
3) For research question number 4, Pearson Product Moment Correlation Coefficient (Pearson's r) will be employed to determine the degree of correlation among the sub-categories subsumed under engagement and performance.

The following rating scales intervals will be adopted in the analyses of the results of the computations obtained from the use of both descriptive and inferential statistical tools: Rating Scales Interval on the extent of personal role engagement and task performance of employees based on 5-point Likert's Scale:

Point	Scale Value	Descriptors
5	4.50- 5.00	Strongly Agree
4	3.50- 4.49	Agree
3	2.50- 3.49	Undecided
2	1.50- 2.49	Disagree
1	1.00- 1.49	Strongly Disagree

RESULTS AND DISCUSSIONS

obtained from the respondents. The presentation of the results are based on the appropriate detailed and correct scoring and statistical treatments of data obtained for this study that which correspond to each of the research questions:

Results:

Problem 1: What is the level of smartphone utilization of the respondents in terms of;
1.1 Academic purposes,
1.2 Behavioral intention,
1.3 Interaction competency and
1.4 Self-efficacy.

.1 – In terms of Academic purposes

Table 1.1. The level of smartphone utilization of the respondents in terms of Academic purposes

Statements	Mean Response	Remarks
1. Using a smartphone helps me to study more efficiently.	3.70	High
2. Using a smartphone improves my performance in studying.	3.63	High
3. Using a smartphone increases my course work productivity.	3.69	High
4. Using a smartphone enhances my study effectiveness.	3.59	High
5. Overall, I find a smartphone useful in my studies.	3.86	High
Grand Mean	**3.69**	**High**

Legend: 1.00 - 150 = Strongly Disagree = Very Low
1.51 - 2.50 = Disagree = Low
2.51 - 3.50 = Moderately Agree = Average
3.51 - 4.50 = Agree = High
4.51 - 5.00 = Strongly Agree = Very High

Table 1.1 reveals the level of smartphone utilization of the respondents in terms of Academic purposes. It shows that all items are rated "High" evidently given at a weighted mean of 3.69. Result means that smartphone utilization for academic purposes among Computer Engineering Students are very helpful for their academic performance.

Yi, You and Bae (2017) investigates the factors that influence college student to use smart phones for their Academic performance. The findings show that smart phones have a strong influence on the opinions of students regarding their academic performance.

1.2 – In terms of Behavioral intention

Table 1.2. The level of smartphone utilization of the respondents in terms of Behavioral intention

Statements	Mean Response	Remarks
1. With a smartphone, I want to email friends about classes.	4.04	High
2. With a smartphone, I want to make phone calls to friends about classes.	3.98	High
3. With a smartphone, I want to send text messages to friends about classes.	4.22	High
4. With a smartphone, I want to send messages via Facebook to friends about classes.	4.22	High
5. With a smartphone, I am able to contact an instructor.	4.17	High
Grand Mean	**4.13**	**High**

Legend: 1.00 - 150 = Strongly Disagree = Very Low
1.51 - 2.50 = Disagree = Low
2.51 - 3.50 = Moderately Agree = Average
3.51 - 4.50 = Agree = High
4.51 - 5.00 = Strongly Agree = Very High

Table 1.2 reveals the level of smartphone utilization of the respondents in terms of Behavioral intention. It shows that all items are rated "Agree (High)" evidently given at a weighted mean of 4.13. Result means that smartphone utilization among Computer Engineering Students are able to contact friends, classmates or even the instructor via Facebook, email, text or phone calls about their classes.

According to Raza et al. (2020) because of technology advancement, student life revolves around smartphones, which make, create or alter their behaviors. Students tend to focus more or rely on their smartphones in relation to their school work or social networking.

1.3 – In terms of Interaction competency

Table 1.3. The level of smartphone utilization of the respondents in terms of Interaction competency

Statements	Mean Response	Remarks
1. With a smartphone, I can maintain social relationships with others.	4.09	High
2. With a smartphone, I can get feedback quickly	4.07	High
3. With a smartphone, I can interact with others using multiple tools.	4.00	High
4. With a smartphone, I can interact with others no matter where they are.	4.23	High
5. With a smartphone, I can easily have a longer conversation with others.	4.15	High
Grand Mean	**4.11**	**High**

Legend: 1.00 - 150 = Strongly Disagree = Very Low
1.51 - 2.50 = Disagree = Low
2.51 - 3.50 = Moderately Agree = Average
3.51 - 4.50 = Agree = High
4.51 - 5.00 = Strongly Agree = Very High

Table 1.3 reveals the level of smartphone utilization of the respondents in terms of Interaction competency. It shows that all items are rated "Agree (High)" evidently given at a weighted mean of 4.11. Result means that smartphone utilization among Computer Engineering Students are able to maintain social relationships and can easily have a longer conversation with classmates and friends for interaction about the past lesson. there is a strong significant positive impact of behavioral intention of smartphones on the Academic performance of students.

.4 – In terms of Self-efficacy

Table 1.4. The level of smartphone utilization of the respondents in terms of Self-efficacy

Statements	Mean Response	Remarks
1. With a smartphone, I currently take tests.	3.91	High
2. With a smartphone, I currently register for courses.	4.00	High
3. With a smartphone, I currently navigate course websites and read course material.	4.03	High
4. With a smartphone, I currently work on assignments, presentations.	4.04	High
5. With a smartphone, I currently search for information.	4.24	High
Grand Mean	**4.04**	**High**

Legend: 1.00 - 150 = Strongly Disagree = Very Low
1.51 - 2.50 = Disagree = Low
2.51 - 3.50 = Moderately Agree = Average
3.51 - 4.50 = Agree = High
4.51 - 5.00 = Strongly Agree = Very High

Table 1.4 reveals the level of smartphone utilization of the respondents in terms of in ten of Self-efficacy. It shows that all items are rated "Agree (High)" evidently given at a weight mean of 4.04. Result means that smartphone utilization among Computer Engineering Studer are able to search for information about their assignments or requirements in school.

Han and Jeong (2018) investigate the effect of smart phone use by college students on th Academic performance. The result with respect to college students shows that, smartpho selfefficacy and behavioral intention have positive relationship with the student's Acaden performance.

1.5 – Summary of the level of smartphone utilization

Table 1.5. Summary table of the level of smartphone utilization of the respondents

Smartphone Utilization	Grand Mean Response	Remarks
Academic purposes	3.69	High
Behavioral intention	4.13	High
Interaction competency	4.11	High
Self-efficacy	4.04	High
Overall Mean	**3.99**	**High**

Legend: 1.00 - 150 = Strongly Disagree = Very Low
1.51 - 2.50 = Disagree = Low
2.51 - 3.50 = Moderately Agree = Average

Table 1.5 shows the summary of the level of smartphone utilization of the respondents. It reveals that the level of smartphone utilization of the respondents in terms of Academic purposes, Behavioral intention, Interaction competency and Self-efficacy are all rated "Agree (High)". Generally, the results of table 1.5 shows that the overall weighted mean of 3.99 for the responses of Computer Engineering Students on level of their smartphone utilization in terms of Academic purposes, Behavioral intention, Interaction competency and Self-efficacy falls under AGREE (High) level.

This finding supports the study of Raza et al. (2020). According to Raza et al. (2020), the use of smartphones provides high quality performance and quick access to information and entertainment, such as mobile audio and video calls, mobile teleconferencing, sending and receiving emails, and easy access to the internet for different kinds of people, including students. One more usage of it is entertainment & social media. It is a source of all kinds of social connectivity and fun. Because of which, people especially students get addicted to it, which in turn influence their studies, moral values and mental & physical health.

Problem 2: What is the academic performance of the respondents?

Table 2. The academic performance of the respondents

rade Point System	cademic Performance	erbal Description			ean	owest	
75 – 1.0	) – 100	utstanding	2	.48			
25 – 1.76	– 89	ery Satisfactory		0.20			
50 – 2.26	) – 84	atisfactory		4.23	5.8		
00 – 2.51	– 79	airly Satisfactory		4.09			
00 – 3.01	– below	id not meet expectation		00			
		OTAL	49	00.0			

Table 2 shows the academic performance of the Computer Engineering Student respondents. Out of 149 Computer Engineering Students, a high percentage of academic performance are rated "Satisfactory" 34.23 percent, 30.20 percent for "Very Satisfactory", 21.48 percent for "\Outstanding" performance, and the lowest percentage of academic performance are 6.71 percent which is rated "Fairly Satisfactory". Generally, the results of table 2, shows that the mean of 85.8 for the academic performance of the Computer Engineering Student-respondents is in the "Very Satisfactory" level. Result means that utilization of smartphone for academic purposes like doing assignment, school requirements, research, etc through engaging to social media site would reasonably help Computer Engineering students accomplished school works that could possibly develop their academic achievement.

According to the study Mukhdoomi, A. et al. (2020) that investigates the impact of smartphone addiction on academic performance of higher education students, result shows there is a strong significant positive impact of behavioral intention of smartphones on the Academic performance of students.

Problem 3: Is there a significant difference in the level of smartphone utilization when data are grouped according to their sex, age, year level, and social-economic status?

3.1 – According to sex

Table 3.1. Significant difference in the level of smartphone utilization when data are grouped according to their sex

Profile		Mean Response	t-value	p-value	Decision on Ho	Interpretation
Sex	Male	.0622	.272	.206	Accept Ho	Not Significant
	Female	.9080				

Table 3.1 reveals that t-computed value is 1.272 and p-value is 0.206 at 0.05 level of significance. This shows that p-value is greater than the level of significance. Therefore, the null hypothesis is accepted. This means that there is no significant difference in the level of smartphone utilization among Computer Engineering Student-respondents when data are grouped according to their sex. Finding means that both male and female are almost same level of using smartphone for their academic purposes.

3.2 – According to age

Table 3.2. Significant difference in the level of smartphone utilization when data are grouped according to their age

Profile		Mean Response	t-value	p-value	Decision on Ho	Interpretation
Age	18-19	.4000	.890	.157	Accept Ho	Not Significant
	20-21	.0702				
	Above 21	.9670				

Table 3.2 presents the significant difference in the level of smartphone utilization among Computer Engineering Student-respondents when data are grouped according to their age. Here, we can see that p-value of 0.157 is greater than alpha level selected at 0.05, therefore, we have evidence to accept the null hypothesis and say that there is no significant difference in the level of smartphone utilization among Computer Engineering Student-respondents when data are grouped according to their age.

s3.3 – According to year level

Table 3.3. Significant difference in the level of smartphone utilization when data are grouped according to their year level

Profile		Mean Response	t-value	p-value	Decision on Ho	Interpretation
Year Level	1st Year	.9132	.331	.719	Accept Ho	Not Significant
	2nd Year	.0588				
	3rd Year	.9670				

Table 3.3 presents the significant difference in the level of smartphone utilization among Computer Engineering Student-respondents when data are grouped according to their year level. Since, p-value of 0.719 is greater than the level of significance at 0.05, we therefore accept the null hypothesis. Result means that all ages of the Computer Engineering Student -respondents included in the study almost have same level of smartphone utilization.

3.4 – According to Socio-Economic Status

Table 3.4. Significant difference in the level of smartphone utilization when data are grouped according to their socio-economic status

Profile		Mean Response	t-value	
Socioeconomic status	Below 5,000	.9541	.354	
	5,001 – 10,000	.0227		
	10,001 – 15,000	.9413		
	15,001 – 20,000	.0500		
	20,001 – 25,000	.2125		
	25,001 – 30,000	.4000		
	30,000 above	.1500		

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