Canadian Journal of Family and Youth, 16 (2), 2024, pp. 1-19
ISSN 1718-9748© University of Alberta
http://ejournals,library,ualberta.ca/index/php/cjfy

On Modeling Students' Study Habits in Statistics under Distance Education

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Abstract

This article aimed to pave an argument that explains the study habits in learning statistics and its influencing factors among students at Visayas State University during the new normal. Cross-sectional and primary data were gathered from an available sample of students using a developed semi-structured questionnaire through a Google Form survey. The data were summarized using standard statistical measures and the ordinary least square (OLS) regression model was employed to depict the different causal factors of study habits in statistics. Results revealed that the students' study habit in statistics during distance education is "good" despite the challenges they are facing in online learning. The OLS models revealed that the significant factors of the student's study habits during the pandemic include "sex", "leisure activities", "social relationship", "physical health" and "availability of laptop". The study suggests that statistics teachers must encourage their students to develop time management to enhance their study habits.

Keywords: statistics, distance education, college students, study habits

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Introduction

Several challenges and obstacles are faced by students as they experienced distance education during the pandemic. In the study of Valenzona et al. (2022), a direct shift from face-to-face to online learning causes students stress and depression which results in a low learning and innovativeness level. Iqbal et al. (2022) portrayed that engaging in online learning amid the COVID-19 pandemic adversely affects their cognitive behavior, learning styles, and study habits. According to Peker Ünal (2021), students' study habits during the pandemic is influenced by various factors related to time constraints, psychological factors, family relation, social environment, and technology, among others. Since the said factors are adversely affected by the pandemic, then the study habits of students are negatively disturbed. The study by Bestiantono et al. (2020) stated that students are having difficulty understanding their lessons which results in low academic performance because of barriers and distractions. In that case, good and enough study habits during distance education amid the pandemic are unworkable for students to attain. Angkarini (2021), delineated that when online education was implemented, most of the students do not like the setup, and they prefer face-to-face education. Plus, Patricia (2020) depicted that online learning is not exciting to students and it causes stress due monotonous nature of the teaching-learning process. On the face of it, it is vital to investigate study habits during the pandemic to form an argument that remedies the current experiences of students in learning online.

According to Casinillo (2022), statistics is one of the subjects at the college level which is difficult and complex to teach and learn in an online class. Students are having difficulty understanding the concepts, formulas, and equations since their statistics teachers cannot properly guide them and cannot monitor their learning progress amid distance education. In that case, students are experiencing tenseness and unease in learning statistics which affects their study habits and learning process. Hence, to learn statistics effectively in online learning during the pandemic, teachers must find an intervention that suits the student's interests and motivation (Sefriani et al., 2021). In the study by Sakirudeen and Sanni (2017), it is stated that a conducive and comfortable learning environment encourages students to study their lessons. However, the learning environment at home during the pandemic has a lot of distractions and disturbance which includes household chores, parents' rules, unnecessary gadgets, and leisure activities, among others, hence, students find studying difficult to achieve (Garris & Fleck, 2022; Casinillo, 2023). Trung et al. (2020) depicted that students' study habits are decreasing amid distance education during the pandemic as opposed to face-to-face education. On the face of it, students' cognitive learning attitude in statistics is adversely affected which leads to a negative impact on academic performance. Hence, online learning in statistics education must be improved for the students to learn continually and effectively during the time of the pandemic.

Apparently, the pandemic has put pressure and added challenging demands on university students which affects their study habits (Clarke et al., 2021). So, educators must have a remedy to the current unprecedented situation through scientific research. Although, there exists some research articles dealing with investigating the study habits of students in the literature, determining their causal factors under the new normal setup during the pandemic is a bit scarce. In fact, developing a statistical model that predicts

the factors affecting the students' study habits in learning statistics in rural areas in Leyte, Philippines has never been executed. In that case, this study is immediately realized. This article aims to describe the students' study habits and elucidate the significant predictors in online learning amid the pandemic. Specifically, the studies objectives are the following: (1) to describe the demographic profile of students; (2) to summarize the learning profile of students in online education; (3) to measure the study habits level of students in online learning; and (4) to determine the different causal factors affecting the study habits of students in online education during the pandemic. The purpose of this study is to construct an argument that forms a policy to improve the learning process and study habits of students despite obstacles in online learning. In addition, the study is conducted in the hope to give the right amount of information to improve the teaching strategies of statistics educators during distance education. Moreover, the findings of this article may serve as a baseline for further research in learning statistics online.

Conceptual Framework

Statistics online education during the COVID-19 pandemic has a lot of challenges, obstacles, and issues that need to be addressed (Casinillo, 2022). During the pandemic, students are facing barriers and limitations where they cannot concentrate on doing their assessment activities in statistics which leads to procrastination and stress. In fact, statistics course is a technical subject that requires analytical skills and good study habits (Miñoza & Casinillo, 2022). In fact, a direct shift from face-to-face learning to online education causes disturbance to students' learning ability which they find it hard to cope with difficulties (Cassibba et al., 2020; Salta et al., 2022).

In that case, the learning attitudes and study habits of students in statistics are adversely affected which results in low performance. Bogaerts et al. (2021) stated that it is necessary to improve the teaching skills in statistics to progress the learning level and study habits of students despite the unprecedented environment. According to Ajai John et al. (2020), study habits are a very important aspect for students to perform better in the learning environment. Study habit is defined as habitual ways of workout and practicing cognitive and analytical abilities for learning. During the pandemic, it is difficult for a student to exercise their learning abilities and study habits because of the distractions and limitations of online education that they are facing (Ajai John et al., 2020; Dubey & Pandey, 2020; Dontre, 2021). Khan (2016) depicted that there are various factors affecting study habits depending on the learning process.

According to the study by Peker Ünal (2021), several causal factors affecting the students' study habits in online learning amid the pandemic include students' status, psychological issues during the pandemic, learning management, teachers, gadgets and technology, and social environment, among others. Angkarini (2021) suggested that diminishing study habits during the pandemic must be improved to maintain the good performance of students despite the challenges and limitations of online learning. Hence, the conceptual framework of this article focuses on the various determinants of students' study habits in learning statistics online during the COVID-19 pandemic. Through constructing a statistical model, significant factors of study habits can be ascertained to pave useful arguments that might enhance the statistics of online education as well as improve the student's well-being while studying.

Method

Research Design

This study made use of a complex-correlational research design to investigate the significant association between several variables. In particular, the study elucidates the factors affecting the students' study habits in learning statistics during distance education. In light of it, this article utilizes standard statistical measures to summarize the variables and employed multiple regression modeling to determine the influencing factors of study habits. Moreover, the design was used to pave a policy that will improve the students' attitudes in statistics towards online learning setup.

Participants, Sampling, and Ethical Procedure

At Visayas State University (VSU), engineering students are the largest group of learners who are required to take up rigorous statistics courses. Hence, the participants of this study were engineering students during the first semester of the school year 2021-2022 who enrolled statistics course titled "Engineering Data Analysis." During the time of the study, online education was fully implemented at VSU where no single student can enter physically in the University. Hence, to accomplish the desired set of data, a Google Form survey was employed. A complete enumeration approach was considered for the sampling size, hence, all engineering students who took the said statistics course were given the link to the Google Form. The survey was implemented in the fourth quarter of the semester to fully evaluate their learning attitudes and study habits in the statistics course. In addition, students were given ample time (one week) to respond. In that case, students who voluntarily filled up the said survey were automatically part of the desired participants of the study. After the given time frame, the survey was terminated and there were 129 (98% relative to the total) engineering students who participated and completely filled up the Google Form questionnaire. Moreover, to attain the homogeneity of the survey data, the gathered information has undergone clearing (excluding outliers) and the study only considered students aged from 19 to 22 years old, which is an ideal age for second-year college. Thus, a total of 128 students are considered participants in this study. Before that, a consent letter to officially conduct the survey was sent to the head of the office of the Department of Statistics at VSU. After that, teachers handling the said statistics course were immediately enlightened regarding the survey. After the approval, students were informed that their participation is voluntary and there is no connection to their performance (grade) in the said statistics course. Furthermore, they were informed that the survey has no sensitive information and that the gathered data were solely for research only.

Survey Questionnaire and Data Collection Process

In the light of Google Forms, the survey questionnaire was constructed which

consists of semi-structured questions, that is, the respondents are asked questions with choices and open-ended. The survey instrument contains the following sections: (1) demographic profile, (2) learning profile in online learning, and (3) study habits in statistics. Under the demographic profile, students were asked for their age, sex, hometown, household size, and household assets, as open-ended questions. In addition, on a scale of 1 to 10, students were asked to rate their leisure activities, social relationship, and health aspect. As for the learning profile, students were asked for their study hours for statistics in a week, money spent on the internet (Philippine Peso, PHP), type of learning (synchronous or asynchronous), preferred e-learning environment, submission of outputs, internet connectivity, type of gadgets (laptop or mobile phone) for online learning. Moreover, on a scale of 1 to 10, students were requested to rate the following: anxiety level, resilience level, challenge level, enjoyable or interest level, logical level, and learning environment (at home). As for the third section, a structured questionnaire adapted from the study by Shepps and Shepps (1971), Sakirudeen and Sanni (2017), and Villa and Sebastian (2021) were developed that is inline in statistics online learning during the pandemic. The questionnaire consists of 18 questions that have worded choices that include often, sometimes, and seldom. The study habits of engineering students were determined by the scoring guidelines of Moussa (2018) as follows: “Often = 5 points”, “Sometimes = 3 points”, and “Seldom = 1 point." The perception scores were treated as a continuous variable and the total scores range from 18 to 90 which indicates that a lower score means poor study habits and a higher score means good study habits in statistics during the pandemic. Table 2 represents the average range of perception scores for study habits in statistics and its linguistic description.

Table 2: Student's Study Habits Average Perception Score and Linguistic Description

Average perception scores	Description
1.00 – 1.80	Very poor study habits
1.81 – 2.60	Poor study habits
2.61 – 3.40	Moderate study habits
3.41 – 4.20	Good study habits
4.21 – 5.00	Excellent study habits

The study habits questionnaire has content validation by mathematics and statistics educators (experts), and it was found that it captures the attitude of students toward learning statistics and was associated with students' learning styles and well-being during the pandemic. Additionally, to guarantee that the study habits questionnaire is reliable, a reliability test was conducted and it was found that the alpha coefficient is equal to 0.80 (good internal consistency) and can be taken as a reliable set of questions (Cronbach, 1951).

Data Management and Empirical Model

The gathered data from the Google Form survey was extracted, and formatted in Microsoft excel to be fitted in STATA version.14.0. After that, the data were summarized with the aid of standard descriptive measures that include mean (M) average, standard deviation (SD), percentages (%), and range (min and max values). In getting the significant factors of students' study habits in statistics, an ordinary least square (OLS) regression was employed since the students' total perception score in study habits was treated as a continuous dependent variable (Mátyás & Sevestre, 2013). Plus, the binary responses of students were treated as dummy (indicator) independent variables. Henceforth, the empirical (regression) model is postulated in the following fashion:

$$S_i = \delta_0 + \delta_1 X_{i1} + \delta_2 X_{i2} + \cdots + \delta_q X_{iq} + e_i \qquad (1)$$

where S_i represents the students' study habits (regressand) total perception score, $i \in \{1, \ldots, n\}$ and n is the number of participants (engineering students), δ_j ($\forall j \in \{0, 1, \ldots, q\}$) are the parameters of the regression equation (1), X_{ij} ($\forall j \in \{1, \ldots, q\}$) are the regressor variables in the regression model (1), and e_j is the remaining random error. Parameters are tested at 1%, 5%, and 10% levels of significance for the probabilistic forecasting and interpretation. In the model construction, the number of regressors was adjusted in connection to the number of participants (Jenkins & Quintana-Ascencio, 2020). Furthermore, standard diagnostic tests in the regression analysis were done to validate the results of the empirical model constructed.

Results

Student's Socio-Demographic and Learning Profile

Table 2 presents the socio-demographic profile and learning profile of students during distance education. The average of engineering students was close to 20.05 (SD=1.19) years old and with a range of 4 (min=18, max=22). There are 38% male and 62% female students. About 74% of them are living in rural areas and 26% are living in the urban place. On average, their family members are close to 6 (SD=1.91) ranging from 2 to 13 members. The students' mean household asset is equal to PHP 192,063.40 (SD=PHP365,535.40). Out of 1a to 10 scaling, on average, students' leisure time during the pandemic is 6.27 (SD=1.78), their social relationship is 7.51 (SD=1.69), their physical health is 6.07 (SD=2.24), and their mental health is 4.77 (SD=2.29). About 83% of these students are using the laptop for online learning and 17% of them are just using mobile phones. Within a week, they studied statistics lessons for about 6.92 (SD=9.71) hours and ranges from 1 hour to 70 hours.

There are 74% of these students prefer to have synchronous learning and 36% of them prefer to have the asynchronous type of learning. In addition, there only 5% of

these students prefer the e-learning (Modular Object-Oriented Dynamic Learning Environment (MOODLE)) of VSU and 95% of them prefer the other e-learning environment. On average, only 27% of these students are able to submit their outputs on time and 73% of them have submitted late from the deadline. Approximately, these students spent PHP 235.54 (SD=PHP 205.54) for internet load within a week and rated their internet signal connectivity as 5.48 from 1 to 10 scaling. On a scale of 1 to 10, students rated their statistical anxiety as 7.15 (SD=1.88), resilience as 6.44 (SD=1.55), challenge as 7.90 (SD=2.18), and logical level as 7.32 (SD=2.17). Moreover, their rating for how conducive learning at home for online setup is 5.59 (SD=2.29) for 1 to 10 scaling.

Table 2: Standard Descriptive Measures for Engineering Students' Profile

Independent variables	Mean	SD	min	max
Socio-demographic profile				
Age: *no. of years*	20.05	1.19	18	22
Male: *dummy variable*	0.38	0.49	0	1
Rural: *dummy variable*	0.74	0.44	0	1
Household size: *counts*	5.64	1.91	2	13
Household assests: *PHP*	192063.40	365535.40	10000	2000000
Liesure time: *1 to 10 scaling*	6.27	1.78	1	10
Social relationship: *1 to 10 scaling*	7.51	1.69	2	10
Physical health: *1 to 10 scaling*	6.07	2.24	1	10
Mental health: *1 to 10 scaling*	4.77	2.29	1	10
Online learning profile				
Availability of laptop: *dummy variable*	0.83	0.38	0	1
Hours studying Statistics per week: *counts*	6.92	9.71	1	70
Synchronous: *dummy variable*	0.74	0.44	0	1
E-learning VSU: *dummy variable*	0.05	0.21	0	1
Output submission on time: *dummy variable*	0.27	0.45	0	1
Money spent for internet load: *PHP*	235.54	205.54	20	1400
Stable internet signal: *1 to 10 scaling*	5.48	1.95	1	10
Statistical anxiety: *1 to 10 scaling*	7.15	1.88	1	10
Statistical resilience: *1 to 10 scaling*	6.44	1.55	2	10
Statistical challenge: *1 to 10 scaling*	7.90	2.18	2	10
Statistical logical level: *1 to 10 scaling*	7.32	2.17	1	10
Conducive to learn at home: *1 to 10 scaling*	5.59	2.29	1	10

Note: PHP - Philippine Peso; Dummy variable - an indicator variable that is assigned with value 1 and 0 otherwise.

Characteristics of Study Habits in Statistics

As seen in Table 3, engineering students have "moderate study habits" when they *are doing anything else* (M=2.61, SD=1.17), *don't have enough focus* (M=3.34, SD=1.20), *have no enough review for class notes* (M=3.00, SD=1.30), *no focus in accomplishing their goals* (M=3.03, SD=1.27). On the other hand, Table 3 shows that students have "good study habits" if they have *good lighting* (M=3.96, SD=1.28), *study tables are clear* (M=4.12, SD=1.27), *quiet place*s (M=3.96, SD=1.35), and *no distractions* (M=3.78, SD=1.51). In addition, they have "good study habits" when they

review their lessons (M=3.93, SD=1.09), *set goals* (M=3.65, SD=1.23), *take a break* (M=3.56, SD=1.32), *study the difficult lessons during their good mood* (M=4.12, SD=1.17), *plan a study management* (M=3.56, SD=1.27), *break their assessments into pieces* (M=3.90, SD=1.14), *familiarizing the concept of the formula* (M=3.78, SD=1.31), *think examples for every definition of terms* (M=3.93, SD=1.09), *ask questions for themselves* (M=3.79, SD=1.28). Moreover, engineering students are having "excellent study habits" when they are *studying in a cool place* (M=4.26, SD=1.06). Overall, the students' study habits in learning statistics online during the pandemic are considered "good" (M=3.68, SD=1.28), on average.

Table 3: Study Characteristics in Learning Statistics Online during the Pandemic

Characteristics	Mean	SD	Description
1. I prefer to study when there is good lighting.	3.96	1.28	Good
2. I prefer to study in a room where the temperature is not warm.	4.26	1.06	Excellent
3. I prefer to study when the desk or table area where I study is always clear.	4.12	1.27	Good
4. I prefer to study in a quiet place.	3.96	1.35	Good
5. I prefer to study facing a wall to minimize distractions	3.78	1.51	Good
6. When I study, I'm not doing anything else.	2.61	1.17	Moderate
7. When I'm studying, I review the subjects that I am going to study.	3.93	1.09	Good
8. I use my "focus" when studying.	3.34	1.20	Moderate
9. I always review my class notes.	3.00	1.30	Moderate
10. I always set a goal in order to take a break and relax.	3.65	1.23	Good
11. Each goal never takes more than about an hour to accomplish.	3.03	1.27	Moderate
12. I take breaks in studying for progress.	3.56	1.32	Good
13. I study the "difficult" part of the subject when I am in the mood.	4.12	1.17	Good
14. I always plan my study management each week.	3.56	1.27	Good
15. When I am working on my assessments, such as problem sets, I break them into pieces.	3.90	1.14	Good
16. When I am studying the formulas, I try to familiarize their concepts.	3.78	1.31	Good
17. When I am studying a definition of terms, I try to think of examples of how it might be useful in a real situation.	3.93	1.09	Good
18. I ask questions to myself when I study until I can get the answer.	3.79	1.28	Good
Total	**3.68**	**1.28**	**Good**

Regression Models for Study Habits in Statistics

The three regression models as shown in Table 4 have undergone the post-estimation technique to guarantee a valid forecast of the results. First, with the aid of the Breusch-Pagan test, the three models (Model 1: X^2=0.08, p-value=0.77; Model 2:

X^2=0.01, p-value=0.98; Model 3: X^2=0.15, p-value=0.70) is shown to be homoscedastic, which means that the variances of the model are homogeneous. Secondly, the three models (Model 1: F=0.72, p-value=0.54; Model 2: F=0.60, p-value=0.61; Model 3: F=0.96, p-value=0.41) have no omitted variable bias based on the results of Ramsey RESET test. The models imply that the independent variables are fitted to explain the response variable. Moreover, the three models have an absence of multicollinearity problems between the independent variables. This follows that no significant correlation between the predictors is present which can affect the reliability of the statistical inference of the models. Furthermore, based on the Shapiro-Wilk test, models 1 and 2 are known to have normal residuals (Model 1: Z=-0.53, p-value=0.70; Model 2: Z=0.66, p-value=0.25). As for Model 3, it is shown that the residuals are not normal (Z=1.86, p-value=0.03) at a 5% level of significance using the Shapiro-Wilk test, however, the graph of kernel density for residuals shows that it is almost normal as seen in Figure 1.

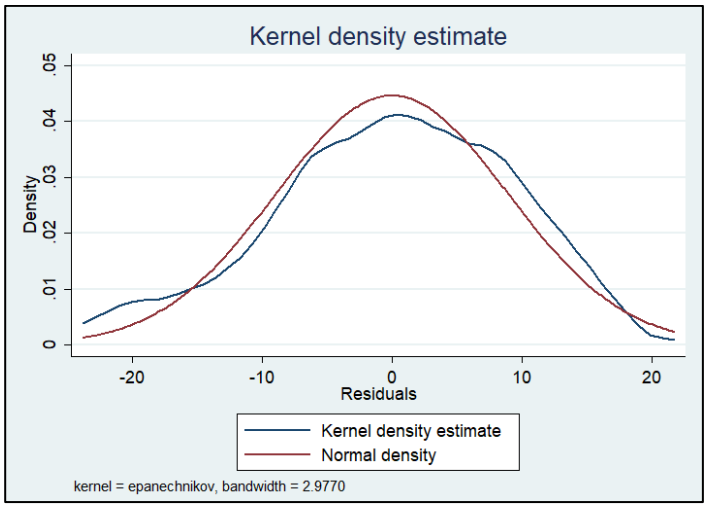

Figure 1. Kernel Density Estimate and Normal Density for Residuals

Hence, the three-regression model assures us to have a valid and reliable inference for the results. Table 4 shows that the three OLS models (Model 1: F=3.67, p-value<0.001; Model 2: F=3.81, p-value<0.001; Model 3: F=5.65, p-value<0.001) are highly significant at 1% level, which indicates that study habits are influenced by some variables. In addition, the coefficient of variation shows that (Model 1: R^2=218; Model 2: R^2=265; Model 3: R^2=301) there are significant factors that explain the students' study habits during distance education. In Model 1, the significant factors of students' study habits are sex (at a 10% level) and social relationships (at a 1% level) (Table 4). In addition, Model 2 shows that sex (at a 5% level), leisure time (at a 1% level), and social relationships (at a 1% level) are significant predictors of students' study habits. Moreover, Model 3 shows that the significant factors of study habits include sex (at a 5% level), leisure time (at a 1% level), social relationship (at a 1% level), physical health (at a 10% level), and availability of laptop (at a 10% level).

Table 4: Regression (OLS) Models for the Level of Study Habits in Statistics and its Influencing Factors under Distance Education

Factors of Study habits	(Dependent variable: Study habits level)		
	OLS Model 1	*OLS Model 2*	*OLS Model 3*
Socio-demographic profile			
Age: *no. of years*	-0.018^{ns}		
	(0.799)		
Male: *dummy variable*	3.391*	4.085**	4.251**
	(1.967)	(1.835)	(1.824)
Rural: *dummy variable*	-2.539^{ns}		
	(2.045)		
Household size: *counts*	-0.074^{ns}		
	(0.473)		
log (Household assests+1: *PHP*)		0.688^{ns}	
		(0.843)	
Leisure time: *1 to 10 scaling*		1.664***	1.747***
		(0.604)	(0.573)
Social relationship: *1 to 10 scaling*	2.722***	1.822***	2.277***
	(0.662)	(0.634)	(0.631)
Physical health: *1 to 10 scaling*	-0.347^{ns}		-0.869*
	(0.479)		(0.457)
Mental health: *1 to 10 scaling*		0.038^{ns}	
		(0.459)	
Online learning profile			
Availability of laptop: *dummy variable*			-3.643*
			(2.259)
Hours studying Statistics per week: *counts*	0.083^{ns}	0.066^{ns}	
	(0.094)	(0.094)	
Synchronous: *dummy variable*		-0.722^{ns}	
		(2.148)	
E-learning of VSU: *dummy variable*			-2.792^{ns}
			(3.963)
Output submission on time: *dummy variable*			1.472^{ns}
			(1.887)
log (Money spent for internet load+1: *PHP*)		3.219^{ns}	
		(2.854)	
Stable internet signal: *1 to 10 scaling*		-0.170^{ns}	
		(0.504)	
Statistical anxiety: *1 to 10 scaling*	0.486^{ns}		
	(0.487)		
Statistical resilience: *1 to 10 scaling*			0.480^{ns}
			(0.548)
Statistical challenge: *1 to 10 scaling*		0.164^{ns}	
		(0.416)	
Statistical logical level: *1 to 10 scaling*			0.319^{ns}
			(0.418)
Conducive to learn at home: *1 to 10 scaling*	0.214^{ns}	-0.054^{ns}	
	(0.412)	(0.449)	
Constant	44.047**	30.034***	39.182***
	(17.944)	(9.103)	(5.429)
No. of Participants	128	128	128
F-test	3.67***	3.81***	5.65***
p-value (two-tailed test)	<0.001	<0.001	<0.001
Coefficient of determination (R^2)	0.219	0.256	0.301

Note: PHP - Philippine Peso; Dummy variable - an indicator variable that is assigned with value 1 and 0 otherwise. Standard error are enclosed by parentheses; ns- not significant; *p-value<10%; **p-value<5%; ***p-value<1%.

Discussion

According to Casinillo (2022), an engineering student who took up "Engineering Data Analysis" as a statistics course is approximately 20 years old. This age is ideal for second-year college students in which their study skills, memory ability, and interest are higher compared to non-traditional age (24 and above) of students (Justice & Dornan, 2001). Based on the results, most of the engineering students are female and this finding is most likely a remedy for insufficient engineers as stated in the study of Balakrishnan and Low (2016). It is worth noting that most of the engineering courses are dominantly enrolled by male students, so if more female students are enrolled in their careers, then the dilemma of insufficient engineers will be resolved. Most of the engineering students at VSU are residing in rural areas, which indicates that they are experiencing some problems in accessing an internet connection (Dubey & Pandey, 2020; Casinillo, 2022). Moreover, students are also having crowded household members which distract their focus from online learning. In fact, they have rated their learning environment (at home) as low because of distractions and not conducive to studying. It is worth noting that a conducive place for learning motivates students to have good study habits and learning styles (Aschenberger et al., 2022). However, during the pandemic, spending time with their family members at home can develop intimacy which positively increases their social relationship level, and spends more time in leisure activities. Apparently, Jaskulska et al. (2022) portrayed that leisure time and family activities is a good coping strategies for students to face the obstacles and challenges in online learning. Moreover, students have rated their health aspect low because of depression, stress, and even anxiety brought on by the difficult situation in online learning and health crisis. In the study by Wang et al. (2020), it is stated that health is the most affected by the pandemic due to the increased levels of anxiety and depression, especially among students in online learning.

Results showed that students are encouraged to study statistics when the temperature of their learning place is not warm. According to Gil-Baez et al. (2021), in a comfortable place and with proper ventilation where the temperature is not hot, students are motivated to study and their ability of thinking is more likely to take place. Aside from that, students are more likely to study their lessons in statistics when there is good lighting, clear study tables, a quiet place, and no distractions. Khafaga (2021) mentioned that a conducive place for learning will give interest students in studying their lessons that enhance their cognitive attitude. Meanwhile, students are out of focus on studying statistics when they have nothing else to do. Dontre (2021) depicted that during online learning, technology is a distraction for students because of social media and games that may snatch their focus on studying their lessons online. Findings revealed that studying and reviewing statistics lessons is effective when the students are in their best state or good mood. Hong et al. (2021) stated that if a student is negatively affected by the surroundings, procrastination, and learning avoidance is more likely to occur. In addition, results show that when students are taking breaks and do relaxation in the middle of studying, they tend to have more progress in learning. This means that if a student is relieved from a stressful environment, their cognitive ability tends to function well and enhance their study habits. Nijland et al. (2021) students must take a break and be involved in leisure activities to relax their minds and reduce their stress levels. Plus, students tend to have an effective study style if they try

to give an imaginative example for statistics formulae and definitions. Students also perform better in studying if they ask questions about what they have learned from their statistics topics. In the study of Chang et al. (2021), it is depicted that inquiring minds and critical thinking skills are very helpful for students in studying their lessons effectively. Overall, students' study habits in learning statistics online during the pandemic are relatively good despite the challenges they are facing. According to Berondo and Fuente (2021), students are motivated to study online because of technology exposure where they can easily access the necessary information they need to learn.

The three regression models showed that male engineering students are more active in studying statistics. According to Mejía-Rodríguez et al. (2021), male students are performing well compared to female students since males are more stimulated in critical thinking skills. Likewise, the findings of Starr and Simpkins (2021) depicted that male students are better in mathematics and science subjects as opposed to female students. Additionally, models 2 and 3 revealed that leisure activities help strengthen the study habits of students in learning statistics under distance education. This means that students need to take a break and unwind from stressful learning environments to relax their minds and regain their strength from studying online. In fact, leisure activities can improve the well-being of students and gives a stimulating environment that results in an active and creative mind (Kayumova et al., 2021; Nijland et al., 2021). Next, the three models have depicted that social relationships can positively influence the students' study habits in statistics. This implies that having a good social relationship will give them good vibes that encourages them to do their duties as a student. Although there are challenges and obstacles during a health crisis, friends and family members are of great help in mediating stressful environments. During the pandemic, social support toward the students can help them ease the difficult situation, enhance their self-efficacy and positively improve their mental and emotional health (Elmer et al., 2020; Saefudin et al., 2021). A reverse result was revealed in model 3, which shows that a lower perception of physical health results in a higher level of study habits. This means that students are encouraged to study their statistics lessons when they are not physically active during the pandemic. When students are in good physical health, they are encouraged to do other activities which hinder studying statistics. This result is not parallel to the findings by Valenzona et al. (2022) which depicted that health is a predictor of students' innovativeness in learning. Likewise, the result contradicts the study of Aristeidou & Cross (2021) that good physical health is vital in study habits during the pandemic. However, in the study of Consoni et al. (2021), it is mentioned that physically healthy students are more inclined to sports and other physical activities which diverts their attention from learning their lessons. Additionally, model 3 also revealed that a student with laptop results in to lower level of study habits in statistics. This means that students prefer to study more statistics if they don't have a laptop. It is worth noting that students are distracted by online games and social media which are easily accessible on advanced gadgets like a laptop. In fact, Selwyn and Aagaard (2021) stated that students cannot focus on studying their lessons during the new normal due to technology distractions and addiction. However, the result is not consistent with the study by Sefriani et al. (2021) that advanced technology is helpful in the effectiveness of learning statistics during the pandemic.

Conclusion

The article aimed to explain the students' study habits in statistics during distance education and determine its statistically significant factors. Results showed that students are having good study habits despite the challenges and obstacles they are facing in distance education. The study concluded that students are encouraged to study statistics if the learning environment is not warm, there is good lighting, quiet, and no distractions. Additionally, students can effectively study statistics lessons if they imagine realistic examples given the formulas and definitions. They can also easily grasp the statistics concepts if they are asking questions themselves. Conclusively, the statistically significant factors that affect the students' study habits in statistics during the pandemic include "sex", "leisure activities", "social relationships", "physical health" and "availability of laptops". Hence, the study suggests that teachers must show positive attitudes and encouragement, especially to female students to boost their interest in studying statistics. Moreover, it is recommended that statistics teachers must encourage their students to develop time management to further enhance their study habits. Teachers must tell their students to avoid distraction from the internet which includes online games and social media but rather focus on their statistics lesson. Plus, teachers must give motivational activities and problem-solve in statistics that are realistic and doable. Furthermore, it is also recommended that teachers, parents, and guardians should work together in guiding the students on how to enhance their study habits in statistics. For future research, it is interesting to incorporate empirical variables such as learning styles and self-efficacy of statistics students to fortify the current findings.

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