Econometric Evidence on Statistical Anxiety of Engineering Students during the New Normal Setup

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Emily L. Casinillo*, Eusebio R. Lina Jr., Leomarich F. Casinillo, Paulo G. Batidor, and Meralyn R. Lebante

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ABSTRACT. Students' anxiety is one of the hindrances to good academic achievement due to its adverse impact on cognitive attitudes. This study aimed to ascertain the impact of socio-economic profile and learning experiences that are affected by the COVID-19 pandemic concerning students' anxiety in learning statistics. The study used descriptive measures and econometric models to elucidate the anxiety level and its predictors of engineering students in a state university. Result reveals that the mean students' perception score for their anxiety level is 34.19 (SD=4.94) and is classified as "anxious". This implies that students are experiencing uncomfortable moments and distressing learning behavior due to the adverse impact of the pandemic on the educational system. The econometric model reveals that older and female students are more anxious about learning statistics online. Findings showed that the level of difficulty and less creativity in statistics lessons contributes to the anxiety level of students. In conclusion, instructors/professors must motivate their students and build their interest in learning statistics by giving them realistic and enjoyable activities that suit online education. Furthermore, instructors/professors must undergo training that develops and improves their teaching strategies in statistics to become competitive educators in online learning amid the pandemic.

1.0. Introduction

The COVID-19 pandemic has brought an abrupt challenge, especially to statistics educators and students, which resulted in unprecedented anxiety. Many students are experiencing anxiety and depression because of the challenges and difficulties they have encountered in online learning, as everyone is following the health protocols of the COVID-19 pandemic (Cassibba et al., 2020; Casinillo et al., 2022). The study by Manapa (2021) found that most students amid the pandemic face moderate to high anxiety problems. Likewise, the findings of Simorangkir et al. (2021) predicted that the pandemic had created anxiety in students that led to depression. Apparently, anxiety is one of the negative factors in learning mathematical subjects like statistics. In fact, anxiety is a negative emotional response to mathematical topics that can be crushing concerning their academic performance. Siew et al. (2019) found that a lot of students are experiencing statistical anxiety that adversely affects their level of achievement and hinders them from understanding their lessons. Moreover, Ashcraft (2002) pictured anxiety as a feeling of tension and mental problem that intervene with the handling of numbers and solving mathematical problems in academic situations.

Statistics, as a branch of mathematics, is one of the courses for engineering students that requires a lot of technical work and mathematical ability. Casinillo and Miñoza (2020) stated that students taking statistics courses must possess a quality of being mathematically tending. However, due to limitations and challenges during the pandemic, students' learning and thinking capacities are strictly declining (Radha et al., 2020; Cassibba et al., 2020). On the face of it, students' anxiety towards statistics comes in. They became anxious about what might happen next as they struggled to learn statistics online. The intensity of statistical anxiety can scope from a feeling of mild tenseness to experiencing a strong fearfulness of statistics. This anxiety leads to a stressful learning experience that can cause students to perform below their ability and even in a motion of disliking statistics. Several studies have widely acknowledged that anxiousness tends to lead to low performance in statistics (Baloğlu & Zelhart, 2003; Onwuegbuzie & Wilson, 2003; Liu et al., 2011; Siew et al.,

*Correspondence: emily.casinillo@vsu.edu.ph
Emily L. Casinillo, Department of Mathematics, Visayas State University, Baybay City, Leyte, Philippines

2019; Zhang et al., 2021). Especially during the COVID-19 pandemic, anxiety is higher than it used to be, affecting students' learning attitudes (Amendola et al., 2021).

It is worth noting that the COVID-19 pandemic is not just a health crisis but also an economic problem where every individual is struggling to cope. Online learning involves financial aspects where students access the internet and use technology and gadgets as an instrument (Fernández-Rovira & Giraldo-Luque, 2021). However, some families cannot afford these kinds of stuff due to crises (Wolinsky, 2020). In that case, students have a hard time because they become stressed and anxious about the unprecedented time as they learn at a distance. Although there are student anxiety studies in the literature, the econometric factors of anxiety are scarcely investigated. In fact, modeling the anxiety of students and its determinants using econometrics has never been done during the pandemic.

Henceforth, this study elucidates the different factors of students' level of anxiety in learning statistics online amid the COVID-19 pandemic. In that case, the dependent variable of the model is the students' level of statistical anxiety. In contrast, the independent variables of the model are the factors (economic variables and learning experiences) that students have encountered during the pandemic embedded by socio-demographic profile as an exogenous variable. The expected results of this study may give an idea to both teachers and students on how to deal positively with anxiety amidst the pandemic. In addition, results may provide useful information that serves as a basis for policy-making bodies and may contribute to the literature in statistics education.

2.0. Framework of the Study

According to Casinillo et al. (2020), students' anxiety level has adversely influenced their learning experience and problem-solving skills. A high level of anxiety resulted in dodging mathematics and statistics class and idleness in solving problem sets and activities. Ashcraft (2002) pointed out that students will become anxious and fearful about learning mathematical subjects due to a high level of anxiety. In other words, anxiety adversely affects students' personal and educational aspects (Betz, 1978; Ashcraft, 2002; Ma, 2003).

Apparently, studies have shown that anxiety affects students' achievement and cognitive behavior in mathematics and statistics (Schillinger et al., 2018; Zhang et al., 2019; Casinillo et al., 2020; Passolunghi et al., 2020). In literature, several causes govern the level of anxiety, such as demographic profile (Szczygiel, 2020), emotional health (Van den Bussche et al., 2020), teaching strategies (Casinillo & Guarte, 2018), interest in learning (Casinillo & Aure, 2018), economic status (Radišić et al., 2015), learning procedure (Manapa, 2021), and health concern (Ludwig, 2021), among others. Plus, Alizamar et al. (2019) found that the level of statistics anxiety of students is different across gender.

3.0. Methodology

Research Design. The design of this study is parallel to the methodology of Casinillo and Aure (2018). Hence, a descriptive-correlational research design was employed for this study to seek some significant factors that governed students' anxiety in learning statistics online during the COVID-19 pandemic. Some descriptive measures were used to summarize the survey data and econometric models were constructed to identify the influencing determinants of students' statistical anxiety.

Participants, Research Locale, and Ethics. The desired participants of this study comprise all engineering students at Visayas State University (VSU) who enrolled in "Engineering Data Analysis" in the first semester of the academic year 2021-2022. Engineering students at VSU were selected as the source of information for this study because most of them live in rural areas where online learning is difficult. The said participants were all chosen as the subject of this study due to the small number of students. Since the survey was conducted using a Google form due to health protocols, a non-probabilistic sampling method was employed. Hence, a student who willingly responded to the said survey was part of the participants of the study. Additionally, a student with an extreme response and missing data was automatically excluded from the analysis. Hence, the study considered 120 students with more or less homogeneous responses (outliers omitted).

This study considered ethics in conducting the data gathering as a procedure. Hence, permission from the department head of Statistics at VSU was asked through formal consent before conducting the survey. After this, teachers handling the subject "Engineering Data Analysis" were requested to allow the survey to their students. Moreover, students were informed that the participation was voluntary and no sensitive information was collected, only

educational data. Furthermore, data gathered from participants were treated as confidential and conformed to the Philippine Data Privacy Act (Republic Act. 10173).

Data Collection and Survey Instrument. The data collection was completed with the aid of a structured questionnaire that was developed using Google Forms. The online survey was posted through a link in their virtual classroom (e-learning environment). In addition, statistics teachers were asked to send the online survey link to students' respective emails and post it on the Facebook group. The said online survey was open for about three weeks in the last quarter of the semester. The selected time interval was considered because students during that time are assumed to be thriving in the learning process, where anxiety is expected to be highly present.

Regarding the instrument, it is sectioned into three parts. The first part is the socio-demographic profile of students in which they will be asked about their age (in years), gender (male or female), residence (urban or rural), number of family members, family monthly income (₱), family assets (₱), family monthly expense (₱), leisure time (scale of 1 to 10), and mental health (scale of 1 to 10). The second part is the students' experiences in distance learning, such as internet connectivity (scale of 1 to 10), money spent on the internet (₱/week), use of a laptop for online learning (yes or no), number of hours studying statistics (per week), how conducive learning at home (scale of 1 to 10), level of difficulty in statistics (scale of 1 to 10), level of creativity in statistics (scale of 1 to 10), how rewarding is learning statistics (scale of 1 to 10), how logical is learning statistics (scale of 1 to 10).

A modified questionnaire for the Anxiety Scale (AS) developed by Betz (1978) will be used to measure the statistics anxiety of engineering students during the pandemic. This AS questionnaire consists of 5 positive and 5 negative worded questions. A lower score in the AS instrument indicates the least anxious and most anxious for a higher score in learning Statistics online. AS questionnaire conforms a Likert scale to the following choices: Strongly agree, Agree, Undecided, Disagree, and Strongly disagree. Furthermore, the AS questionnaire has undergone a reliability test which resulted in a coefficient of 0.75 using Cronbach's alpha and was interpreted as reliable (Cronbach, 1951). For the scoring guidelines of the anxiety questionnaire, readers may refer to Casinillo et al. (2020). Tables 1 and 2 depict the perception score of individual anxiety questions and the range of overall anxiety perception scores in different verbal description categories, respectively.

Table 1. Perception scores anxiety questionnaire

Perception Scores	Verbal Description
1.00 – 1.80	Strongly disagree
1.81 – 2.60	Disagree
2.61 – 3.40	Undecided
3.41 – 4.20	Agree
4.21 – 5.00	Strongly agree

Table 2. Anxiety perception scores in Statistics

Perception Scores	Verbal Description
10.0 – 18.0	Not anxious
18.1 – 26.0	Slightly anxious
26.1 – 34.0	Moderately anxious
34.1 – 42.0	Anxious
42.1 – 50.0	Very anxious

Data Investigation and Econometric Model (EM). The data gathered were encoded to excel and were formatted for statistical software STATA v.14. Some descriptive measures such as minimum (min), maximum (max), mean (M), standard deviation (SD), and coefficient of variation (CV) were calculated to evaluate the various variables of this study. For further analysis, ordinary least squares (OLS) econometric models were constructed to expose the significant factors affecting the statistical anxiety of engineering students. Econometric modeling is a statistical method determining the association between dependent and independent variables (Mátyás & Sevestre, 2013). An econometric model was employed in this study to capture some economic predictor variables in the students' anxiety. Now, considering a data set $\{A_i, V_{i1}, \ldots, V_{ip}\}_{i=1}^{n}$ of n participants, multiple linear econometric models in the form of regression assume that the relationship between the dependent variable (regressand) A_i and the p-vector of the independent variable (regressor) V_{it} $(\forall t \in \{1, \ldots, p\}$ is linear. This implies that the equation determines the line of best fit that minimizes the errors or variances of each regressor included in the model as it associates with the regressand. Hence, in multiple linear regression, the equation model takes the following form:

$$A_i = \beta_0 + \beta_1 V_{i1} + \cdots + \beta_p V_{ip} + e_i \qquad (1)$$

where A_i refers to the level of statistical anxiety, i=1,...,n and n refers to the number of students who participated in the survey, β_t $(\forall t \in \{0, 1, \ldots, p\})$ refers to the parameters to be estimated, V_{it} $(\forall t \in \{1, \ldots, p\})$ refers to the different independent variables, and e_i refers

to the random error. In interpreting the model, β_t $(\forall t \in \{1, \ldots, p\}$ is the estimated change in the level of statistical anxiety in every 1 unit change in the regressor (causal factors) variable V_{it} $(\forall t \in \{1, \ldots, p\})$ while holding other regressors constant. Furthermore, diagnostic tests were employed to ensure the models' validity to provide a legitimate conclusion and predictions. For a rigorous discussion on regression modeling and its diagnostic tests, one may refer to Greene (2008) and Casinillo and Aure (2018).

4.0. Results and Discussion

Profile and learning experiences of students

Table 3 depicts the socio-demographic profile and learning experiences of engineering students during the COVID-19 pandemic. The average age of students taking the course "Engineering Data Analysis" was nearly 20 years old. As for their gender, about 40% of them are male, and 60% are female students. Dominant (73%) live in rural areas, and only 23% live in urban places. The average household size of these students is close to 7 members, and the average monthly income is approximately ₱26261.76 (SD=33076.97). Concerning their monthly family expense and family assets, these are more or less ₱14567.50 (SD=11797.22) and ₱204861.70 (SD=374107.4), respectively. On average, students rated their leisure time during the pandemic as 6.65 (SD=2.47) on a scale of 1 to 10. However, they have rated their mental health as relatively low (M=4.78, SD=2.29) due to the challenges they face during the pandemic setup. Learning at home (M=5.73, SD=2.27) with their internet connectivity (M=5.54, SD=1.94) is rated average while spending more or less ₱229.38 (SD=207.02) per week for internet load. About 82% of these students use a laptop as their learning gadget, which is an advantage in learning statistics programs. Every week, students study statistics lessons for about 6.34 (SD=8.18) hours. Students simultaneously find learning statistics moderately creative (M=6.05, SD=1.90) and rewarding (M=6.90, SD=2.09). Moreover, they perceived that learning statistics online is quite difficult (M=7.81, SD=2.28) and logical (M=7.21, SD=2.26).

Table 3. Engineering students' profile (n=125).

Variables	M(±SD)	min	max
Profile of students			
Age[a]	20.10 (± 1.48)	18	30
Male[b]	0.40 (± 0.49)	0	1
Urban[b]	0.27 (± 0.44)	0	1
Family members[a]	5.62 (± 1.85)	2	13
Monthly Family Income[c]	26261.76 (± 33076.97)	3000	250000
Monthly Family Expense[c]	14567.50 (± 11797.22)	800	100000
Family assets[c]	204861.70 (± 374107.4)	1000	2000000
Leisure time[d]	6.65 (± 2.47)	1	10
Mental health[d]	4.78 (± 2.29)	1	10
Learning experiences			
How conducive to learn at home[d]	5.73 (± 2.27)	1	10
Internet connectivity[d]	5.54 (± 1.94)	1	10
Money spent for the internet[c] (₱/week)	229.38 (± 207.02)	20	1400
Use of laptop for online learning[b]	0.82 (± 0.30)	0	1
Number of hours studying statistics[d] (per week)	6.34 (± 8.18)	1	70
Level of difficulty in statistics[d]	7.81 (± 2.28)	1	10
Level of creativity in statistics[d]	6.05 (± 1.90)	2	10
How rewarding is learning statistics[d]	6.90 (± 2.09)	2	10
How logical is learning statistics[d]	7.21 (± 2.26)	1	10

Note: a - count; b - dummy variable; c - Philippine Peso (₱); d- Scale 1 to 10.

Statistical anxiety

In Table 4, the different characteristics of students' anxiety in learning statistics online are presented as well as their perception scores. On average, students are undecided or undetermined (M=2.79SD=0.88) if they are bothered to take more courses in statistics under an online setup. This means that they are unsure if they can continue learning due to the unprecedented learning environment they have encountered. Students are uncomfortable concerning their online classes, especially in their statistics activities (M=2.47, SD=0.83) and examinations (M=2.58, SD=0.76). Plus, they are bothered by their ability and potential

(M=2.28, SD=0.92) in solving statistics problems and feel edgy (M=2.33, SD=0.80) during the examinations. In addition, students agree or perceive that they feel uptight (M=3.57, SD=0.85) in taking examinations in statistics online, and they have a sinking feeling (M=3.64, SD=0.90) every time they solve hard problems in statistics. Moreover, students are undecided or undetermined to perceive that they are unable to think intelligibly (M=3.15, SD=0.94) in working statistics activities, they feel depressed and nervous (M=3.08, SD=0.96) in statistics class, and Statistics makes them feel confused and uneasy (M=3.18, SD=1.00) to learn.

Overall, students are anxious (M=34.19[b], SD=4.94) as they learn statistics online amid the pandemic setup. This implies that students are experiencing worry and feelings of unease about an uncertain outcome. This result is consistent with the findings of Siew et al. (2019) that students are experiencing anxiety in learning statistics. Likewise, several studies have revealed that students are experiencing statistical anxiety during the pandemic setup (Zhang et al., 2021; Jazayeri et al., 2022). However, it can be gleaned from Table 3 that students' perception scores on the anxiety characteristics are not "consistent" based on the coefficient of variation (CV>20%) (Reed et al., 2002). This implies that their responses can be changed depending on their mood and other factors affecting their anxiety level.

Table 4. Statistical anxiety of engineering students

	Anxiety Characteristics in Statistics	M (±SD)	CV (%)	Response[a]
1.	I wouldn't bother at all to take more statistics classes online.	2.79 (± 0.88)	31.54	Undecided
2.	Usually, I have been at comfort during Statistics activities.	2.47 (± 0.83)	33.60	Disagree
3.	Usually, I have been at comfort in Statistics examinations.	2.58 (± 0.76)	29.46	Disagree
4.	Usually, I don't bother about my ability to solve Statistical problems.	2.28 (± 0.92)	40.35	Disagree
5.	I never get edgy while taking Statistics exams.	2.33 (± 0.80)	34.33	Disagree
6.	I get uptight during Statistics exams.	3.57 (± 0.85)	23.81	Agree
7.	I acquire a sinking feeling when I consider trying hard on Statistics problems.	3.64 (± 0.90)	24.73	Agree
8.	I am unable to think intelligibly when working on Statistics.	3.15 (± 0.94)	29.84	Undecided
9.	Statistics make me feel depressed and nervous every time.	3.08 (± 0.96)	31.17	Undecided
10.	Statistics make me feel confused and uneasy	3.18 (± 1.00)	31.45	Undecided
	Mean Perception Score (± SD)	**34.19[b] (± 4.94)**		**Anxious[c]**

Note: a - See Table 1 for details; b - Kindly refer to the scoring guidelines in Casinillo et al. (2020); c - See Table 2 for details.

Econometric models and their diagnostics

Four econometric models (EMs) were constructed in this study, as seen in Table 5, and have undergone diagnostic tests to ensure a reliable inference (Mátyás & Sevestre, 2013). The four models are homoscedastic in relation to their variances based on the Breusch-Pagan test, where the p-values are greater than a 5% level of significance. Except for the second model (EM II: p-value=0.0422), there is no omitted variable bias exists with the aid of the Ramsey RESET test (p>5%). Plus, the four models have no problem with multicollinearity between independent variables involved, that is, the VIF<10% (Allison, 2012). Lastly, the four models have revealed the normality of residuals by the Shapiro-Wilk test (p-values are greater than 5%). Hence, the models (I-IV) can provide valid and reliable findings.

Although the first three models are not significant at the 10% level (but significant at the 15% level) (EM I: p=0.1233; EM II: p=0.1070; EM III: p=0.1126), it has revealed a few significant predictors or causal factors that influence the students' anxiety in learning statistics during the pandemic (Table 6). The coefficient of variation (^{2}) also shows a very low level of goodness of fit for the three models. Only the fourth model (EM IV: p=0.0645) has shown significant constructs at a 10% level of significance. Plus, it has depicted the highest coefficient of variation (R^2=0.1325) among other econometric models, as shown in Table 6.

In EM I, the age of students is a significant factor in anxiety. In every one-unit increase in age, there is an approximately 0.47 increase in anxiety perception score while holding other variables constant. This implies that students become anxious about learning statistics online amid the pandemic as they age. This result is parallel to the findings of Er (2015), who stated

Table 5. Diagnostic Test for Econometric Models

EM	Assumptions	Test Statistic		p-value	Decision
I	Homoscedasticity	Breusch-Pagan	χ^2=0.28	0.5957	Yes
	Omitted variable bias	Ramsey RESET test	F_c=0.28	0.8421	None
	Multicollinearity	Variance inflation factor (VIF)	Mean VIF=1.12	-	None
	Normality of residuals	Shapiro-Wilk test	Z_c =-0.571	0.7159	Yes
II	Homoscedasticity	Breusch-Pagan	χ^2=0.08	0.7788	Yes
	Omitted variable bias	Ramsey RESET test	F_c=2.82	0.0422	Yes
	Multicollinearity	Variance inflation factor (VIF)	Mean VIF=1.50	-	None
	Normality of residuals	Shapiro-Wilk test	Z_c=-0.004	0.5018	Yes
III	Homoscedasticity	Breusch-Pagan	χ^2=0.12	0.7240	Yes
	Omitted variable bias	Ramsey RESET test	F_c=0.58	0.6295	None
	Multicollinearity	Variance inflation factor (VIF)	Mean VIF=1.25	-	None
	Normality of residuals	Shapiro-Wilk test	Z_c =-0.295	0.6160	Yes
IV	Homoscedasticity	Breusch-Pagan	χ^2=0.39	0.5348	Yes
	Omitted variable bias	Ramsey RESET test	F_c=0.89	0.4502	None
	Multicollinearity	Variance inflation factor (VIF)	Mean VIF=1.54	-	None
	Normality of Residuals	Shapiro-Wilk test	Z_c=-0.776	0.7810	Yes

that older students have high anxiety levels for the reason that as students grow old, they become independent of their parents. Thus, older students are more anxious to finish their education while facing the challenges brought on by the pandemic. Likewise, Baloglu and Kocak (2006) found that older students are more experiencing mathematical anxiety due to some factors that include the level of stressful life events they have encountered than younger students.

Both EM III and IV revealed that female students are more experiencing anxiety as opposed to male students. In fact, EM IV has shown that if a student is a female, there is a 1.92 anxiety perception score higher than a male student considering other predictors constant. This implies that a female engineering student is more uncomfortable and anxious in statistics and online classes than male students. Several studies have revealed that male students are more confident in mathematical subjects and less anxious about learning numerical problems than female students (Simorangkir et al., 2021; Alizamar et al., 2019; Rozgonjuk et al., 2020; Wang et al., 2020). In fact, anxiety is a very common emotional problem associated with statistics and mathematics (Debowska et al., 2020), especially for female students.

In addition, EM IV has shown that for every one-unit increase in the perception of students on how difficult statistics is, students' perception score in anxiety increases by more or less 0.40, ceteris paribus, and it is significant at a 10% level. This implies that due to the challenges and difficulties in online education amid the pandemic, students are anxious and uneasy about learning statistics. According to Browning et al. (2015), it is significantly true that anxious students have difficulty learning the activities in statistics, especially in an unprecedented learning environment. Macher et al. (2012) stated that a student shows procrastinating behavior during difficult times, which results in a higher anxiety level. Apparently, statistical anxiety is the main problem for students learning attitude, and it is the main concern of a teacher to reduce and increase the student's level of achievement, especially during the times of global pandemic (Jazayeri et al., 2022).

Moreover, the four econometric models revealed that if a statistics class is less creative, students' anxiety level is more likely to be high while keeping other independent variables constant, and it is statistically significant. Creativity is worth noting where students' innovative ideas are being created and explored (Casinillo, 2022).

According to Miñoza and Casinillo (2022), statistics is a subject that needs exploration of new methods for analyzing problems and data extractions. So, creative thinking is very helpful in good academic performance in statistics courses. However, during the global pandemic, some barriers and obstacles include limitations of internet connectivity and proper guidance of instructors/professors. Hence, the creativity level of the statistics subject online is relatively low compared to face-to-face learning. Low creativity results in low productivity, which leads to a high level of anxiety in learning statistics. In fact, Katz-Buonincontro et al. (2017) stated that the creativity level of students is a strong predictor of interest in learning. In that case, to lower the level of anxiety and increase the level of performance of students, students' interest must be cultivated by increasing the creative nature of the subject statistics online.

Table 6. Regression models for the level of anxiety in learning Statistics online and its influencing predictors

Predictors of Anxiety	Econometric Model (EM)			
	EM I	**EM II**	**EM III**	**EM IV**
Age[a]	0.4688*			0.4854[ns]
	(0.3140)			(0.3120)
Male[b]	-1.4081[ns]	-1.3456[ns]	-1.4520*	-1.9200**
	(0.9870)	(0.9177)	(0.9306)	(0.9465)
Urban[b]	-1.3204[ns]			
	(1.0506)			
Family members[a]	0.1387[ns]			
	(0.2533)			
log (Monthly Family Income[c]+1)	-0.3096[ns]	-0.2234[ns]	-0.3804[ns]	-2.5256[ns]
	(1.3060)	(1.3015)	(1.3745)	(1.9614)
log (Monthly Family Expense[c]+1)				3.2631[ns]
				(2.4367)
log (Family assets[c]+1)			0.1913[ns]	0.0383[ns]
			(0.6668)	(0.6653)
Leisure time[d]	-0.0077[ns]			
	(0.1913)			
Mental health[d]	-0.1324[ns]			0.2490[ns]
	(0.2078)			(0.2259)
How conducive to learn at home[d]				-0.0921[ns]
				(0.2190)
Internet connectivity[d]		-0.3332[ns]	-0.3227[ns]	
		(0.2446)	(0.2512)	
log (Money spent for the internet[c] +1) (₱/week)			0.6441[ns]	0.7030[ns]
			(1.4476)	(1.4319)
Use of laptop for online learning[b]			-1.2478[ns]	-1.3357[ns]
			(1.2189)	(1.1971)
Number of hours studying statistics[d] (per week)		0.0139[ns]		
		(0.0549)		
Level of difficulty in statistics[d]		0.2726[ns]		0.4002*
		(0.2765)		(0.2394)
Level of creativity in statistics[d]	-0.4649*	-0.6927**	-0.6934**	-0.7609***
	(0.2396)	(0.3163)	(0.2878)	(0.2891)
How rewarding is learning statistics[d]		0.1007[ns]		
		(0.3226)		
How logical is learning statistics[d]			0.3555[ns]	
			(0.2433)	
Constant	29.7186***	38.8058***	38.4798***	234797***
	(8.8414)	(5.5279)	(6.6013)	(9.8897)
No. of participants	120	120	120	120
F_{computed}	1.63	1.74	1.67	1.87
p-value (two-tailed)	0.1233	0.1070	0.1126	0.0645
Goodness-of-fit (R^2)	0.1053	0.0980	0.1077	0.1325

Note: a - count; b - dummy variable; c - Philippine Peso (₱); d- Scale 1 to 10; Standard errors are enclosed by parentheses; ns- not significant; * - significant at 10% level; ** - significant at 5% level; *** - significant at 1% level.

5.0. Conclusion

The study concluded that engineering students are anxious about learning statistics online due to the challenges and limitations during the pandemic. In fact, learning statistics at a distance is a difficult mode of learning for both instructors/professors and students since it requires direct interaction to address the technicality of the subject. Conclusively, the econometric models revealed that the predictors of the anxiety level of students include age, gender, level of difficulty of statistics subject, and level of creativity of statistics subject. Results revealed that older students are more anxious about learning statistics online due to their experiences during the pandemic. It also revealed that female students are more anxious than male students. Plus, the difficulties that students experience are a significant factor in their level of anxiety in learning statistics. Moreover, if the subject is less creative, students tend to be more anxious and uncomfortable with the statistics activities online. Hence, instructors/professors must take action that builds the students' motivation and self-efficacy by providing them with a counseling procedure and giving them interesting and realistic statistics activities that suit online learning. The school leaders must

provide some training programs to statistics educators to improve their teaching strategies suitable for teaching the subject at a distance. For future work, it is recommended to include variables such as happiness level or well-being and academic performance of students to assess the efficacy of the results of this current study.

6.0. Declaration of Conflicting Interest

There is no potential conflict of interest was reported by the authors.

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Additional Author's Information:

EMILY L. CASINILLO
Department of Mathematics, Visayas State University
Baybay City, Leyte, Philippines
emily.casinillo@vsu.edu.ph
elagumbay12201990@gmail.com

EUSEBIO R. LINA JR.
Department of Mathematics, Visayas State University
Baybay City, Leyte, Philippines
eusebio.lina@vsu.edu.ph
https://orcid.org/0000-0001-6392-4831

LEOMARICH F. CASINILLO
Department of Mathematics, Visayas State University
Baybay City, Leyte, Philippines
leomarichcasinillo02011990@gmail.com
https://orcid.org/0000-0003-3966-8836

PAULO G. BATIDOR
Department of Statistics, Visayas State University
Baybay City, Leyte, Philippines
paulo.batidor@vsu.edu.ph
https://orcid.org/0000-0001-9783-5917

MERALYN R. LEBANTE
Department of Statistics, Visayas State University
Baybay City, Leyte, Philippines
mr.lebante@vsu.edu.ph
https://orcid.org/0000-0003-2533-144X