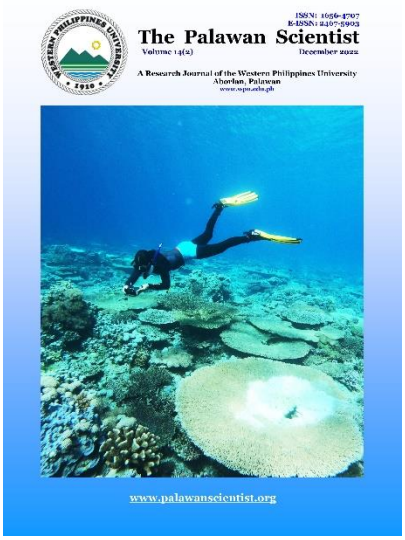

On modelling student's resilience in learning statistics at a distance

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ABSTRACT

Learning statistics online during the COVID-19 pandemic became a challenging experience for most students in higher institutions. This study aimed to measure the students' level of resilience and determine its influencing factors in distance learning during the pandemic. Data from an availability sampling of 129 engineering students were gathered with the aid of a Google form survey. The study used some descriptive measures and employed a regression modeling approach to extract detailed information from the survey data. Results showed that, on average, students were considered "resilient" in learning statistics during the pandemic. Statistical models revealed that sex, number of family members, household assets, and level of how conducive learning at home are significant predictors of students' resilience. Additionally, the model showed that male students are more resilient compared to female students. Lastly, more family members and household assets can increase students' resilience level as well as a comfortable place (at home) for learning. Hence, the study suggests that teachers must strengthen the interest of students especially female students by showing them a good attitude that promotes well-being. Furthermore, teachers must regularly monitor their learning progress, and provide comfortable and reasonable learning activities suitable for distance learning.

Keywords: engineering students, level of resiliency, predictors, statistical modeling, state university

INTRODUCTION

Distance learning is a challenging and draining procedure for both teachers and students to continue the teaching-learning process during the COVID-19 pandemic. Learning at a distance (online learning) amidst the pandemic has existing problems that include a lack of technology and internet connectivity (Carius 2020; Casinillo et al. 2022), limitations in presenting the lessons (Schneider and Council 2021), costs for gadgets and acquiring internet load (Srivastava and Agarwal 2020), and misuse of online technology (Bakker and Wagner 2020), among others. On the face of it, technical courses in higher institutions may not be properly taught especially in the field of statistics which requires more attention and work monitoring from instructors/professors. Statistics is one of the toughest courses for degree programs with a high-paying career in the future like engineering and other sciences. In the study of Legaki et al. (2020), it is explained that in times of the pandemic as a hindrance to understanding science,

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there is a need to improve the teaching strategies in statistics education to be more engaging and suited for remote learning. This accelerates the students' background, attitude, and interest in statistical analysis and mathematical skills (Ramirez et al. 2012; Miñoza and Casinillo 2022). In this regard, resilience is one of the important variables during unprecedented times in education. According to Karairmak (2010), resilience is essential because it regains positive reasoning that builds up intellectual well-being from adversity.

As engineering students, some statistical concepts must be familiarized and illustrated in practical application, specifically, in engineering projects (Zhan et al. 2010). It is worth noting that most of the students in higher education detected that statistics is a daunting course in the curriculum. Comprehending statistical methods and theories is quite challenging (Haines 2015) especially during the COVID-19 outbreak, teaching and learning statistics have become a very difficult process due to the negative attitudes and anxiety brought about by the pandemic. In the study of Repedro Jr. and Diego (2021), it is mentioned that attitudes toward learning statistics are correlated to students' statistical literacy. To have a positive attitude toward learning statistics, students must increase their resilience to cope with difficulties experienced during distance learning. According to Johnston-Wilder and Lee (2010), resilience in education means that students continue learning despite encountering setbacks and difficulties in their learning process. According to Keener et al. (2021), there are related factors that govern the fluctuating behavior of resilience during the COVID-19 pandemic. Additionally, Laird et al. (2019) found some psycho-biological factors that significantly influence the level of resilience in different stages of life and situation. In that case, this study assumed that the resilience level of students in learning statistics is affected by causal determinants during the pandemic. Hence, elucidating the students' resilience in learning statistics online is crucial in formulating policy inputs to improve statistics education and enhance teaching strategies suitable to distance learning.

Evaluation of engineering students' resilience in learning statistics during the COVID-19 pandemic is scarce in the body of statistics education literature. Statistical modeling of the level of resilience and its influencing predictors has never been realized in a State University in Leyte, Philippines where most students live in rural areas. Hence, the study was realized. In this current study, it accomplished its goals by elucidating the following specific objectives: (1) to summarize the profile of engineering students; (2) to measure the level of resilience of engineering students in learning statistics online; and (3) to model the level of resilience of engineering students and its predictors. The findings of the current study might help instructors/professors understand the resilience level in learning statistics under distance learning. Perhaps, the results might improve the teaching strategies in statistics, and serve as a benchmark for future researchers in the field of statistics education. Furthermore, this study might contribute momentous information to the literature on educational studies.

METHODS

The Research Design

A complex correlational research design was employed in this study to determine the evident predictors of students' resilience levels in learning statistics online amid the COVID-19 pandemic. To shed light on the research objectives, the study concentrated on primary and cross-sectional data from engineering students that dealt with the resiliency instruments of Kooken et al. (2013) and influencing factors based on the study by Casinillo et al. (2022). Moreover, to excerpt detailed ideas and policies, the study used some descriptive statistics and regression models.

The Respondents, Sampling Procedure, and Ethics

The population of interest in this study was the bonafide engineering students of Visayas State University who were currently enrolled in the course "Engineering Data Analysis" in the 1st semester of the academic year (A.Y.) 2021-2022. These students were chosen to be the respondents because they were considered the students with a rigorous approach to statistics in the University with a large population. Google form survey was employed in gathering the desired data for this study. Hence, the sampling procedure used in this study is a non-probabilistic approach where it applies a non-random technique, that is, availability sampling. Hence, by the complete enumeration method, all engineering students were sent the link of the survey, and those students who willingly participate automatically be part of the respondents. Students were given one week to respond to the Google form survey questionnaire which could be accomplished within 10-15 min. To motivate students in responding to the survey, they were given additional points for their course "Engineering Data Analysis" to get the desired data within the time constraint. Fortunately, a summation of 129 students which consists of 98% of the total population responded to the survey and the remaining 2% declined the participation of the said survey. According to Jenkins and Quintana-Ascencio (2020), the needed respondents in constructing multiple regression models is above 100 samples which can suffice its minimum requirement. In this case, 129 students are enough and considered large in dealing with a statistical model. Furthermore, this study considered ethics in dealing with the survey. First, a

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letter of consent was sent to the Department Head of Statistics. After its approval, the two teachers handling the course "Engineering Data Analysis" were informed about the survey. Students were also oriented about their participation and the information to be collected that follows the Data Privacy Act (Republic Act 10173).

The Survey Instrument and Data Collection

A developed structured questionnaire was used in the study as a Google survey. It comprised three (3) parts that include a profile of students, learning experiences, and the Mathematics Resilience Scale (MRS). As for the profile of students, this covered data such as age (in years), sex (1=male, 0=female), residence (1=Urban, 0=Rural), Use of laptop(s) (1=Yes, 0=No), internet signal strength (Scale of 1 to 10), hours studying statistics per week, money spent on internet load per week (PHP), number of family members, household assets (PHP), monthly family income (PHP), monthly family expense (PHP), leisure time (Scale of 1 to 10), physical health (Scale of 1 to 10), and mental health (Scale of 1 to 10). In addition, students were asked about their learning experiences including how conducive learning at home (Scale of 1 to 10), statistical anxiety (Scale of 1 to 10), difficulty level in learning statistics (Scale of 1 to 10), logical level of statistics (Scale of 1 to 10), level of creativity in learning statistics (Scale of 1 to 10), how rewarding is learning statistics (Scale of 1 to 10). Furthermore, to capture the resilience level of engineering students in learning statistics online, this study adapted the questionnaire of Kooken et al. (2013), that is, the MRS. The questionnaire dealt with 23 worded questions on the negative and positive sides of students' resilience in learning. However, this study only considered the positive questions to capture the students' positivity and resilience behavior during the pandemic, hence, it dealt with 17 questions only. MRS follows a 5-point Likert scale such as 1-Strongly disagree, 2-Disagree, 3-Undecided, 4-Agree, and 5-Strongly agree. According to Kooken et al. (2013), the MRS instrument has undergone content validation with experts in which it is found that it is correlated to an individual's emotions and well-being as a student. Moreover, the negative questions captured the pessimistic overview of students, stress, and anxiety level in learning. To ensure the reliability of the adapted MRS questionnaire, it has undergone a reliability test. In this case, the result showed that it has a Cronbach's alpha coefficient of 0.86, which can be interpreted as reliable (Cronbach 1951). Table 1 represents the range of possible scores and their verbal description.

Table 1. Resilience perception scores and their corresponding description.

Perception Scores	Response	Description
1.00 – 1.80	Strongly disagree	Not resilient
1.81 – 2.60	Disagree	Slightly resilient
2.61 – 3.40	Undecided	Moderately resilient
3.41 – 4.20	Agree	Resilient
4.21 – 5.00	Strongly agree	Very resilient

The Data Management and Statistical Model

In summarizing the data collected, some descriptive analyses that include mean or average (M), a measure of dispersion called standard deviation (SD) and coefficient of variation (CV), minimum (min) observation, and maximum (max) observation were engaged. As for the modeling procedure, multiple regression analysis in the form of ordinary least squares (OLS) was used to shed light on the significant regressors of the students' level of resilience in learning statistics at a distance. Hence, the regression model takes the following form:

$$R_j = c_0 + c_1 V_{j1} + c_2 V_{j2} + \cdots + c_p V_{jp} + \varepsilon_j \qquad (1)$$

where R_j refers to the students' total resilience score, $j = 1, \ldots, n$ and n refer to the number of students, c_t ($\forall \mathrm{t} \in \{0, 1, \ldots, \mathrm{p}\}$) are the parametric quantity of the model (1) that is to be approximated and can be interpreted as incremental change in R_j for every 1 unit change in V_{jt} while holding other regressors constant, V_{jt} ($\forall \mathrm{t} \in \{1, \ldots, \mathrm{p}\}$) are the causal regressor variables in the model (1), and ε_j refer to the random error in the model (1). The parametric quantity c_t ($\forall \mathrm{t} \in \{0, 1, \ldots, \mathrm{p}\}$) are tested at 1%, 5%, and 10% level of significance since the respondents are human in which their response is somehow affected by their emotions or mood (Klasen 2002). Three regression models were constructed considering the number of independent variables is subject to the sample size (Jenkins and Quintana-Ascencio 2020). Also, the independent variables that were included in the model were based on the optimality of the coefficient of determination or the goodness of fit. To be accurate in the data analysis, STATA version 14.0 was used for the calculation. Moreover, for the post-estimation technique (diagnostic test), the heteroscedastic test, test for omitted variables, test for multicollinearity, and non-normality test for residuals were employed to validate the results of the statistical model and tested at a 5% level of significance.

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RESULTS

Students' Profile

The mean age of engineering students was close to 20.12 (± 1.47) with the youngest at 18 years old and 30 years old as the oldest (Table 2). Thirty-nine percent of them are male and 61% are female. Most of them are living in rural areas (74%) and while 26% of them live in urban places. Eighty-two percent of these students were using laptop/s in their online classes and 18% were just using cellular phones. On average, students were studying their statistics lessons for 6.90 (± 9.68) h and spent PHP234.49 (± 205.09) on internet load per week. Approximately, the household size of each student was close to 6 (± 1.90) members and their household assets were close to PHP190,722.1 (± 364,422.4). Regarding their family income, it was more or less PHP24,871.51 (± 32,455.24) and their household expense was approximately PHP14011.05 (± 11983.83).

Meanwhile, students' perception of their leisure time during the COVID-19 pandemic was 6.60 (± 2.53) and their rating for their physical health was close to 6.09 (± 2.24). However, these students have rated their mental health low at about 4.81 (± 2.34) out of 10. They also rated their internet signal relatively low for more or less 5.49 (± 1.95) as well as their learning environment at their respective home (5.63 ± 2.29). On a scale of 1 to 10, students' statistical anxiety was about 7.16 (± 1.88) and they have difficulty learning the statistical concepts online (7.85 ± 2.26). Students found that learning statistics is somewhat logical (7.27 ± 2.22) and moderately creative (6.07 ± 1.86). Furthermore, they found that their learning in statistics is rewarding (6.93 ± 2.08) and fulfilling in nature.

Students' Resilience Level

Table 3 shows students' level of resiliency. Data disclosed that no engineering students were not resilient and slightly resilient during their statistics classes amid the pandemic. Of these students, 60.47% were resilient in learning statistics online and 35.66% were a very resilient attitude during the online class. This student can easily adopt the new type of learning and could manage the difficulties behind it. However, only 3.88% of the students were moderately resilient. On average, engineering students during the pandemic were resilient (4.13 ± 0.43) in remote learning during the COVID-19 pandemic. This result is considered consistent based on the coefficient of variation (CV = 10.41%), which implies that students are persistent in their resilient behavior in the cognitive process despite the challenges brought by distance learning and limited interaction with their instructors/professors. Hence, this suggests that students have developed a coping mechanism to level up their resilience and adapt to the new normal activities in online learning consistently.

Table 2. Descriptive statistics for profile and learning experiences of engineering students. a-dummy (indicator) variable; b-count; c-Philippine Peso (PHP); d-Scale 1 to 10.

Variables	M± SD	min	max
Students' profile			
Age in years	20.12 ± 1.47	18	30
Male[a]	0.39 ± 0.49	0	1
Urban[a]	0.26 ± 0.44	0	1
Use of laptops(s)[a]	0.82 ± 0.38	0	1
Hours (h) studying math lesson (per week)[b]	6.90 ± 9.68	1	70
Money spent on internet connection (per week)[c]	234.49 ± 205.09	20	1400
Family members[b]	5.64 ± 1.90	2	13
Household Assets[c]	190722.1 ± 364422.4	10000	2000000
Monthly Family Income[c]	24871.51 ± 32455.24	5000	250000
Monthly Household Expenses[c]	14011.05 ± 11983.83	3000	70000
Leisure Time[d]	6.60 ± 2.53	1	10
Physical Health[d]	6.09 ± 2.24	1	10
Mental Health[d]	4.81 ± 2.34	1	10
Internet Signal Strength[d]	5.49 ± 1.95	1	10
Students' learning experiences			
How conducive learning at home[d]	5.63 ± 2.29	1	10
Statistical anxiety level[d]	7.16 ± 1.88	1	10
Difficulty level in learning Statistics[d]	7.85 ± 2.26	1	10
Logical level of Statistics[d]	7.27 ± 2.22	1	10
Level of Creativity in Statistics[d]	6.07 ± 1.86	2	10
How rewarding is learning Statistics[d]	6.93 ± 2.08	2	10

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Table 3. Students' level of resilience. a - See Table 1 for details; b - If the CV is less than 20%, then it is considered a consistent response (Reed et al. 2002).

Response to Resiliency	Frequency	Percentage (%)	Description
Strongly disagree	0	0.00	Not resilient
Disagree	0	0.00	Slightly Resilient
Undecided	5	3.88	Moderately resilient
Agree	78	60.47	Resilient
Strongly agree	46	35.66	Very resilient
M (± SD)	**4.13 (± 0.43)**		**Resilient[a]**
CV (%)	**10.41**		**Consistent[b]**

Statistical Models for Students' Resilience

Three regression models were constructed and estimated based on the sample size, number of independent variables, and optimality of the coefficient of determination (Table 4). All three regression models (*P*'s are greater than the 5% level) in Table 4 were found to be homoscedastic concerning the variances of residuals with the aid of the Breusch-Pagan test. Models 1 and 2 did not contain omitted variable bias ($P > 0.05$) while model 3 possessed omitted variable bias ($P = 0.012$) at a 5% level using the Ramsey RESET test. Additionally, the three models do not have problems in multicollinearity. Thus, there was no significant correlation between the predictor variables. This implies that the variance inflation factor (VIF) is lesser than 10.

Table 4. Statistical models for students' level of resilience in learning statistics online and its predictors. a-dummy (indicator) variable; b-count; c-Philippine Peso (PHP); d-Scale 1 to 10; Standard error is enclosed with parenthesis; $*P < 0.10$; $**P < 0.05$; $***P < 0.01$, ns-not significant.

Predictors	Statistical models		
	OLS Model I	**OLS Model II**	**OLS Model III**
Age in years	-0.4958[ns] (0.4478)		
Male[a]	3.3870** (1.3883)	2.8205* (1.4448)	2.5461* (1.3000)
Urban[a]	0.8454[ns] (1.5168)		
Use of laptops(s)[a]		0.2141[ns] (1.7812)	
Hours (h) studying math lesson (per week)[b]		0.0667[ns] (0.0692)	
log (Money spent on internet connection (per week)[c]+1)	0.3506[ns] (2.0628)		
Family members[b]	0.7011** (0.3441)	0.6333* (0.3606)	0.5566* (0.3353)
log (Household Assets[c]+1)	1.9701*** (0.7134)		0.9278[ns] (0.6417)
log (Monthly Family Income[c]+1)	-3.1495[ns] (2.7459)		
log (Monthly Household Expenses[c]+1)	0.2894[ns] (3.0790)		
Leisure Time[d]		-0.0046[ns] (0.2780)	
Physical Health[d]		0.3282[ns] (0.3910)	
Mental Health[d]		0.0976[ns] (0.4019)	
Internet Signal Strength[d]		-0.5077[ns] (0.3653)	
How conducive learning at home[d]		0.5667* (0.3102)	
Statistical anxiety level[d]		0.3473[ns] (0.3659)	

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Predictors	Statistical models		
	OLS Model I	**OLS Model II**	**OLS Model III**
Difficulty level in learning Statistics[d]			-0.5761[ns] (0.4484)
Logical level of Statistics[d]			0.6212[ns] (0.4876)
Level of Creativity in Statistics[d]			0.1066[ns] (0.4541)
How rewarding is learning Statistics[d]			0.6015[ns] (0.5097)
Constant	76.9091*** (11.6581)	59.5671*** (4.7445)	55.8534*** (4.0792)
Number of students	129	129	129
F-computed	1.89*	1.34[ns]	2.47**
P-value (P)	0.0683	0.2148	0.0164
R-squared	0.1117	0.1023	0.1413

Moreover, the normality test for residuals using the Shapiro-Wilk test revealed that Model 1 (P = 0.047) was not normal. However, the density estimate graph showed that it was almost normal. In addition, Models 2 (P = 0.083) and 3 (P = 0.133) possess normal residuals revealed by the Shapiro-Wilk test. The first model (Model 1: $F_c = 1.89$; P = 0.068) is significant at a 10% level and had a goodness-of-fit (R^2) of 0.112. This implies that this model has few significant predictors of students' resilience that include gender (P=0.016), number of family members (P = 0.044), and household assets (P = 0.007).

As for the second model (Model 2: $F_c = 1.34$; P = 0.215), it was only significant at a 21.5% level and possessed a goodness-of-fit (R^2) of 0.102. However, it had revealed significant predictors of students' resilience such as gender (P = 0.053), the number of family members (P = 0.082), and how conducive learning at home (P = 0.070). Furthermore, the third model (Model 3: F_c = 2.47; P = 0.016) is significant at a 5% level with a goodness-of-fit (R^2) of 0.141. Specifically, predictors that include gender (P = 0.053) and the number of family members (P = 0.100) were significant in the model.

DISCUSSION

Students' Profile

The same finding was revealed from the study of Casinillo et al. (2022) that the average age of first-year students is more or less 20 years old. Additionally, results revealed that the dominant sex of engineering students is female. This finding is consistent with the findings of Balakrishnan and Low (2016) that the insufficiency of engineers will be resolved if female students intend to enroll in engineering as their career. Most of the engineering students live in rural areas where internet connectivity is relatively low as opposed to urban places. In that case, even if the dominant of students are using a laptop as their learning instrument, they still have an unconducive place to learn in their home. Carius (2020) justified that internet connection is one of the barriers in remote learning where the teaching-learning process is adversely affected. Although students can afford to load for the internet considering their parents/guardians can supply money, still, these students are having challenges due to fluctuating internet signals. Because of health protocols, students are limited to doing some physical activities outside their homes. On the face of it, they do not have the opportunity to relieve stress through leisure activities that's why they have poor mental health during the pandemic. Accordingly, Gao et al. (2021) portrayed that students during the pandemic are experiencing mental health trouble that includes depression, anxiety, and stress disorder. Moreover, although students found learning statistics online to be logical, creative, and rewarding, they still struggle with some barriers and limitations that produce anxiety. Dratva et al. (2020) found that during the pandemic, students are having a high level of anxiety due to abrupt changes and challenges that they confronted.

Students' Resilience Level

Results presented that there are only a few engineering students who are not resilient during their statistics classes online. Resilience is vital to adapt to abrupt changes and adverse impacts due to the COVID-19 pandemic. Through resilience, students can continue and cope with the difficulties and even learn despite the limited interaction with their instructors/professors. Moreover, the results have revealed that most of the students are resilient and some are very resilient. This implies that, in the actual situation, students have developed and implemented strategies that build and increase their resilience and well-being while learning at a distance. According to Schlesselman et al. (2020), to earn a good education amid the pandemic, students must improve and restore

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their resilience level. Another reason is that students have a life purpose and that is to earn a degree, that's why students are actively doing their duties as a student and intent to persevere (increasing their level of resilience) despite the unfavorable issue of online learning to them (Ardhiani et al. 2021; Sharma and Yukhymenko-Lescroart 2022). Likewise, the study of Hamadeh Kerbage et al. (2021) found that students are developing some coping strategies that include staying connected via the internet, establishing a daily routine, and always processing self-help methods that promote well-being (good mental health) and enhancing their resilience level amid the difficult times of the pandemic.

Statistical Models for Students' Resilience

The three statistical models revealed that a male engineering student is more resilient in learning statistics at a distance. This implies that male students are more capable of handling difficulties and obstacles brought on by the pandemic. In addition, male students are more likely to have a strong ability to cope emotionally and even mentally amid challenges as opposed to female students. This result is aligned with the study by McGee and Pearman (2015) that depicted that male students are achievers in the different areas of mathematics. Likewise, the study by Pilotti et al. (2022), discovered that male students performed better in mathematics courses compared to female students during online classes amid the pandemic. On the face of it, male students can be more productive in the cognitive process despite barriers and limitations in remote learning. It is worth noting that resilience that it promotes positivity in the mental and behavioral processes that boost the learning ability of a student. Apparently, Cheung (2017) explained that the mathematical and statistical literacy of students is positively influenced by resilience.

Additionally, the three models have shown that family members influence the students' level of resilience in learning statistics online. This result suggests that students are inspired to do their duty as educatee if they have more family members in the household that encourage them despite the disruptive environment due to the COVID-19 pandemic. The more family members they have, the more they can develop resilient behavior and cope with stress in learning online because they are not bored and they have more time for family bonding. Adams (2021) found out that family bonding and therapy can nurture the resilience of family members as they face challenges amid the pandemic. In that case, a student who belongs to a resilient family can continue the learning process as creatively compared to non-resilient families. Orlowski et al. (2022) pictured that families who are working together with constant care and parents that meaningfully communicate with their children can creatively develop good resilience and well-being in a time of the COVID-19 pandemic. Note that, good communication with family members can encourage students to perform better in class even if they are facing obstacles and limitations in online learning.

Next, the result showed that household assets are a significant predictor of students' resilience in learning statistics online. It is worth noting that household assets provide benefits and even comfort that helps them increase their well-being. According to Valenzona et al. (2022), students with more resources and belongings tend to be more creative in the learning process despite the limitation of distance education. This indicates that students with more assets or possessions can work advantageously with difficulties due to the benefits of available resources they have. Qazi et al. (2020) expressed that students with more assets like gadgets, internet access, and the like can easily cope with the difficulties of online learning and progress their resilient behavior in-class activities. It is worth noting that statistics activities require advanced gadgets like laptops and good internet access. Hence, this implies that students with higher household assets value are more resilient and productive in learning statistics online.

Moreover, Model II revealed that a conducive place for learning is a significant determinant of students' level of resilience in learning statistics under distance education. The result implies that a student with a comfortable learning environment is more likely adaptive to the unprecedented situation amid the pandemic. In other words, learning in a conducive environment results in a more collaborative and active student (Pratama and Scarlatos 2020). In the study of Oducado and Soriano (2021), it is found that students with a conducive environment and stable internet connections tend to have a better learning attitude and well-being as they face the disrupted education brought by the pandemic. In addition to that, Dai and Xia (2020), a conducive learning environment can be more effective in progressing the students' academic performance since they can develop positive learning cognitive behavior and be resilient to difficulties.

On the face of it, statistics teachers must rectify the negative behavior of engineering students in online education by constantly monitoring and measuring their learning progress and always entertaining their concerns (Baharun et al. 2017). Teachers must provide realistic and lively statistics activities to boost their interest and to be collaborative in learning despite the adverse situation brought by the pandemic. This study recommended that it is vital for the policymakers in education to address the issues and concerns of teachers and students for their online classes especially for statistics so that effectiveness in learning will not be compromised amidst the health crisis. Additionally, it is suggested that for future

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research, one may construct a statistical model that captures the determinants of statistical anxiety of students to supplement the information of the current study. A possible limitation of this study is the small sample size used, hence, it is recommended that a large population of students must be considered for future research to gather richer and statistically sound information. Another limitation is that the study does not gather information from the teachers' side, thus, it is suggested that to have a strong argument concerning resilience amid the pandemic, both teachers and students must be part of the respondents for further studies.

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