Perceived Effect of Home Environmental Factors to the Academic Stress of College Students: A Case Study during COVID Pandemic

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Abstract

The COVID-19 pandemic had caused the closure of all schools, turning traditional learning into digital learning. College students are now pushed into a new style of learning in the comfort of their home, limiting the social interactions which are evident in the four corners of a classroom. The current set-up of learning during the COVID-19 pandemic is very different since college students are now studying all the time in their homes facing the computer or laptop. The online-based learning setting is not an ideal one and is considered only as a temporary alternative to face-to-face learning but based on the current trends of the COVID cases here in the Philippines, it may not be the case. Switching settings between traditional classroom learning to fully online learning have their respective effects on a person's ability to learn and adapt which may cause unwanted stress to the learner. This study would like to explore how environmental factors at home can affect the stress levels of a college student. To further understand the factors to be considered, the demographics of the students, as well as the physical and psychological aspects of their home, must be taken into consideration. In this study, the researchers investigated the effects of the factors using a home environmental questionnaire wherein the factors include parental involvement, social-economic conditions, and academic achievement. Then these factors were related to the academic stress of students in terms of fear of contagion, fear of isolation, and relationship to academic life. A total of 104 college students participated in the study. The validity of instruments was ensured through measures of Cronbach's alpha having a minimum value of 0.7. The findings of the study showed that during the pandemic, the economic status of the family, and the relationship between parent and student influences the student's stress and academic performance. The importance of support given by the parent to the student in terms of providing adequate academic materials and supervision enables the student to study well and at the same time making the student feel supported, therefore improves the academic performance.

Keywords
Academic stress, online learning, COVID-19 pandemic, home environment

1. Introduction
The impact of the COVID-19 pandemic is widely felt by the educational sector, in which new learning modes are proposed due to the risks that are observed in traditional or face-to-face learning. The new way of learning is now switched to online mode, where students are utilizing gadgets for them to carry on with their studies. Due to the

COVID-19 pandemic, many educational institutions have accepted the use of modern technology, from going offline to an online mode of delivering education (Dhawan, 2020). Each student has their capabilities, strengths, and weaknesses. Given the new normal, all skills and attributes that each student has built up in face-to-face learning would be challenged. The academic performance of students has affected by the COVID-19 pandemic in different ways; the students who are motivated are less likely to be affected by the pandemic, the students who are already weak in learning through face-to-face faces difficulty even if it is online, and some students who economically have a disadvantaged background are unable to cope up because they cannot afford online learning (Pokhrel & Chhetri, 2021).

According to Dhawan (2020) in our present situation, online learning is not considered an option, thus it is already a necessity. Due to the closure of universities and educational institutions, the COVID-19 pandemic has pushed the transition of learning from traditional to online where students can do synchronous and asynchronous school activities. Based on the study of Parkes, Stein, & Reading (2015) in an online learning environment, the students must be able to balance their family and social life with their studies in which the students have a hard time doing. Not all students have the ability to perform well in an online learning environment, because some do not even have a comfortable study area especially when a pandemic is occurring at the same time.

The online learning environment is simply learning at home, but the major difference is there is less student-student and student-professor interaction in terms of socialization. The quality of the online learning environment can directly affect the quality of the student's academic performance. Home environmental factors must be taken into account because all students are studying at home which is a completely different environment from what the students have been used to. The household environment has certain stimuli that would make some students react differently compared to when they are in an academic setting. Factors such as the physical layout of the study area, the social environment of the household, and other factors can affect some students differently. Okpara (2014) argued that parents' failure to provide proper educational materials and unconcerned attitudes toward their children's education, as well as the socio-economic status of the student's household, all have an impact on the students' academic performance.

This study will focus on the college-level students who are currently undergoing an online classes setup due to the continuous spread of COVID-19. Since college students are more aware of their state of being, it is best to have them as the main respondents. Maintaining the quality of education through online learning is a goal of all educational institutions; meeting the standards of traditional learning is a challenge especially during the COVID-19 pandemic, where concerns about plagiarism, cheating, etc. arise. It is also very crucial that the online setup would not be different in terms of the global competency of graduates. Assessing the factors that affect the student's capacity during the online setup would be vital in knowing if the system is doing more damage than good.

This research will contribute to the current literature that aims to study the effect of online class set up on the physical and mental health of college students during the COVID-19 pandemic. In addition, the factors that brought stress to the students and greatly influenced the college student's academic performance will be identified and will be a guide to improving the current online system of learning.

1.1 Objectives
Based on this background, the study investigated the influence of parental involvement, social-economic status, and academic achievement as home environmental factors on students' academic stress during COVID-19 to recommend what should be done to help teachers, parents, and education departments further understand the impact of online class setup to the academic stress and academic performance of students.

2. Literature Review
Parental involvement in the academic performance of the student is a big factor (Baraka Manjale Ngussa & Gundula, 2019). The parental involvement or support given to the student lets the student feel that the parents are concerned about his studies, which will drive the student to study well. Parents who discuss school-related topics with their children communicate the importance of studying, therefore improving their child's attitude and performance towards education (Sheldon & Epstein, 2005).

The parental expectation of their child is a factor that influences academic performance. Based on Zakaria (2013), some factors positively influence academic achievement, the following factors are: interaction and communication with the child, nurturing practices, relaxation activities, transparency, and acceptance from the parents. The parents must be more open to their children and must show support to their children in terms of academic performance. School-related tasks are a big part of determining the academic performance of a student. Katz et al. (2011) found out that parents must have competence, beliefs, and a positive attitude towards school-related tasks like homework, provision of children's psychological needs, and needs have a positive effect on the academic performance of their child.

The socio-economic status of parents plays also a significant impact on student's academic achievement at all levels of education. Sirin (2005) defines the socio-economic position as the numerous aspects of economic and social well-being that distinguish people from different social classes. The socio-economic classes have been divided into three categories: high socio-economic class, middle socio-economic class, and lower socio-economic class. In this regard, researches have shown that children of parents with a high socioeconomic standing appear to do better than pupils whose parents have a lower socioeconomic status. Parental educational qualifications, neighborhood poverty, parental occupational status, and family income are among the essential characteristics related to student accomplishment, according to Rothman (2003).

3. Methods

There are three sections of a questionnaire answered by the respondents, the first section is about the demographic profile of the respondents that include the following information: gender, age, year level, number of a household member, and average household monthly income. The second section of the survey is the Home Environmental Factors Questionnaire (HEFQ) where the respondents rated from 1-4 Likert scale on how the identified home environmental factors affected them. The instrument was 12 items structured questionnaire which consists of questions on parental involvement, social-economic conditions, and academic achievement. The last section of the survey is the COVID-19 Student Stress Questionnaire developed by Zurlo et al. (2020). The COVID-19 Student Stress Questionnaire (CSSQ) was created primarily to gauge students' stress levels during the COVID-19 pandemic lockdown. It consists of 7 items on a 5-point Likert scale ranging from zero ("Not at all stressful") to four ("Extremely stressful"). Perceived stress was operationalized based on transactional models of stress for instrument design (Lazarus and Folkman, 1984). Each item was created to cover a variety of domains that could have been affected by the COVID-19 pandemic lockdown and, as a result, could be seen as sources of stress. (i.e., fear of contagion, fear of isolation, and poor relationship and academic life). The scale also provides a Global Stress score ranging from 0 to 28.

The collected responses were analyzed with the help of Minitab software and the reliability of the survey instrument was measured using Cronbach's alpha test having a coefficient value of .70. Statistical analysis such as ANOVA with Tukey's Post Hoc Test was also employed to determine the significant difference in the average level of stress of respondents in terms of demographic profile such as age, gender, year level, no. of household, and average monthly income of the household. After which, results of survey responses were further treated using correlation analysis to determine the relationship between home environmental factors to the perceived stress of students in terms of the following: (1) fear of contagion, (2) fear of isolation, and (3) relationship and academic life.

Due to the COVID-19 Pandemic, the researchers conducted an online survey through Google forms to determine the effect of environmental factors on the academic stress of college students during the pandemic. A total of 104 college students participated in the study. All of the respondents are college students who are studying in Laguna, Philippines.

4. Results and Discussion

4.1. Profile of Respondents

Due to the COVID-19 Pandemic, the researchers conducted an online survey through Google forms to determine the effect of environmental factors on the academic stress of college students during the pandemic. From the 104 responses gathered from the online survey, the majority of our respondents are male college students (64.40%). Most of the respondents of the survey are at the age of 21 years old and are currently 3rd-year students (66%). From the survey, the majority of the respondents have been found to have an average of four (4) household members, and 43.30% of survey respondents have an average monthly incoming range of Php. 70,000 to Php. 130,000. The summary of respondents' profiles is shown in Table 1.

Table 1. Demographic Summary of Respondents' Profile

Respondent's Profile	Category	N	%
Gender	Male	67	64.4%
	Female	37	35.6%
Age	19	16	15.4%
	20	27	26.0%
	21	56	53.9%
	22	5	4.8%
Year Level	Year 1	16	15.4%
	Year 2	19	18.3%
	Year 3	69	66.3%
No. of household members	3	11	10.6%
	4	42	40.4%
	5	28	26.9%
	6	17	16.3%
	7 and above	6	5.8%
Household monthly income	Php10,000 and below	1	1.0%
	Php10,001 - Php20,000	6	5.8%
	Php20,001 – Php40,000	6	5.8%
	Php40,001 – Php70,000	39	37.5%
	Php70,001-Php130,000	45	43.3%
	Php130,001 – Php200,000	5	4.8%
	Php200,000 and above	2	1.9%

4.2. Result of Home Environmental Factor Questionnaire

The data collected from the respondents were analyzed using a frequency table, percentage, and mean. Based on the 4-point Likert scale namely: strongly Agreed (SA) = 4, Agree (A) = 3, Disagree (D) =2, Strongly Disagree (SD) =1, a mean of 2.50 was taken as the minimum acceptable mean score which an item will score before it is accepted. Any mean below 2.50 will be rejected while a mean from 2.50 and above will be accepted.

Table 2. Summary Result of Home Environmental Factors

Factors	Mean	Std. Dev.	Remarks
I am enrolled late in a good school	2.51	0.88	Accept
I have minimum provision of adequate education materials/supervision for my academic work	2.73	0.61	Accept
I have poor relationship with my parent or guardian	1.59	0.74	Reject
My parents/guardian have serious attitude towards my education	2.45	0.77	Reject
The socio-economic status of my family has influence on my academic performance	2.69	0.73	Accept
The income level of my family influences myself-esteem and confidence in school	3.67	0.71	Accept
My family structure can affect my academic performance	2.41	0.70	Reject
A broken home can affect my academic performance	2.33	0.75	Reject
The household size can affect my academic performance	2.30	0.91	Reject
A broken home can affect my academic performance	3.12	0.70	Accept
The household size can affect my academic performance	2.34	0.95	Reject
Disagreement between my parents can affect my academic performance	3.62	0.68	Accept

In Table 2, the respondents agreed that 6 out of 12 home environmental factors affect the academic performance of the students as revealed by their mean scores which were all up to and above the acceptable mean score of 2.50 with item no. 6 having the highest score of 3.67. This shows that the income level of family, disagreement between parents, being part of a broken family, minimum provision of adequate learning materials, economic status of a family, and the type of school the student attends greatly influences the academic performance of college students, with a corresponding score of 3.67, 3.62, 3.12, 2,73, 2.69 and 2.51 respectively.

Figure 1 below shows the frequency of scores per item; blue for 1 (strongly disagree), orange for 2 (disagree), grey for 3 (agree), and yellow for 4 (strongly agree). It is evident that the items "The income level of my family determines the type of school I attend to", and "Disagreement between my parents can affect my academic performance" has the highest score.
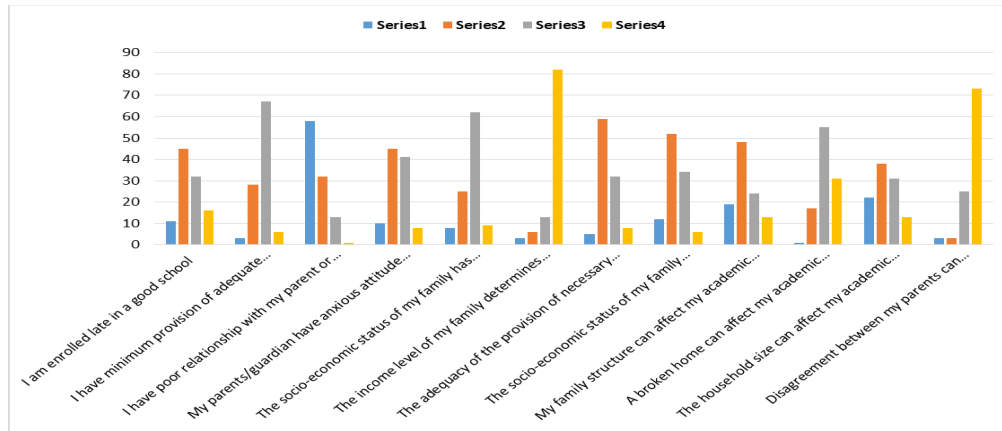

Figure 1. Graphs Showing Frequency of Scores on Home Environmental Factor Questionnaire

4.3. Result of COVID-19 Student Stress Questionnaire

The COVID-19 Student Stress Questionnaire (CSSQ) consists of three subscales that measure COVID-19 students' stressors related to (1) Relationships and Academic Life (i.e., relationships with relatives, colleagues, professors, and academic studying); (2) Fear Isolation (i.e., social isolation and couple's relationship, intimacy, and sexual life); (3) Fear of Contagion. A Global Stress score was also provided. The questionnaire revealed a satisfactory internal consistency (Cronbach's alpha = 0.70). The questionnaire provided a brief, valid and reliable measure to assess perceived stress to be used for understanding the impact of the COVID-19 pandemic lockdown among university students and for developing tailored interventions fostering their wellbeing (Zurlo, 2020).

Table 3 shows the items, means, standard deviations, and ranges of the CSSQ scales (Relationships and Academic Life, Isolation, Fear of Contagion) and the total score (Global Stress). Considering that high levels of COVID-19-related stress can be indicated by scores that are 1 SD above the and low levels of stress can be indicated by scores that are 1 SD below the distribution of the CSSQ scores, we can affirm that scores of 6 or below indicate low levels of perceived COVID-19-related Global stress, scores of 7–15 indicate average levels of perceived COVID-19-related Global stress, and scores of 16 or more indicate high levels of perceived COVID-19-related Global stress among university students.

Table 3. Summary Result of COVID-19 Student Stress Questionnaire

Factors	Items	Mean	Std. Dev.	Range
Fear of Contagion	1	3.76	0.68	0-4
Fear of Isolation	2,7	3.97	1.23	0-8
Relationship and Academic Life	3,4,5,6	9.49	2.38	6-16
Global Stress	All items	17.22	4.29	11-28

Based on the result, of the 104 college students surveyed, 75 college students (72.12%) experienced high levels of academic stress during the COVID-19 Pandemic., and 27.88% experienced an average level of stress. The distribution of the global stress score is shown in Figure 2.
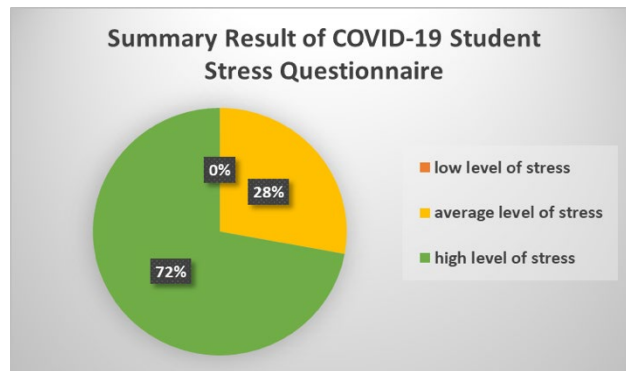

Figure 2. Graph Showing Frequency of Global Stress Scores

5. Numerical Results
5.1. Result of Analysis of Variance
After gathering the responses for the perceived level of academic stress of students during COVID-19 using CCSQ, the researchers have employed an analysis of variance to determine if there is a significant difference in the stress level of students based on demographic factors. As shown in Table 4, all factors (gender, age, year level, no. of household, and monthly income) have no significant difference in the CCSQ score of respondents having a p-value of greater than 0.05.

Table 4. Summary of ANOVA Result

Factors	Variables	Mean	Std. Dev.	p-value	Remarks
Gender	Male	17.75	4.179	0.095	not significant
	Female	20.05	4.31		
Age	19-20	17.95	3.776	0.159	not significant
	21-22	19.9	4.745		
Year Level	1	17.813	4.167	0.18	not significant
	2	17.105	2.183		
	3	19.4	4.828		
No. of Household	3	18.455	4.845	0.417	not significant
	4	18.15	3.66		
	5	17	3.479		
	6	16.706	1.572		
Monthly Income	10,000-40,000	19.917	6.097	0.116	not significant
	40,000-70,000	17.85	3.483		
	70,000-130,000	16.85	2.621		

Ho: There is no significant difference in the CCSQ score of students based on factors
Ha: There is a significant difference in the CCSQ score of students based on factors

5.2. Result of Correlation Analysis between Home Environmental Factors to Fear of Contagion
One factor in the CCSQ is the Fear of Contagion, comprised of one item in the questionnaire assessing perceived stress related to the risk of infection. The importance of the dimension is following prior research on the importance of fear of becoming infected, fear of others (e.g., family, friends) becoming ill, and fear of becoming a source of contagion for others (Ahorsu et al., 2020; Brooks et al., 2020; Taylor et al., 2020).

Based on the result shown in Table 5, the home environmental factors that have a significant correlation with fear of contagion are items 2, 3, 4, 5, 6, and 12. This proves that minimum provision of adequate education materials, poor relationship with parents, the anxious attitude of parents towards student performance, the influence of socio-economic status on academic performance of students, income level of family, and disagreement between parents have a direct impact on the fear of contagion of students as part of their academic stress.

Table 5. Result of Correlation Analysis between Home Environmental Factors to Fear of Contagion

Item	Home Environmental Factors	pearson correlation	p-value	Remarks
1	I am enrolled late in a good school	0.061	0.538	not significant
2	I have minimum provision of adequate education materials/supervision for my academic work	0.265	0.007	significant
3	I have poor relationship with my parent or guardian	-0.199	0.042	significant
4	My parents/guardian have anxious attitude towards my education	0.228	0.02	significant
5	The socio-economic status of my family has influence on my academic performance	0.24	0.014	significant
6	The income level of my family determines the type of school I attend	0.317	0.001	significant
7	The adequacy of the provision of necessary school materials affects my academic performance	-0.095	0.337	not significant
8	The socio-economic status of my family influences my self-esteem and confidence in school	0.136	0.167	not significant
9	My family structure can affect my academic performance	-0.072	0.47	not significant
10	A broken home can affect my academic performance	0.162	0.101	not significant
11	The household size can affect my academic performance	-0.16	0.105	not significant
12	Disagreement between my parents can affect my academic performance	0.259	0.008	significant

5.3. Result of Correlation Analysis between Home Environmental Factors to Fear of Isolation

Another factor in the CCSQ is the Fear of Isolation, comprised of two items in the questionnaire exploring perceived stress related to social isolation and changes in sexual life due to the containment measures. In this regard, research has shown that containment methods such as quarantine and social separation have a significant impact on people's psychological health and well-being (Brooks et al., 2020; Horesh and Brown, 2020; Lee, 2020a; Williams et al., 2020), the second factor also captured the perceived disease and sense of loneliness derived from living this condition, often far from the loved ones (Sahu, 2020; Zhai and Du, 2020).

Based on the result as shown in Table 6, the home environmental factors that have a significant correlation with Fear of Isolation are items 2, 5, 6, 8, 10, and 12. This proves that minimum provision of adequate education materials, the influence of socio-economic status on academic performance of students, income level of family, the influence of socioeconomic status on the self-esteem of students, being part of a broken home, and disagreement between parents have a direct impact on the fear of isolation of students as part of their academic stress.

Table 6. Result of Correlation Analysis between Home Environmental Factors to Fear of Isolation

Item	Home Environmental Factors	pearson correlation	p-value	Remarks
1	I am enrolled late in a good school	0.032	0.748	not significant
2	I have minimum provision of adequate education materials/supervision for my academic work	0.198	0.043	significant
3	I have poor relationship with my parent or guardian	-0.119	0.229	not significant
4	My parents/guardian have anxious attitude towards my education	0.132	0.182	not significant
5	The socio-economic status of my family has influence on my academic performance	0.304	0.002	significant
6	The income level of my family determines the type of school I attend	0.31	0.001	significant
7	The adequacy of the provision of necessary school materials affects my academic performance	-0.103	0.296	not significant
8	The socio-economic status of my family influences my self-esteem and confidence in school	0.241	0.014	significant
9	My family structure can affect my academic performance	0.073	0.464	not significant
10	A broken home can affect my academic performance	0.224	0.022	significant
11	The household size can affect my academic performance	0.008	0.934	not significant
12	Disagreement between my parents can affect my academic performance	0.797	0	significant

5.4. Result of Correlation Analysis between Home Environmental Factors to Relationship and Academic Life

The last factor in the CCSQ is Relationships and Academic Life. It is comprised of four items covering perceived stress related to relationships with relatives, relationships with colleagues, relationships with professors, and academic studying. Given that students' daily routines have changed (Cao et al., 2020; Chen et al., 2020; Lee, 2020b), this aspect contributed to a better grasp of the features defining these changes among university students in terms of relationships and academic life.

Based on the result as shown in Table 7, the home environmental factors that have a significant correlation with Relationships and Academic Life are items 5, 6, 8, 10, 11, and 12. This proves that the influence of socio-economic status on academic performance of students, income level of family, the influence of socioeconomic status on the self-esteem of students, being part of a broken home, the effect of household size on academic performance, and disagreement between parents have a direct impact on the relationship and academic life of students as part of their academic stress.

Table 7. Result of Correlation Analysis between Home Environmental Factors to Relationship and Academic Life

Item	Home Environmental Factors	pearson correlation	p-value	Remarks
1	I am enrolled late in a good school	0.053	0.593	not significant
2	I have minimum provision of adequate education materials/supervision for my academic work	0.137	0.166	not significant
3	I have poor relationship with my parent or guardian	0.037	0.71	not significant
4	My parents/guardian have anxious attitude towards my education	0.084	0.395	not significant
5	The socio-economic status of my family has influence on my academic performance	0.287	0.003	significant
6	The income level of my family determines the type of school I attend	0.24	0.014	significant
7	The adequacy of the provision of necessary school materials affects my academic performance	-0.004	0.966	not significant
8	The socio-economic status of my family influences my self-esteem and confidence in school	0.25	0.011	significant
9	My family structure can affect my academic performance	0.165	0.089	not significant
10	A broken home can affect my academic performance	0.275	0.005	significant
11	The household size can affect my academic performance	0.409	0	significant
12	Disagreement between my parents can affect my academic performance	0.796	0	significant

6. Conclusion

The results of our survey and analysis of the data showed that problems financially and family relationships do greatly affect the academic stress of students during this COVID-19 pandemic. The importance of support given by the parent to the student in terms of providing adequate academic materials and supervision enables the student to study well and at the same time making the student feel supported, therefore improves the academic performance. A good relationship between the parent and student can also lessen the stress that the student is experiencing due to the current setup of learning. Taking into account the home environmental factors can determine what improvements should be made to take care of the students who are greatly affected by the COVID-19 pandemic, where digital learning is now a current trend.

Due to the Covid-19 pandemic, conducting face-to-face classes are canceled, so students are obliged to continue their study at home. The students felt that online classes are a burden because there's a need to learn lessons mostly by themselves. Adding to the burden of online classes are some external reasons that can influence the academic performance of students like family problems in terms of financial and family relationships. The support of parents to their child's academic journey is expected during this time. Parents can show their support to their child by providing their child the necessities needed for online classes like a study area, laptops, computers, etc., and also through moral support by having constant communication with the child. Parents can show their support to a child's academic journey by providing an area where their child can concentrate in terms of academics (Leonhardt, 2020). Parents should also consider providing proper ventilation to the provided room/area which will help the child's focus.

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Biographies

Ma. Janice J. Gumasing is a Professor of the School of Industrial Engineering and Engineering Management at Mapua University, Philippines. She has earned her B.S. degree in Industrial Engineering and a Master of Engineering degree from Mapua University. She is a Professional Industrial Engineer (PIE) with over 15 years of experience. She is also a professional consultant of Kaizen Management Systems, Inc. She has taught courses in Ergonomics and Human Factors, Cognitive Engineering, Methods Engineering, Occupational Safety and Health, and Lean Manufacturing. She has numerous international research publications in Human Factors and Ergonomics.

Jorell Ansell Basical is currently an Industrial Engineering Student at Malayan Colleges of Laguna. He took Industrial Engineering to work in a banking or stock brokerage firm which is both directly inclined to his interests.

Elaissa Denapo is a student of Malayan Colleges under the degree of BS Industrial Engineering. She took up the BSIE course to one day be part of a business firm in the design, marketing, or sales department as a reflection of her

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Daniel Mallari is an Industrial Engineering student at Malayan Colleges of Laguna. He is taking Industrial Engineering to work at bigger companies and have a stable business or built his own company.

Karen Manalo is an Industrial Engineering student at Malayan Colleges of Laguna. She currently has a small business in their home as her sideline while taking up her college degree. Her experiences enhanced her skills and she aspires to work in a company that will further develop her skills, and applies her knowledge in the corporate world.

Johnvyll Errol Rosales is a current Bachelor of Science in Industrial Engineering student of Malayan Colleges Laguna. He is an academic achiever and took Industrial Engineering to work in a business firm that fully maximizes all the things he learned from the school. His research interests are agriculture, medicine, and optimization.