

Impact of COVID-19 on College Students' Well-Being: Development of Chatbot through Multi-Criteria Decision Analysis

Lyka Marie M. Degala,
Industrial Engineering Department
Adamson University
lykamariedegala@gmail.com

Kharizza Jhae M. Dela Fuente,
Industrial Engineering Department
Adamson University
kharizzadela Fuente@gmail.com

Noe D. Enriquez, PIE, ASEAN Eng.
Research Co-Adviser
Director, IPPDO
Adamson University
noe.enriquez@adamson.edu.ph

Dr. Venusmar C. Quevedo, PIE, ASEAN Eng.
Research Adviser
Vice President for Administration
Adamson University
vcquevedo@gmail.com

Abstract

The main objective of this study is to develop a chatbot that helps minimize the negative impact of the new normal on college students' well-being. In order to do that, the researchers also determined the physical and psychological impact of the Covid-19 pandemic on college students in the Philippines. To assess the impact of the Covid-19 pandemic, the researchers conveniently surveyed 328 college students who are currently enrolled in online classes and are living in the Philippines. The data gathered were analyzed using IBM SPSS and Microsoft Excel. The test of normality has revealed that there is enough evidence that there is a significant impact of the Covid-19 pandemic on the physical ($p(0.000) < 0.05$) and psychological well-being ($p(0.000) < 0.05$) of college students. Furthermore, the study has revealed that there are factors that make the students more vulnerable to experiencing physical discomfort and psychological distress. On the other hand, the study has revealed that there is a weak to negligible correlation between the demographics of the college students and the physical and psychological impact they were experiencing during the pandemic. Furthermore, there is a weak correlation between the physical impact and the college students' human attributes while there is a moderate correlation between the psychological impact and the college students' human attributes.

Keywords

Well-being, COVID-19, Pandemic, College Students, Multi-Criteria Decision Analysis

1. Introduction

The cases of COVID-19 are continuously increasing as the virus constantly mutates over time. COVID-19 is one of the most serious health issues being addressed globally since the first outbreak in China in November 2019. The Philippines had the largest number of confirmed cases and deaths in the Western Pacific Region, accounting for more than half of all cases and 40% of all deaths (WHO, 2020). During the outbreak of the pandemic in March 2020, Metro Manila was placed under a long-enhanced community quarantine (ECQ) to prevent virus transmission, which in return, affects numerous aspects of society such as the economy, livelihood, and education. Among the safety protocols implemented by the Philippine government is the shutdown of all schools and universities in Metro Manila, causing educational institutions to transition to a blended learning approach, otherwise known as “online distance learning”. Due to the suspension of face-to-face classes to reduce the risk of transmission of COVID-19, about 27 million students in the country are placed in a distance learning system, in which the medium of instruction is through modules and online platforms.

1.1. Objectives

This research aims to develop a wellness chatbot for college students in private and public colleges and universities in the Philippines to aid their physical discomfort and psychological distress using multi-criteria decision analysis. This study specifically aims: (1) To identify the factors that make the students more vulnerable to experiencing physical discomfort and mental distress; (2) To identify the relationship between college students’ age, sex, student type, year level, course, school type, and location of schools and the impacts on their wellbeing; (3) To identify the significant relationships between the students’ physical discomfort and psychological distress and their human attributes.

2. Literature Review

College students in the Philippines

As of the academic year 2019-2020, there are a total of 3,408,815 enrolled college students, showing an increase of 196, 273 students who were enrolled in the previous academic year (CHED, 2019). When the surge of the Covid-19 pandemic started, the Philippine Association of State Universities and Colleges (2020) stated that about 44,069 college students from different state universities and colleges did not enroll due to the virus fear, and financial constraints, and lack of access to gadgets.

Impact of Covid 19 on college students’ physical health

Students are more likely to be at risk for developing musculoskeletal pain and disorders which in turn could affect their education and health. Kazemi et al. found a significant prevalence of general health problems and musculoskeletal disorders among students in their 2017 study. The current academic setting of students, especially college students has exposed them to physical risks, which in turn triggers the occurrence of musculoskeletal problems (Morais, et al., 2019). Online education has substituted face-to-face interaction in several countries around the world (Kaya, H., 2020) and primarily with the use of electronic gadgets such as laptops, desktops, tablets, and mobile phones (Napoli, et al., 2020).

Musculoskeletal

The current academic setting of students, especially college students has exposed them to physical risks, which in turn triggers the occurrence of musculoskeletal problems (Morais, et al.,2019). Leirós-Rodríguez, R., et al. (2020) supported that the academic routine of students in pre-pandemic and pandemic times includes sitting for long hours, often on inappropriate chairs, and the frequent use of electronic devices has increased the tendency of students to experience musculoskeletal overload. (2020). With the frequent use of electronic gadgets, students tend to develop improper postures that cause pain, especially in the spine and the upper limbs (Kazemi, et al., 2017). In relation to the improper posture developed, continuous use of electronic gadgets increase pain, especially in the rachis and the shoulders (Hoe, V., et al., 2020).

Vision

Online education has substituted face-to-face interaction in several countries around the world (Kaya, H., 2020) and primarily with the use of electronic gadgets such as laptops, desktops, tablets, and mobile phones (Napoli, et al., 2020). However, this new style of learning lets students be in front of their screens for long hours (Kaya, H., 2020). According to Kim, et al. (2017), the use of electronic devices such as computers and mobile phones has increased the symptoms of eye fatigue such as burning sensation, dryness, and tearing in the eyes.

Impact of COVID-19 on the mental well-being of college students

Irawan et al. (2020) stated that the psychological situation of college students during the pandemic has worsened as they were prohibited from leaving their houses and limiting their interactions with other people. Evidence showed that college students were more likely to feel anxious and distressed as a result of these big changes (Chang, et al., 2021). Moreover, Bartoszek, et al. (2020) stated that People experience higher levels of despair, insomnia, loneliness, and general fatigue during the homestay.

Anxiety and panic attacks

According to Santabarbara, et al. (2021), university students have had to adjust to online classrooms, and internship quality and logistics have changed, causing psychological distress. Since the onset of COVID-19, there have been reports of higher-than-normal levels of despair, worry, discomfort, and insomnia (Wu, et al., 2021). Similarly, Chang, et al. (2021) revealed that COVID-19's global pandemic has impacted negatively on people's lives, and college students have been badly affected. Evidence showed that college students were more likely to feel anxious and distressed as a result of these big changes.

Lethal thoughts

Suicide is a major public health concern around the world, accounting for about 1.5% of all deaths. It is particularly common among adolescent and young adult populations (Estrada, et al., 2019). Suicidal thoughts and behaviors are more common in adolescence and young adulthood (STB). Mortier, et al. (2017) stated that college students are becoming a larger segment of the youthful population. In the study conducted by Batra, et al. (2021), it is highlighted that academic performance is the first thing to deteriorate for college students.

The use of chatbots in improving college students' well-being

Chatbots may be used to help people improve their habits, and provide mental health assistance, smoking cessation, and disease diagnosis (Zhang, et al., 2020). Ennis, et al., 2021 also stated in the domain of mental health, digital technologies such as chatbots can be exploited. Chatbots can be used to help individuals in remote communities that face issues such as limited access to mental health services, a lack of 24/7 support, hurdles to engagement, a lack of age-appropriate support, and budget constraints (Ennis, et al., 2021).

3. Methods

Quantitative research design is applied in the study to allow the researchers to efficiently and critically analyze, calculate and interpret the collected data from the online survey of large and convenient respondents from the Philippines. The Slovin's Formula is used in this study to calculate the number of respondents (sample size) needed for the survey. With a population size of 3,408,815 enrolled college students in all regions of the Philippines as of 2019, and a 6% margin of error (95% confidence level).

4. Data Collection

Survey questionnaires are administered to the 278 participants selected through convenience sampling. The participants of the study were selected based on their availability and willingness to participate in the online survey with the inclusion criteria of the participants needed for the survey: College students enrolled in online classes; Residing in the Philippines. The survey was divided into 5 sections that included the respondents' demographics, Likert scale rating, and their insights regarding the need for a wellness chatbot in a university. Data collected from the survey were analyzed through the Statistical Package for Social Science (SPSS) Software.

5. Results and Discussion

5.1. Reliability Test

The researchers conducted a Cronbach's Alpha reliability test in Statistical Package for Social Science (SPSS) software to test the reliability of the 95 Likert scale items in the survey. The generated result for the survey with 95 items was 0.53 which is $\alpha \geq 0.9$. Therefore, the survey instrument has an excellent internal consistency according to the reliability test.

5.2. Correlation Between Demographics and the Impact of Covid-19 on College Students' Physical and Psychological Well-Being

Physical Well-Being

Age

The age and impact of Covid-19 on college students' physical well-being are negligible and negatively correlated, $r = -0.060$, $p (0.281) > 0.05$. The p-value associated with the test statistics is not statistically significant. Therefore, the null hypothesis failed to be rejected at a 5% significant level.

Sex

The sex and impact of Covid-19 on college students' physical well-being are weakly and positively correlated, $r = 0.217$, $p (0.000) < 0.05$. The p-value associated with the test statistics is statistically significant. Therefore, the null hypothesis is rejected at a 5% significant level.

Student Type

The student type and impact of Covid-19 on college students physical well-being are negligible and negatively correlated, $r = -0.054$, $p (0.328) > 0.05$. The p-value associated with the test statistics is not statistically significant. Therefore, the null hypothesis failed to be rejected at a 5% significant level.

College Year Level

The college year level and impact of Covid-19 on college students' physical well-being are negligible and positively correlated, $r = 0.011$, $p (0.842) > 0.05$. The p-value associated with the test statistics is not statistically significant. Therefore, the null hypothesis failed to be rejected at a 5% significant level.

Course/Program

The course/program and impact of Covid-19 on college students' physical well-being are negligible and positively correlated, $r = 0.039$, $p (0.485) > 0.05$. The p-value associated with the test statistics is not statistically significant. Therefore, the null hypothesis failed to be rejected at a 5% significant level.

School Type

The school type and impact of Covid-19 on college students' physical well-being are negligible and negatively correlated, $r = -0.097$, $p (0.079) > 0.05$. The p-value associated with the test statistics is not statistically significant. Therefore, the null hypothesis failed to be rejected at a 5% significant level.

School Location

The school location and impact of Covid-19 on college students' physical well-being are negligible and negatively correlated, $r = -0.043$, $p (0.435) > 0.05$. The p-value associated with the test statistics is not statistically significant. Therefore, the null hypothesis failed to be rejected at a 5% significant level.

Psychological Well-Being

Age

The age and impact of Covid-19 on college students' psychological well-being are negligible and positively correlated, $r = 0.06$, $p (0.910) > 0.05$. The p-value associated with the test statistics is not statistically significant. Therefore, the null hypothesis failed to be rejected at a 5% significant level.

Sex

The sex and impact of Covid-19 on college students' physical well-being are weakly and positively correlated, $r = 0.217$, $p (0.000) < 0.05$. The p-value associated with the test statistics is statistically significant. Therefore, the null hypothesis is rejected at a 5% significant level.

Student

Type

The student type and impact of Covid-19 on college students' psychological well-being are negligible and negatively correlated, $r = -0.070$, $p (0.206) > 0.05$. The p-value associated with the test statistics is not statistically significant. Therefore, the null hypothesis failed to be rejected at a 5% significant level.

College Year Level

The college year level and impact of Covid-19 on college students' psychological well-being are negligible and positively correlated, $r = 0.042$, $p (0.444) > 0.05$. The p-value associated with the test statistics is not statistically significant. Therefore, the null hypothesis failed to be rejected at a 5% significant level.

Course/Program

The course/program and impact of Covid-19 on college students' psychological well-being are negligible and negatively correlated, $r = -0.005$, $p (0.931) > 0.05$. The p-value associated with the test statistics is not statistically significant. Therefore, the null hypothesis failed to be rejected at a 5% significant level.

School Type

The school type and impact of Covid-19 on college students' physical well-being are negligible and negatively correlated, $r = -0.097$, $p (0.079) > 0.05$. The p-value associated with the test statistics is not statistically significant. Therefore, the null hypothesis failed to be rejected at a 5% significant level.

School Location

The school location and impact of Covid-19 on college students' psychological well-being are negligible and positively correlated, $r = -0.021$, $p (0.703) > 0.05$. The p-value associated with the test statistics is not statistically significant. Therefore, the null hypothesis failed to be rejected at a 5% significant level.

5.3. Correlation Between College Students' Physical Discomfort and Psychological Distress and Their Human Attributes

Physical Discomfort

Correlations

		RQ6_PHA	RQ1_PH
Spearman's rho	RQ6_PHA	Correlation Coefficient	1.000
		Sig. (2-tailed)	.364**
		N	.000
RQ1_PH	RQ1_PH	Correlation Coefficient	.364**
		Sig. (2-tailed)	1.000
		N	.000

** . Correlation is significant at the 0.01 level (2-tailed).

The college students' physical discomfort and their human attributes are weakly and positively correlated, $r = 0.364$, $p (0.000) < 0.05$. The p-value associated with the test statistics is statistically significant. Therefore, the null hypothesis is rejected at a 5% significant level.

Psychological

Distress

The college students' psychological distress and their human attributes are moderately and positively correlated, $r = 0.616$, $p (0.000) < 0.05$. The p-value associated with the test statistics is statistically significant. Therefore, the null hypothesis is rejected at a 5% significant level.

Correlations

			RQ6_MHA	RQ1_MH
Spearman's rho	RQ6_MHA	Correlation Coefficient	1.000	.616**
		Sig. (2-tailed)	.	.000
		N	328	328
	RQ1_MH	Correlation Coefficient	.616**	1.000
		Sig. (2-tailed)	.000	.
		N	328	328

** . Correlation is significant at the 0.01 level (2-tailed).

5.4. Multi-Criteria Decision Analysis (MCDA)

Table 4.5.1.17. MCDA Criteria Weighing

WEIGHING THE CRITERIA				
Criteria		Percentage	Rank	Weight
Accessibility				
	Available 24/7	68.60%	4	11.54%
	Gives instant and real-time response	67.40%	6	8.97%
Cost				
	Free of Charge	61.30%	8	6.41%
Features				
	Conversationalist	65.90%	7	7.69%
	Emotional Intelligent	72.00%	3	12.82%
	Gives guidance and health advice	68.00%	5	10.26%
	Recommends wellness programs	60.10%	9	5.13%
	Collects feedback from user	46.30%	11	2.56%
Safety and Security				
	Values Confidentiality/Privacy	77.10%	1	15.38%
	Collects user Information	31.70%	12	1.28%
Convenience				
	Schedules online appointments with a school doctor/guidance counselor	50.30%	10	3.85%
Design				
	User-friendly	74.10%	2	14.10%
	TOTAL		78	100.00%

Table 4.5.1.17 shows the weighted scores of each alternative/option. Following the MCDA procedure, the weighted scores on each criterion and option were computed by multiplying the criteria assessment of the options by the weight of each criterion. The sum of the weighted scores on each option was computed. The highest the sum, the most optimal the option is. Based on the computed table, the most optimal option is Option A which has almost all of the features except for the “Free of Charge” feature. Therefore, the prototype of the chatbot will be based on the optimal option.

6. Conclusion

The researchers based upon the analysis of the survey result through the use of a web-based survey, related literature, Statistical Package for the Social Sciences (SPSS) software, and Microsoft Excel. Furthermore, Convenience Sampling and Multi-Criteria Decision Analysis were used in this study to obtain relevant information and analyze the data gathered.

In conclusion, the researchers have found that there are significant factors that make college students more vulnerable to experiencing physical discomfort and psychological distress with a p-value less than 0.05 ($p(2.1107E-12) < 0.05$). Therefore, talking to professionals, looking for external validation, and searching the web are the factors that make college students more vulnerable to experiencing physical discomfort and psychological distress.

Upon using the spearman’s rho correlation to test the relationship between college students’ age, sex, student type, year level, course, school type, and location of schools physical discomfort, and psychological distress they are experiencing, the researchers found that the sex the college students has a weak positive correlation and their year level has a negligible positive correlation on the impact of the Covid-19 pandemic on their physical well-being. It means that males and females experience different impacts of the Covid-19 pandemic on their physical well-being.

Upon using the spearman’s rho correlation to test the relationship of college students’ sex to psychological well-being, the researchers found that 0.7% of the time, there is a weak positive correlation between sex to the psychological well-being of college students. This implies that the impact of Covid-19 on their psychological well-being varies differently for both sexes. Furthermore, the result of the spearman’s rho correlation states that 84.2% of the time, the college year level and the impact of the Covid-19 pandemic on their physical well-being have a negligible positive correlation. The result of the spearman’s rho correlation states that 84.2% of the time, the college year level and the impact of the Covid-19 pandemic on their physical well-being have a negligible positive correlation.

The result of the spearman’s rho correlation implies that the college students' physical discomfort and their human attributes are positively correlated. This shows that their physical discomfort affects their human attributes. Furthermore, the result of the spearman’s rho correlation shows that the college students' psychological distress and their human attributes are positively correlated, implying that their psychological distress has an impact on their human attributes.

References

- Alsolais A; Alquwez N; Alotaibi KA; Alqarni AS; Almalki M; Alsolami F; Almazan J; Cruz JP; (n.d.). *Risk perceptions, fear, depression, anxiety, stress and coping among Saudi nursing students during the COVID-19 pandemic*. Journal of mental health (Abingdon, England). Retrieved May 21, 2022, from <https://pubmed.ncbi.nlm.nih.gov/33978543/>
- Coping during a pandemic*. Student Health on Haven. (2021, July 29). Retrieved May 21, 2022, from <https://www.studenthealth.cuimc.columbia.edu/resources-and-support/covid-19-resources/coping-during-pandemic>
- Coping with stress during the 2019-ncov outbreak - who*. (n.d.). Retrieved May 20, 2022, from https://www.who.int/docs/default-source/coronaviruse/coping-with-stress.pdf?sfvrsn=9845bc3a_2&ua=1
- Covid-19: Six essential coping strategies*. Munson Healthcare. (n.d.). Retrieved May 21, 2022, from <https://www.munsonhealthcare.org/blog/covid-19-six-essential-coping-strategies>
- Dunton, G. F., Do, B., & Wang, S. D. (2020, September 4). *Early effects of the COVID-19 pandemic on physical activity and sedentary behavior in children living in the U.S. - BMC public health*. BioMed Central. Retrieved May 21, 2022, from <https://bmcpublikealth.biomedcentral.com/articles/10.1186/s12889-020-09429-3>
- Effect of covid 19 on perceived stress, coping skills, self-control and self-management skills*. Home. (2020, July 30). Retrieved May 21, 2022, from <https://www.researchsquare.com/article/rs-48393/v1>

- Fernández Cruz M;Álvarez Rodríguez J;Ávalos Ruiz I;Cuevas López M;de Barros Camargo C;Díaz Rosas F;González Castellón E;González González D;Hernández Fernández A;Ibáñez Cubillas P;Lizarte Simón EJ; (n.d.). *Evaluation of the emotional and cognitive regulation of young people in a lockdown situation due to the COVID-19 pandemic*. *Frontiers in psychology*. Retrieved May 21, 2022, from <https://pubmed.ncbi.nlm.nih.gov/33192840/>
- Freire, C., Ferradás, M. del M., Regueiro, B., Rodríguez, S., Valle, A., & Núñez, J. C. (1AD, January 1). *Coping strategies and self-efficacy in university students: A person-centered approach*. *Frontiers*. Retrieved May 21, 2022, from <https://www.frontiersin.org/articles/10.3389/fpsyg.2020.00841/full>
- Girma, A., Ayalew, E., & Mesafint, G. (2021, May 20). *Covid-19 pandemic related stress and coping strategies: NDT*. *Neuropsychiatric Disease and Treatment*. Retrieved May 21, 2022, from <https://www.dovepress.com/covid-19-pandemic-related-stress-and-coping-strategies-among-adults-wi-peer-reviewed-fulltext-article-NDT>
- Investigation of the effect of online education on Eye Health in ... - eric*. (n.d.). Retrieved May 20, 2022, from <https://files.eric.ed.gov/fulltext/EJ1272791.pdf>
- Kaur, H., Singh, T., Arya, Y. K., & Mittal, S. (1AD, January 1). *Physical Fitness and exercise during the covid-19 pandemic: A qualitative enquiry*. *Frontiers*. Retrieved May 21, 2022, from <https://www.frontiersin.org/articles/10.3389/fpsyg.2020.590172/full>
- Kazemi, S. S., Javanmardi, E., & Ghazanfari, E. (2017, September 10). *Relationship between general health and musculoskeletal disorders among Tarbiat Modares University students*. *International Journal of Musculoskeletal Pain Prevention*. Retrieved May 21, 2022, from <https://ijmpp.modares.ac.ir/article-32-8145-fa.html>
- Labrague LJ;McEnroe-Petitte DM;Al Amri M;Fronza DC;Obeidat AA; (n.d.). *An integrative review on coping skills in nursing students: Implications for policymaking*. *International nursing review*. Retrieved May 21, 2022, from <https://pubmed.ncbi.nlm.nih.gov/28664984/>
- Logel, C., Oreopoulos, P., & Petronijevic, U. (2021, May 17). *Experiences and coping strategies of college students during the COVID-19 pandemic*. *NBER*. Retrieved May 21, 2022, from <https://www.nber.org/papers/w28803>
- López-Valenciano, A., Suárez-Iglesias, D., Sanchez-Lastra, M. A., & Ayán, C. (2021, January 15). *Impact of covid-19 pandemic on university students' physical activity levels: An early systematic review*. *Frontiers in psychology*. Retrieved May 21, 2022, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7845570/>
- Mariani, R., Renzi, A., Di Trani, M., Trabucchi, G., Danskin, K., & Tambelli, R. (1AD, January 1). *The impact of coping strategies and perceived family support on depressive and anxious symptomatology during the coronavirus pandemic (COVID-19) lockdown*. *Frontiers*. Retrieved May 21, 2022, from <https://www.frontiersin.org/articles/10.3389/fpsyg.2020.587724/full>
- Romero-Blanco C;Rodríguez-Almagro J;Onieva-Zafra MD;Parra-Fernández ML;Prado-Laguna MDC;Hernández-Martínez A; (n.d.). *Physical activity and sedentary lifestyle in university students: Changes during confinement due to the COVID-19 pandemic*. *International journal of environmental research and public health*. Retrieved May 21, 2022, from <https://pubmed.ncbi.nlm.nih.gov/32916972/>
- Romero-Blanco, C., Rodríguez-Almagro, J., Onieva-Zafra, M. D., Parra-Fernández, M. L., Prado-Laguna, M. del C., & Hernández-Martínez, A. (2020, September 9). *Physical activity and sedentary lifestyle in university students: Changes during confinement due to the COVID-19 pandemic*. *MDPI*. Retrieved May 21, 2022, from <https://www.mdpi.com/1660-4601/17/18/6567/htm>
- SARS-COV-2 infection and persistence throughout the human body and brain*. (n.d.). Retrieved May 20, 2022, from https://assets.researchsquare.com/files/rs-1139035/v1_covered.pdf?c=1640020576
- Savitsky, B., Findling, Y., Ereli, A., & Hendel, T. (2020, July). *Anxiety and coping strategies among nursing students during the COVID-19 pandemic*. *Nurse education in practice*. Retrieved May 21, 2022, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7264940/>

Biographies

Lyka Marie M. Degala, a graduate of Bachelor of Science in Industrial Engineering from Adamson University, is a Kayan Chan Scholar, a consistent Dean's Lister, and IE top student from her first to her third year in college. She was a former Operations and Logistics intern of MC Global Freight Solutions Inc., where she was involved in monitoring and documenting cargo movements and requirements. She is also a Certified Lean Six Sigma Yellow Belt, who has a passion for innovation and design. She and her teammate, Kharizza, have received funding for their IE Capstone Project Innovation entitled "ABot (Amity Bot): Wellness Chatbot for College Students."

Kharizza Jhae M. Dela Fuente is a Bachelor of Science in Industrial Engineering graduate at Adamson University in the year 2022 who resides in the City of Las Piñas. She was an innovator at the AltruInnovate Project for their “ABot (Amity Bot)” technology under the innovation funding of the AdUNest. She is a Certified Lean Six Sigma Yellow Belt and a former intern at the Asian Institute of Management from August to September 2021. She was also a Kayan Chan Scholar from the Academic Year 2020-2022. During her college years, she has also been affiliated with the Philippine Institute of Industrial Engineers - Operations Research Society of the Philippines (PIIE-ORSP) Adamson University Chapter, holding the position as the Logistics Directress in the A.Y. 2019-2020, and the former ORSP Ambassador A.Y. 2020-2021. In her 3rd year in college, she ranked as the Top 8 Industrial Engineering student during the 1st term, and the Top 9 Industrial Engineering student during the 2nd term.

Noe Enriquez. Engr. Noe D. Enriquez is the Director of Institutional Planning and Policy Development Office of Adamson University since 2008 to the present. He finished his degree in Bachelor of Science in Industrial Engineering degree from Adamson University. He later earned his Master of Business Administration in Ateneo de Manila. He also acts as Deputy Quality Management System representative in Adamson University.

Venusar Quevedo. Dr. Venusmar is a Associate Professor of the Industrial Engineering Department at Adamson University, Manila, Philippines. Dr. Quevedo holds a Bachelor of Science degree in Industrial Engineering from Adamson University and both her Master’s degree in Industrial Engineering and Doctor of Philosophy in Educational Evaluation and Research from University of the Philippines. She has been recognized as one of the Inspiring Woman Engineer by the Philippine Technological Council with her more than 35 years of experience and contribution in the industry. She has taught courses in management, feasibility and engineering research for engineers. She has published and presented research papers both local and international.