Stress experiences and coping mechanisms of science and mathematics students on online learning amidst COVID-19 pandemic

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Abstract

The COVID-19 pandemic has made online learning the trend and best option for students to continue education that led to more stress to the students. The remote-distance learning has caused mathematics and science students to have more difficulty in their studies. This study aims to determine what stressors college students enrolled in technical and science programs are experiencing in their online classes and what strategies and actions are done to cope with them. The study employed a quantitative-descriptive research design. To determine the stressors and coping mechanisms of students, a survey questionnaire was used and disseminated to 1,025 students from the College of Allied Health Science (CAHS) and College of Engineering, Architecture and Technology (CEAT) of Northwestern University. Results shows that factors such as pessimism, negative self-talk, financial worries and having a major life change like failing grade, losing scholarship or death of loved ones can cause the students weary and develop anxiety and depression that affects their academic performance. It is also found that coping mechanisms employed by the students are praying, meditating or enhancing their spiritual life can help alleviate the stress. Other coping mechanisms are taking a break, relaxing like listening to music or watching television and creating a hobby.

Keywords: Facebook group, learning management system, technology acceptance model, mathematics performance, online learning

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1. Introduction

The World Health Organization (WHO) declared the coronavirus disease (COVID-19) as a global pandemic on March 11, 2020, thus, the world has made drastic changes in order to mitigate its effect on society. Social isolations were encouraged; travel bans were implemented; work from home became the new trend; and from face-to-face set up turned to online/modular distance learning in the educational system. Everyone was forced to adapt with these unprecedented demands caused by COVID-19 that led to psychological stress, uncontrolled emotions like anxiety or depression and mental and physical fatigue.

Changes are perceived to be stressful because changes require a person to adjust and to adapt where he/she employs a coping strategy to overcome negative events or realities while trying to keep a positive self-image and emotional equilibrium. With the educational online flexible learning in the Philippines implemented by Commission on Higher Education (CHED) to Higher Educational Institutions (HEI), social distancing becomes a reality. Students, teachers, and faculty needed to make adjustments to meet the stress that the new normal had caused.

Commonwealth of Learning (2020) has provided the world guidelines with regards to distance education during this COVID-19 pandemic. It gave a wider perspective for everyone with the most appropriate innovation to continue education in spite of the crisis the world is facing. Benefits such as access and cost were mentioned that allow learners to extend knowledge at a more efficient way but also, these can be the reason students struggle in coping with distance education. Learning resources, Pedagogy, Learner Support and the Administration are the key elements in making distance education successful. To help students achieve a productive learning with the digital platform, developing skills to online learning, having a study schedule and staying connected with teacher and other student are some of guidelines provided.

Selye introduced the terms "distress" and "eustress" to distinguish the non-adaptive and adaptive effects to stress reactions. Eustress is healthy, positive and constructive results of stressful events and stress response. In contrast, distress is the negative type of stress like excessive demands in the workplace, procrastination and death of a family member. Every day, everyone feels stressed, especially now that a global health crisis is experienced. But this does not mean that one must drown into anxiety and depression because of the fear of being infected. Students may be less likely to get exposed to COVID-19 but they are the ones who are greatly vulnerable and prone to psychological and mental stresses. These stresses may then affect their performance in school. As such, strategies and coping mechanisms are done to manage these stressful events going on.

Stress is mainly a physical response to a feeling, situation or event that interferes with the sense of well-being of a person. Cause of stress comes in two categories: the external and internal factors. External factors of stress are the events or situations faced every day like relationship problems, serious injury or chronic illness, financial problems or family bereavement. Internal factors of stress on the other hand, are the ones that come from within the self like a sudden sadness felt for no reason. These are stress-inducing thoughts or behaviors that come from one's psychological mindset or expectations which can lead to feelings of anxiety and depression.

Coping with these unusual demands or stressors requires a greater effort with greater energy than just what's needed in the daily routines of life. In which these coping mechanisms may give a challenge to lessen one's feeling of anxiety such as asking others for help/assistance, distance oneself from the source of stress, engage in problem solving, direct attempt to change the source of stress, maintain emotionally supportive relationships or

take responsibility for the situation. Stress relieving strategies like concentrating on solutions rather than problems, keeping a positive state of mind and looking for a stress-relief like a hobby are some coping mechanisms to alleviate the feeling of restlessness. However, prolonging mobilization of effort to cope with stress can elevated levels of stress-related hormones and to eventual physical breakdown and illness.

All students are indeed affected by the COVID-19 pandemic with the implementation of academic freeze and a shift from a face-to-face platform to e-learning was implemented by institutions to provide safety from the virus while learning. However, academic struggles and other unique challenges bloomed and promoted more stress in different aspects like psychological, mental, physical, and even economical since not every student in the country has enough digital resources to cope up with the demands of the digital platform in education.

Northwestern University, Laoag City has adapted a learning management system called canvas to continue providing quality education. Despite the materials provided in the canvas, there are still struggles encountered like the difficulty of self-learning or independent learning coupled with poor internet connection that makes learning a very challenging activity. For engineering students, it is an excruciating feeling on how they are learning mathematical concepts and theories because there are times when students cannot comprehend what is being explained in synchronous classes. Health-science students have their struggles as well, they need to experience being in hospitals to know how management and operations are done but the current pandemic is obstructing them from doing so.

Under section 25 of Republic Act 11036 also known as the "Mental Health Act", states that educational institutions shall develop policies and programs for students, educators and other employees designed to: raise awareness on mental health issues, identify and provide support and services for individuals at risk, and facilitate access, including referral mechanisms of individuals with mental health conditions to treatment and psychological support. Thus, this study aims to determine what stressors college students enrolled in technical and science programs are experiencing in their online classes and what are their coping mechanisms done to be able to meet these stressors.

1.1 Theoretical Underpinning

The study is based on Richard Lazarus and Susan Folkman's Transactional Model of Stress and Coping in 1984. Considered stress to be a result from an "imbalance between demands and resources" or as occurring when "pressure exceeds one's perceived ability to cope". By developing stress management and perceiving stress not a direct response to a stressor but rather one's resources and ability to cope conciliates the stress response and are amenable to change, makes stress to be controllable. Before developing a stress management, it is important to identify first the factors affecting a person controlling his/her stress, and to identify the possible options to suppress these factors.

Lazarus and Folkman's interpretation of stress focuses on the transaction (interaction) between people and their external environment. The model envisioned stress as a result of how a stressor is appraised and how a person appraises his/her resources to cope with the stressor. The model breaks the stressor-stress link by perceiving stressors as positive or challenging rather than a threat, and if the stressed person's confidence of an adequate rather than deficient coping strategies, stress may not necessarily follow the presence of a potential stressor. This suggests that stress can be reduced by helping stressed people change their perceptions of stressors, providing them with strategies to help them cope and improving their confidence in their ability to do so.

Certain situation/event that is encountered by someone where they are being at a stake like goals are thwarted is being evaluated in the first appraisal. Appraising the significance of the situation is either harmful/threatening/challenging, benign-positive encounter (desirable) or no significance for the person. Once evaluated, the secondary appraisal takes place which concerns coping options. Individual is engaged in the secondary appraisal to think out how to best deal with situation and change undesirable conditions. Evaluate resources to create a more positive environment. Making it become a reappraisal of stressor and coping

resources.

According to the transactional model, a person experiences stress when the perceived demands of the environment are greater than their ability to cope with them (Lazarus & Folkman, 1984). Each person has different stress response. The appraisal of the same situation will have different perceptions to everyone wherein it may be threatening to some, or it may appear harmless to others. Individuals can either think that it is possible to deal with the problem (prepare to take some action towards handling the situation), or have the feeling that one cannot cope with the situation that causes stress – feeling a sense of helplessness in relation to managing the situation. The variables that will be used in this study are the profile of the student-respondents, the internal and external factors causing stress on online learning experienced by students, the resources available to the students, and the coping mechanisms employed by the Science and Mathematics Students to overcome perceived stress.

2. Literature Review

Stress and Coping Mechanisms and Distance Learning - Yaw Kwaah & Essilfie (2017) conducted a study entitled "Stress and Coping Strategies among Distance Education Students at the University of Cape Coast, Ghana". It was designed to identify the causes of stress and coping strategies adopted among distance education students at the College of Distance Education in the University of Cape Coast. A total of 332 distance education final year students in business and education were randomly sampled from final year students at two purposively selected study centers. The study was a quantitative research design with a cross-sectional survey carried out using a voluntary, anonymous and self-administered questionnaire. Findings were high academic work, high frequency of examinations, financial and family problems combined with other social responsibilities are the major causes of stress to distance education students. The work and academic load combination has been the major source of stress to students which goes to point to the fact that most employees do not inform their employers when they are enrolling on a distance education program hence continue to hold on to their tight schedules at work with academic work. This situation could affect their academic performance resulting in stress in most cases or even some students' dropping out eventually.

Another study conducted by Reddy et al. (2018) entitled "Academic Stress and its Sources among University Students" sought to find if there exists academic stress among students. Further, this study was also conducted to understand if there is a gender wise and stream wise difference in academic stress reported by the participants. The total number of participants who were subjected to the analysis procedures was 336. The study was a quantitative research design and random sampling technique was used to determine the respondents. Results were academic stress still continues to be a devastating problem affecting a student's mental health and well-being. Moreover, the Ribeiro et al. (2017) study entitled "Stress and Quality of Life among University Students: A Systematic Literature Review" aimed to analyze recent scientific productions about stress and quality of life in university students. Out of 142 articles identified from Web of Science, Scopus, Science Direct, PubMed and Virtual Health Library (BVS) databases, between November and December 2015, 13 articles were considered to be eligible. Research method used was article searching performed electronically to locate peer reviewed articles using the following terms: "quality of life", "stress" and "students" in the title, abstract or keywords. Findings were negative associations between stress and quality of life in university students, through the deterioration of various aspects related to physical and mental health and pointed out that factors such as burnout, sleep disorders and depression can maximize this negative association, deteriorating even more the quality of life.

Distance Learning Readiness - The transition to distance learning of schools at all levels required a shift in the approach of the teachers and schools which relied on the online platform. A study by Ag-Ahmad, N. (2020) focused on describing the Online Distance Learning (ODL) experiences of tertiary students particularly their preferences, their views of the instructional technology as well as the issues that arise in the integration of their courses in the new online class structure. The study was conducted among 68 tertiary students from a local institution in Kota Kinabalu, Sabah, East Malaysia. A mixed-method approach composed of questionnaires and

open-ended questions that were asked to gather insights regarding their overall views of Online Distance Learning (ODL). The results showed that the participants perceived that Malaysian students are only partially ready to adapt their learning behavior to ODL and similarly, they also believed that higher institutions in Malaysia are partially ready for purely open and distance learning.

Moreover, a study of Mok et al. (2021) titled "COVID-19 pandemic's disruption on university teaching and learning and competence cultivation: Student evaluation of online learning experiences in Hong Kong" aimed to explore Hong Kong higher education students' online learning experiences and its effectiveness during the pandemic with particular reference to examine students' competence cultivation. The study was conducted among 1,227 university students in Hong Kong. The research design is descriptive quantitative study using snowball sampling approach. Their findings have evidently demonstrated the dissatisfaction of students from the emergency online learning. While, Perante et al. (2020) conducted a study of the lived experiences of junior high school students in blended learning amidst pandemic. It aims to identify the implications of blended learning to junior high school students' lived experiences amidst pandemic. The respondents were Junior High School students currently studying in Bulacan in the school year 2020-2021 and respondents from the community engaged in blended learning. The research design was qualitative research with a purposive sampling technique through in-depth interview to explore the authentic experiences of the participants. The researchers found out that blended learning implications are mostly negative, especially to the lived experiences of Junior High School students amidst pandemic. Junior High School students are most challenged in adopting a lesson due to lacking resources.

A study by Mina et al. (2020) titled "Inclinations of Engineering and Marketing Management Students to Engage in Online Learning Technology Amidst the COVID-19 Pandemic" aimed to explore the availability of the resources needed by the students, the environment, the knowledge of the student–learners, and the challenges in engaging on online classes. The respondents were 568 college students from different courses in the province of Nueva Ecija, Philippines. The research design used was descriptive–quantitative research design. It was concluded that students are not capable of engaging in online learning in terms of availability of resources, environment, and level of the knowledge to basic technical skills. Further, Dianito et al. (2021) researched on the situation of PWD learners under the pandemic. Their study titled "A Glimpse into the Lived Experiences and Challenges Faced of PWD Students towards Online Learning in the Philippines Amidst COVID-19 Pandemic" aimed to discover and understand the experiences, challenges, and coping mechanisms of PWD students towards online learning during the global pandemic. The respondents consisted of PWD students that were currently enrolled in school during the pandemic in Bocaue, Bulacan, Philippines. The research design used was qualitative: Interpretative Phenomenological Analysis (IPA). Their results showed that most of the PWD students were challenged by the limitations of assistive technologies and internet connectivity. However, PWD students remained resilient because of having a healthy support system behind them.

Overall, there is a challenge in the transition towards online distance learning due to both the negative perception of the students and the lack of resources available. However, higher education institutions are more adaptable in the current shift to online. Logistical capabilities are critical in a successful online distance learning experience.

Factors Causing Stress - Online Learning during this time of the pandemic has developed different factors of stress to students, teachers and society. According to Mina et al. (2020), financial challenge being encountered by the family brought about by the pandemic serves as a major factor for success of executing online learning. In a study conducted by Sharma et al. (2020) entitled "Addressing the COVID-19 Burden on Medical Education and Training: The Role of Telemedicine and Tele-Education During and Beyond the Pandemic" to critically evaluate the impact of COVID-19 on medical education, training and medical students and make targeted recommendations to maintain continuity and support mental health, well-being and education needs of affected students. The PubMed/Medline was performed using the keywords "Medical Students," "COVID-19" and "Medical Education" until July 31, 2020 to find relevant literature that depicts original, opinion and perspective articles, topic reviews,

official national medical associations/bodies and societal guidelines and media sources. It was found out that the pandemic has caused increased stressors, with social isolation measures particularly associated with, and resulting in, increased depression, anxiety and suicidal ideations, as well as poor health behaviors among medical students during COVID-19, and also medical specialists and trainees. The widespread redundancies, job losses and closure of non-essential services due to COVID-19 have forced several students to resume work to support their families.

Another study which was conducted by Chandra (2020) entitled "Online education during COVID-19: perception of academic stress and emotional intelligence coping strategies among college students" aimed to understand and analyze the academic stress as experienced by students in higher educational institutions and their coping strategies COVID-19 pandemic. Respondents were a heterogeneous group of students pursuing graduation and post-graduation from different management schools in India. Purposive sampling technique was used to determine the respondents of the study. Data were gathered using online questionnaire, telephonic discussion, Perceptions of Academic Stress Scale and Emotional Intelligence Scale. Results were almost 85.1% of the respondents have not failed academically before, 58.5% are dissatisfied with the current online learning environment. Male students are more dissatisfied with the current online learning environment compared to female students, stress continue to put heavy pressure on the students to perform academically well while at the same time dealing with non-academic stress, and students knowingly and unknowingly employed coping strategies to manage their stress during the pandemic.

Klaassen et al.'s study in 2021 entitled "COVID-19 pandemic and its impact on dental students: A multi-institutional survey" focused on investigating dental students' perceptions and concerns regarding the COVID-19 pandemic, their coping strategies and support resources, and their perceived stress levels. Undergraduate dental students from North American dental schools, dental schools from Spain, Ireland, Chile, India and Brazil were chosen to be respondents in this multi-institutional survey of a customized 19-item survey and the Perceived Stress Scale (PSS). Findings were dental students in different countries, being a woman, having a less smooth transition, and demonstrating more concern were associated with increased perceived stress levels. While, Sheroun et al. (2020) carried out a study entitled "A Study to Assess the Perceived Stress and Coping Strategies among B.Sc. Nursing Students of Selected Colleges in Pune during COVID-19 Pandemic." aimed to assess the perceived stress and coping strategies among B.Sc. Nursing students of all batches in regard to COVID 19 lockdown, and to determine the association of stress and coping with selected demographic variables. The inclusion criteria for chosen respondents of the study were B.Sc. Nursing students aged 17-25 years of various colleges in Pune, India. The study was a cross sectional descriptive design with a purposive sampling technique used to determine the respondents and data were gathered through an online questionnaire consisting of 3 sections; Sociodemographic data, Modified Perceived Stress Scale and Modified Brief Coping Strategies Scale. Findings were 82.67% of the students had moderate level of perceived stress score and 13.35% had high perceived stress score due to the COVID 19 outbreak. 92.3% of the students are residing at hostels away from home which adds to the stress due to lack of interpersonal communication.

In conclusion, financial challenges, satisfaction with the online learning environment, academic performance and social isolation are some of the perceived stress students experience during the COVID-19 pandemic. Chandra (2020) said male are more dissatisfied than women and Klaassen et al. (2021) stated being a woman, having a less smooth transition, and demonstrating more concern were associated with increased perceived stress levels. These stress factors are needed to be dealt with in order to maintain a balance in the education system of a country to provide successful graduates.

Student Mental Health under Distance Learning - The unprecedented challenges caused by a quick shift of classes to an online format have caused much worry, stress, and grief to everyone. These stressors can cause mental health challenges for anyone and can cause acute symptoms to appear for people who may experience preexisting mental health challenges. Sharma et al. (2020) said disruptions in traditional medical education and training due to COVID-19 have increased risk of poor mental health among medical students worldwide; There is an increased risk of isolation and subsequent mental health issues, with an Australian study showing that international students

have higher baseline depression risk than local students considering loneliness, anxiety and stress scores. The COVID-19 pandemic has not only presented acute challenges to medical education and students but also exposed systemic issues that merit consideration.

Yadav et al.'s (2021) study entitled "Anxiety and Depression Among Health Sciences students in Quarantine During The COVID-19 Pandemic on selected Provinces of Nepal" sought to assess anxiety and depression among health sciences students at home quarantine during the COVID-19 pandemic in selected provinces of Nepal. Four hundred nine (409) health science students enrolled at graduate and post-graduate levels in selected universities and their affiliated colleges were chosen to be the respondents. A Quantitative web-based cross-sectional study was done so only students who had internet access were able to fill out the online form. Findings were anxiety and depression in health science students showed a correlation with province, internet use for education, and postponement of exams and it was also said these correlations could be common among students of other fields as well. A large-scale study covering a wider geographical area and various fields of education is necessary to further evaluate the impact of COVID-19 on (health sciences) students.

Another study conducted by Elisabeth Kohls (2021) entitled "Mental Health, Social and Emotional Well-Being, and Perceived Burdens of University Students During COVID-19 Pandemic Lockdown in Germany" pointed to examine the mental health social and emotional well-being and perceived burdens of University students during COVID-19 pandemic lockdown in Germany. A cross-sectional study was conducted online in July and August 2020 from a total of 3,382 university students in the University of Leipzig (15% of the whole population) who were chosen to be the respondents. Results were nearly half of the students (49%) reported that they are worried or very much worried about the COVID-19 pandemic. A Patient Health Questionnaire-9 (PHQ-9) sum score of 10 or above, indicating clinically relevant depressive symptoms, was reported by 37% (n = 1,249). The PHQ-9 sum score was on average 8.66 (SD = 5.46). Suicidal thoughts were indicated by 14.5% of the participants. Other aspects of lifestyle such as social and cultural activities, dating, and hobbies were reported to be negatively affected during the pandemic.

To sum it up, Stressors such as location, internet use for education, and postponement of exams, and social isolation correlates to mental health problems such as anxiety and depression. Worrying too much about the covid-19 pandemic can cause depressive symptoms and suicidal thoughts is starting to be spread among students.

Necessity of Student Support System - According to University Professional and Continuing Education Association, during this time, lives are stressed and strained by COVID-19. It is more evident than in the lives of students, staff and faculty members engaged in the transformed role of online learning. As higher education adapts to teaching and learning at a distance, the workload and the learning load of adopting a new delivery mode is taking a huge toll on the lives of those in higher education perceived to be an immense problem that is growing rapidly. The toll of the virus, isolation, increased workloads and other associated effects are rising among many students, staff and faculty members. Every institution must deal with these challenges that threaten the well-being of their constituents. The mental and emotional pressures faculty and students are experiencing can be expressed in deteriorated physical health. Anxiety and stress can lower immunity, making people prone to illness, and not just the common cold. People with high levels of self-reported distress are found to be 32 percent more likely to die of cancer and depression was found out to be associated with heart disease. These are not trivial effects. They are life altering and destructive.

Most students are feeling the strain. To a many, strain begins with the eyes and those unaccustomed to squinting at poorly adjusted computer screens in sub optimum ambient lighting are subjected to eyestrain that can have lasting effects. Ophthalmologists have suggested taking breaks from the screen reading every 20 minutes and adjusting room lighting to avoid glare and reflections. According to Ag-Ahmad, N. (2020), nursing students' psychological support and assurance can help the students to overcome stress and cope in the lockdown and perform better in their studies. Klaassen et al. (2021) stated that support from faculty was the major factor in

mediating the relationship between transition in learning and stress levels.

Elisabeth Kohls (2021) implies that universities and health care providers need to take action to continuously assess, prevent, identify, and manage mental health conditions of university students in an adequate manner, as other studies among university students in China claimed already. Sheroun et al. (2020) pointed out that students need to be given a personal space and time to focus on online learning entirely and at the same time be tolerated by the lecturers if they need more time, materials and guidance to complete their tasks. Supporting the mental health needs of online students is a critical mission for each university. The radical change in lifestyle can feed loneliness, anxiety and even lead to depression. Faculty members are now at the front line of responsibility for identifying emotional and mental health issues. No one else is monitoring the students in most cases. On campus, those students may be observed by classmates, resident advisers and other campus staff who observe students informally every day. But, online, those students often are not seen by fellow students, advisers or others. They are living in unobserved anonymity. Faculty are often the primary direct contact with online students. The COVID-19 crisis is taking a heavy toll, much of which has not been recorded. But, early on, it is clear that the stresses are disproportionately placed on the shoulders of women.

Coping Strategies and Mechanisms - Jayasankara et al. (2018) conducted a study entitled "Academic Stress and its Sources among University Students". The main objective of the study was to find if there exists academic stress among students. Further, this study was also conducted to understand if there is a gender wise and stream wise difference in academic stress reported by the participants. The total number of participants who were subjected to the analysis procedures was 336. A Quantitative Research Design in which respondents were determined through random sampling technique. It was found out that academic stress still continues to be a devastating problem affecting a student's mental health and well-being, techniques like biofeedback, yoga, life-skills training, mindfulness meditation, psychotherapy have been found to be effective in reducing stress among students and improving the holistic well-being of the student would eventually be productive not only the individual but, for the overall productivity of the institutions as well.

August et al. (2020) conducted a study entitled "Benefit Finding in the COVID-19 Pandemic: College Students' Positive Coping Strategies." The objective of the study was exploratory in nature, aimed at understanding college students' coping styles during the early stages of the COVID-19 pandemic, with a particular emphasis on benefit finding, a type of meaning-focused coping rooted in theories of stress as well as positive psychology. 63 students in two sections of a statistics for Psychology course compose of 2 first-years, 13 sophomores, 40 juniors and 8 seniors. Qualitative data were collected through a homework assignment assigned to the two sections of a statistics for psychology course. It was found out that college students in this study did extensively use benefit finding, a key strategy in meaning-focused coping, in response to their experiences with the pandemic. Benefit finding appears at some level to have acted as an effective coping strategy for participants, ultimately having an impact on their state of mental health.

Rotas and Cahapay (2021) conducted a study entitled "From stress to success: Exploring how Filipino students cope with remote learning amid COVID-19 pandemic" sought to explore how Filipino students cope with remote learning amid the COVID-19 pandemic. A qualitative research design with a descriptive approach and respondents were 32 purposely sampled Filipino university students. Conclusion was the current pandemic has pushed the students to adapt various coping strategies in order to achieve success in their academic performance despite the immense stress.

2.1 Objectives of the study

The study aims to determine the Stress Experiences and Coping Mechanisms of Science and Mathematics Students on online learning amidst the COVID-19 Pandemic of Northwestern University particularly, students in the Health-Science and Engineering departments. Specifically, it sought answer to the following questions:

➢   What is the profile of the respondents as to course, year level, age, sex, and number of sibling?

> ➢   What resources are available to students in the conduct of their online classes?

> ➢   What are the factors causing stress on online learning experienced by students in terms of internal factors and external factors?

> ➢   What coping mechanisms are employed by the respondents to overcome stress?

2.2 Research Paradigm

Figure 1 shows the research paradigm which illustrates the variables considered in this study and how they are related. The study determines the Profile of the respondents, the resources available in the conduct of the on line classes and the factors that causes stress. These variables serve as basis for determining the coping mechanisms of respondents in overcoming stress in the conduct of online class
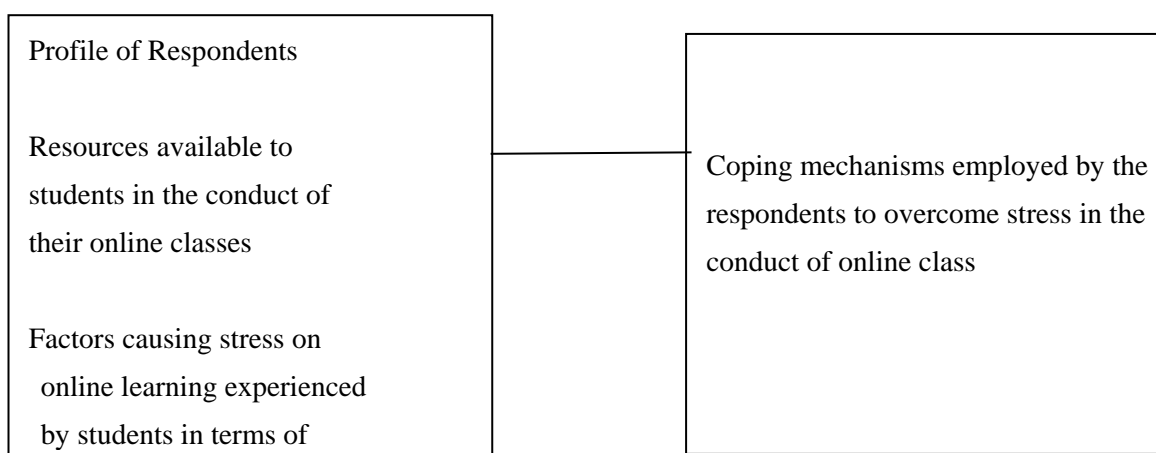
Profile of Respondents

Resources available to students in the conduct of their online classes

Factors causing stress on online learning experienced by students in terms of

Coping mechanisms employed by the respondents to overcome stress in the conduct of online class

Figure 1. Research Paradigm of the Study

3. Methodology

Research Design - The type of research used in the study is quantitative-descriptive research. Specifically, the researchers utilized the survey research approach as the main technique and strategy which helped them solve the posed problems or answer the inquiries. Survey research is the chosen type of quantitative research because it is a procedure in which researchers administered a survey to a sample or to the entire population of people to describe the attitudes, opinions, behaviors, or characteristics of the population. (Tahmina Ferdous Tanny, 2018).

Participants - This study involved the randomly selected college students of Allied Health Sciences and Engineering (CAHS) and Engineering, Architecture and Technology (CEAT) of Northwestern University. Convenience Sampling was used because of the restrictions caused by the covid-19 pandemic. The total number of students from CAHS and CEAT is 1,025. A 5% margin of error and a 95% confidence level was used to come up with a number of sample size of 280 coming from all year levels of the said colleges.

Research Instruments - The current pandemic discouraged the researchers to conduct face-to-face data collection methods. Therefore, a structured online survey questionnaire using Google Forms was utilized by the researchers to adapt to the challenge of distance data gathering. The questionnaire is composed of four categories in which the first part is to characterize the demographic information of the respondents. The second category is about available resources students use on online learning. Motivation for developing questions in category three were taken from Mayo Foundation for Medical Education and Research (2021) which specifically sought to determine the internal and external factors that causes stress. The fourth part focused on the coping mechanisms and stress management strategies of the respondents. The experts validated the content of the questionnaire before it was floated to the respondents by the researchers to ensure objectivity, appropriateness, and relevance.

Data Analysis - The following statistical procedures were used to interpret data gathered from the respondents of the study. Demographic profile variables of the respondents used simple percentage by organizing the frequency and total number of respondents. Likert Scale. The following Likert Scale serves as the guide for interpreting the data gathered by calculating for the weighted mean of each table in the questionnaire answered by the respondents.

4. Results

Table 1

Demographic Profile of the Respondents

| College	Frequency	Percentage (%)
College of Allied Health Sciences	160	78
College of Engineering, Architecture and Technology	44	22
Year Level		
First year	48	24
Second year	33	16
Third year	61	30
Fourth year	62	30
Age		
17-20	81	39.7
21-24	104	50.98
25-28	6	2.94
29-32	6	2.94
33-36	2	0.98
37-40	3	1.48
41-44	2	0.98
Sex	Frequency	Percentage (%)
Female	132	65%
Male	68	33%
Prefer not to say	4	2%
Number of Siblings	Frequency	Percentage (%)
None	27	13%
1	38	19%
2	59	29%
3	41	20%
4	22	11%
5	8	4%
More than 5	9	4%

Table 1 shows the demographic profile of the respondents in which majority are from the College of Allied Health Sciences with 160 (78%) and 44 (22%) are from the College of Engineering, Architecture and Technology. For the year level, the number of respondents has been dominated by the third year and fourth year students with both 61 (30%) and 62 (30%) students, respectively. Followed by the first year students with 48 (24%) and last are the second year students with 33 (16%). Majority of the respondents are at the age of 21-24 with 104 (50.98%), followed by respondents from 17-20 of age with 81 (39.7%). The rest are around 25 to 44 years of age with a total of 19 (9.32%) respondents. Out of the 204 respondents, 132 are female and 68 are males. Also, 4 did not disclose their sexuality. For the last category, 27 (13%) are the only child and 38 (19%) has a sibling. 59 (29%) of them has two siblings and 41 (20%) has three. 22 (11%) has four siblings and those who have five siblings, there are 8 (4%) of them. Lastly, 9 (4%) respondents have more than 5 siblings.

Table 2 illustrates what resources are available for the respondents in the conduct of their online classes. Mobile phones (android or apple) is the most common to the respondents with 49 (24%) of them using it; followed by laptops with 38 (19%) out of the 204 respondents having this material; 33 (16%) has cabled internet connection and 28 (14%) are using wifi/data connection; 23 (11%) respondents rely on other learning materials such as textbooks, dictionaries and encyclopedias; 17 (8%) have tablets and 14 (7%) has at least a desktop computer or are using radios. The least materials available for the respondents during the conduct of their online learning are the newspapers with 6 (3%) using those and having a mobile phone (analog) with 7 (3%) of them as

well as magazines with 4 (2%) of them using such material.

Table 2

Resources available to students in the conduct of their online classes
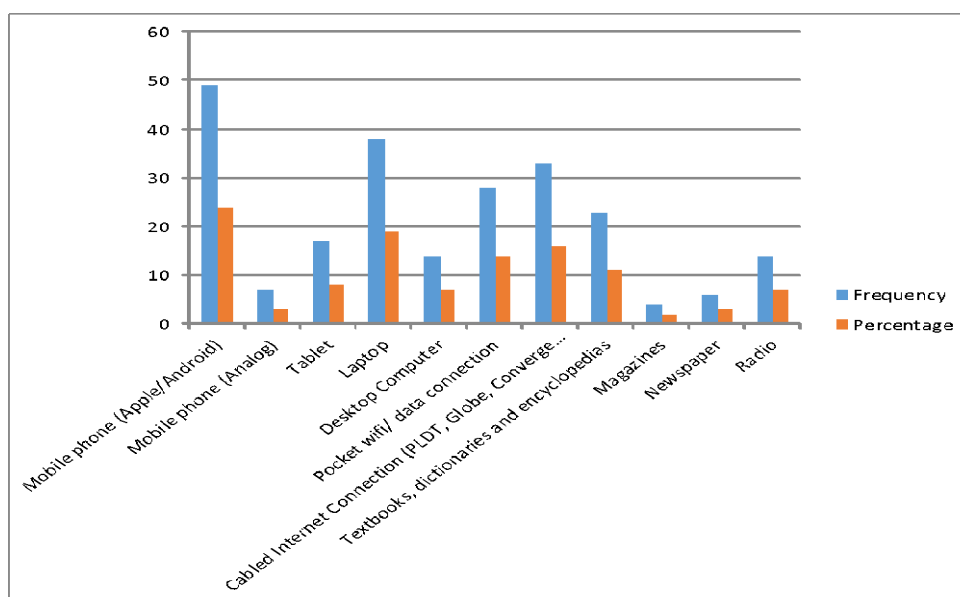
Table 3

Factors causing stress on online learning experienced by students

Factors	WM	VI
Internal Factors		
1. Inability to accept uncertainty	2.54	Sometimes
2. Pessimism	2.52	Sometimes
3. Negative self-talk	2.51	Sometimes
4. Unrealistic expectations	2.66	Sometimes
5. Rigid thinking, lack of flexibility	2.41	Seldom
6. All-or-nothing attitude	2.41	Seldom
7. Need to always be perfect	2.54	Sometimes
Component Mean	*2.51*	*Sometimes*
External Factors		
1. Major life changes, such as death of a loved one, separation of parents, failing grade, losing scholarships	2.53	Sometimes
2. Work or school	2.78	Sometimes
3. Relationship difficulties	2.3	Seldom
4. Financial worries	2.9	Sometimes
5. Being too busy	2.82	Sometimes
6. Children and family	2.26	Sometimes
Component Mean	*2.60*	*Sometimes*
Overall Weighted Mean	*2.55*	*Sometimes*

Legend: 3.26-4.00=Always; 2.51-3.25=Sometimes; 1.76-2.50=Seldom; 1.00-1.75=Never

Table 3 shows students' perceived stress on both internal and external factors that cause them stress during their online learning. For internal factors, rigid thinking, lack of flexibility and all-or-nothing attitude with 2.51 weighted mean seldom occur to them. As for the rest with a range of weighted mean from 2.51 to 2.66: Inability to accept uncertainty, pessimism, negative self-talk, unrealistic expectations and the need to always be perfect sometimes felt by the respondents. These internal factors indicate that students are susceptible and may succumb to anxiety and depression which enervate their mental capacity that can cause some academic failure. Aligned to Ribeiro et al. (2017) in their study entitled "Stress and Quality of Life among University Students: A Systematic Literature Review" where quality of life was frequently negatively associated to stress and factors as insomnia and burnout were also associated with its deterioration.

For external factors, all the factors perceived sometimes affect their online learning such as major life changes, like death of a loved one, separation of parents, failing grade, losing scholarships with 2.53 weighted mean, work or school matters having 2.78 weighted mean, a 2.3 weighted mean on relationship difficulties, financial worries has the highest with 2.9 weighted mean, being too busy has a 2.82 weighted mean and being disturbed by their children and family has a 2.26 weighted mean. Such factors are contributors to students' mental health stressors which may also cause some academic failure parallel to the study of Sharma et al. (2020) entitled "Addressing the Covid-19 Burden on Medical Education and Training: The Role of Telemedicine and Tele-Education During and Beyond the Pandemic" where students from vulnerable backgrounds are influenced by environmental factors such as unemployment of themselves and family members, lack of or inequity in provision and access to educational technologies and remote delivery-platforms, and increased levels of mental health stressors due to prolonged isolation and self-quarantine measures.

Table 4

Coping mechanisms employed by the respondents to overcome stress

Coping Mechanism		WM	Verbal Interpretation
1. I use internet/TV/music to relax.		3.39	Much
2. I joke with my friends and use humor to take the edge off.		2.97	Much
3. I seek out friends for conversation and support.		3.04	Much
4. I try to focus on the things I can control and accept the things I can't.		3.20	Much
5. I take a little time to relax, breathe, and unwind.		3.46	Much
6. I maintain a healthy diet.		2.70	Much
7. I get involved in a hobby or interest that help me unwind and enjoy myself.		3.16	Much
8. I take some time off and get away from school works.		2.94	Much
9. I change my outlook and put it in better perspective.		3.13	Much
10. I just ignore the problem and hope it will go away.		2.68	Much
11. I ignore my own needs and just work harder and faster.		2.79	Much
12. I pray, meditate or enhance my spiritual life.		3.47	Much
13. I go out shopping and buy something to make myself feel good.		2.56	Much
14. I confront my source of stress and work to change it.		2.92	Much
15. I sleep more than I really need to.		2.70	Much
16. I get irritable and take it out on those around me.		2.40	Little
17. I withdraw emotionally and just go through the motions of the day.		2.56	Much
18. I worry about the problem and am afraid to do something about it.		2.62	Much
19. I engage in some type of physical exercise.		2.60	Much
20. I eat more than usual.		2.69	Much
21. I take medicine to help me relax or sleep better.		1.70	Little
22. I smoke a cigarette or drink a caffeinated beverage.		1.65	Little
	Total	2.79	Much

Legend: 3.26-4.00=Great Deal; 2.51-3.25=Much; 1.76-2.50=Little; 1.00-1.75=Never

Table 4 shows the coping mechanisms employed by the respondents to overcome stress. Coping mechanisms such as smoking a cigarette or drink a caffeinated beverage has the lowest weighted mean with 1.65 and a verbal interpretation of "Little" which then suggest that having vices are not recommended as coping mechanisms. Other verbal interpretation of "Little" are taking medicine to help their selves relax or sleep better with 1.70 weighted mean and getting irritated and taking it on those around that surrounds the respondents with 2.4 weighted mean. All the rest coping mechanisms that have been shown has a verbal interpretation of "Much" with the least weighted mean for this verbal interpretation having a 2.56 for both withdrawing emotionally and just go through the motions of the day and going out for shopping and buy something to make them feel good. The highest weighted mean lies in praying, meditating or enhancing their spiritual life with 3.47, followed closely by taking a little time to relax, breathe, and unwind with 3.46 weighted mean.

Based on these data, the researchers then found that being spiritually active, praying to the omniscient and sharing all the worries can help reduce the stress and focus in their academics. It is also found out that going somewhere to relax and unwind can also reduce the pressure the students are experiencing in their online learning. Aligned to Yaw Kwaah & Essilfie (2017) in their study, "Stress and Coping Strategies among Distance Education Students at the University of Cape Coast, Ghana", where multiple coping strategies were used such as

praying or meditating, self-distracting activities like listening to music and having an emotional and instrumental support from family, friends and lecturers.

5. Conclusion

After analysis and interpretation of data gathered, the researchers came up with the following conclusions: Having mindsets like being pessimistic, negative self-talk, having unrealistic expectations or being too worried, some financial worries and work or school matters are some of the major causes of stress. The lack of flexibility and having relationship difficulties of the respondents seldom occurs. This shows how formidable the respondents are when it comes to adjusting to situations. For the coping mechanisms employed by the respondents, praying, meditating or enhancing spiritual life and taking a little time to relax, breathe and unwind as well as using the internet or television to relax are the most common ways to overcome stress on their online learning.

5.1 Implications and Future Research Directions

Relative to the findings and conclusions of this study, the following recommendations are suggested. Parents as well as learners must be able to create a conducive, online environment to alleviate the stress students are experiencing. Students' siblings must not be of disturbance to them during their online learning so that the students can focus on the lessons. In addition, students may develop a time management schedule for their online learning to have time to enjoy other things like having a family time during weekends. On the part of the teachers, they may take into consideration the amount of requirements they give to students so as not to add stress to learners. The Guidance office may adopt programs and activities related to students' mental health and how to dope with stress related to on line learning.

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