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Students' Time Management, Academic Procrastination, and Performance during Online Science and Mathematics Classes

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Abstract. COVID-19 affected all sectors, including academia, which resulted in an increase in online learning. While education continued through online platforms, various students-related problems arose, including improper time management, procrastination, and fluctuating academic performance. It is in this context that this quantitative study was carried out to determine how time management and procrastination affected students' performance in science and mathematics during the pandemic. We surveyed 650 Filipino high school students using the Procrastination Assessment Scale-Students and Wayne State University's Time Management questionnaire with a 0.93 reliability coefficient. The findings revealed that in science and mathematics, female students outperformed males. Eleven 12-year-olds had the highest mean grades in science and mathematics, while 15 16-year-olds had the lowest. Younger respondents (11-14) were more likely to have better time management in than older ones. Further, older respondents (15-18) procrastinate more than younger ones. Time management correlates positively with success in science and mathematics. Achievement in science and mathematics is the highest among students with good time management. Procrastination negatively affects achievement. High school students who procrastinated less fare better in mathematics. With this, the study opens possibilities for teaching older learners in time management to boost their performance. Students across ages should be urged to avoid procrastinating as it negatively affects academic performance. As reinforcement, schools may educate learners on time management and procrastination avoidance through orientations and other platforms.

Keywords: online learning; academic performance; time management; academic procrastination; pandemic

1. Introduction

Students stayed inside their homes because of the coronavirus 2019 (COVID-19). In this regard, the learners took their classes online had less resources and participated in class less frequently. Thus, their ability to communicate and adapt was hampered (Demuyakor, 2020). The use of technology in education, such as online learning, encourages interactive classrooms, increase access to resources, and enhances student participation. A person's strength to manage his or her time online is a predictor of success (Shepperd, 2002). According to statistics, time management, the ability to multitask, and setting one's own pace are all linked to higher job quality. Time management enhances grades. Students are easily distracted by online learning (Batbaatar, 2021). Distractions, social media, poor internet connections, and mental health difficulties are some of the factors that are blamed for poor academic achievement. Students put off finishing their schoolwork because they lack motivation, which is an unacceptable response to chores that they find unpleasant (Naturil-Alfonso et al., 2018; Parantika, et al., 2020). Academic procrastination can be predicted based on factors such as organization, self-control, planning, and monitoring. Student achievement demands effective time management, which is something that students need to acquire in order to be successful. Managing one's time well is necessary for effective performance (Alay & Kocak, 2003). The key to efficient management of one's time is to organize one's tasks in descending order of importance and spend less time on those that are not as essential to achieving one's objectives (DeBeliso et al., 2022). Ineffective time management can affect both the social and academic life of a student. The ability to manage time effectively has an impact on mental capacity, stress, and performance (Ahmad, 2020). It is alarming that some online science and math teachers claim their pupils cannot finish their assignments on time. Students who struggle in school do not lack motivation; rather, they lack structure and attentiveness. If they do not do that, they will end up loathing their tasks, putting off their chores, procrastinating, and missing their deadlines. In this study, the academic accomplishments of online students in the fields of science and mathematics are analyzed. Lessons about time management can be found online. Students' performance suffers when there is poor time management. The ability to better manage one's time online may contribute to increased academic success.

2. Literature Review

We reviewed the literature to identify theories and studies on the academic dilemma, academic performance, time management, and procrastination during the conduct of online classes as a result of the COVID-19 pandemic.

Academic Dilemma during COVID-19 Pandemic

When COVID-19 struck the academic world, a shift toward online learning became prevalent. Knowing how to use new information and communication technologies is becoming increasingly crucial as these fields continue to advance in ways that are beneficial to humanity. Internet networks opened up new doors of opportunity for educators, and in-person teaching has mostly been replaced by online instruction (Bernard et al., 2009). Several studies have investigated how the use of technology can boost academic achievement. Pupils can benefit from

learning online. However, concerns have been raised about students' access to the internet in rural locations (Kulal & Nayak, 2020). Some of the students struggle to adjust to new situations. Different students have different ways of adapting to new learning (Harefa & Sihombing, 2021). When schools were shut down, the majority of teachers were forced to make significant adjustments. Even though many people felt unprepared for online study, it was the only choice available. Students were required to adapt and discover meaning in this time of pandemic. Students who were impacted by this new strategy were required to grasp the material. Students were also called to re-adapt their coping methods in the areas of motivation, emotional regulation, physical regulation, and time management.

Academic Performance during COVID-19 Pandemic

COVID-19-related literature grew quickly. Online learning and its implementation changed students' lives. Their problems were social, psychological, and academic. Research indicated that the pandemic negatively affected students' performance, especially in math and science. Only using familiar online learning tools improved proficiency. These favorable impacts appeared only with increased use of online learning software (Žnidaršič et al., 2022). During the pandemic, many had problems understanding coursework. Students complained about lessons, materials, and homework (Tezer et al., 2021). As a result, learners' academic performance declined (Soysal et al., 2022). A science teacher confessed that the limited skill on navigating various digital tools makes science pedagogy as well as makes science pedagogy and education in the context of the new normal tougher or more difficult, resulting in trouble following instructions among learners (Geverola et al., 2022). According to Capinding (2022), children stress over science and math advancement. Even when taught online and not assessed, students have an unfavorable opinion of these disciplines. Experiments and issues stress them out and freeze their brains. Treceñe (2022) said COVID-19 was difficult as students faced several obstacles with online learning. Their grades suffered. Various researchers showed that COVID-19 negatively affected students' academic achievement (Pagaran et al., 2022).

Managing Time during the COVID-19 Pandemic

When analyzing ways to boost students' academic performance, appropriate management of a person's time is undeniably a significant factor to take into account (Miertschin et al., 2015). Proper management of one's time is considered an essential strength for students to cultivate if they wish to boost their academic performance and progress. Students are expected to be able to make effective use of their time, which requires them to create and adhere to a schedule, delegate responsibilities, and make use of a variety of other time-management strategies (Desmond et al., 2022). On the other hand, a lot of people can have trouble effectively managing their time, which would prevent them from attaining the goals that they have set for themselves. This is due to a variety of factors, including difficulties at home, in the classroom, and in the wider community. Students regularly mismanage time devoted to academic work, which is relatively prevalent among students, which is sometimes caused, at least in part, by students' inability to properly manage their time (Ocak & Boyraz, 2016).

Academic Procrastination during COVID-19 Pandemic

Procrastination in the classroom refers to the act of putting off essential work to such an extent that it results in lateness, discomfort, and other negative outcomes (Solomon & Rothblum, 1988; Narci, 2022). According to studies, students frequently put off doing their homework, which has a negative impact on their results (Steel, 2007). Learners can enhance their grades and outputs in the classroom as well as in their personal lives if they learn to avoid procrastinating (Laurie & Hellsten, 2002). Students frequently put off doing their work because they are unable to organize their time effectively, they dislike having to do the work, and they are anxious about the future. They are unable to organize their work in a way that makes sense to them, so they put things off and get side-tracked. Students who were under the impression that they were to blame for their poor academic performance were found by Gargari et al. (2011) to engage in less procrastination. According to Noran (2000), a person who engages in procrastination is one who is confident on his or her strength to pursue all tasks effectively, plans to do so, and then fails, or delays it excessively before transferring their attention to other interesting pastimes. Although not all students are good at it, hence oftentimes, many of them experience struggle and worse failure in many learning areas (Rabin et al., 2011).

3. Research Objectives

This study focuses on (1) determining the profile (academic, sex, and age) of the respondents in science and mathematics; (2) differentiating the time management and procrastination profile of high school students during online learning when grouped according to their sexes and ages; and (3) identifying how time management and procrastination are related to high school students' academic performance in science and mathematics during pandemic.

4. Methods

This section presents the study design, research instrument with its validity and reliability report, data gathering procedures, statistical evaluation, and the scope and limitations of the study.

4.1. Design

This study measures and analyzes survey data quantitatively. The researchers determined the numerical value and revised the Wayne State University's 26-item procrastination questionnaire (PASS). This online survey was administered to 650 randomly selected high school science and mathematics students in the Philippines.

Table 1: The respondents' sociodemographic characteristics

Variables	Category	Count	Percent
Sex	Female	392	60.31%
	Male	258	39.69%
Age \bar{x} =14.89 SD=1.68	11-12	77	11.85%
	13-14	157	24.15%
	15-16	294	45.23%
	17-18	122	18.77%

4.2. Research Instrument

Researchers used 25 statements from the revised 2014 Wayne State University's Instrument. Using Likert scale, they scored each indicator (0-Never, 1-Sometimes, 2-Frequently, 3-Always). The researchers gave range and the 2013 Bocar-adapted description to enhance understanding.

Table 2. Bocar-adapted (2013) qualitative description

Value	Range	Description	Interpretation
0	0 - 38	Never	Due to difficult and less pleasurable science and math classes, respondents' time management skills should be enhanced.
1	39 - 51	Sometimes	Respondents' science and math studies will be unpleasant and less fulfilling if they don't manage their time.
2	52 - 63	Frequently	Respondents can manage time, yet feel overwhelmed sometimes.
3	64 - 75	Always	Respondents can manage time in science and math classes.

The second section of the Procrastination Assessment Scale—Students (PASS) (Solomon & Rothblum, 1988) was modified, which gives a procrastination scenario and possible excuses. The second section reviews 13 academic procrastination factors (2 items for each reason). These 13 factors fall under three categories: (1) Fear of failing, (2) Task aversion, and (3) Low frustration.

4.3. Validity cum Reliability of Instruments

To avoid vagueness and unreliability, the scales were pilot-tested to the laboratory high school students of the researchers. Applying Cronbach's Alpha ensures internal consistency among the items. Students (31) were examined on the Procrastination Assessment Scale-Students and on the questionnaire adapted from the Wayne State University. Students were questioned about any problems they encountered with the scales' English statements. This group's Cronbach's alpha reliability coefficient was 0.93, which indicates high internal consistency.

4.4. Data Gathering Procedures

Researchers invited teachers to administer the online questionnaire to respondents to ensure its completion, while observing confidentiality. Answers were tallied, analyzed, and interpreted.

4.5. Statistical Evaluation

Utilizing percentage, mean, and standard deviation (SD), the data set were evaluated and analyzed. Through the utilization of Pearson Product Moment Correlation, the link between science and mathematics proficiency, time management, and academic procrastination were determined and established. To compare academic procrastination and time management by sex and age the researchers used One-way Analysis of Variance (ANOVA).

4.6. Scope and Limitation

This study is only limited to determining the time management and procrastination of the science and mathematics secondary school students in Central Luzon area of the Philippines.

5. Results and Discussions

The current study profiled the students, focusing on their gender, age brackets, and academic performances (final grades) in the said learning areas. To determine the said profile, descriptive statistics (mean and SD) were utilized, and reported in Table 3.

Table 3. Profile of the students in Science and Mathematics

Profile	Final Grade in Science		Final Grade in Mathematics	
	Mean	SD	Mean	SD
Sex				
Female	89.94	6.29	89.38	4.87
Male	88.40	5.02	87.84	5.31
Age				
11-12	91.49	3.23	91.00	3.72
13-14	89.29	4.62	89.12	4.77
15-16	88.71	5.26	87.61	5.12
17-18	89.48	8.91	89.70	5.56
Overall	89.33	5.86	88.77	5.11

Table 3 shows a close difference between the overall mean grades of the respondents in science ($\bar{x}=89.33$, $SD=5.86$) and mathematics ($\bar{x}=88.77$, $SD=5.11$). Considering their sexes, female students ($\bar{x}=89.94$, $SD=6.29$) surpass the overall average in science grades. Meanwhile, males ($\bar{x}=88.40$, $SD=5.02$) achieved lower than females, as shown in their science mean grades lower than the overall average. Seeing their grades in mathematics, female students ($\bar{x}=89.38$, $SD=4.87$) still receive higher mean grades than the overall average in mathematics. On the other side, male students ($\bar{x}=87.84$, $SD=5.31$) received a mathematics mean grade below the overall average. Based on the results revealed by Pilotti et al. (2022), males performed significantly better in online mathematics and science classes than their female counterparts. Vooren et al. (2022) discovered that women who had superior grades in mathematics while they were still high schoolers had lower chances of specializing in STEM-related fields compared to men who had equivalent ratings. This was the case even if both genders had similar grades. The findings of this current study reveal, contrary to the findings of a great number of academics, that the performance of female respondents in the areas of science and mathematics is superior to that of male respondents. In a similar vein, one study compared the attitudes of students as well as their academic performance in STEM-oriented classes. The results showed that girls outperformed males (Ahmad et al., 2022).

In view of their age brackets, the age group of 11-12, which usually covers students at Grade 7 or Grade 8 levels, received the highest mean grades in science ($\bar{x}=91.49$, $SD=3.23$) and in mathematics ($\bar{x}=91.00$, $SD=3.72$), both being higher than their respective overall averages. These figures show that the youngest among the

respondents are high achieving in science and mathematics compared to the older respondents. The educators were able to perceive the educational obstacles that are dependent on the ability to solve them, and they maintained the opinion that younger learners have superior numerical and scientific skills than those of older learners, as postulated by Gagnier et al. (2022). Conversely, the age group of 15-16, that usually comprises Grade 9 or Grade 10 students, had the lowest mean grades in science ($\bar{x}=88.71$, $SD=5.26$) and in mathematics ($\bar{x}=87.61$, $SD=5.12$), both being lower than their respective averages. These results indicate that the respondents who are approaching the end of their time in junior high school have a lower level of achievement in science and mathematics than the respondents who are younger. In line with the data presented here, the younger children of the same age group and grade level consistently demonstrated better levels of success (Al-Balushi et al., 2022).

This study also focused on distinguishing between the practices of high school learners focusing on how they manage their time and how they commit procrastination while being registered to online learning, while taking into account the participants' ages as well as their genders. In order to differentiate the aforementioned variables when they were grouped according to their ages and sexes, One-way ANOVA tests were conducted at a significance level of 5%. Additionally, there were certain preliminary tests performed to ensure the assumptions were met, such as for normality and homogeneity of variances. There was no significant violation of these assumptions. The disparities between the male and female respondents' approaches to time management and academic procrastination are outlined in Table 4. Table 5 displays the disparities between students who are younger or older than the mean age in terms of their ability in managing and balancing their time well and avoiding procrastinating.

Table 4. Differences on students' time management and academic procrastination when grouped according to sexes

Variable	Group	Mean	SD	df	F	p
Time Management	Female	2.122	0.502	1, 649	0.111	0.739
	Male	2.110	0.572			
Academic Procrastination	Female	3.284	0.667	1, 649	0.067	0.796
	Male	3.300	0.780			

As shown in Table 4, there is insufficient evidence to draw conclusions as regards the existence of significant differences relative to the respondents' sexes in respect of time management ($F_{(1,649)}=0.111$, $p>0.05$) and academic procrastination ($F_{(1,649)}=0.067$, $p>0.05$). This set of data clearly shows that students of both sexes, regardless of how they perceive themselves in relation to academic procrastination scenarios and how well they manage their time are of the same statistically. average. Similarly, procrastination affects the behavior of students, and this is true, independent of gender or educational setting (Fentaw et al., 2022). Njuguna (2022) came to the same conclusion and stated that gender did not influence either time management or procrastination. In addition, the degrees of academic procrastination and time management are the same regardless of whether or not the individual engages in sexual activity or spends time in front of a screen (Garcia et al., 2022).

Table 5. Differences on students' time management and academic procrastination when grouped according to ages

Variable	Group	Mean	SD	df	F	p
Time Management	Below the mean age	2.238	0.511	1, 649	19.499**	0.000
	Above the mean age	2.049	0.529			
Academic Procrastination	Below the mean age	3.214	0.745	1, 649	4.201*	0.041
	Above the mean age	3.333	0.692			

Note: * $p < 0.05$

** $p < 0.01$

A noteworthy difference was found in the respondents' time management while being categorized based on their ages ($F_{(1,649)}=19.499$, $p < 0.01$), as shown in Table 5. Statistically, younger respondents ($\bar{x}=2.238$, $SD=0.511$) aged 11-14 are most likely to have better time management in studying science and mathematics compared to the older ones ($\bar{x}=2.049$, $SD=0.529$). In this context, Hinderliter et al. (2022) discovered that the fact that adult learners struggle to juggle their academic calendar suggests that they struggle in view of efficiently managing their time because of the increased amount of work required of them. In addition, Migliozi (2022) stated that the inability to manage one's time efficiently is a major problem, particularly for older students who choose to work part-time during the pandemic in order to satisfy their financial obligations, while other students have numerous jobs.

Table 5 also shows a notable difference in the respondents' academic procrastination when arranged based on their ages ($F_{(1,649)}=4.4201$, $p < 0.05$). On average, older students ($\bar{x}=3.333$, $SD=0.692$) aged 15-18 have high tendencies to procrastinate while studying science and mathematics compared to the younger ones ($\bar{x}=3.214$, $SD=0.745$). Xu (2022) found that senior pupils in secondary school demonstrated less dedication to performing tasks regularly, which indicated procrastination to focus on other subjects. In a related study, De Paola et al. (2022) found that there was a correlation between the higher-level student's level of difficulty and their failure to keep a consistent study schedule. This helps to explain why learners at higher level are more prone to put off doing their assignments until the last time.

Researchers used a series of bivariate correlation analyses and Pearson's product moment coefficient (Pearson's r) calculations to reveal the nature of the link between students' time management and academic procrastination and their performance in science and mathematics during this pandemic. Table 6 shows the findings of various statistical analyses.

Table 6. Relationship of high school students' time management and academic procrastination toward the academic performance in Science and Mathematics during pandemic

Variables	Academic Performance in Science	Academic Performance in Mathematics
Time Management	0.225**	0.288**
Academic Procrastination	-0.079*	-0.111**

Note: * $p < 0.05$ (2-tailed) ** $p < 0.01$ (2-tailed)

Based to the results shown on the Table 6, there is a very substantial positive correlation on the learners' time management and academic performance in science ($r=0.225$, $p<0.01$). According to the statistics, students who believe they have an easier time managing their time are likely to have an overall superior performance in science. According to the findings of Lopez-Agudo and Marcenaro-Gutierrez (2022), students' performance in both science and mathematics peaks substantially when their time is allocated effectively. According to the findings of Karagiannopoulou et al. (2022), students in the sciences who have better time management and scheduling report improved academic performance and learning. Similarly, a highly significant positive link was discovered between the respondents' strength to balance and manage well both their time and academics, and their success in mathematics as a learning area ($r=0.288$, $p<0.01$). Students who successfully control their time schedule are statistically more reasonable to perform well in mathematics than others who struggle with this skill. In support of this idea, de Vera et al. (2022) made the prediction that a student's performance in mathematics would improve if the students were instructed on how to efficiently schedule their time to accomplish increasingly complex mathematical activities.

Meanwhile, bivariate correlation analysis shows substantial negative correlation on the students' academic procrastination and performance in science ($r=-0.079$, $p<0.05$). This implies that students who have a lower perception of their own procrastination levels in relation to their academic work are more likely to have higher accomplishment in science. According to the data revealed by Al-Bahrani et al. (2022), decreasing the number of point rewards given to the students who procrastinate leads to the improvements in those students' academic outcomes in their mathematics and science courses. According to bin Mohammed Al-Subaie (2022), students majoring in the humanities are more likely to procrastinate in their work than students majoring in mathematics or science, which leads to more extensive academic reports. Further, a highly significant negative correlation exists on the learners' academic procrastination and academic accomplishment in mathematics ($r=-0.111$, $p<0.01$). This suggests that students who are less prone to putting their schoolwork off until the last minute of their submission are more likely to obtain better grades in mathematics. In addition, Winanda et al. (2022) provided evidence that supported the findings presented here in this study, by demonstrating that students who were enrolled in academic tracks other than science and mathematics were more likely to engage in academically detrimental behaviors such as procrastination and perform poorly in their respective classes. When students refrain from putting off their work in favor of completing it all before the deadline, they see an improvement in their marks in both mathematics and science (Shaked & Altarac, 2022).

6. Conclusion

We aimed to find the connection between time management and procrastination toward high school students' academic performance in science and mathematics in Central Luzon, Philippines, during the pandemic. In science and mathematics, female learners had a higher total average score than male learners. The youngest

age bracket, 11-12, had the greatest mean science and mathematics grades, while the oldest age bracket, 15-16, had the lowest mean science and mathematics grades. A highly significant difference in their time management demonstrates that younger respondents are more likely to have superior time management in studying science and mathematics than older respondents. Procrastination is prevalent among the older student population. Students with effective ways and practices for managing time are leaning towards excellence in science and mathematics. This demonstrates that when time is handled and allocated effectively, students in the sciences report improved academic performance and learning. Nonetheless, a considerable negative correlation on academic procrastination and science and mathematics performances was evident. This suggests that pupils with a lower propensity for academic procrastination are likely to perform better in science and mathematics. For future studies, a systematic method to encourage time management, particularly among older students, should be incorporated into their training thus enhancing mathematics and science performances. Similarly, young and elderly students alike should be regularly advised to prevent procrastination, which obstructively clashed their performances in the aforementioned subject areas. In the future, academic institutions may also consider incorporating time management and procrastination avoidance into their class orientations as a means of reinforcement and program development.

7. References

- Ahmad, S., Batool, A., & Ch, A. H. (2020). Path relationship of time management and academic achievement of students in distance learning institutions. *Pakistan Journal of Distance and Online Learning*, 5(2). <http://journal.aiou.edu.pk/journal1/index.php/PJDOL/article/view/441/89>
- Ahmad, S., Sultana, N., & Jamil, S. (2022). Students' Attitude towards Biology and Academic Achievement in Biology at Secondary Level, in Islamabad, Pakistan. *American Journal of Educational Research*, 10(5), 268-275. <https://doi.org/10.12691/education-10-5-1>
- Alay, S., & Kocak, S. (2003). Relationship between time management and academic achievement of university students. *Journal of Educational Management in Theory and Practice*, 35, 326-335. <https://doi.org/10.1177/014572179902500411>
- Al-Balushi, S. M., Al-Harthy, I. S., & Almehrizi, R. S. (2022). Attention Drifting Away While Test-Taking: Mind-Wandering in Students with Low-and High-Performance Levels in TIMSS-Like Science Tests. *International Journal of Science and Mathematics Education*, 1-22. <https://doi.org/10.1007/s10763-022-10258-6>
- Al-Bahrani, A., Apostolova-Mihaylova, M., & Marshall, E. C. (2022). Helping some and harming others: Homework frequency and tradeoffs in student performance. *The Journal of Economic Education*, 53(3), 197-209. <https://doi.org/10.1080/00220485.2022.2075506>
- Batbaatar, N., & Amin, G. (2021). Students' time management during online CLASS. In *International Conference Universitas Pekalongan 2021* (Vol. 1, No. 1, pp. 189-194). <https://proceeding.unikal.ac.id/index.php/icunikal2021/article/view/627>
- Bernard, R. M., Abrami, P. C., Borokhovski, E., Wade, C. A., Tamim, R. M., Surkes, M. A., & Bethel, E. C. (2009). A meta-analysis of three types of interaction treatments in distance education. *Review of Educational Research*, 79(3), 1243-1289. <https://doi.org/10.3102/0034654309333844>
- bin Mohammed Al-Subaie, A. (2022). Academic Procrastination and Metacognitive Strategies Among Prince Sattam Bin Abdulaziz University Students. *Journal of*

- Positive School Psychology*, 6(8), 7601-7610.
<https://journalppw.com/index.php/jpsp/article/view/11109>
- Bocar, A., & Daga-ang, MG (2013). Time management of work scholars.
<https://www.researchgate.net/publication/270566011>
- Capinding, A. T. (2022). Impact of Modular Distance Learning on High School Students Mathematics Motivation, Interest/Attitude, Anxiety and Achievement during the COVID-19 Pandemic. *Impact of Modular Distance Learning on High School Students Mathematics Motivation, Interest/Attitude, Anxiety and Achievement during the COVID-19 Pandemic*, 11(2), 917-934. <https://doi.org/10.12973/eu-jer.11.2.917>
- DeBeliso, M., Gauthier, H., Sevene, T., Adams, K. J., Lawrence, M. M., Climstein, M., ... & Navalta, J. W. (2022). The time management matrix re-tooled: an instrument for academics navigating the tenure process. *International Journal of Multidisciplinary Perspectives in Higher Education*, 7(1), 31-51.
https://researchportal.scu.edu.au/discovery/delivery/61SCU_INST:ResearchREpository/991012998198802368#1395510230002368
- Demuyakor, J. (2020). Analysis of social media utilization by students in higher education: A critical literature review of Ghana. *Journal of New Media and Mass Communication*, 6(1), 1-7. <https://doi.org/10.18488/journal.91.2020.61.1.7>
- Desmond, A., & Amadi, K. (2022). Influence of Time Management on academic performance of Business Education Students in Universities in Rivers State. *Journal homepage: www.ijrpr.com ISSN, 2582, 7421.*
<https://ijrpr.com/uploads/V3ISSUE6/IJRPR5096.pdf>
- de Vera, J. V., Peteros, E. D., Peconcillo Jr, L. B., Alcantara, G. A., Villarín, E. R., & Fulgencio, M. D. (2022). Assessing differences on students' attributes in mathematics based on their learning sessions. *Open Journal of Social Sciences*, 10(3), 170-185. <https://doi.org/10.4236/jss.2022.103012>
- De Paola, M., Gioia, F., & Scoppa, V. (2022). Online teaching, procrastination and students' achievement: evidence from COVID-19 induced remote learning.
<http://dx.doi.org/10.2139/ssrn.4114561>
- Fentaw, Y., Moges, B. T., & Ismail, S. M. (2022). Academic Procrastination Behavior among Public University Students. *Education Research International*, 2022.
<https://doi.org/10.1155/2022/1277866>
- Gagnier, K. M., Holochwost, S. J., & Fisher, K. R. (2022). Spatial thinking in science, technology, engineering, and mathematics: Elementary teachers' beliefs, perceptions, and self-efficacy. *Journal of Research in Science Teaching*, 59(1), 95-126.
<https://doi.org/10.1002/tea.21722>
- Garcia, M. I., Carraig, D. J., Carator, K., Oyco, M. T., Tababa, G. A., Linaugo, J., & De Oca, P. R. (2022). The Influence of Gadget Dependency on the Academic Procrastination Levels of Grade 12 STEM Students. *International Journal of Multidisciplinary: Applied Business and Education Research*, 3(6), 1197-1210.
<https://doi.org/10.11594/ijmaber.03.06.22>
- Gargari, R. B., Sabouri, H., & Norzad, F. (2011) Academic procrastination: The relationship between causal attribution styles and behavioral postponement. *Iranian Journal of Psychiatry and Behavioral Sciences*, 5(2), 76-82.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3939975/>
- Geverola, I. J. R., Mutya, R. C., Siason, L. M. B., & Bonotan, A. (2022). Challenges and struggles of public senior high school science teachers during the new normal. *Journal of Research, Policy & Practice of Teachers and Teacher Education*, 12(1), 49-68.
<https://doi.org/10.37134/jrpptte.vol12.1.4.2022>
- Harefa, S., & Sihombing, G. L. A. (2021). Students' perception of online learning amidst the Covid-19 pandemic: A study of junior, senior high school and college students in a remote area. *F1000Research*, 10.
<https://doi.org/10.12688/f1000research.52152.2>

- Hinderliter, H., Xie, Y., Ladendorf, K., & Muehsler, H. (2022). Path Analysis of Internal and External Factors Associated with Parental Satisfaction over K-12 Online Learning. *Computers in the Schools*, 38(4), 354-383. <https://doi.org/10.1080/07380569.2021.1988319>
- Karagiannopoulou, E., Milienos, F. S., & Rentzios, C. (2022). Grouping learning approaches and emotional factors to predict students' academic progress. *International Journal of School & Educational Psychology*, 10(2), 258-275. <https://doi.org/10.1080/21683603.2020.1832941>
- Kulal, A., & Nayak, A. (2020). A study on perception of teachers and students toward online classes in Dakshina Kannada and Udupi District. *Asian Association of Open Universities Journal*. <https://doi.org/10.1108/AAOUJ-07-2020-0047>
- Laurie, A., & Hellsten, M. (2002). What Do We Know About Time Management? A Review of the Literature and a Psychometric Critique of Instruments Assessing Time Management University of Saskatchewan, Canada. <https://doi.org/10.5772/37248>
- Lopez-Agudo, L. A., & Marcenaro-Gutierrez, O. D. (2022). Instruction time and students' academic achievement: a cross-country comparison. *Compare: A Journal of Comparative and International Education*, 52(1), 75-91. <https://doi.org/10.1080/03057925.2020.1737919>
- Miertschin, S. L., Goodson, C. E., & Stewart, B. L. (2015). Time management skills and student performance in online courses. In *2015 ASEE Annual Conference & Exposition* (pp. 26-1585). <https://doi.org/10.18260/p.24921>
- Migliozzi, C. L. (2022). Engaging the Adult College Student: A Case Study on Improving Nontraditional Students' Persistence. https://scholarworks.umb.edu/instruction_capstone/82
- Narci, M. (2022). *The Relationship Between Problematic Internet Use and Academic Procrastination and Life Satisfaction of University Students* (Doctoral dissertation, University of Alabama Libraries). <https://www.proquest.com/openview/59be06329f73db36012c76a7fe6f6745/1.pdf?pq-origsite=gscholar&cbl=18750&diss=y>
- Naturil-Alfonso, C., Peñaranda, D., Vicente, J., & Marco-Jiménez, F. (2018, October). Procrastination: the poor time management among university students. In *4th International Conference on Higher Education Advances (HEAD'18)* (pp. 1-8). Editorial Universitat Politècnica de València. <https://doi.org/10.4995/HEAD18.2018.8167>
- Njuguna, M. N. (2022). Antecedents of Academic Procrastination and its Relationship to Academic Achievement among form Three Students in Kiambu County, Kenya. <https://ir-library.ku.ac.ke/bitstream/handle/123456789/23953/Antecedents%20of%20Academic%20Procrastination.....pdf?sequence=1>
- Noran, F. Y. (2000). Procrastination among students in institutes of higher learning: Challenges for K-Economy. Retrieved December, 30, 2008. <https://files.eric.ed.gov/fulltext/EJ1066019.pdf>
- Ocak, G., & Boyraz, S. (2016). Examination of the Relation between Academic Procrastination and Time Management Skills of Undergraduate Students in Terms of Some Variables. *Journal of education and training studies*, 4(5), 76-84. <https://eric.ed.gov/?id=EJ1092698>
- Pagaran, G. M., Loremas, M. L., Gultiano, J. D., & Etcuban, J. O. (2022). Mathematics Performance of Senior High School Students in Blended Learning Amidst the Covid-19 Pandemic. *Journal of Positive School Psychology*, 10593-10613. <https://journalppw.com/index.php/jpsp/article/view/9686/6321>

- Parantika, I. W. A., Suniasih, N. W., & Kristiantari, M. R. (2020). Differences in academic procrastination attitude between fifth grade male and female students. *Journal of Psychology and Instruction*, 4(1), 10-15. <https://doi.org/10.23887/jpai.v4i1.24451>
- Pilotti, M. A., El-Moussa, O. J., & Abdelsalam, H. M. (2022). Measuring the impact of the pandemic on female and male students' learning in a society in transition: A must for sustainable education. *Sustainability*, 14(6), 3148. <https://doi.org/10.3390/su14063148>
- Rabin, A. L., Fogel, J., & Upham-Nutter, E. K. (2011). Academic procrastination in college students: The role of self-reported executive function. *Journal of Clinical and Experimental Neuropsychology*, 3(3), 344-357. <https://doi.org/10.1080/13803395.2010.518597>
- Shaked, L., & Altarac, H. (2022). The possible contribution of procrastination and perception of self-efficacy to academic achievement. *Journal of Further and Higher Education*, 1-17. <https://doi.org/10.1080/0309877X.2022.2102414>
- Shepperd, R. S. (2002). *Predictors of student success in distance education courses*. West Virginia University. <https://www.proquest.com/openview/d4c1195ea0c6ffe90fef5b104ea60872/1?pq-origsite=gscholar&cbl=18750&diss=y>
- Solomon, L. J., & Rothblum, E. (1988). Procrastination assessment scale-students. *Dictionary of behavioral assessment techniques*, 358-360. https://web.archive.org/web/20091222073641id_/http://www-rohan.sdsu.edu:80/~rothblum/doc_pdf/procrastination/ProcrastinationAssessmentScaleStudents.pdf
- Soysal, D., Bani-Yaghub, M., & Riggers-Piehl, T. A. (2022). Analysis of anxiety, motivation, and confidence of STEM students during the COVID-19 pandemic. *International Electronic Journal of Mathematics Education*, 17(2), em0684. <https://doi.org/10.29333/iejme/11836>
- Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure, *Psychological Bulletin*, 133, 65-94. <https://doi.org/10.1037/0033-2909.133.1.65>
- Tezer, M., Çavuş, S., Orkun, M. A., Osum, A., & Ture, A. (2021). Examination of opinions of elementary school students on Mathematics course in the COVID-19 pandemic process. *International Journal of Learning and Teaching*, 13(1), 42-53. <https://doi.org/10.18844/ijlt.v13i1.5279>
- Time Management Questionnaire. (2014). Wayne State University. Retrieved July 05, 2022 from <http://advising.wayne.edu/hndbk/time.php>
- Treceñe, J. K. D. (2022). COVID-19 and Remote Learning in the Philippine Basic Education System: Experiences of Teachers, Parents, and Students. In *Socioeconomic Inclusion During an Era of Online Education* (pp. 92-110). IGI Global. <https://www.igi-global.com/chapter/covid-19-and-remote-learning-in-the-philippine-basic-education-system/307359>
- Vooren, M., Haelermans, C., Groot, W., & van den Brink, H. M. (2022). Comparing success of female students to their male counterparts in the STEM fields: an empirical analysis from enrollment until graduation using longitudinal register data. *International Journal of STEM Education*, 9(1), 1-17. <https://doi.org/10.1186/s40594-021-00318-8>
- Winanda, R. S., Mikail, A., Ahmad, D., Agustina, D., & Rahmawati, R. (2022). University Students' Procrastination: A Mathematical Model (Case Studies: Student in Mathematics Department Universitas Negeri Padang). *Eksakta: Berkala Ilmiah Bidang MIPA (E-ISSN: 2549-7464)*, 23(02), 98-105. <https://doi.org/10.24036/eksakta/vol23-iss02/315>
- Xu, J. (2022). More than minutes: A person-centered approach to homework time, homework time management, and homework procrastination. *Contemporary*

- Educational Psychology*, 70, 102087.
<https://doi.org/10.1016/j.cedpsych.2022.102087>
- Žnidaršič, A., Brezavšček, A., Rus, G., & Jerebic, J. (2022). Has the COVID-19 Pandemic Affected Mathematics Achievement? A Case Study of University Students in Social Sciences. *Mathematics*, 10(13), 2314.
<https://doi.org/10.3390/math10132314>

Appendix 1. Sample Survey Questionnaire

Dear Respondent:

Greetings!

We are conducting a study titled, "Students' Time Management Skill and Performance during Online Science and Mathematics Classes." The COVID-19 has obviously affected the world and part of it is education. This study concentrates on determining the influence of time management and procrastination of high school students in the Philippines toward their academic performance during pandemic. The study may be helpful in time management for better academic performance in online learning, particularly in science and mathematics programs. Your participation is integral to the success and completion of this study. We look forward to generating your contributions.

Rest assured that data gathered shall remain with confidentiality for the purpose of this study.

Thank you very much.

Sincerely,

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DATA PRIVACY CLAUSE AND CONSENT

In compliance with the Data Privacy Act (DPA) of 2012, and its Implementing Rules and Regulations (IRR) effective since September 8, 2016, I allow the researchers to provide me certain services related to welfare and development in relation to my connection to the institution as student. As such, I agree and authorize the researchers to:

1. Continue to use my personal information to provide services and administer the benefits as student.
2. Retain my information for a period of 5 years, or at such time that I submit a written cancellation of this consent. I agree that my information will be deleted/destroyed after the said period.
3. Gather relevant information related to its services and I am assured that all information are treated with high confidentiality.
4. Share my information to the affiliates and other relevant offices for any legitimate purpose. I am assured that security systems are employed to protect my information.

I also acknowledge and warrant that I have acquired the consent from all other offices relevant to this consent and hold free and harmless and indemnify the researchers from any complaint, suit, or damages, which anyone may file or claim to my consent.

- o I agree

General Instructions: Provide the information asked or needed in every item. Kindly choose one from among the given options as your answer. Meanwhile, those items with rating options, kindly provide your honest assessment by ticking one rating (Never, Sometimes, Frequently, Always) for **Modified Time Management Personal Assessment** and (Strongly Disagree, Disagree, Neither agree nor disagree, Agree, or Strongly Agree) for **Reasons for Procrastination Questionnaire**.

1. Respondent's Profile:

1.1 Name

1.2 Province

1.3 Age

1.4 School

1.5 Sex:

____ Female

____ Male

1.6 Final Grade in Science (SY 2021-2022)

1.7 Final Grade in Mathematics (SY 2021-2022)

2. Modified Time Management Personal Assessment

Skills	Never	Sometimes	Frequently	Always
1. Whenever we have quizzes and performance tasks in Science and Math, I do things in order of priority.				
2. I accomplish what needs to be done during the day in Science and Math.				
3. I always get Science and Math assignments done on time.				
4. I feel I use my time effectively in Science and Math.				
5. Whenever I have quizzes and performance tasks in Science and Math, I tackle difficult unpleasant them without procrastinating.				
6. I force myself to make time for planning in Science and Math.				
7. I spend enough time planning in Science and Math.				
8. I prepare a daily or weekly "to do" list in Science and Math.				
9. Whenever there are quizzes, activities or performance tasks in Science and Math, I prioritize my list in order of importance, not urgency.				
10. In Science and Math class, I am able to meet deadlines without rushing at the last minute.				
11. I keep up-to-date on my reading and homework assignments in Science and Math.				
12. I prevent interruptions from distracting me from high priority tasks in Science and Math classes.				
13. I avoid spending too much time on trivial matters especially those not related in my Science and Math classes.				
14. I spend enough time on academic matters especially those related in my Science				

and Math classes.				
15. I plan time to relax and be with friends in my weekly schedule.				
16. I have a weekly schedule on which I record fixed commitments such as classes and work hours especially those related in my Science and Math classes.				
17. I try to do the most important Science and Math tasks during my most energetic periods of the day.				
18. I make constructive use of my commuting time for my Science and Math classes.				
19. I periodically re-assess my activities in relation to my goals in Science and Math classes.				
20. I have discounted any wasteful or unprofitable activities or routines if they affect my Science and Math goals.				
21. I screen and group my phone/social media activities to allow for control over any interruptions that may affect time I spent for Science and Math activities.				
22. In Science and Math, I judge myself by accomplishment of tasks rather than by amount of activity or "busy-ness".				
23. My actions in both Science and Math classes are determined primarily by me, not by circumstances or by other people's priorities.				
24. I have a clear idea of what I want to accomplish in my Science and Math classes.				
25. I am satisfied with the way I use my time to concentrate in Science and Math classes.				

3. Reasons for Procrastination

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
1. You were concerned the professor wouldn't like your work.					
2. You had a hard time knowing what to include and what not to include in your class project, activities or performance task.					
3. You waited until a classmate did his/hers, so that he/she could give you some advice.					
4. You had too many other things to do.					
5. There's some information you needed to ask the professor, but you felt uncomfortable approaching him/her.					
6. You were worried you would get a bad grade.					
7. You resented having to do things assigned by others.					
8. You didn't think you knew enough to write the paper.					
9. You really disliked writing term papers.					
10. You felt overwhelmed by the task.					
11. You had difficulty requesting information from other people.					
12. You looked forward to the excitement of doing this task at the last minute.					
13. You couldn't choose among all the topics.					
14. You were concerned that if you did well, your classmates would resent you.					
15. You didn't trust yourself to do a good					

job.					
16. You didn't have enough energy to begin the task.					
17. You felt it just takes too long to write a term paper.					
18. You liked the challenge of waiting until the deadline.					
19. You knew that your classmates hadn't started the paper either.					
20. You resented people setting deadlines for you.					
21. You were concerned you wouldn't meet your own expectations.					
22. You were concerned that if you got a good grade, people would have higher expectations of you in the future.					
23. You waited to see if the professor would give you some more information about the paper.					
24. You set very high standards for yourself and you worried that you wouldn't be able to meet those standards.					
25. You just felt too lazy to write a term paper.					
26. Your friends were pressuring you to do other things.					

Thank you very much for your honesty, for your time to take this survey, and for your great contribution to the success of this study.

-The Researchers