

Workload Assessment of Online Classes on Teachers in Technological Institute of the Philippines - Manila

**Thea G. Espinueva, Vincent Matthew F. Labrador, Angel Shaine N. Martin,
Christine Joy V. Olanosa and Mary Jo M. Santiago**

Industrial Engineering Department
Technological Institute of the Philippines - Manila
mtgespinueva@tip.edu.ph, mvmflabrador@tip.edu.ph, masnmartin@tip.edu.ph,
mcjvolanosa@tip.edu.ph, mmjmsantiago@tip.edu.ph

Janina Elyse A. Reyes
Industrial Engineering Department - Adviser
Technological Institute of the Philippines - Manila
janina.elyse.reyes@gmail.com

Abstract

The COVID-19 pandemic drastically changed the education system and forced schools to adopt online teaching. However, it affects the teachers' workload globally. The study aims to assess the workload level of the 95 teachers at the Technological Institute of the Philippines - Manila during the online setup. Using the NASA Task Load Index assessment tool, the researchers could evaluate the different workload sources. The Analysis of Variance and pairwise correlation analysis were also used so that the researchers could determine if their demographic profile significantly affects their current workload and if the different sources have a significant relationship with each other. After this, the findings revealed an 80.86% on teachers' workload level, which is greater than workload acceptability. The current setup also demands good performance, intense thinking, and effort in the new learning setup. The researchers found that the result is still the same even though they are weighted based on their demographic profile. Moreover, there is a low positive relationship between temporal and mental demand and a very low positive relationship between effort and performance. The relationships between effort and temporal demand, performance, and temporal demand also show a low negative correlation. At the same time, there is a very low negative relationship between frustration and physical demand, performance and mental demand, and physical and mental demand. The recommended practices for the school and teachers are also created to help them ease and reduce zoom fatigue without jeopardizing the quality of education they deliver to the students.

Keywords

NASA Task Load Index (TLX), Online Classes, Modular Group, Teachers, Workload Acceptability

1. Introduction

COVID-19 has infected 94 million individuals and caused 2 million fatalities in 191 countries (John Hopkins University, 2021, cited in Barrot et al., 2021). It led the government to cancel national exams and schools to temporarily shut down, stop face-to-face teaching, and observe the physical distance, which has disrupted 1.5 billion children's education. These events triggered higher education's digital transition and tested its capacity to adapt quickly. Pham and Nguyen (2020), as well as Simbulan (2020), stated that some schools had an easy transition while others, especially those in underdeveloped nations, struggled (cited in Barrot et al., 2021).

As a result, the Technological Institute of the Philippines (T.I.P.) decided to utilize the learning platform, Canvas, to continue delivering excellent quality learning during the pandemic. However, due to the fast transition, the institution faced challenges in preparing the teachers regarding efficient methods to manage virtual classes. Hence, the school's management implemented a new setup that divides the module into three modular groups for college programs. The teachers will teach their designated courses within six weeks per modular group. But it can be more

challenging for them since they are only given a short duration for each modular group, which can pressure them and cause fatigue.

Teachers worldwide are extending their efforts to guarantee that education continues to flow steadily. However, their exhaustion and dissatisfaction result from the continual pressure and heavy workload. Different sources of workload (including mental demand, temporal demand, effort, performance, frustration, and physical demand) contribute to the workload level of the teachers' performance during online classes, which causes fatigue, mental exhaustion, and a downgrade in performance. More than 70% of teachers who responded to a survey by the Alliance of Concerned Teachers (ACT) in the Philippines of 6,731 public school teachers between March 29 and April 11 claimed that the workload associated with distance learning has a negative impact on their physical and mental health, with about 10% of those teachers admitting to having already become ill as a result of distance learning problems and their demanding tasks (Malipot, 2021). These issues prompt the researchers to assess the workload level of teachers at the Technological Institute of the Philippines-Manila to deeply understand their situation and find solutions for reducing their burden and improving their work-life balance in an online class.

1.1 Objectives

This research aims to achieve the following objectives:

- To analyze if the workload level of the teaching professionals is proportionate within the acceptability level
- To identify if the teachers' demographic profile significantly affects their workload.
- To identify if there is a significant relationship between the workload sources.
- To determine their work's issues, effects, and challenging aspects during the online class.
- To identify ways to help manage mental workload based on the research findings.

2. Literature Review

Due to the COVID-19 pandemic, the online setup has been widely adopted in the different sectors of the community, especially in educational institutions. Ally and Khan (2015) mentioned that online learning uses the internet, multimedia materials, and social media tools to create a rich learning environment free of time and location restrictions and revolutionizes teaching and learning in various settings. Luo et al., (2021) found that schools should follow the four standards to have an excellent online environment for teaching and learning. It includes a user-friendly platform for both the teachers and students, a platform that does not add a burn to teachers and students, a platform that is stable and reliable, and a platform that is assertive and online interactive teaching, which has good data storage (Luo et al., 2021). Teachers ultimately figured out how to modify their teaching for the new online environment (Ghanbari and Nowroozi, 2022), and teachers are still capable of delivering what is demanded of them, which is effective teaching, even if given workloads (Magalong and Torreon, 2021).

Akram et al. (2021) discovered that student engagement and teachers' abilities, techniques, training, domain, and perspective are the most influential factors in the effectiveness of online teaching. Their research proposes that institutions concentrate on teachers' needs to make more effective online teaching. Barrot et al. (2021) also stated that for schools to adapt to the online educational system, they incorporated applicable technology, developed learner and staff resources, created systems and infrastructure, and altered curricula. It is also said that online sessions are a helpful tool when an educational institution lacks available instructors (Hadadnia et al., 2012).

However, Niemi and Kousa (2020) argue that despite the successful implementation of distance education, teachers still need help with difficulties since the new online setup causes non-authentic engagement and a lack of spontaneity. Although the teachers learned to utilize technology rapidly and most appreciated online education, the interaction could have been better, and they could not effectively engage young students in online lessons (Niemi and Kousa, 2020; Hysaj, 2021). The teachers were concerned about student learning and did not recognize students' severe workload and motivation issues (Niemi and Kousa, 2020). In addition, they encountered problems with classroom organization and the design and administration of online assessment activities (Hysaj, 2021). Teachers also experience difficulties during online courses due to poor internet connection, lack of appropriate classroom equipment, and limited interaction between teachers and students (Gong and Sheng, 2021).

Dabrowski (2020) stated that the COVID-19 lockdown has resulted in a massive increase in teachers' workload, and many have still negotiated a continuation of learning under terrible conditions. He also stated that before COVID-19, instructors were already at risk of burnout, and their work is one of the most demanding professions. Since

teachers have a significant impact on the lives of young learners, as nations continue to navigate distant education, recognizing and supporting teacher welfare should be a focus (Dabrowski, 2020). Lizana et al. (2021) conducted a health survey showing Chilean teachers had lower health-related quality of life scores before the pandemic and dropped significantly during the pandemic. Similarly, over half of the 749 Australian teachers (including early career teachers, primary school teachers, and teachers in rural and isolated regions) reported being extremely stressed and burned out and contemplating quitting the profession (Carroll et al., 2022). This finding was also the same as Klapproth et al. (2020) results, showing that over 50% of 380 teachers from different schools spent more than four hours a day on online teaching, with secondary grammar school teachers suffering higher stress and working longer hours than special education teachers. The findings suggest that teachers' digital skills should improve, schools should be better equipped with computer hardware and software, and more studies should be done on psychological key contributors to teachers' desire to embrace online teaching technologies during the pandemic and beyond (Klapproth et al., 2020). Teachers' workloads can be regarded as heavy, and the teaching profession can be associated with high-stress levels and physical ailments (Bogaert et al., 2014). Due to the pandemic, many instructors experienced anxiety, stress, and depression when schools and universities reopened (Ozamiz-Etxebarria et al., 2021). This pandemic causes stress, reduced teacher efficacy, decreased job satisfaction, lower levels of commitment, and increased burnout (Jomuad et al., 2021; Bartosiewicz, 2022). Similarly, James et al. (2022) discovered that because of the lengthy participation in online activities, both teachers and students experienced bodily discomforts due to the online teaching and learning process, including back pain, blurred vision, headaches, and other physical discomforts. Also, the teacher's workload increased while working remotely since some had to supervise their children's online learning while balancing online teaching (James et al., 2022).

The related literature explained that COVID-19 significantly increased the teacher's workload and stated that the instructor experienced challenges during the pandemic that were considered a factor that hindered them in coping with the new-normal learning setup. Although other professors can work under the job's pressure and see the advantages of technology in teaching, some instructors need time to cope with the new education system. Moreover, the instructor showed the symptoms of anxiety, stress, and depression, which are the repercussions of the fast-paced transition of the learning environment to prevent the widespread transmission of the COVID-19 virus. The virtual class has also become the main factor affecting employees' psychosocial health and physical burnout due to stress and exhaustion. Moreover, the professors' workload has become higher than usual. Therefore, the instructor's workloads shall be reduced, and practiced eliminating unnecessary tasks that catalyze burnout and poor mental well-being. Online teaching can be effective and efficient if the institutions concentrate on the teachers' needs and have a deeper understanding of their attitudes.

3. Methods

This section explains the research design, instrument, participants, and statistical treatments to achieve the expected results.

3.1 Research Design and Instrument

The researchers used a quantitative and qualitative research design as a survey technique, using Google forms, to gather and analyze the information about the professors' workload during online class modality. It consists of a series of questions that may be answered by many respondents and is often evaluated numerically. The researchers employed this survey to get detailed information and rationale from respondents to know the causes, effects, and solutions to the problem of this study.

3.2 Participants and Sampling Technique

The participants of this study have a total of 95 teachers from the Technological Institute of the Philippines-Manila. They were collected according to their demographic profile, such as their age (e.g., below 30, 31-39, 40-49, 50-59, and 60 and above), year of teaching experience (e.g., 1-5 years, 6-10 years, 11-15 years, 16-20 years, 21-25 years, and 26 years and above), department (e.g., Architecture, College of Business Education, Civil Engineering, Chemical Engineering, Computer Engineering, College of Information Technology Education, College of Arts, Electronics Engineering, Electrical Engineering, Industrial Engineering, Senior High School, and others), and the number of subjects being taught in the second semester of the school year 2021-2022 (e.g., 1-2 subjects, 3-4 subjects, 5-6 subjects, 7-8 subjects, 9-10 subjects, 11 subjects and above). The sample size was calculated using Slovincs' formula from a population of professional teachers at the Technological Institute of the Philippines-Manila

(N=167). The researchers used a 7 percent of error margin as an estimate for how many survey respondents may be considered representative of an entire population's opinions. The formula was written as follows:

$$n = \frac{N}{(1 + N(e^2))} \quad (1)$$

Where: n = Number of samples; N = Total population; and e = Error tolerance (level).

By applying this formula, the researchers obtained a sample size of 92 from the population of teachers. Thus, a sample size of 92 teachers out of the 167 total population is needed. However, the gathered response was 95. Since it is not that much, the researchers still considered the excess three respondents counted.

3.3 Data Analysis Technique

The NASA-TLX (National Aeronautical Space Administration Task Load Index) is used as a guide in the survey questions. It helped assess the workload demand on performing their tasks as professional teachers during an online class. Moreover, the researchers used various statistical tools, such as Single Factor Analysis of Variance (ANOVA) and Pairwise Pearson Correlation analysis, to identify the aspects of tasks that contribute significantly to the workload of the respondents and the relationship between the sources of workload.

4. Data Collection

The study was conducted online from March 17 to April 27, 2021–2022 (second semester). In this timeframe, the data was collected from the target sample size of the professors' population at the Technological Institute of the Philippines in Manila Campus. To obtain valid findings and outcomes in the study, the researchers distributed the survey across the T.I.P. faculty and acquired all the data required for the study. The survey comprises closed or binary questions (Yes or No), choice, open-ended, and NASA TLX workload questions. The NASA TLX helps assign a task assessment based on performance across six dimensions or subscales. They are asked to rank their performance on a scale ranging from lowest (1) to highest (10).

Moreover, the TLX incorporates a procedure for paired comparisons. It is accomplished by providing participants with 15 pairwise combinations and asking them to choose the scale from each pair with the most significant influence on the workload during the online classes. Using these data, researchers can identify factors that may help alleviate teachers' online fatigue.

The researchers also devised a research paradigm to reach the study's goal through a series of processes (see Table 1). This research paradigm includes the inputs utilized in the study, the technique or procedure performed, and the intended outcomes.

Table 1. Conceptual framework

Input	Process	Output
<ul style="list-style-type: none"> - Technological Institute of the Philippines (T.I.P.) - Manila Professors - Quantitative and qualitative survey questions - NASA TLX workload survey questions 	<ul style="list-style-type: none"> - NASA TLX Mean Score Analysis - Analysis of Variance (ANOVA) - Pairwise Correlation Analysis - Interpretation of research survey questions 	<ul style="list-style-type: none"> - Condition of teachers' workload level during an online class. - Effective plans and strategies to use by T.I.P. Manila leaders and teachers to help them ease and reduce zoom fatigue caused by online classes.

5. Results and Discussion

This section provides the interpretation of data and analysis of the results gathered from the survey questionnaire (Google Form), Microsoft Excel, and Minitab.

5.1 Numerical and Graphical Results

Interpretation of Quantitative and Qualitative data

Using Quantitative and Qualitative tools in the deployed survey questionnaire, the researchers acquired the following information.

Question 1) What are the effects of the current setup and workload on professors?

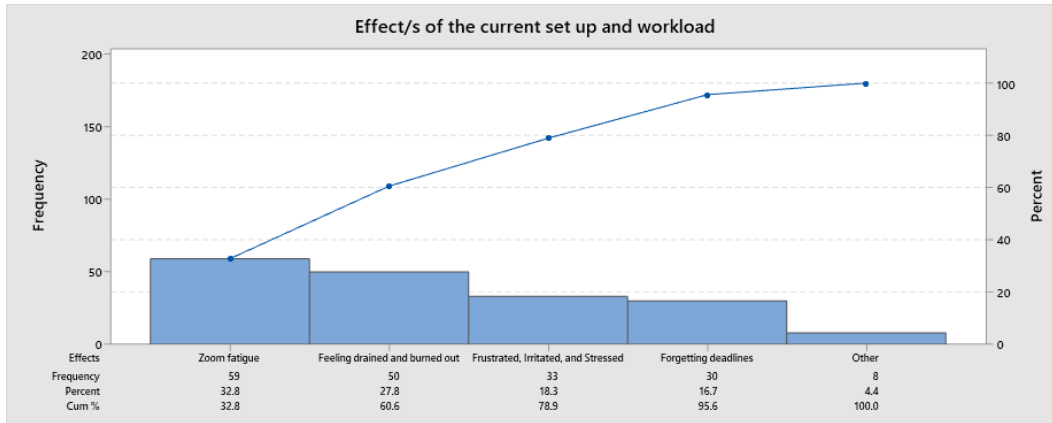


Figure 1. Effect/s of the current set-up and workload to T.I.P. professors

Figure 1 illustrates the effects professors are commonly experiencing when they perform their responsibilities under the current setup and workload. The outcome demonstrates the most frequent effects that the professors are experiencing, which are: (1) zoom fatigue (32.8%); (2) feeling exhausted and burned out (27.8%); and (3) being annoyed, irritated, and stressed (18.3%). This result also shows how challenging the work is, particularly in terms of mental health, which may suggest that various types of mental stress are brought on by an employee's current environment or setup. The cumulative percentage (78.9%) also indicates that these three vital few needs to appropriately treat to address the other effects demonstrated by the professors.

Question 2) What are the issues affecting the professor's performance?

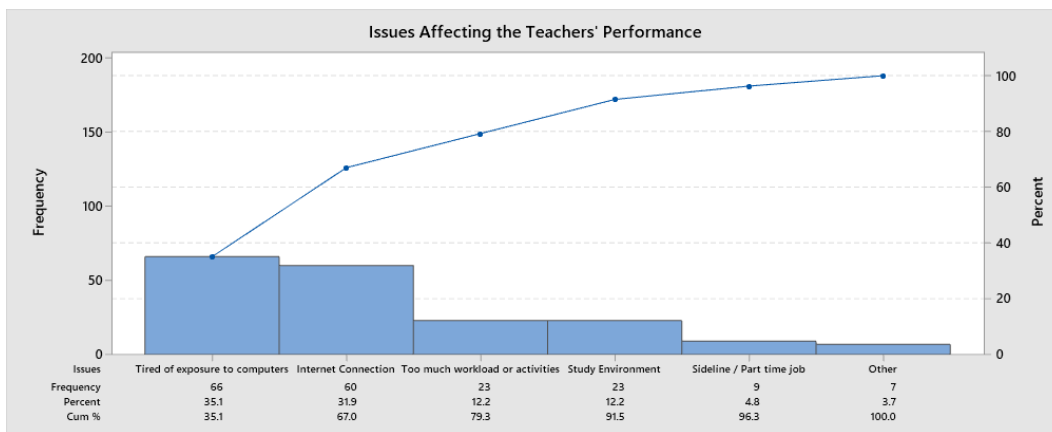


Figure 2. Issues affecting the teacher's performance

Figure 2 illustrates that the most frequent issue that affects the performance of teaching personnel is being tired of the exposure to computers (35.1%), internet connection (31.9%), and too much workload (12.2%). The cumulative percentage (79.3%) indicates that the said issues are the vital few (20%) that must be prioritized in solving so that it can accommodate solutions to the other 80% of the issues enumerated by the professors.

Question 3) What aspect of your work is the most challenging or burdensome?

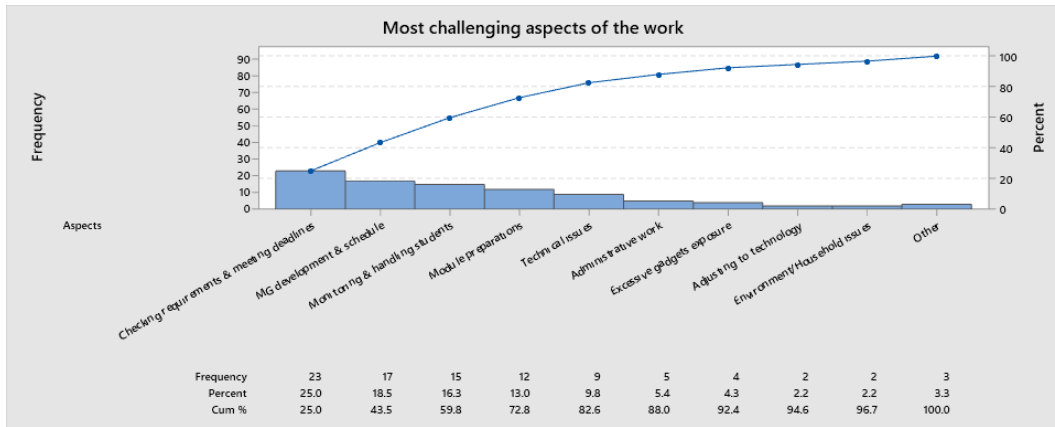


Figure 3. Most challenging aspects of the work for T.I.P. professors

Figure 3 shows that checking requirements and meeting deadlines (25%), Modular Group (MG) development and schedule (18.5%), monitoring and handling students (16.3%), and module preparations (13.0%) are the factors with the highest frequency for the most challenging aspect that burdens professors. The cumulative percentage (72.8%) shows that these factors are the vital few that must be addressed to precisely modify the other challenges that professors face during online classes.

Mean Analysis of NASA TLX Scoring Worksheet

The following weighted scores are the results of data gathering and calculations using the TLX scoring manual.

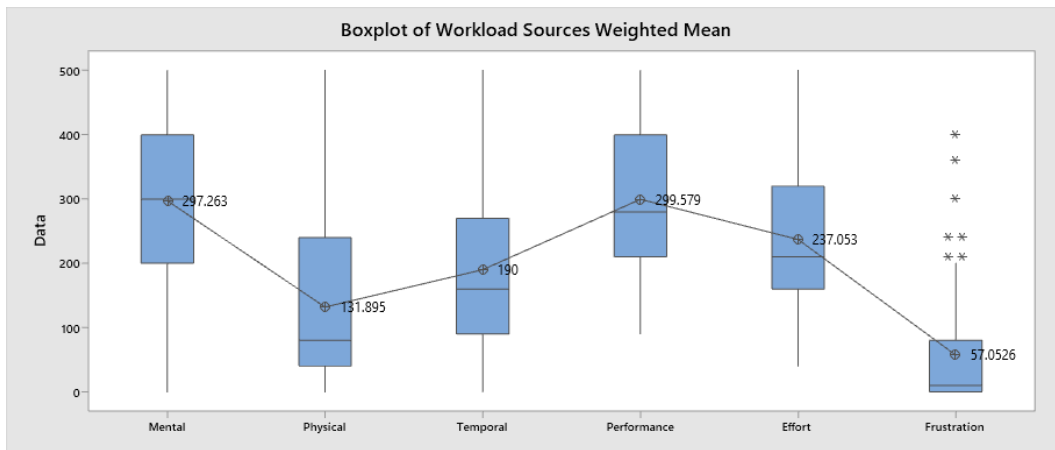


Figure 4. Boxplot of workload sources weighted means

The statistics shown in Figure 4 have been examined and weighted from raw scores (unweighted mean) to help explain the study's conclusions about the contribution of sources to the workload. As observed in the table under the weighted mean, the top three highest workloads are performance, mental, and effort. Performance is the highest (WM = 299.58, 24.70% out of 100%) source of workload, which indicates that online classes demand a higher level of performance. It is also because they are tired of exposure to computers, causing zoom fatigue, and they have poor internet connections, which affects their performance (see Figure 1 for issues affecting the teachers' performance). Mental demand came in second (WM = 297.26, 24.51%), which indicates that the assigned work of teaching an online course is mentally demanding. It was followed by effort (WM = 237.05, 19.55%), indicating that professors strive to give their best effort in online classes despite feeling pressure on their performance and are mentally exhausted due to the volume of workloads assigned in a given period.

On the other hand, not all of the medians of the six (6) workload categories overlapped, implying a statistically significant difference between the respondents' workload rates at these sources.

To identify the overall weighted rating, the researcher used the NASA TLX provided formula:

$$\text{Weighted Rating} = [(\text{Sum of Adjusted Rating})/15] = 1,212.84/15 = 80.86$$

Table 2. NASA TLX scale interpretation

Scale Interpretation	
0-25	Low Mental Workload
26-50	Medium Mental Workload
51-75	High Mental Workload
76-100	Very High Mental Workload

Table 2 shows the interpretation of the NASA TLX range of scale. According to the NASA TLX scale interpretation by DiDomenico and Nussbaum (2008) and Seker (2014), cited in Dasmariñas et al. (2021), the overall weighted rating of 80.86% from the analysis is significantly high, indicating that the online class has a high probability of triggering teacher fatigue. Since it was greater than 70 on a scale of zero to 100, it corresponds to at least 70% of the highest load in percentage terms. Moreover, according to Eitrhein and Fernandes (2016), a workload of less than 50 is considered reasonable (cited in Reyes et al., 2020). Furthermore, higher workload scores were linked to lower participant acceptability. It indicates that the workload level of online classes is therefore related to low acceptance because it is considerably below the acceptable limit. This result justifies the actual sentiments of the professors. 52.60% of 95 participants said they felt pressured to be a teacher during this pandemic. When asked about their teaching experience in an online class, they stated that the online class setup is very challenging because there are too many preparations, very tight, and limited delivery of the module schedule. They also noted that online class makes people like a robot wherein they cannot see the expression of students, and they have a lack of human interaction with students, severely affecting their work. Also, it is more difficult for them to ensure that students learn because they can only monitor them online.

Analysis on the significant difference of workload of teachers based on their demographic profile

The researchers aim to assess the teachers' workload during the online class based on their age, years of experience, departments, and the number of subjects being handled using the single factor ANOVA to understand if these significantly contributed to how they can handle their workload. The researchers used the following hypotheses to test this assumption:

Ho: There are no differences that exist between the workload level of teachers when they are categorized by their age, years of experience, departments, and the number of subjects being handled.

Ha: There are differences that exist between the workload level of teachers when they are categorized by their age, years of experience, departments, and the number of subjects being handled.

Table 3. Summary of P-value of workload based on different demographic profile categories

Demographic Profile Category	P-value	Interpretation
Age	0.78	No significant effect
Years of teaching experience	0.16	No significant effect
Departments	0.57	No significant effect
Number of subjects being handled	0.42	No significant effect

As shown in Table 3, all the p-values are greater than the alpha level of 0.05, indicating that the null hypothesis is valid. Their demographic profile does not significantly affect the teachers' perspective in rating their workload in an online class. It can be perceived that all the respondents, regardless of their age, how long they have been teaching, their department, and how many subjects they have handled, all have the same current workload and find it less acceptable.

Correlation between the sources of workload

Table 4. Pairwise Pearson correlations of workload sources

Sample 1	Sample 2	Correlation	95% CI for ρ	P-Value
Physical	Mental	-0.21	(-0.40, -0.01)	0.04
Temporal	Mental	0.33	(0.14, 0.50)	0.00
Performance	Mental	-0.28	(-0.46, -0.08)	0.01
Frustration	Physical	-0.29	(-0.46, -0.09)	0.01
Performance	Temporal	-0.32	(-0.49, -0.13)	0.00
Effort	Temporal	-0.41	(-0.57, -0.23)	0.00
Effort	Performance	0.22	(0.02, 0.40)	0.03

The six (6) subscales of the NASA TLX—mental demand, physical demand, temporal demand, performance, effort, and frustration—were examined using a correlation test aside from ANOVA test. Amid a pandemic, they are utilized to determine which correlates the most when assessing the mental workload of TIP teachers. Based on the correlation matrix's P-value in Table 4, the researchers demonstrated that it presents a significant value. The researcher used a scale to interpret the results, with 0.90 to 1.00 (-0.90 to -.1.00) denoting a very high positive (negative) correlation, 0.70 to .90 (-0.70 to -0.90), indicating a high positive (negative) correlation, 0.50 to .70 (-0.50 to -0.70) means a moderate positive (negative) correlation, 0.30 to .50 (-0.30 to -0.50), denoting a low positive (negative) correlation, and 0.00 to -0.30 (0.00 to -0.30) means very low or negligible correlation (Hinkle et al., 2003, as cited in Mukaka, 2012).

Table 4 shows that temporal and mental demand ($r = 0.33, p < 0.05$) and effort and performance ($0.22, p < 0.05$) have a low and very low positive correlation, respectively. It means that the relationship between these subscales is weak, but it indicates that as the respondent's temporal and effort increase, their mental demand and performance also increase. At the same time, effort and temporal demand ($r = -0.41, p < 0.05$), performance and temporal demand ($r = -0.32, p < 0.05$), frustration and physical demand ($r = -0.29, p < 0.05$), performance and mental demand ($r = -0.28, p < 0.05$), and physical and mental demand ($r = -0.21, p < 0.05$) show low to very low negative correlations with weak to very weak strengths, denoting that: as the effort and performance increases, the professors temporal demand also decrease; as frustration increases, their physical demand decreases; and as performance and physical increases, their mental demand decreases. These support the correlation between the effects of the current setup and workload and the most challenging aspect of work that burdens them most. It shows that mental demand, physical demand, temporal demand, performance, effort, and frustration are significantly related to the working routine of TIP professors. The results of the data analysis might lead to the researcher recommending that institutions consider and adequately care for their employees' needs. Emphasizing the employee's frustration, effort, mental demand, and physical demand will significantly improve TIP teachers' total performance and service.

5.2 Proposed Improvement

The following are the various recommendations to be considered considering the study's findings.

1. The 6-week modular group schedule for college programs is fast-paced and has limited time to cover all the lessons. It affects the teachers' workload, which has negative impacts on their performance and their mental health. Thus, the study suggests that the school should redesign and improve its modular scheduling. It should consider the engineering programs with three and above units, such as computational courses, laboratory experiments, and study papers (case studies, feasibility studies, undergraduate research, project design, etc.). These courses should be taught within an 18-week schedule for the teachers and students have enough time to finish their requirements. Furthermore, instead of having three grading periods (prelim, midterm, and finals), the school may consider having two (midterm and finals) for each subject. It will help lessen the requirements of teachers, such as checking the assignments, quizzes, and exams and even annotating research papers. In an 18-week schedule, teachers can have nine online synchronous meetings (one live conference per subject per week) and three hybrid classes for each grading period. At the same time, there are no hybrid classes for courses under the 6-week modular group to prioritize the mentioned courses. Teachers in modular groups can also have one synchronous meeting with a maximum of three

hours, or they can divide it into two meetings with a maximum of one hour and a half for each subject to reduce zoom fatigue. The following charts are the proposed schedules for the T.I.P. college and senior high school departments.

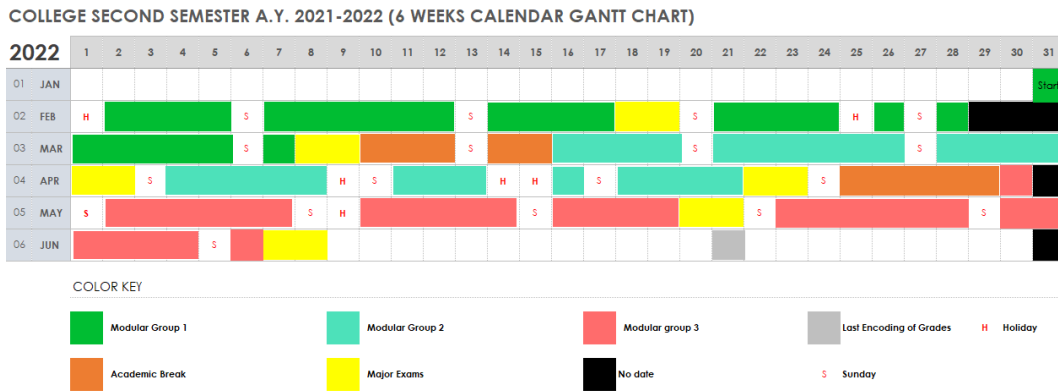


Figure 5. Proposed 6-week modular group schedule for college

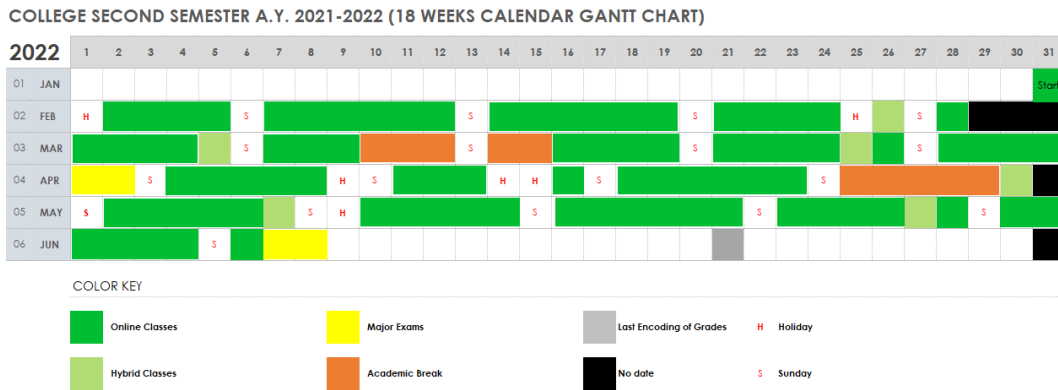


Figure 6. Proposed 8-week class schedule for college

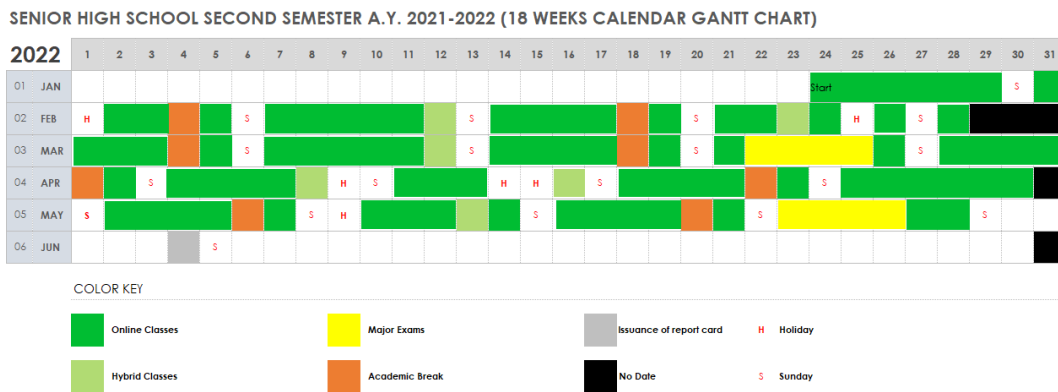


Figure 7. Proposed 18-week class schedule for Senior High School

- The researchers recommended that teachers adopt a time management tool that works best for them, such as the Eisenhower Matrix. This tool will help them learn to prioritize, especially when a lot of tasks need to be done in a short period. The Eisenhower matrix, named after former US President Dwight D. Eisenhower

and commonly referred to as the Urgent-Important Matrix, was a prioritizing technique employed to identify which jobs required urgent attention and could wait (Mfondoum et al., 2019). It may assist teachers in remaining focused on the activities that will ultimately increase their effectiveness (Hendricks, 2018).

3. To address the instructors' concerns regarding the interaction and participation of their students' live conference (online discussion), they should use data analytics as it shows statistics of how many hours a student stayed in the conference room and how active they were in the discussion. Moreover, instructors may come up with a new and exciting way of having recitation, or an in-class (after) activity, such as using interactive websites like Kahoot, Quizziz, and Slido. This may cause the students to listen attentively in their live discussions. Additionally, the professors may give attendance incentives that boost students' motivation to attend classes.
4. According to the findings, module preparation is one of the professors' most challenging aspects of teaching. Therefore, the recommended practice based on the study and thorough investigation is to allow two days of preparation before the start of the modular group. In addition, the T.I.P. administration may assign academic personnel to create the compilation of modules from reliable sources that the professors will utilize.
5. Regarding the students' requirements, the professors at T.I.P. Manila encounter a challenge in finishing the papers (e.g., capstone or thesis advising and paneling), which extends their time working on accomplishing the tasks. Therefore, the researcher recommended that the school administrator should motivate the professor to enhance their teaching performance by providing recognition or even incentives such as getting an additional 10% of their hourly rate, which serves as overtime pay for the time dedicated to paneling and other academic-related works that are held outside their working schedule.

6. Conclusion

The result from the conducted survey reveals that the online classes caused the teachers at Technological Institute of the Philippines – Manila to have zoom fatigue due to several conferences, meetings, and classes conducted virtually. The online setup also makes most of them feel drained, burned out, frustrated, irritated, and stressed. It is due to their prolonged exposure to computers, poor internet connection, and too much workload, which are also the main contributors to the decrease in professors' performance in teaching virtually. Moreover, the study findings showed that the most challenging work aspect is checking requirements and meeting deadlines because they have many students and subjects to handle, especially when there are late submissions. It is hard for the teachers to check the students' papers online, causing them to have prolonged exposure to their computers. According to them, the Modular Group (MG) development is poor, and its schedule (6 weeks per modular group) is not enough for most college teachers to discuss all the lessons since it is fast-paced and has limited time. The current setup also requires more module preparation since they handle many subjects. Each has a different preparation, which is time-consuming, and needs to fit all the topics within the schedule of 6 weeks.

This result supports why the present workload level (80.86%) of teachers in an online class is well beyond 50, which means it is less acceptable. Moreover, the study reveals that their online class demands good performance and intense mentality or thinking, significantly affecting their workload. Too much workload could also have a reverse effect on the teachers' performance and may affect their mental health. On the other hand, teachers' demographic profile does not have a significant impact on their workload. The correlation analysis also showed that the relationship between temporal and mental demand and between effort and performance indicates a weak to very weak positive relationship. In addition, there is a weak to very weak negative correlation between effort and temporal demand, performance and temporal demand, frustration and physical demand, performance and mental demand, and physical and mental demand. These results suggest that it will considerably enhance the TIP teachers' overall working routine and level of service by addressing the employees' mental demand, physical demand, temporal demand, performance, effort, and frustration.

References

- Akram, F., Ul Haq, M. A., Malik, H. A. and Mahmood, N., Effectiveness of online teaching during COVID-19, *2021 International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies (3ICT)*, pp. 568-573, Zallaq Bahrain, September 29-30, 2021. Available: <http://dx.doi.org/10.1109/3ICT53449.2021.9582144>, Accessed on March 20, 2022.

- Ally, M., and Khan, B. H., *International handbook of e-learning, volume 2: Implementation and case studies*, 1st Edition, Routledge, New York, 2015. Available: <https://doi.org/10.4324/9781315760902>, Accessed on March 20, 2022.
- Barrot, J.S., Llenares, I.I., and del Rosario, L.S., Students' online learning challenges during the pandemic and how they cope with them: The case of the Philippines. *Educ Inf Technol* 26, pp. 7321–7338, 2021. Available: <https://doi.org/10.1007/s10639-021-10589-x>, Accessed on March 20, 2022.
- Bogaert, I., De Martelaer, K., Deforche, B., Bogaert, I., De Martelaer, K., Deforche, B., Clarys, P., and Zinzen, E., Associations between different types of physical activity and teachers' perceived mental, physical, and work-related health. *BMC Public Health* 14(1), 2014. Available: <https://doi.org/10.1186/1471-2458-14-534>. Accessed on March 20, 2022.
- Bartosiewicz A, Łuszczki E, Zaręba L, Kuchciak M, Bobula G, and Dereń K, Król P. Assessment of job satisfaction, self-efficacy, and the level of professional burnout of primary and secondary school teachers in Poland during the COVID-19 pandemic. *PeerJ*, 2022. Available: <https://doi.org/10.7717/peerj.13349>, Accessed on August 05, 2022.
- Carroll, A., Forrest, K., Sanders-O'Connor, E., Flynn, L., Bower, J.M., Fynes-Clinton, S.F., York, A., and Ziaei, M., Teacher stress and burnout in Australia: examining the role of intrapersonal and environmental factors. *Soc Psychol Educ* 25, 441–469, 2022. Available: <https://doi.org/10.1007/s11218-022-09686-7>, Accessed on March 20, 2022.
- Dabrowski, A., Teacher wellbeing during a pandemic: Surviving or thriving?. *Social Education Research*, 2(1), pp. 35–40, 2020. Available: <https://doi.org/10.37256/ser.212021588>, Accessed on March 20, 2022.
- Dasmariñas, S.F., Otalla, J.M.A., Perea, K.J.H., Ergonomics assessment on the mental workload of work from home employees, *Proceedings of the Second Asia Pacific International Conference on Industrial Engineering and Operations Management*, pp. 2008-2019, Surakarta, Indonesia, September 14-16, 2021.
- Ghanbari, N., and Nowroozi, S., Iranian EFL teachers' challenges and coping strategies during COVID-19 pandemic: A case study, *The Qualitative Report*, 27(3), pp. 605-625, 2022. Available: <https://doi.org/10.46743/2160-3715/2022.5066>, Accessed on March 20, 2022.
- Gong, F. and Sheng, M., Regression analysis of online teaching effect and satisfaction, *2021 2nd International Conference on Artificial Intelligence and Education (ICAIE)*, pp. 498-501, Dali, China, June 18-20, 2021. Available: <https://doi.org/10.1109/ICAIE53562.2021.00110>, Accessed on August 05, 2022.
- Hadadnia, S., Hadadnia, N., and Shahidi, N., Effects of teaching through online teacher versus real teacher on student learning in the classroom. *Contemporary Educational Technology*, 3(1), 50-59, 2012. Available: <https://doi.org/10.30935/cedtech/6067>, Accessed on April 02, 2022.
- Hendricks, B., Using the Eisenhower decision matrix to prioritize tasks. Available: <https://study.com/academy/lesson/using-the-eisenhower-decision-matrix-to-prioritize-tasks.html>. Accessed on April 15, 2022.
- Malipot, M. H., 'Overworked, undersupported, stressed out' teachers seek help from the government, April 29, 2021, <https://mb.com.ph/2021/04/29/overworked-undersupported-stressed-out-teachers-seek-help-from-the-govt/>, March 20, 2022.
- Hysaj, A., COVID- 19 pandemic and online teaching from the lenses of K-12 STEM teachers in Albania, 2021 *IEEE International Conference on Engineering, Technology & Education (TALE)*, pp. 01-07, Wuhan, Hubei Province, China, December 05-08, 2021. Available: 10.1109/TALE52509.2021.9678579, Accessed on April 20, 2022.
- James, F., Massiah, A., Pierre, L., Richardson, C., and Williams, J., Leading classroom instruction during the COVID-19 Pandemic and preparation for face-to-face reopening: Caribbean teachers' experiences, *School Leadership & Management*, 42(2), pp. 208-229, 2022. Available: 10.1080/13632434.2022.2047638, Accessed on April 2, 2022.
- Jomuad, P., Antiquina, L. M., Cericos, E., Bacus, J., Vallejo, J., Dionio, B., Bazar, J., Cocolan, J., and Clarin, A. Teachers' workload in relation to burnout and work performance. *International Journal of Educational Policy Research and Review* 8(2), pp. 48–53, 2021. Available: <https://doi.org/10.15739/ijeprr.21.007>, Accessed on August 05, 2022.
- Klapproth, F., Federkeil, L., Heinschke, F., and Jungmann, T., Teachers' experiences of stress and their coping strategies during COVID-19 induced distance teaching. *Journal of Pedagogical Research*, 4(4), pp. 444-452, 2020. Available: <https://doi.org/10.33902/JPR.2020062805>, Accessed on April 02, 2022.
- Lizana, P. A., Vega-Fernandez, G., Gomez-Bruton, A., Leyton, B., and Lera, L. Impact of the COVID-19 pandemic on teacher quality of life: A longitudinal study from before and during the health crisis. *International Journal of*

- Environmental Research and Public Health, 18(7), p. 3764, 2021. Available: <https://doi.org/10.3390/ijerph18073764>, Accessed on April 02, 2022.
- Luo, W., Lin, Y., Jin, M., and Hu, C., Construction and empirical study of comprehensive evaluation index system of online teaching in the period of COVID-19, 2021 2nd International Conference on Artificial Intelligence and Education (ICAIE), pp. 494-497, Dali, China, June 18-20, 2021. Available: 10.1109/ICAIE53562.2021.00109, Accessed on August 05, 2022.
- Magalong, A.A., and Torreon, L.C. Teaching workload management: its impact to teachers' wellbeing and effectiveness. American Journal of Multidisciplinary Research & Development, 3(2), pp. 31–36, 2021.
- Mfondoum, N. H. A., Tchindjang, M., Mfondoum, V. and Makouet, I., Eisenhower matrix * Saaty AHP = Strong actions prioritization? Theoretical literature and lessons drawn from empirical evidences, IAETSD Journal For Advanced Research in Applied Sciences, 6(2), pp. 13 - 27, 2019. Available: https://www.researchgate.net/publication/333516142_Eisenhower_matrix_Saaty_AHP_Strong_actions_prioritization_Theoretical_literature_and_lessons_drawn_from_empirical_evidences, Accessed on April 2022.
- Mukaka M. M. Statistics corner: A guide to appropriate use of correlation coefficient in medical research. Malawi Medical Journal, 24(3), pp. 69–71, 2012. Available: <https://www.ajol.info/index.php/mmj/article/view/81576>. Accessed on September 05, 2022.
- Niemi, H. M., and Kousa, P. A case study of students' and teachers' perceptions in a Finnish high school during the COVID pandemic. International Journal of Technology in Education and Science (IJTES), 4(4), pp. 352-369, 2020. Available: <https://doi.org/10.46328/ijtes.v4i4.167>, Accessed on August 05, 2022.
- Ozamid-Etxebarria N, Berasategi Santxo N, Idoiaga Mondragon N and Dosil Santamaria M. The Psychological State of Teachers During the COVID-19 Crisis: The Challenge of Returning to Face-to-Face Teaching. Front. Psychol, 2021. Available: <https://doi.org/10.3389/fpsyg.2020.620718>, Accessed on March 20, 2022.
- Reyes, J.E.A., Buan, K.B.P., Limin, R.V.B., and Marucot, J.R.D., Workload Level Assessment of Online Classes of College Students in Technological Institute of the Philippines Manila Using NASA Task Load Index (NASA TLX), Proceedings of the 21st Congress of the International Ergonomics Association (IEA 2021), 220, pp. 105-112, June 13-18, 2021. Available: https://doi.org/10.1007/978-3-030-74605-6_13, Accessed September 05, 2022.

Biographies

Thea G. Espinueva is a 4th year Bachelor of Science in Industrial Engineering student at Technological Institute of the Philippines-Manila. She is a former Industrial Engineering Department Student Council (IE DSC) Treasurer, Junior Philippine Institute of Industrial Engineering (JPIIE) Vice President of External Affairs, and Certified Yellow Belt Lean Six Sigma (CLSSYB).

Vincent Matthew F. Labrador is a 4th year Bachelor of Science in Industrial Engineering student at Technological Institute of the Philippines-Manila. He is one of the members of the Junior Philippine Institute of Industrial Engineering (JPIIE) and a scholar of the Department of Science and Technology.

Angel Shaine N. Martin is a 4th year Bachelor of Science in Industrial Engineering student at Technological Institute of the Philippines-Manila. She is a former Industrial Engineering Student Council (IE DSC) Auditor, and one of the members of the Junior Philippine Institute of Industrial Engineering (JPIIE).

Christine Joy V. Olanosa is a 4th year Bachelor of Science in Industrial Engineering student at Technological Institute of the Philippines-Manila. She is a former IE Representative of the Technological Institute of the Philippines Society of Scholars, a scholar of the Commission of Higher Education, a Certified White Belt Lean Six Sigma, and one of the members of the Junior Philippine Institute of Industrial Engineering (JPIIE).

Mary Jo M. Santiago is a 4th year Bachelor of Science in Industrial Engineering student at Technological Institute of the Philippines-Manila. She is one of the members of the Junior Philippine Institute of Industrial Engineering (JPIIE).

Janina Elyse A. Reyes is a Technological Institute of the Philippines Industrial Engineering Department's Associate Professor. She completed her Bachelor's degree in Industrial Engineering and Operations Research at the University of the Philippines-Diliman. Also, she took her Master's Degree in Engineering Management. at Mapua University.