



Republic of the Philippines
Department of Education
REGION XI
SCHOOLS DIVISION OF PANABO CITY

Office of the Schools Division Superintendent

DIVISION MEMORANDUM

CID-2025- 0267

To : Asst. Schools Division Superintendent
Chief Curriculum Implementation Division
All Public School District Supervisors
All Elementary School Heads
All Secondary School Heads

Subject : **ADOPTION AND IMPLEMENTATION OF AUTOMATED CLASS AND
TEACHER SCHEDULER (ACTS) IN PANABO CITY DIVISION**

Date : November 25, 2024

Pursuant to Regional Memorandum No. 007, s. 2025, titled "*Adoption and Implementation of Automated Class and Teacher Scheduler (ACTS) in Davao Region,*" this Office strongly recommends the adoption of the Automated Class and Teacher Scheduler (ACTS) by all elementary and secondary schools within the Division. This innovation aims to streamline class and teacher scheduling processes, reduce administrative workload, and ensure the optimal utilization of teaching resources.

Attached herewith is a copy of the ACTS innovation for your reference and guidance.

For your compliance.


JINKY B. FIRMAN PhD, CESO VI
Schools Division Superintendent

RELEASED

MAY 07 2025

RECORDS SECTION SDO PANABO CITY
BY 

Enclosed: As stated
CID/jey/ jbv



Address: City Hall Compound, Km 31, JP Laurel,
Panabo City, Davao del Norte
Telephone No: (084) 823-1469, (084) 628-4066
Email: panabocity.division@depd.gov.ph
Website: www.depdpanabocity.com



Republic of the Philippines
Department of Education
DAVAO REGION

April 23, 2025

REGIONAL MEMORANDUM
No. 007, s. 2025

**ADOPTION AND IMPLEMENTATION OF AUTOMATED CLASS AND TEACHER
SCHEDULER (ACTS) IN DAVAO REGION**

To: Schools Division Superintendents

1. In line with the Department of Education's commitment to enhance the efficiency and effectiveness of school operations, Davao Region issued Regional Memorandum No. 25, s. 2023, known as Regional Policy Guidelines in the Substitution of Classes Grant of Service Credits. It outlines a contextualized intervention scheme to strengthen time on tasks and minimize disruption of classes.
2. Thus, in support of the provisions of Regional Memorandum No. 25, s. 2023, this Office hereby directs Regional Functional Divisions and Schools Division Offices for the adoption and implementation of the research innovation titled Automated Class and Teacher Scheduler (ACTS): A Novel Approach to preventing Class Disruptions in DepEd Region XI public schools. This initiative aims to streamline the scheduling process, reduce administrative workload, and ensure optimal utilization of teaching resources.
3. Copy of the study and the Terms of Reference for the Use of the Automated Class and Teacher Scheduler (ACTS) Program are attached.
4. Immediate dissemination and strict compliance of this Memorandum is highly desired.

ALLAN G. FARNAZO
Director IV *gpm*

Enclosed: As Stated
ROP2/cadi

DEPARTMENT OF EDUCATION - DAVAO REGION
RECORDS SECTION
RELEASED

By: *[Signature]*
Date: *Apr. 28, 2025*
Time: *12:04 PM*



Republic of the Philippines
Department of Education
DAVAO REGION

Enclosure 1

Terms of Reference for the Use of the Automated Class and Teacher Scheduler (ACTS) Program

1. Introduction

The Automated Class and Teacher Scheduler (ACTS) has been developed to help generate class and teacher timetables with pre-assigned vacant substitute teachers in case of class disruptions. This document outlines the terms and conditions governing the use of the ACTS to ensure its proper and ethical utilization.

2. Access and Usage

- 2.1. Authorized Users: The ACTS is intended for use by **public schools in DepEd Region XI**, subject to a valid license agreement.

3. Restrictions

- 3.1. Sharing of Files: No individual or entity is permitted to share, sell, or transfer the ACTS program, its source code, or any related files, in part or in whole, to any third party without the explicit written consent of the developer.

4. Confidentiality and Intellectual Property

- 4.1. Intellectual Property Rights: The ACTS program is the developer's intellectual property. The developer owns all copyrights and other property rights associated with the program.
- 4.2. Confidentiality: Users agree to maintain the confidentiality of all Confidential Information provided during the course of using the ACTS program. Users shall not disclose, distribute, or share such information with any third party without the prior written consent of the developer.

5. Termination

- 5.1. Breach of Terms: In the event of a breach of these terms and conditions, the developer reserves the right to terminate the user's access to the ACTS program, revoke the license, and take legal action as deemed necessary.

6. Disclaimer

The ACTS program is provided "as is," and the developer makes no warranties or representations regarding its fitness for a particular purpose, accuracy, or reliability. Users accept all risks associated with the use of the program.

The Developer: **JOSE L. BARBA JR.**
ACTS TOR Date created: **April 24, 2025**



Address: F. Torres St., Davao City (8000)
Telephone Nos.: (082) 291-1665; (082) 221-6147
Email Address: region11@deped.gov.ph
Website: www.depedroxi.ph





AUTOMATED CLASS AND TEACHER SCHEDULER (ACTS): A NOVEL APPROACH TO PREVENTING CLASS DISRUPTIONS IN DEPED REGION XI

Barba, Jose Jr. L; Barba, Janice F.
Completed 2024



E - Saliksik
Department of Education
Research Portal
e-saliksik.deped.gov.ph

E-Saliksik: the DepEd Research Portal is the official repository of education research in the Department of Education (DepEd). This research was funded by the Basic Education Research Fund.

ABSTRACT

Continuous and uninterrupted learning is significant, yet DepEd has no existing policy on handling the classes of absent teachers. The “No Disruption of Classes Policy” does not acknowledge teacher absence as one cause of class disruptions. Although schools have existing ways of substituting the classes of absent teachers, the process of selecting a teacher substitute is not clearly defined, and the substitute teachers were not given due credit. This action research was conducted to provide a solution for automating the selection of available substitute teachers using ACTS, a macro-enabled spreadsheet. Using ACTS during class scheduling allowed schools to automatically generate timetables with teacher substitutes. The ACTS was evaluated by various teachers and administrators in Region XI regarding its effectiveness in preventing class disruptions. The respondents were also asked to provide feedback on the functionality and usability of ACTS and how it can be enhanced to cater to the scheduling needs of schools. The feedback was collected through surveys and focus group discussions. The survey revealed that ACTS is exceptionally effective, functional, and usable. The thematic analysis of the FGD supported the high user ratings of ACTS. Respondents noted that ACTS helped them prevent class disruptions caused by teacher absences and made their scheduling tasks easier and faster. There are still improvements to be done in the future, such as using advanced features to plot automatically, optimizing its scalability for multi-shifts and huge schools, and incorporating data analytics and user guides.

Keywords: timetabling, class disruption, time-on-task, automated, scheduling, BERF, City of Mati, Region XI

ACKNOWLEDGEMENT

We want to express our heartfelt gratitude to everyone who contributed to the successful completion of this action research. Representing the Division Office of Mati City, we, the authors, extend our most profound appreciation to our Schools Division Superintendent and Senior Education Program Specialists for Planning and Research for their guidance and encouragement. To our colleagues and stakeholders who supported and inspired us throughout this journey, your insights were instrumental in achieving our goals. We are also deeply grateful to our respondents who willingly participated and shared their valuable experiences, making this study possible. Above all, we thank God for the wisdom, strength, and inspiration that guided us every step of the way.

CONTEXT AND RATIONALE

Uninterrupted learning experiences offered several advantages that contributed significantly to learners' growth and academic achievement. Numerous studies emphasized the significance of maximizing engaged time-on-task for educational success. Continuous and uninterrupted classes enabled a smooth flow of instruction and educational activities. The "Flow Theory" by Mihaly Csikszentmihalyi (2009) supported the idea that uninterrupted classes allowed learners to build on existing knowledge and participate in a deeper grasp of the subject matter. Csikszentmihalyi's concept of "flow" highlighted the importance of uninterrupted concentration for deep learning. When learners engaged in a learning task without interruptions, they were more likely to enter a state of flow, enhancing their cognitive processes and retention of information.

The teacher's presence and time management were essential to achieving educational goals. Marzano, Marzano, & Pickering (2003), in their book "Classroom Management That Works," agreed that minimizing class disruptions was crucial for keeping a productive learning environment. Marzano et al. (2003) emphasized that classroom management became more effective when students actively engaged in their learning and that consistent classroom procedures were essential. A positive learning environment, which promotes productive interactions and collaborative learning, can be developed when the teacher is readily available and the class is not interrupted. Cohen & Lotan (2014) highlighted the role of the teacher in monitoring class activities, giving feedback, and intervening whenever necessary. A known

Australian psychologist, John Sweller (2011), also agreed with the vital role of teachers in providing learners with guidance and scaffolding to reduce the learner's cognitive load. Sweller's Cognitive Load Theory states that a human's working memory is a limited-capacity system. Unnecessary class interruptions, a possible addition to a learner's mental load, overloaded the working memory, hindering their ability to process and retain information effectively.

DepEd has consistently emphasized the importance of maintaining uninterrupted classes even before the COVID-19 pandemic to ensure a productive and effective learning environment. DepEd Order No. 9, s. 2005 was issued to institute measures in increasing engaged time-on-task. The policy highlighted no disruption of classes and that the number of school days indicated in the school calendar must be devoted to instructional-relevant class activities. On July 11, 2022, in line with the government's goal to bounce back from the pandemic, DepEd Order No. 34, s. 2022 mandated that the number of school days shall be solely dedicated to academic-related activities and strictly prohibiting the conduct of extra-curricular activities. DepEd Order No. 3, s. 2023, entitled "An Order Allowing the Conduct of In-Person Activities in Schools," reiterated the no class disruption policy and clarified that extra-curricular activities were strictly prohibited during class hours and co-curricular activities must be conducted only after quarterly examination.

In 2018, a Continuous Improvement (CI) Project at Mati School of Arts and Trades (MSAT) entitled Automated Class and Teacher Scheduler (ACTS) for Misconducts of Students and Absences of Teachers was conducted. The study aimed to solve the high number of student misconduct recorded in the

Guidance Office. Surprisingly, as our CI team conducted root-cause analysis, it was discovered that class disruptions due to teacher absences mostly caused high student misconduct cases. Data showed that 90% of the recorded student misconduct happened when the teacher was not around. Hence, the ACTS program was crafted to ensure that there is always a substitute whenever a teacher is absent or attending training. Even today, no DepEd policy states the process of substituting absent teachers. All orders pertaining to the no disruption of classes policy did not have detailed guidelines on resolving class disruptions caused by teacher absences. Therefore, at MSAT, a policy was made that the teacher class programs/timetables generated by ACTS served as a basis for substituting absent teachers. ACTS was tailored to fit the MSAT class scheduling requirements, which comprised 32 sections and more than 50 combined JHS and SHS teachers.

MSAT, a large public TechVoc Secondary School in Mati City, had a weak system for substituting classes during teacher absences. This finding could also be true for other schools in DepEd Region XI. The ACTS program developed was found to be effective and was able to solve our primary objective of reducing student misconduct cases in MSAT. Additionally, it also yielded some positive outcomes like accelerating the generation of school timetables, meeting quarterly learning competencies, increasing engaged time-on-task, and reducing cases of class disruptions.

Recently, DepEd intensified the policy on no disruption of classes. Most new issuances regarding DepEd programs and activities were subject to the no-disruption-of-classes policy. Since DepEd has not addressed teacher absences directly causing class disruption, a school-developed program like

ACTS can be a good solution as it was proven effective in MSAT. However, ACTS was made explicitly for MSAT, so for it to be used by all types of schools in the entire DepEd Region XI, it must be updated. Thus, there was a need to collect region-wide data samples and recreate ACTS to generate automated timetables with a substitution program for absent teachers. The conduct of this action research to develop an automated program as a novel approach to prevent class disruption was therefore highly sought.

INNOVATION

The deployment of ACTS, the Automated Class and Teacher Scheduler, was a significant innovative intervention for solving the problem of class disruption due to teacher absences, whether planned (e.g., training) or unplanned (e.g., sickness), as it had been empirically shown to affect students considerably. Research indicated persistent teacher absences led to considerable learning losses and affected students' nonacademic and behavioral outcomes (Greene & Butcher, 2023).

Even educational institutions embraced automated scheduling systems as valuable enhancers of operations. These included simplifying scheduling processes, reducing conflicts, and assuring optimum resource usage. Automation-prepared schedules with minimal disruption while providing continuity in the academic environment in learning institutions (International Journal of Novel Research and Development, 2024).

Simply put, ACTS was programmed to schedule substitute appointments promptly, thus addressing the problems that arose from teacher absences. It was yet another resource for maintaining the continuity of instruction to ensure that students remained in the learning process toward achieving attainment. Through automatic scheduling mechanisms, educational institutions efficiently deal with unexpected absences while maintaining the quality of education students receive.

This paper fell under the Educational Timetabling type of study. Only a few research works on educational timetabling in the Philippines were published. Ladia (2015) developed the UP-Manila Course Timetabling System

to automate the scheduling process of the University of the Philippines Manila. At that time, UP was still using the traditional manual method of scheduling classes. Similar studies were undertaken by Labuanan et al. (2019) and Mirafuentes et al. (2020) with the same objective of improving class scheduling at their respective campuses, Isabela State University-Main Campus and De La Salle University. The results of these national studies showed that the programs they developed helped improve the class scheduling of their respective schools. They suggested that several aspects of their programs be enhanced and that further tests be conducted in the future.

Commercial and open-source timetabling applications were already available; however, these programs were designed to solve specific school timetabling problems. Oude Vrielink et al. (2017) stated that commercial timetabling products were less concerned with implementing such solution methods in timetabling applications. They only improved the user interface, but the algorithm inside was outdated. In the Department of Education (DepEd), no published real-world datasets were available for timetabling problem-solving. There was also a need to develop a separate timetabling program to be used by DepEd schools because these schools were unique.

The Automated Class and Teacher Scheduler (ACTS) program was developed to automate the generation of substitute teachers in the Mati School of Arts and Trades (MSAT) to combat class disruptions caused by teacher absences. Updating it to be used by other schools in Region XI was an ambitious project, considering how diverse the schools were to be studied. DepEd had many unique school types, such as specialized schools, special education (SPED), multi-grade, and multi-shift schools. This program aimed

to achieve efficiency in generating timetables and assigning substitute teachers, which is essential for maintaining the efficiency of educational institutions.

Features of ACTS

1. Automation

Before the ACTS program was developed, MSAT used traditional pen-and-paper scheduling. Using this method, the scheduling of classes required at least two weeks to complete and another two weeks to resolve conflicts and implement changes. The ACTS program accelerated this process to as fast as two hours. Timetabling was performed through spreadsheets (MS Excel), which, while still considered manual, employed a formulation that detected conflicts. Timetables with vacant substitute teachers were automatically generated after plotting teacher workloads.

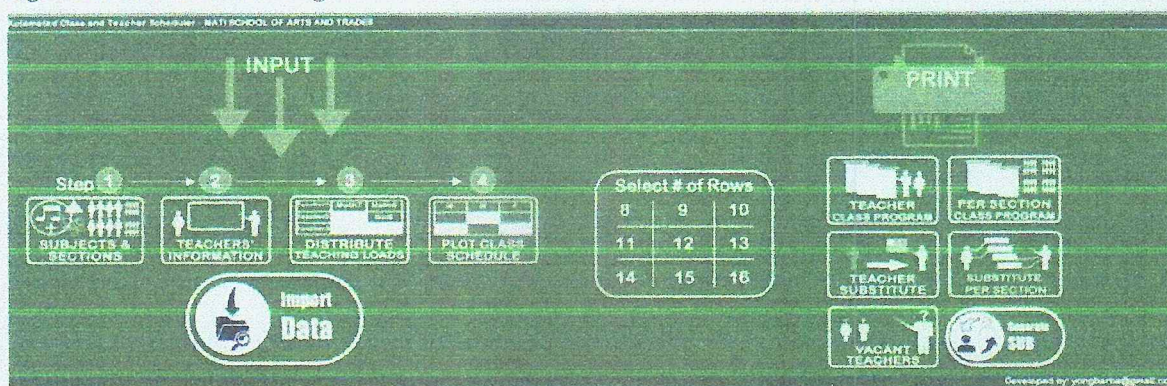
Key Functions and Elements of ACTS

a. Page (Figure 1)

The home page served as the central dashboard, providing users with intuitive navigation to all features and modules within ACTS. A well-designed dashboard facilitated user interaction and ensured the system's effectiveness. For instance, Teach 'n Go's scheduling software emphasized the importance of a user-friendly interface that allowed teachers to select classrooms, customize classes, and manage schedules efficiently (Teach 'n Go, n.d.). On the Home Page, the four input steps were present so that users could easily access these important sheets. After entering data in the input sheets, the printable timetables, which are located on the right side of the home page, are

now ready for print. An Import Data button was added so that schools can copy data from the old version of ACTS with only a few clicks. The number of rows in the timetable can be easily increased or reduced using the number shortcut buttons. A Generate Sub button was added to generate substitute teachers in just one click.

Figure 1. ACTS Home Page



b. Step 1: Input all Subjects and Sections (Figure 2)

In this module, users input comprehensive information about each subject, including subject codes or activity, the minutes per period, the number of periods/ meetings per week, and the number of sections/ classes of each subject. The subject description and the grade level are only optional data. Another important input data is the Section/ Class name with Grade Level. These imputed subjects and sections appear in the drop-down list of subjects and sections needed in the subsequent input sheets.

Figure 2. Subjects and Sections input sheet

| List of Subject with *Important Details | | | | | | | List of Sections/ Classes | |
|---|---------------------------|-------------------------------|------------------------------------|------------------------|---|------------------------------------|---------------------------|--|
| No. | Subject Code/ Activity | Description (Optional) | Grade/ Year Level (Optional) | *Minutes per period | *Number of periods/ meetings per week | *Number of Sections/ Classes | No. | Section/ Class Name (Include Grade/ Year Level) |
| 1 | AP10 | Araling Panlipunan | 10 | 45 | 5 | 4 | 1 | G7 Perseverance |
| 2 | AP7_MATATAG | Araling Panlipunan | 7 | 45 | 5 | 6 | 2 | G7_Humility |
| 3 | AP8 | Araling Panlipunan | 8 | 45 | 5 | 4 | 3 | G7_Sincerity |
| 4 | AP9 | Araling Panlipunan | 9 | 45 | 5 | 4 | 4 | G7_Honesty |
| 5 | ContArts | | | 60 | 4 | 6 | 5 | G7_Faith |
| 6 | ELSci | | | 60 | 4 | 6 | 6 | G7_Friendship |
| 7 | EmTech | | | 60 | 4 | 6 | 7 | G8_Generosity |
| 8 | Eng10 | English | 10 | 45 | 5 | 4 | 8 | G8_Obedience |
| 9 | Eng7_MATATAG | English | 7 | 45 | 5 | 6 | 9 | G8_Patience |
| 10 | Eng8 | English | 8 | 45 | 5 | 4 | 10 | G8_Prudence |
| 11 | Eng9 | English | 9 | 45 | 5 | 4 | 11 | G9_Agumaldo |
| 12 | EngAPP | English for Academic Purposes | | 60 | 4 | 6 | 12 | G9_Bonifacio |
| 13 | Entrep10 | Entrepreneurship | 10 | 45 | 2 | 4 | 13 | G9_Jacinto |
| 14 | Entrep9 | Entrepreneurship | 9 | 45 | 2 | 4 | 14 | G9_Mabini |
| 15 | EntrepSHS | | | 60 | 4 | 6 | 15 | G10_Burgos |
| 16 | ESP10 | Edukasyon sa Paunangkatao | 10 | 45 | 5 | 4 | 16 | G10_Zamorá |

c. Step 2: Input Teachers' Information (Figure 3)

This section recorded school information and important teacher data such as names, positions, courses, advisory classes, and others. The group number as a substitute teacher is also determined in this step. This number is needed before generating substitute teachers. Schools have the freedom to group teachers. Generally, in big schools, teachers handling the same subjects were in the same group number, while in small schools, they grouped all teachers as one. Those teachers in the same group number were automatically selected by the ACTS program to be substitute teachers. Accurate input of teacher information was essential for balancing workloads and preventing scheduling conflicts. The International Journal of New Research and Development highlighted the importance of managing faculty availability and discussed automated scheduling systems considering teacher constraints to optimize timetables (Ramesh et al., 2023).

Figure 3. Teachers' Information input sheet

| Region: XI Division: City of Mati District: Mati Central School: MATI SCHOOL OF ARTS AND TRADES Semester: 2ND School Year: 2014-2015 | | | | | | | | | | Signatories of Class Program | | | | Prepared by | | Recommended by | | Approved by | |
|---|-----------|-----------------|-------------|-----|-------------|----------------|--------------------------|--------|--------------|--|----------------|------------------------------------|--|---------------------------------------|--|----------------|--|-------------|--|
| | | | | | | | | | | Role and Name of Signatories | | | | Designation | | | | | |
| | | | | | | | | | | Prepared by: JARCE E. BARBA JOSAM B. ROJAS | | | | Head Teacher I Principal I | | | | | |
| | | | | | | | | | | Recommended by: MARY JEAN M. FRANCISQUETE, EdD MARIA GRACIA F. FLORES | | | | District School Division Office Chief | | | | | |
| | | | | | | | | | | Approved by: | | | | | | | | | |
| Employee No. | Last Name | First Name | M.N. | Sex | Fund Source | Position | Status of Accomplishment | Course | Course Major | Course Minor | Advisory Class | Group Number as Exhibiting Teacher | | | | | | | |
| 8320670 | Acosta | Jessabelle | Maraguhang | F | National | Teacher II | Regular Teacher | BSED | English | | G11 Math | 1 | | | | | | | |
| 9101791 | Aguias | Sharon Rose | Mercaderona | F | National | Teacher I | Regular Teacher | BSM-D | Science | Physics | G12 Math | | | | | | | | |
| 9130111 | Amang | Aria | Bonafate | F | National | Teacher I | Regular Teacher | BSM-D | Tagalog | | G12 History | | | | | | | | |
| 9129170 | Andono | Martha | Castro | F | National | Teacher II | Regular Teacher | BSM-D | TEFL/ESP | | | 3 | | | | | | | |
| 9130146 | Antero | Kristelle Marie | Blaug | F | National | Teacher II | Regular Teacher | Others | TEFL/ESP | | G12 Math | 3 | | | | | | | |
| 9129171 | Asa-as | Artemio | Narido | M | National | Teacher II | Regular Teacher | BSM-D | English | | G10 Filipino | | | | | | | | |
| 6450755 | Balansa | Gonzalo | Nogales | M | National | Teacher I | Regular Teacher | BSM-D | TEFL/ESP | | | 3 | | | | | | | |
| 9129117 | Bandagan | Mary Ann | Danarao | F | National | Teacher I | Regular Teacher | BSM-D | Math | 1CE/ESP | | | | | | | | | |
| 9129193 | Barka | Janice | Fernando | F | National | Head Teacher I | Regular Teacher | BSM-D | Science | | | | | | | | | | |
| 9129145 | Bastan | Janayma | Fernando | F | National | Teacher I | Regular Teacher | BSM-D | Science | | G10 Math | | | | | | | | |

d. Step 3: Distribute Subject Loads per Teacher (Figure 4)

Subjects were allocated to teachers based on their specializations, experience, availability, and other preferences, ensuring a balanced distribution of workloads. Automated systems like ACTS utilized formulations and data validation tools to facilitate the distribution of teaching loads. There is a counter of distributed subjects to help users if all subjects have already been distributed. There is also a summary of teaching loads for each teacher, and overloaded teachers were highlighted to prompt the users. This approach was supported by the Lecture Timetable Scheduling Software, which used algorithms to assign lectures to appropriate time slots and resources (Kumar & Kumar, 2018).

Figure 4. Distribute Teaching Loads input sheet

| Region: XI Division: City of Mati District: Mati Central School: MATI SCHOOL OF ARTS AND TRADES Semester: 2ND School Year: 2014-2015 | | | | | | | | | | This is a Counter of Distributed Subject Loads to help you check if you have already distributed all the subjects. A negative number means you have not distributed all the subjects. | | | | | | | | | | | |
|---|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---|------------------|------------------|------------------|------------------|--|--|--|--|--|--|--|
| Employee No. | Last Name | Teaching Load 1 | Teaching Load 2 | Teaching Load 3 | Teaching Load 4 | Teaching Load 5 | Teaching Load 6 | Teaching Load 7 | Teaching Load 8 | Teaching Load 9 | Teaching Load 10 | Teaching Load 11 | Teaching Load 12 | Teaching Load 13 | | | | | | | |
| 8320670 | Acosta | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | | | | | | | |
| 9101791 | Aguias | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | | | | | | | |
| 9130111 | Amang | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | | | | | | | |
| 9129170 | Andono | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | | | | | | | |
| 9130146 | Antero | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | | | | | | | |
| 9129171 | Asa-as | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | | | | | | | |
| 6450755 | Balansa | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | | | | | | | |
| 9129117 | Bandagan | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | | | | | | | |
| 9129193 | Barka | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | | | | | | | |
| 9129145 | Bastan | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | AP10 | | | | | | | |

e. Step 4: Plot the Schedules or Activities (Figure 5)

The Plot Sheet is the fourth and final input step. The ACTS program is still considered manual timetabling, and no advanced algorithm has been used to plot teacher schedules. However, advanced formulation and data validation tools were used to help users avoid and detect schedule conflicts. All changes made in the Plot sheet automatically appear in the printable timetables. The system's ability to detect and resolve scheduling conflicts was akin to features in Bullet Solutions' automated timetable software, which delivered conflict-free scheduling solutions (Bullet Solutions, n.d.).



Figure 5. Plot Schedules input sheet

| Time | Day | Subject & Teachers | G11_ALS | G11_Mabait | G11_Masinop | G11_Mapagkumbabe | G11_Masipag | G11_Matulungin |
|-----------|-----|--------------------|-------------------------|-------------------------|----------------------------|------------------------|-------------------------|------------------------|
| 7:30-8:30 | M | Teacher | Carpio, Rose G. | Lupogan, Moana Guine P. | Acosta, Jessabelle M. | Bohol, Rose G. | Roena, Samuel | Mabandos, Jennifer B. |
| | | Subject | SHS_ALS_SPECIALIZATION | ReadWS | ReadWS | Pagbasa | PEH | Pagbasa |
| | T | Teacher | Masangulid, Christopher | Lupogan, Moana Guine P. | Acosta, Jessabelle M. | Carpio, Geraldina A. | Fetiza, Vergel R. | Mabandos, Jennifer B. |
| | | Subject | ICL | ReadWS | ReadWS | PEH | UCSP | Pagbasa |
| | W | Teacher | Carpio, Rose G. | Toong, Shylene R. | Acosta, Jessabelle M. | Bohol, Rose G. | Fetiza, Vergel R. | Mabandos, Jennifer B. |
| | | Subject | SHS_ALS_SPECIALIZATION | SHS_BPP | ReadWS | Pagbasa | UCSP | Pagbasa |
| | Th | Teacher | Carpio, Rose G. | Toong, Shylene R. | Paguyan, Mechelle J. | Bohol, Rose G. | Fetiza, Vergel R. | Mabandos, Jennifer B. |
| | | Subject | SHS_ALS_SPECIALIZATION | SHS_BPP | Research I | Pagbasa | UCSP | Pagbasa |
| | F | Teacher | Carpio, Rose G. | Mabandos, Jennifer B. | Acosta, Jessabelle M. | Bohol, Rose G. | Lupogan, Moana Guine P. | Ngocho, Alberto Jr. A. |
| | | Subject | SHS_ALS_SPECIALIZATION | Pagbasa | ICL | Pagbasa | ReadWS | Lit |
| | M | Teacher | Carpio, Rose G. | Ngocho, Alberto Jr. A. | Lupogan, Orlan A. | Acosta, Jessabelle M. | Lupogan, Moana Guine P. | Dizon, Hannee Vall A. |
| | | Subject | SHS_ALS_SPECIALIZATION | Lit | Stat | ReadWS | ReadWS | UCSP |
| 8:30-9:30 | T | Teacher | Masangulid, Christopher | Mabandos, Jennifer B. | Lupogan, Orlan A. | Ngocho, Alberto Jr. A. | Calungsod, Jonilee D. | Dizon, Hannee Vall A. |
| | | Subject | ICL | Pagbasa | Stat | UCSP | Research I | UCSP |
| | W | Teacher | Carpio, Rose G. | Toong, Shylene R. | Fetiza, Vergel R. | Acosta, Jessabelle M. | Calungsod, Jonilee D. | Dizon, Hannee Vall A. |
| | | Subject | SHS_ALS_SPECIALIZATION | SHS_BPP | UCSP | ReadWS | Research I | UCSP |
| | Th | Teacher | Carpio, Rose G. | Toong, Shylene R. | Villares, Princess Jane T. | Acosta, Jessabelle M. | Lupogan, Moana Guine P. | Dizon, Hannee Vall A. |
| | | Subject | SHS_ALS_SPECIALIZATION | SHS_BPP | ICL | ReadWS | ReadWS | PEH |
| | F | Teacher | Carpio, Rose G. | Mabandos, Jennifer B. | Acosta, Jessabelle M. | Ngocho, Alberto Jr. A. | Calungsod, Jonilee D. | Dizon, Hannee Vall A. |
| | | Subject | SHS_ALS_SPECIALIZATION | Pagbasa | Catch Up Fridays | Catch Up Fridays | Research I | UCSP |

f. Printable Timetables

Once the schedules were plotted, ACTS provided printable timetables for teachers and classes, facilitating easy distribution and reference. The generation of clear, organized timetables that teachers and students could easily interpret was a feature also found in QuickSchools' class scheduling software (QuickSchools, n.d.).

Figure 6. Teacher's Class Program

Republic of the Philippines
Department of Education
Region XI
DIVISION OF City of Mati
Mati Central DISTRICT
MATI SCHOOL OF ARTS AND TRADES

| TEACHER'S CLASS SCHEDULE/ TIMETABLE | | | | | |
|---------------------------------------|---------------------|------------------------|------------------------------|---|---------|
| 2ND Semester, School Year 2024-2025 | | | | | |
| Name: | Balusca, Gonzalo N. | Sex: | M | Employee No./ TIN: | ***** |
| Designation/ Position: | Teacher I | Status of Appointment: | Regular Permanent | Course/ Degree: | BSED |
| Ancillary/ Special Assignments: | | | | Course Major: | TLE/EPP |
| | | | | Course Minor: | |
| | | | | Number of actual teaching hours per week: | 28 |
| Advisory: | NONE | Subject Taught: | SHS_ALS_EIM; SHS_EIM; Worklm | | |

| TIME | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|-------------|----------------------------|--------------------|----------------------------|----------------------------|--------------------------|
| 7:30-8:30 | SHS_ALS_EIM G11_ALS_EIM | | SHS_ALS_EIM G11_ALS_EIM | SHS_ALS_EIM G11_ALS_EIM | Worklm G12_WorklmmEIM |
| 8:30-9:30 | SHS_ALS_EIM G11_ALS_EIM | | SHS_ALS_EIM G11_ALS_EIM | SHS_ALS_EIM G11_ALS_EIM | Worklm G12_WorklmmEIM |
| 9:45-10:45 | SHS_EIM G11_EIM | SHS_EIM G11_EIM | SHS_EIM G11_EIM | SHS_EIM G11_EIM | Worklm G12_WorklmmEIM |
| 10:45-11:45 | SHS_EIM G11_EIM | SHS_EIM G11_EIM | SHS_EIM G11_EIM | SHS_EIM G11_EIM | Worklm G12_WorklmmEIM |
| 1:00-2:00 | | | | | |
| 2:00-3:00 | | | | | |
| 3:00-4:00 | SHS_EIM G12_EIM | SHS_EIM G12_EIM | SHS_EIM G12_EIM | SHS_EIM G12_EIM | |
| 4:00-5:00 | SHS_EIM G12_EIM | SHS_EIM G12_EIM | SHS_EIM G12_EIM | SHS_EIM G12_EIM | |

In conformity:

Prepared by:

Teacher's Signature

JANICE F. BARBA
Head Teacher I

Noted by:

Recommending Approval:

JORISAM B. ROJAS
Principal I

MARY JEAN M. FRANCISQUETE, EdD
PSDS-Mati Central District

Approved:

MARIA GINA F. FLORES
CID-Chief

The timetable of each teacher in the Teacher's Class Program sheet contains various information and teaching loads that automatically appear (Figure 6). The users selected the names of each teacher from the drop-down list, and the timetable can now be printed (Figure 7).

Figure 7. Drop-down list of teachers in the Teacher Class Program sheet

Select Teacher: **Balusca, Gonzalo N.**

Select Subject: **SHS**

of Plotted: **1**

DepEd MATATAG

of the Philippines
Department of Education
Division Office - City of Mati
Central DISTRICT
SCHOOL OF ARTS AND TRADES

TEACHER'S CLASS SCHEDULE/ TIMETABLE
2ND Semester, School Year 2024-2025

| | | | | | |
|---------------------------------|----------------------------|------------------------|-------------------------------------|---|----------------|
| Name: | Balusca, Gonzalo N. | Sex: | M | Employee No./ TIN: | ***** |
| Designation/ Position: | Teacher I | Status of Appointment: | Regular Permanent | Course/ Degree: | BSED |
| Ancillary/ Special Assignments: | | | | Course Major: | TLE/EPP |
| | | | | Course Minor: | |
| | | | | Number of actual teaching hours per week: | 28 |
| Advisory: | NONE | Subject Taught: | SHS_ALS_EIM; SHS_EIM; Worklm | | |

| TIME | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|-----------|----------------------------|---------|----------------------------|----------------------------|--------------------------|
| 7:30-8:30 | SHS_ALS_EIM G11_ALS_EIM | | SHS_ALS_EIM G11_ALS_EIM | SHS_ALS_EIM G11_ALS_EIM | Worklm G12_WorklmmEIM |
| 8:30-9:30 | SHS_ALS_EIM G11_ALS_EIM | | SHS_ALS_EIM G11_ALS_EIM | SHS_ALS_EIM G11_ALS_EIM | Worklm G12_WorklmmEIM |
| | SHS_EIM | SHS_EIM | SHS_EIM | SHS_EIM | Worklm |

Figure 8. Drop-down list of Sections/ Classes in the Per Section Class Program sheet

Select Section: **G11_Mabait**

Select subject: **SHS**

Vacant Sched: **1**

DepEd MATATAG

of the Philippines
Department of Education
Division Office - City of Mati
Central DISTRICT
SCHOOL OF ARTS AND TRADES

PER SECTION CLASS PROGRAM
2ND Semester, School Year 2024-2025

| | | | | | |
|--------------------|-------------------|----------|---------------------------------|--|--|
| Grade and Section: | G11_Mabait | Adviser: | Lupogan, Moana Guiane P. | | |
|--------------------|-------------------|----------|---------------------------------|--|--|

| TIME | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|-------------|-------------------------------------|-------------------------------------|---------------------------------|-------------------------------------|-------------------------------------|
| 7:30-8:30 | Lupogan, Moana Guiane P. ReadWS | Lupogan, Moana Guiane P. ReadWS | Toong, Shyrene R. SHS_BPP | Toong, Shyrene R. SHS_BPP | Mabandos, Jennifer B. Pagbasa |
| 8:30-9:30 | Ngoho, Alberto Jr. A. Lit | Mabandos, Jennifer B. Pagbasa | Toong, Shyrene R. SHS_BPP | Toong, Shyrene R. SHS_BPP | Mabandos, Jennifer B. Pagbasa |
| 9:45-10:45 | Toong, Balusca, SHS_BPP_EIM | Toong, Balusca, SHS_BPP_EIM | Toong, Balusca, SHS_BPP_EIM | Toong, Balusca, SHS_BPP_EIM | Ngoho, Alberto Jr. A. Lit |
| 10:45-11:45 | Toong, Balusca, SHS_BPP_EIM | Toong, Balusca, SHS_BPP_EIM | Toong, Balusca, SHS_BPP_EIM | Toong, Balusca, SHS_BPP_EIM | Lupogan, Moana Guiane P. ReadWS |
| 1:00-2:00 | Dizon, Hanney Vall A. UCSP | Dizon, Hanney Vall A. UCSP | Dizon, Hanney Vall A. UCSP | Dizon, Hanney Vall A. UCSP | Paguyan, Mechelle J. Research1 |
| 2:00-3:00 | Paguyan, Mechelle J. Research1 | Ngoho, Alberto Jr. A. Lit | Lupogan, Moana Guiane P. ICL | Paguyan, Mechelle J. Research1 | Ngoho, Alberto Jr. A. Lit |
| 3:00-4:00 | Gorion, Cheston Silverio S. Stat | Gorion, Cheston Silverio S. Stat | Dizon, Hanney Vall A. ICL | Gorion, Cheston Silverio S. Stat | Gorion, Cheston Silverio S. Stat |
| 4:00-5:00 | Mabandos, Jennifer B. Pagbasa | Paguyan, Mechelle J. Research1 | Lupogan, Moana Guiane P. PEH | Lupogan, Moana Guiane P. ReadWS | Lupogan, Moana Guiane P. HGP |

The timetables per section or class were generated automatically as well.

The users selected the section from the drop-down list, and the timetable can

now be printed (Figure 8). The Teacher's Class Substitution Program was also automatically generated (Figure 9). This timetable showed the vacant substitute for each teacher. These teachers were in the same group number previously set in the teachers' information sheet. The Generate Sub button was also placed in this sheet. This button generated the substitute teachers in a single click.

Figure 9. Teacher's Class Substitution Program

Select Teacher: Balusca, Gonzalo N.
 Acosta, Jessabelle M.
 Agbas, Sharon Rose M.
 Amiang, Aisa B.
 Andoyo, Marilou E.
 Antero, Krystelle Marie B.
 Awa-ao, Jeremie S.
 Balusca, Gonzalo N.
 Bandigan, Mary Ann D.
 Barba, Janice F.
 Basfari, Jamayma F.
 Baudon, Evelyn L.
 Belona, Margaux

Generate Sub

CLASS SUBSTITUTION PROGRAM
 School Year 2024-2025

| Name of Teacher to be substituted: | | Advisory: NONE | | | | |
|------------------------------------|---------------------|---|---|---|---|---|
| TIME | Substitutes | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
| 7:30-8:30 | Subject | SHS_ALS_EIM | | SHS_ALS_EIM | SHS_ALS_EIM | Workim |
| | Section | G11_ALS_EIM | | G11_ALS_EIM | G11_ALS_EIM | G12_WorkimEIM |
| | Vacant Sub Teachers | Desales, Jaynud Deen M. | | Andoyo, Marilou E. Desales, Jaynud Deen M. Roena, Samuel | Andoyo, Marilou E. Desales, Jaynud Deen M. Roena, Samuel | Andoyo, Marilou E. Roena, Samuel Villases, Princess Jane T. |
| 8:30-9:30 | Subject | SHS_ALS_EIM | | SHS_ALS_EIM | SHS_ALS_EIM | Workim |
| | Section | G11_ALS_EIM | | G11_ALS_EIM | G11_ALS_EIM | G12_WorkimEIM |
| | Vacant Sub Teachers | Andoyo, Marilou E. Bomboc, Cyrille O. Roena, Samuel Villases, Princess Jane T. | | Andoyo, Marilou E. Bomboc, Cyrille O. Roena, Samuel Villases, Princess Jane T. | Andoyo, Marilou E. Bomboc, Cyrille O. Roena, Samuel | Andoyo, Marilou E. Napuli, Cindy Mae G. Roena, Samuel Villases, Princess Jane T. |
| 9:45-10:45 | Subject | SHS_EIM | SHS_EIM | SHS_EIM | SHS_EIM | Workim |
| | Section | G11_EIM | G11_EIM | G11_EIM | G11_EIM | G12_WorkimEIM |
| | Vacant Sub Teachers | Antero, Krystelle Marie B. Bomboc, Cyrille O. Lim, Arwen A. | Andoyo, Marilou E. Antero, Krystelle Marie B. Bomboc, Cyrille O. Lim, Arwen A. | Andoyo, Marilou E. Antero, Krystelle Marie B. Bomboc, Cyrille O. Lim, Arwen A. | Andoyo, Marilou E. Antero, Krystelle Marie B. Bomboc, Cyrille O. Lim, Arwen A. | Andoyo, Marilou E. Carpio, Geraldina A. Napuli, Cindy Mae G. Roena, Samuel |

There was also a timetable per section with substitute teachers (Figure 10). This timetable was also automated. The sections were selected from the drop-down list, and the timetable data, such as the class adviser, the assigned teachers and subjects, and the identified vacant substitute teachers, automatically appeared. All vacant teachers in all periods or schedules were displayed in the Vacant Teachers sheet (Figure 11). This timetable was also automated, providing the school heads with a matrix of their school classes.

Select Section: **G11_Mabait**

Select subject: **40**

Vacant Sched: **Republic of the Philippines
Department of Education
Region XI
DIVISION OF City of Mati
Mati Central DISTRICT
MATI SCHOOL OF ARTS AND TRADES**

CLASS SCHEDULE PER SECTION WITH VACANT SUBSTITUTE TEACHERS

2ND Semester, School Year 2024-2025

| Grade and Section: | | G11_Mabait | | Adviser: | | Lupogan, Moana Guiane P. | |
|--------------------|---------------------|--|--|-------------------|-------------------|--|--|
| TIME | | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | |
| 7:30-8:30 | Teacher | Lupogan, Moana Guiane P. | Lupogan, Moana Guiane P. | Toong, Shyrene R. | Toong, Shyrene R. | Mabandos, Jennifer B. | |
| | Subject | ReadWS | ReadWS | SHS_BPP | SHS_BPP | Pagbasa | |
| | Vacant Sub Teachers | Beloria, Margaux Dizon, Hanney Vall A. Fetiza, Vergel R. Gorion, Cheston Silverio S. Lupogan, Orlan A. | Beloria, Margaux Bohol, Rose G. Dizon, Hanney Vall A. Gorion, Cheston Silverio S. Lupogan, Orlan A. | | | Beloria, Margaux Calungsod, Jonilee D. Dizon, Hanney Vall A. Gorion, Cheston Silverio S. Lupogan, Orlan A. | |
| 8:30-9:30 | Teacher | Ngoho, Alberto Jr. A. | Mabandos, Jennifer B. | Toong, Shyrene R. | Toong, Shyrene R. | Mabandos, Jennifer B. | |
| | Subject | Lit | Pagbasa | SHS_BPP | SHS_BPP | Pagbasa | |
| | Vacant Sub Teachers | Beloria, Margaux Bohol, Rose G. Calungsod, Jonilee D. Gorion, Cheston Silverio S. Masanguid, Christopher | Acosta, Jessanelle M. Beloria, Margaux Bohol, Rose G. Gorion, Cheston Silverio S. Lupogan, Moana Guiane P. | | | Beloria, Margaux Gorion, Cheston Silverio S. Lupogan, Moana Guiane P. Lupogan, Orlan A. Masanguid, Christopher | |
| 9:45-10:45 | Teacher | Toong_Balusca, | Toong_Balusca, | Toong_Balusca, | Toong_Balusca, | Ngoho, Alberto Jr. A. | |
| | Subject | SHS_BPP_EIM | SHS_BPP_EIM | SHS_BPP_EIM | SHS_BPP_EIM | Lit | |
| | Vacant Sub Teachers | | | | | Beloria, Margaux Calungsod, Jonilee D. Gorion, Cheston Silverio S. Lupogan, Moana Guiane P. | |

[illegible]

2. Defined Roles

Implementing the Automated Class and Teacher Scheduler (ACTS) program necessitated the involvement of various personnel, each with clearly defined roles, to ensure the adequate substitution of classes during teacher absences. This action research aimed to delineate the specific responsibilities of school heads, teachers, and students in executing and overseeing the substitution process during class disruptions. A critical focus was placed on identifying the essential functions of substitute teachers.

Roles of School Heads

School heads are expected to ensure the smooth overall implementation of the ACTS Program, which includes defining the roles of all stakeholders and ensuring that the procedure of a successful substitution is going well. The school heads should coordinate with the regular teacher and substitute teachers to provide instructional continuity in regular teacher absences. School administration's effective leadership is important in managing teacher absence and has proven effective in the delivery of substitute teaching (Red Rover, 2023).

Roles of Regular Teachers

Regular teachers were detailed in preparing complete lesson plans and instructional materials in advance to allow for smooth transitions in their absence in case of planned absences. Still, in the case of unplanned absences, the regular teacher will notify the school head through message and the topics left for discussion. Providing detailed instructions for substitute teachers would allow them to deliver such a lesson best, aligning with quality

education. In this regard, the National Science Teaching Association (2023) further supported the idea that regular teachers should write clear and conspicuous lesson plans to the knowledge of the substitutes to enable continuity of instruction.

Roles of Substitute Teachers

The function of substitute teachers was to take over the class of the absent teachers. Their responsibilities included using the lesson plan given to them, managing the learning environment on their end, and providing positive performances in the classroom. It has been observed that classroom management on the part of the substitute teacher also impacted the engagement of students and learning outcomes (Ostapczuk, 1994). Another factor for substitute teachers was to give feedback to regular teachers on what transpired during the day, including students' progress and issues the students faced.

Roles of the Learners

Introducing a substitute teacher into a classroom was to be accepted by learners according to established classroom norms. While the relationship between a substitute teacher and students was typically considered temporary, it could have lasting effects. An experienced and enthusiastic substitute teacher brought new ideas and teaching styles, enriching the student's learning experience (Teachers Guide, 2023). Therefore, fostering a culture of adaptability and respect among learners was essential for the success of the substitution process.

3. Policy

Teacher absences have long been a critical issue affecting the quality of education in the Philippines. Despite existing policies, such as the DepEd Order No. 55, s. 1992, which mandates that teachers fulfill their teaching duties during school days, the problem persists. A recent World Bank study highlighted that teacher absences contributed significantly to the country's high learning poverty, with 40% of surveyed students reporting that their teachers were sometimes or often absent from class (Chi, 2023).

This action research aimed to provide substantial input for policymakers in developing strategies related to school management and teacher workloads. Recognizing that teachers are susceptible to absences due to various factors, the study emphasized the importance of crafting policies addressing teachers' absence effects due to sickness or attending training and seminars. Moreover, it advocated for incentives for teachers who serve as substitutes, ensuring continuity in student learning. The International Institute for Educational Planning (2021) supported this approach, emphasizing the need for context-specific strategies to tackle teacher absences effectively.

The research collected real-world datasets from various school types to adapt the Automated Class and Teacher Scheduler (ACTS) program to the diverse needs of schools across DepEd Region XI. The data encompassed the number of teachers, sections, subjects, specializations, and class durations. Tailoring the ACTS program based on specific school data, the system could effectively automate the generation of substitute teachers, thereby minimizing class disruptions caused by teacher absences. This approach aligns with the International Institute for Educational Planning (2021) recommendations,

emphasizing the importance of context-specific strategies in addressing teacher absenteeism.

Moreover, the study highlighted the pressing issue of teacher absences, whether planned or unplanned and their detrimental effects on student learning. It called for the Department of Education to revisit and enhance existing policies, ensuring they effectively address current challenges. Moreover, the adaptation and implementation of programs like ACTS, tailored to the unique needs of individual schools, are crucial steps toward mitigating the impact of teacher absences and promoting uninterrupted student learning.

4. Updating the ACTS

The Department of Education (DepEd) Region XI encompasses various educational institutions with unique scheduling requirements. To address the challenges posed by this diversity, an action research initiative was undertaken to enhance the Automated Class and Teacher Scheduler (ACTS) program. This enhancement aimed to tailor the program to the specific needs of schools within the region, thereby improving scheduling efficiency and minimizing class disruptions.

A comprehensive data collection process was implemented, gathering information on the number of teachers, sections, subjects, specializations, and class durations from various schools in DepEd Region XI. The collected data provided a nuanced understanding of each school's scheduling complexities, enabling the customization of the ACTS program to meet specific institutional needs.

Incorporating the analyzed data, the ACTS program was refined to offer a user-friendly interface that accommodates the diverse scheduling demands of Region XI schools. The program's adaptability allowed for efficient allocation of classes and teachers, reducing administrative burdens and ensuring continuity in student learning. Features such as automated timetable generation and real-time updates were integrated, aligning with best practices in educational technology (SkoolSheet, n.d.).

The research underscored the importance of leveraging technology to streamline administrative processes, allowing educators to focus more on instructional quality and student engagement.

This action research project successfully updated the ACTS program by grounding its development in comprehensive, real-world data from schools in DepEd Region XI. The tailored enhancements ensured the program was functional and responsive to each institution's unique needs. Automating scheduling through the refined ACTS program reflected the efficacy of customized technological solutions in improving educational administration and minimizing disruptions to student learning.

ACTION RESEARCH QUESTIONS

This action research seeks to answer the following questions:

1. How do teachers and administrators perceive the effectiveness of the ACTS in preventing class disruptions in schools?
2. What is the feedback of the teachers and administrators towards the functionality and usability of the ACTS?
3. How can the functionality and usability of the ACTS be enhanced to accommodate better the unique scheduling needs of schools in DepEd Region XI?

ACTION RESEARCH METHODS

A. Participants and/or other sources of data and information

This study's participants were one hundred twelve (112) teachers and administrators from different schools in Region XI. These participants were the actual users of the Automated Class and Teacher Scheduler (ACTS), representing their school. Of the 112 participants, 20 participated in the Focus Group Discussions (FGDs).

B. Data Gathering Methods

The data-gathering methods for this action research were designed to thoroughly investigate the effectiveness of ACTS in preventing class disruptions caused by teacher absences and address the challenges and opportunities for improving its functionality and usability for DepEd Region XI schools. This comprehensive approach ensured that the research effectively identified areas for enhancement and provided actionable insights for optimizing the ACTS program to serve the educational institutions within the region better.

Research Design

This action research employed quantitative and qualitative approaches, emphasizing quantitative elements supplemented by qualitative components. The quantitative phase involved administering survey questionnaires to 112 teachers or administrators from different schools in DepEd Region XI. These surveys provided structured data to assess the effectiveness, functionality, and usability of the Automated Class and Teacher Scheduler (ACTS).

Concurrently, qualitative data were collected through Focus Group Discussions (FGDs) with the 20 teachers or administrators from the different schools in the region. This approach revealed more profound insights into the successes, challenges, and opportunities associated with using ACTS.

Data Collection

The quantitative part of this study's action research was gathered using a survey questionnaire. The researchers distributed the survey questionnaires to the participants using Google Forms. Open-ended questions were also provided to encourage participants' feedback and comments to enhance the Automated Class and Teacher Scheduler (ACTS) version. A focus group discussion was conducted through virtual meetup to facilitate open and interactive discussions for the participants outside the Mati City Division. In-person FGDs were conducted for the participants from the Mati City Division.

Data Analysis

The data collected from the questionnaire on the Automated Class and Teacher Scheduler (ACTS) were analyzed by calculating the means and grand means of all responses within each of the three categories: Effectiveness, Functionality, and Usability. These categories aim to evaluate ACTS's overall performance in addressing school scheduling needs, automating class timetabling, and ensuring a user-friendly experience for educators and administrators.

The responses were scored using a five-point Likert scale, where 5 = Strongly Agree, 4 = Agree, 3 = Moderately Agree, 2 = Disagree, and 1 = Strongly Disagree. These scores were averaged to determine the level of agreement for

each aspect, which was then categorized and interpreted according to the established scales.

The Effectiveness table measured ACTS's efficiency in averting disruptions and unscheduled class activity due to teacher absences and providing timely and accurate scheduling. Scoring in the range of Exceptionally Effective (4.2-5.0) states that ACTS has met the required objectives, while lower scores indicate an aberration between fulfilled and unfulfilled needs. The interpretation adds insight into the system's effectiveness in adequately performing its core purpose, streamlining class, and substitute scheduling.

Table 1. Description and Interpretation of Results for the Effectiveness of ACTS in preventing class disruptions caused by teacher absences

| Mean Range | Description | Interpretation |
|-------------------|--------------------------------|---|
| >4.2 – 5.0 | Exceptionally Effective | "ACTS ensures seamless scheduling, effectively preventing class disruptions caused by teacher absences." |
| >3.4 – 4.2 | Highly Effective | "ACTS reliably manages scheduling and substitute assignments with minor areas for improvement." |
| >2.6 – 3.4 | Moderately Effective | "ACTS addresses scheduling needs adequately but may struggle with complex disruptions or scenarios." |
| >1.8 – 2.6 | Somewhat Effective | "ACTS demonstrates limited effectiveness in preventing scheduling conflicts and addressing teacher absences." |
| 1.0 – 1.8 | Ineffective | "ACTS fails to meet scheduling needs, leading to frequent disruptions and inefficiencies." |

The Functionality table evaluated ACTS's technical competencies in terms of generating accurate timetables, avoiding schedule conflict, and satisfying users' requirements. High functionality scores (4.2-5.0) indicate a strong and reliable system that can perform during complex scheduling issues. Conversely, lower scores indicate that the system does not sufficiently provide the feature and may result in a scheduling error or generate dissatisfaction among the users.

Table 2. Description and Interpretation of Results for the Functionality of ACTS

| Mean Range | Description | Interpretation |
|-------------------|---------------------------------|---|
| >4.2 – 5.0 | Exceptionally Functional | "ACTS offers all necessary features to generate accurate and conflict-free timetables with high reliability." |
| >3.4 – 4.2 | Highly Functional | "ACTS has well-developed features that perform reliably, meeting most user expectations with minor adjustments needed." |
| >2.6 – 3.4 | Moderately Functional | "ACTS provides essential features but occasionally lacks precision or flexibility in timetable generation." |
| >1.8 – 2.6 | Somewhat Functional | "ACTS functionality is limited, with noticeable shortcomings in addressing scheduling conflicts or user requirements." |
| 1.0 – 1.8 | Non-Functional | "ACTS lacks the features required for effective timetable generation, making it unreliable for scheduling tasks." |

The Usability table explained how intuitive and user-friendly ACTS is regarding its interface with teachers and administrators. High usability scores (4.2-5.0) indicate a very smooth, efficient user experience, while lower scores indicate elements where the system could be more accessible or intuitive. This aspect was also essential in promoting the system's take-up and lowering

users' learning curve.

Table 3. Description and Interpretation of Results for the Usability of ACTS

| Mean Range | Description | Interpretation |
|-------------------|-----------------------------|--|
| >4.2 – 5.0 | Exceptionally Usable | "ACTS is extremely user-friendly, with an intuitive interface that simplifies the scheduling process." |
| >3.4 – 4.2 | Highly Usable | "ACTS is easy to use and supports efficient navigation, though minor improvements could enhance the experience." |
| >2.6 – 3.4 | Moderately Usable | "ACTS usability is acceptable but may require additional support or training for optimal use." |
| >1.8 – 2.6 | Somewhat Usable | "ACTS usability presents challenges, with features that are difficult to access or understand for most users." |
| 1.0 – 1.8 | Not Usable | "ACTS is challenging to use, with an unintuitive design that hampers the scheduling process." |

For interpreting the data, the mean scores of the three questionnaire items were grouped into five different ranges: Exceptionally high, High, Moderate, Somewhat Low, and Low. These ratings further supplement an efficiently descriptive analysis of the system's overall performance. The calculated means for determining the strengths and weaknesses ACTS is currently benefiting from in its implementation.

With the data from the questionnaire analyzed, it is now possible to draw insights into ACTS's strengths and weaknesses in terms of performance: effectiveness, functionality, and usability. High scores in these categories

indicate that ACTS is a tool designed proportionately well to save time and resources when scheduling. On the contrary, lower scores in any of the categories likely lead to necessary improvements in areas such as the inclusion of advanced features, the improvement of interface advancement, or even existing technical problems.

Ethics

Conducting action research on the Automated Class and Teacher Scheduler (ACTS) involves ethics to ensure that the rights of participants are guaranteed and that the research is conducted responsibly. The study strictly adhered to protocols established by ACTS to maintain transparency, confidentiality, and even informed consent.

Participants were very well informed concerning the research's aims, procedures, and significance. An important right that was defined was voluntary participation and withdrawal without consequence at any time. Before participants were involved in the research, informed consent was obtained to ensure participants fully understood what involvement entailed.

All these were done under the strictest conditions to ensure the privacy and safekeeping of participants and the data collected through ACTS. No sensitive data were collected from the schools because the users kept their copies of the ACTS program, and only their feedback on the ACTS use was collected. On this count, tight access restrictions were implemented, with the researchers limited to giving individual copies of ACTS to schools that they used offline, so effective protection was given against any unauthorized access to sensitive information related to teacher schedules and school operations.

The entire research process upheld transparency. Findings were duly reported, and any limitations encountered during research were acknowledged. This approach ensured that the research's endpoints represented an honest evaluation of the ACTS and gave wise recommendations for further system improvement.

It must be interpreted well to mean that the study was validated by all concerned, such as the Schools Division Superintendent, Assistant Schools Division Superintendent, and Chief of the Curriculum Implementation Division with the Public Schools District Supervisors per district, as such, grants ethical justification to the research, which fulfills the assurance that the research bears an alignment with the prevailing institutional and ethical standards as all activities meant for it are compliant and within stipulations on the grand principles of responsible research.

This is all to finalize some ethical integrity commitments while continuing the application and evaluation of ACTS to improve scheduling processes and class disruptions in these institutions.

C. Action Research Spiral: Reflect-Plan-Act-Observe

This research adhered to the four-step Action Research Spiral which ensured a systematic and iterative approach:

1. **Reflect** - The study began by identifying the problem of class disruptions caused by teacher absences. Existing policies and practices were reviewed, revealing gaps in managing substitute teachers

effectively. Feedback from stakeholders highlighted the need for a structured and automated solution.

2. **Plan** - Based on the identified problem, the researchers designed the Automated Class and Teacher Scheduler (ACTS) as a solution. The planning phase involved creating a macro-enabled spreadsheet to automate scheduling and substitute teacher assignments. The design incorporated input from teachers and administrators to ensure the tool addressed their specific needs.
3. **Act** - The ACTS program was implemented in schools across Region XI. Participants were trained on how to use the tool, and it was integrated into their scheduling processes. The implementation phase focused on real-world application to evaluate the tool's practicality and effectiveness.
4. **Observe** - Data was collected through surveys and focus group discussions to assess the impact of ACTS. Observations included user feedback on the tool's usability, functionality, and effectiveness in preventing class disruptions. Insights gained during this phase informed recommendations for future improvements.