

DISCUSSION OF RESULTS AND REFLECTION

The Automated Class and Teacher Scheduler (ACTS) evaluation revealed consistently high ratings across its effectiveness, functionality, and usability, as reflected in the updated results. These findings suggest that ACTS is a well-designed and reliable tool for addressing scheduling challenges in educational institutions.

A. Results

The discussions below are the results of the survey questionnaires to the participants of this action research which provide the answers to the questions of this paper.

Table 4. Effectiveness of ACTS in Preventing Class Disruptions

Statements	Mean	Interpretation
The ACTS generates Timetables with vacant Substitute per Teacher and per Class or Section.	4.91	Exceptionally Effective
The ACTS automates the generation of vacant Teachers per period/ time.	4.89	Exceptionally Effective
The ACTS helps to ensure the availability of vacant Substitute Teachers during class disruptions caused by teacher absences.	4.91	Exceptionally Effective
The ACTS generates multiple vacant Substitute Teachers to ensure that when the first Sub Teacher listed is also absent, more are available to take-over.	4.85	Exceptionally Effective
The ACTS has positively increased the engaged time-on-task by helping the school automate the generation of vacant Substitute Teachers, thus ensuring no class disruptions caused by teacher absences.	4.91	Exceptionally Effective
	GRAND MEAN	4.90
		Exceptionally Effective

The effectiveness of ACTS received a grand mean of 4.90, categorizing it as "Exceptionally Effective." This indicates that ACTS is proficient in

automating schedules and minimizing class disruptions caused by teacher absences. Key features highlighted include the automation of substitute teacher generation and the system's ability to handle multiple substitutes to ensure continuous instructional delivery.

Such automation is crucial in modern educational settings. According to Raza et al. (2020), automated systems streamline administrative tasks and improve organizational effectiveness by reducing human intervention in repetitive tasks. The ability of ACTS to generate accurate schedules aligns with the findings of Kalyani (2024), who emphasized that technological interventions in schools contribute to increased productivity and reduced class disruptions. These results position ACTS as a critical innovation for ensuring continuity in learning despite unforeseen teacher absences.

Table 5. Functionality of ACTS

Statements	Mean	Interpretation
The ACTS has the features to generate the needed timetables of the school.	4.92	Exceptionally Functional
The ACTS detects and prevents scheduling conflicts.	4.92	Exceptionally Functional
The ACTS provides accurate timetables based on user input.	4.81	Exceptionally Functional
The ACTS has appropriate input sheets needed to generate the correct timetables.	4.86	Exceptionally Functional
The ACTS can generate Substitute Teachers with the same subject or Sub-group based on user input.	4.75	Exceptionally Functional
GRAND MEAN	4.85	Exceptionally Functional

The functionality of ACTS garnered a grand mean of 4.85, placing it in the "Exceptionally Functional" range. Respondents particularly appreciated its features for generating accurate and conflict-free timetables based on user inputs. The system's capacity to detect scheduling conflicts and its provision

of appropriate input sheets further contribute to its high functionality rating.

Functional systems are essential for addressing the complexities of educational scheduling. Wiese et al. (2021) highlighted that systems capable of identifying and resolving conflicts in scheduling reduce operational inefficiencies and optimize resource allocation. Moreover, ACTS's ability to handle subject-specific requirements mirrors the findings of Galleguillos et al. (2018), who noted that customizable scheduling systems are more effective in meeting diverse institutional needs. These strengths ensure that ACTS is functional and adaptable to various school contexts.

Table 6. Usability of ACTS

Statements	Mean	Interpretation
The ACTS as a scheduling tool is easy to learn.	4.88	Exceptionally Usable
The ACTS has user-friendly features which accelerate the school scheduling process.	4.81	Exceptionally Usable
The ACTS has buttons which are well organized and pleasing.	4.81	Exceptionally Usable
The ACTS as a scheduling tool matches the class programming needs of my school.	4.72	Exceptionally Usable
The ACTS is protected to prevent possible errors and tampering of important data.	4.89	Exceptionally Usable
GRAND MEAN	4.82	Exceptionally Usable

ACTS's usability received a grand mean of 4.82, indicating that it is "Exceptionally Usable." Features such as its user-friendly interface, organized layout, and robust error-prevention mechanisms were particularly noted. These attributes reduce users' learning curve, making the system accessible even to those with limited technical expertise.

The importance of usability in educational technologies is widely documented. Nielsen (2020) emphasized that systems with intuitive interfaces

and straightforward navigation are more likely to be adopted and utilized effectively. Similarly, Bradley (2021) found that usability directly correlates with user satisfaction and operational efficiency. ACTS's high usability rating demonstrates its success in addressing these critical factors, ensuring that users can effectively leverage the system for scheduling tasks.

The consistently high ratings across effectiveness, functionality, and usability suggest that ACTS is a well-rounded solution for educational scheduling challenges. Its capacity to automate tasks, resolve conflicts, and provide an intuitive user experience positions it as an essential tool for modern schools.

Suggestions to improve

The open-ended responses provided by participants offer rich qualitative insights into their experiences with the Automated Class and Teacher Scheduler (ACTS). These responses complement the quantitative results by highlighting specific areas of effectiveness, functionality, and usability while identifying opportunities for improvement.

Participants generally expressed satisfaction with ACTS, indicating that the tool effectively minimizes disruptions caused by teacher absences. Comments such as *"It helps us save time in making class programs every year"* and *"ACTS helped us quickly generate schedules, timetables, and class programs in a shorter period than manual processes"* reflect the tool's positive impact on streamlining scheduling tasks.

These findings align with studies by Boudreau et al. (2019), which emphasize the role of automation in reducing administrative workloads and

ensuring continuity in educational operations. Furthermore, the ability of ACTS to resolve scheduling conflicts was appreciated, with one participant noting that "*ACTS has helped me identify and manage time conflicts in the schedule.*" This statement demonstrates that the tool prevents disruptions and enhances planning and organization.

The responses confirm ACTS's functionality, with participants highlighting features like conflict detection and automation of substitute assignments. One respondent suggested that "the system itself is very innovative," while another appreciated that "ACTS simplifies the scheduling process, reducing manual errors and making the scheduling process easier."

However, there were suggestions for further improvements, such as adding a "database of substitutes for their availability and subject expertise" and ensuring that "the system is fully functional on mobile devices." These insights indicate areas where ACTS could evolve to address user needs better. According to Wiese et al. (2021), incorporating advanced features and increasing platform compatibility are critical steps in enhancing the functionality of educational technologies.

The tool's usability received significant praise, with comments like "*It is very easy to use, even for those new to automated systems*" and "*ACTS has streamlined our scheduling process significantly, making it easier to organize class programs with greater efficiency.*" These responses reflect the system's user-friendly design, which reduces the learning curve and enhances user satisfaction.

Some participants noted usability challenges, such as the need for further orientation on using the tool effectively. One participant suggested that

"providing instructions or tutorials would help teachers maximize the tool's potential." According to Nielsen (2020), systems incorporating user training and support resources are more likely to achieve widespread adoption and satisfaction.

However, while the results are overwhelmingly positive, opportunities for improvement exist. Expanding the system's features to include predictive analytics, enhanced customization for multi-shift schools, or integration with other administrative tools could improve performance. Additionally, providing training sessions for staff unfamiliar with automated systems could enhance usability even further.

Key Themes

The results of the participants Focus Group Discussions (FGD) generated themes using thematic analysis. The core ideas and essential themes that emerged were based on the action research question number three: How can the functionality and usability of the ACTS be enhanced to accommodate better the unique scheduling needs of schools in DepEd Region XI?

Table 7. Experiences regarding the Automated Class Timetabling System (ACTS)

Essential Themes	Core Ideas
Efficiency in Scheduling	<ul style="list-style-type: none">• Significant time-saving and error reduction in timetable creation.• Minimized manual intervention.• Ensures smooth scheduling processes.
User-Friendliness	<ul style="list-style-type: none">• Intuitive design enables quick adaptation by new users.• Minimal learning curve, making it accessible to all staff members.• System navigation is straightforward, even for non-technical

	<p>users.</p> <ul style="list-style-type: none"> • Effective management of substitute teacher assignments ensures minimal disruptions. • Ensures uninterrupted class schedules during staff absences. • Critical in maintaining school's academic consistency.
Impact on Class Continuity	<ul style="list-style-type: none"> • Need for enhanced customizability, including multi-shift scheduling. • Desire for additional features like databases for teacher availability. • Compatibility with mobile devices for improved accessibility.
Potential for Improvement	<ul style="list-style-type: none"> • Seamless integration with existing school systems. • Potential for optimization in larger or more complex school settings. • Scalable for diverse educational contexts and requirements.
Integration and Scalability	<ul style="list-style-type: none"> • Quickly identifies and assigns substitutes for absent teachers. • Avoids delays in schedule generation. • Maintains effective teaching delivery during unexpected changes.
Effectiveness in Scheduling Disruptions	<ul style="list-style-type: none"> • Adequate training provided but could be enhanced with video tutorials or a help section. • Supportive resources are key for new users. • Encourages professional development through ease of use.
Support and Guidance	<ul style="list-style-type: none"> • Streamlined processes have reduced stress for administrators. • Positive reception from staff regarding error reduction and efficiency. • Long-term success tied to continuous updates and user feedback integration.
Overall Impact and Feedback	<ul style="list-style-type: none"> • Streamlined processes have reduced stress for administrators. • Positive reception from staff regarding error reduction and efficiency. • Long-term success tied to continuous updates and user feedback integration.

Efficiency in Scheduling

The ACTS significantly reduced the time required to create and manage schedules, which was previously a labor-intensive process. This not only saves time for administrators but also ensures that errors common in manual scheduling are minimized, leading to smooth daily operations in schools. For DepEd Region XI, where diverse schools face varying demands, the efficiency of ACTS can alleviate the pressure on administrators, allowing them to focus on other critical areas.

User-Friendliness

The system's intuitive interface was frequently highlighted as a strength. Both experienced and novice users found the platform easy to navigate, which encourages widespread adoption without extensive training. For schools in Region XI, additional user guides and video tutorials tailored to the specific needs of the region's staff would enhance usability further and empower teachers and administrators to maximize its potential.

Impact on Class Continuity

By assigning substitute teachers effectively during absences, ACTS ensures that classes remain undisrupted. This is particularly beneficial in maintaining academic consistency and addressing sudden scheduling challenges. In DepEd Region XI, where remote and resource-constrained schools may face staffing challenges, ACTS's capability to optimize substitute allocation can ensure equitable teacher distribution and minimize class disruptions.

Potential for Improvement

While the system meets most needs, feedback points to the demand for additional features such as multi-shift scheduling and expanded teacher databases. For DepEd Region XI, where schools may operate under unique scheduling constraints due to geographic and demographic factors, enhancements like mobile compatibility and customizability can address these challenges effectively. Tailored solutions for multi-grade and alternative learning systems can also improve its applicability.

Integration and Scalability

ACTS's ability to integrate with existing scheduling systems reduces redundancies. However, its scalability for larger schools with complex scheduling needs can be optimized further, ensuring it adapts to diverse educational contexts. In Region XI, where schools range from urban hubs to remote areas, scalable solutions that address regional disparities in resources and infrastructure are essential for effective implementation.

Support and Guidance

Adequate support mechanisms are critical for first-time users. Participants suggested the inclusion of video tutorials and an integrated help section to improve the onboarding process, making the system more accessible for all users. Schools in Region XI, especially those in remote areas, could benefit from localized training sessions and accessible support channels to ensure successful adoption of ACTS.

Overall Impact and Feedback

ACTS has been a game-changer for scheduling in schools, significantly reducing stress for administrators and ensuring classes are never left without teachers. For DepEd Region XI, continued updates incorporating user feedback, such as addressing regional-specific needs and challenges, will be vital for its sustained success. The tool's potential to adapt to the region's unique scheduling demands reinforces its value as an indispensable asset in education management.

B. Reflection

Implementing the Automated Class and Teacher Scheduler (ACTS), an automated scheduling tool, has been a journey of both challenges and triumphs. Engaging in this action research, the researchers envisioned a streamlined, efficient, and user-friendly scheduling system to address class disruptions and administrative inefficiencies in schools. Reflecting on the results, the findings highlight a narrative of success, user satisfaction, and opportunities for continuous improvement.

One of the primary objectives of ACTS was to ensure the seamless creation of class schedules, particularly during unforeseen teacher absences. The results show that ACTS excelled in its core purpose, with high effectiveness, functionality, and usability ratings. Teachers and administrators consistently recognized its value in preventing class disruptions and simplifying the scheduling process. For example, respondents noted how ACTS "streamlined our scheduling significantly" and "helped us quickly generate schedules, timetables, and class programs." These remarks

demonstrate the system's positive impact in addressing critical scheduling challenges.

However, achieving this effectiveness was not without its challenges. Users highlighted areas for improvement, such as the need to increase system scalability for larger schools or implement additional features like substitute teacher databases. This reflects a recurring theme in educational technology research: the balance between addressing immediate needs and designing systems with scalability and adaptability in mind (Wiese et al., 2021). Future iterations of ACTS should incorporate these suggestions to enhance flexibility and functionality.

The functionality of ACTS emerged as a significant strength, with users praising its ability to detect scheduling conflicts and automate complex tasks. One respondent aptly described it as "innovative and dependable." However, some users needed additional tools, such as "features to plot substitute teachers and reliever schedules automatically." These insights echo the findings by Galleguillos et al. (2018), who emphasize the importance of user-driven system design in educational technologies. By integrating these enhancements, ACTS can further align with user expectations and institutional requirements.

The usability of ACTS also stood out as a critical factor in its success. Participants frequently mentioned its user-friendly interface and the ease with which it could be integrated into existing workflows. One participant stated, "It is very easy to use, even for those unfamiliar with automated systems." Such feedback underscores the value of intuitive design in fostering user adoption and satisfaction. However, a recurring suggestion was more training

and orientation sessions to maximize the system's potential. As Nielsen (2020) suggests, even the most user-friendly systems benefit from comprehensive training resources to support a diverse user base.

While ACTS has demonstrated significant strengths, it is essential to acknowledge its limitations. The study's scope was limited to specific school contexts, which may not generalize to all educational institutions. Furthermore, some users pointed out system compatibility issues, particularly regarding mobile accessibility. Addressing these limitations can broaden ACTS's applicability and ensure it meets the evolving demands of modern educational systems.

Moving forward, the development of ACTS offers numerous opportunities for innovation. Expanding its functionalities, such as incorporating analytics for decision-making or customizing features for different school levels, can enhance its versatility. Moreover, integrating user feedback into the development process ensures that ACTS evolves into a truly responsive and adaptive tool for educational management.

The implementation of ACTS has reflected the power of technology in transforming educational processes. Despite the challenges of limited resources and varying user needs, the successes achieved in effectiveness, functionality, and usability lay a solid foundation for future growth. By embracing user feedback and leveraging lessons learned, ACTS can evolve into a more powerful tool for streamlining class schedules, improving efficiency, and supporting the dynamic needs of schools and educators.

ACTION PLAN

Action/Activities	Timeline	Expected Result
Collaborate with Division ITO or external developers to integrate additional features, such as multi-shift scheduling and mobile compatibility.	January 2025-March 2025	Enhanced usability and accessibility of ACTS, accommodating diverse school settings and needs.
Conduct a technical audit of ACTS to identify system inefficiencies and address potential bugs.	April 2025- May 2025	Improved functionality and smoother user experience by addressing performance issues.
Develop a comprehensive user guide and tutorial videos to support new users and provide advanced tips for experienced users.	June 2025-July 2025	Increased user confidence and self-sufficiency in using ACTS effectively.
Expand ACTS functionalities to include automated reports for time schedules and substitute teacher performance tracking.	July 2025-August 2025	Broader utility of ACTS in decision-making and improved monitoring capabilities for school management.
Establish a continuous feedback mechanism to regularly collect user insights and suggestions for further improvements.	Continuous Process	A responsive and evolving ACTS system that aligns with user needs and technological advancements.

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