



# DEVELOPMENT AND VALIDATION OF ATTENDANCE AND PARENTS ALERT SYSTEM (APAS)

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## ABSTRACT

The purpose of this study is to solve the difficulties associated with producing school IDs, parents keeping an eye on their children, and checking attendance. This study was developed in five steps, using the Rapid Application Development (RAD) Model as a guide. The system received a perfect score of 100 percent. It received an exceptionally high overall grade in all dimensions (Mean = 4.00; Standard Deviation = 0.00) such as design, accessibility, accuracy, usability, reliability, functionality, and efficiency. The evaluators' consistent responses revealed an apparent degree of agreement, indicating a rather uniform view that the method is a superior innovation and effective in the school. Parents also commend the system as to its convenience and operational efficiency, parental involvement and reassurance, and new experience and novelty. Considerably, a new experience and a novelty garnering many positive emotional responses with acceptance despite limitations. Subsequently, the system needs not to be changed perhaps needs to be developed for future recommendation of the stakeholders. It is recommended that, when needed, the system be improved continuously over time. Moreover, teachers can use the system to pinpoint problems with its application and confirm its efficacy. It is also recommended that the system be reevaluated later to better align it. As the system is developed, school processes could be improved, leading to a more skillful, advanced, flexible, and relevant educational experience.

**KEYWORDS:** development and validation; Attendance; Computer System; Parents Monitoring; Quality-assurance.

## CONTEXT AND RATIONALE

In the department of education, monitoring student attendance is a critical aspect in schooling. Traditionally, attendance tracking has been a manual and time-consuming process, often prone to errors and inefficiencies. However, the rapid advancement of technology has provided an opportunity for educational institutions to revolutionize the way they manage attendance through computer-based attendance systems.

Student attendance serves as an effective predictor of future academic achievement as well as of high school graduation. An analysis of Indiana attendance data indicates a direct link between absenteeism and school achievement, with chronically absent students scoring lower on achievement tests and dropping out of high school at higher rates than peers with better attendance Allensworth, E.M., & Easton, J.Q. (2007- 23).

Smith (2020- 17) conducted a longitudinal investigation into the relationship between student attendance and their academic performance. The study has collected data over an extended period to examine how attendance patterns influenced academic achievement. Accordingly, students' attendance could impact on academic success therefore students' attendance monitoring should be done in educational institutions.

Computer-based attendance systems have gained significant attention and adoption in recent years. These systems leverage cutting-edge technology, such as biometrics, RFID (Radio-Frequency Identification), QR codes, and various software solutions to automate and streamline the attendance monitoring process. By implementing such systems, educational institutions aim to achieve a variety of goals, including improved accuracy in attendance recording, time savings for both educators and students, enhanced data analysis, and a more robust foundation for fostering student engagement and accountability.

In 2018, a research team led by Parsons conducted a comprehensive study that aimed to evaluate the effectiveness of biometric attendance systems. Biometric attendance systems are technology solutions that use unique physical or behavioral characteristics of individuals, such as fingerprints, facial recognition, or iris scans, to verify and record their presence at a particular location or event. These systems have gained prominence in various sectors, including education, businesses, and government institutions, due to their potential to provide

efficient and secure attendance monitoring. Otherwise, RFID technology has become increasingly common in schools and workplaces (Smith, 2020- 203). In addition, Machine learning algorithms have shown promise in automating attendance tracking (Brown, 2021- 43). Moreover, in 2019, researchers Johnson and Williams conducted a study that examined the impact of mobile attendance apps on user engagement. This statement suggests that the study conducted by Johnson and Williams yielded findings indicating that the use of mobile attendance apps had a positive effect on user engagement.

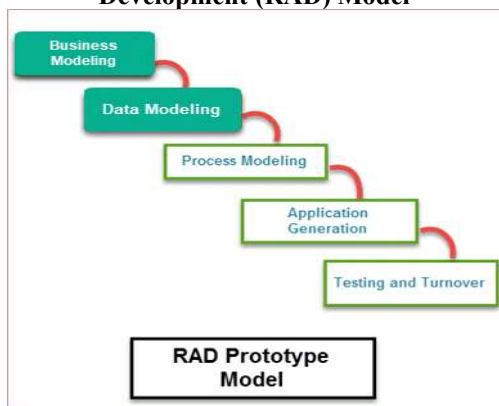
There have been several research studies in the Philippines related to attendance monitoring systems, particularly in educational institutions. These studies often explore the implementation and effectiveness of attendance monitoring systems to enhance the educational experience. De La Salle University is known for its adoption of modern technology, including attendance monitoring systems. They have used card-based systems and mobile apps for tracking student attendance. University of the Philippines campuses have implemented various attendance monitoring systems, including RFID technology and mobile apps, to track student and employee attendance. Ateneo is another prestigious university in the Philippines that has explored using technology-based attendance monitoring systems. Far Eastern University has utilized biometric attendance systems and student ID cards to track attendance. Polytechnic University of the Philippines PUP has implemented biometric and RFID-based attendance systems in some of its campuses. University of Santo Tomas has investigated using RFID-based systems for attendance tracking in their facilities. De La Salle-College of Saint Benilde: This institution has adopted mobile-based attendance apps for tracking student attendance. These are just some of the schools that implemented a system-based attendance monitoring and there are many schools even in the local schools in Pagadian City.

This research is anchored with Agile and Lean Principles: These theories are often applied to the development and improvement of computerized processes. Agile emphasizes adaptability and collaboration in software development, while Lean focuses on eliminating waste and maximizing efficiency. Accordingly, Lean and Agile principles promote focusing on work and the processes through which workflows, rather than the people responsible for the work. This approach, known as Lean and Agile development in IT, allows teams to move away from unhealthy cycles of finger

pointing and defensiveness, allowing for better collaboration, more creativity, and faster value delivery (Wang, 2011- 56).

This action research seeks to delve into the myriad aspects of computer-based attendance systems, exploring their implementation, functionality, benefits, and potential challenges within the educational landscape. The primary objective is to provide a comprehensive understanding of how computer-based attendance systems impact educational institutions and students. Also, the creation of school-produced free students' ID to be used for the QR-code scanning of the students' attendance in adherence to DepEd Order No. 45 series of 2008 specifies on the provision of identification cards at no cost for the students and the school administration shall fund this to the school MOOE.

**Figure 1: Development Chart of the Attendance and Parents Alert System (APAS) using the Rapid Application Development (RAD) Model**



In crafting the system, the researchers were guided by the Rapid Application Development (RAD) Model. This RAD model is a software development process based on prototyping without any specific planning. In RAD model, there is less attention paid to the planning and more priority is given to the development tasks. It targets at developing software in a short span of time. Prototyping approach is chosen so software developers can know all too well what the user wants to leave no rules as well as the technical foundation of software development, which in turn produced software that fits the needs of users A K Nalendra (2021- 3)

### ACTION RESEARCH QUESTIONS

The main objective of this action research is to provide a comprehensive understanding of how computer-based attendance systems impact educational institutions such that of Zamboanga del Sur National High School – Senior High School (ZSNHS-SHS) of school year 2023-2024. The expected outcome of this study is to lessen effort on monitoring attendance and parents on their children's attendance and to adapt to the new generation of computer-based transactions and processes.

Specifically, this action research seeks answers to the following queries:

1. What is the extent of the validity of the Attendance and Parents Alert System (APAS) in terms of:
  - 1.1. Design;
  - 1.2. Accessibility;
  - 1.3. Accuracy;
  - 1.4. Usability; and
  - 1.5. Functionality?
2. What are the comments/ suggestions/ recommendations made by expert validators on the developed Attendance and Monitoring System (APAS)?
3. What are the comments and feedback of users in using the attendance and monitoring system (APAS)?
4. What changes or improvements can be made to make Attendance and Monitoring System (APAS) more useful to learners, parents, teachers, and administrators?

### INNOVATION, INTERVENTION, AND STRATEGY

The researchers designed a computer program to address the problem of students' attendance and monitoring of in and out in school premises.

This research and innovation reasonably address the problems/challenges encountered by the school administrators, teachers, learners, and parents as to using computer programs in monitoring students' attendance and parents/ guardians' monitors has become increasingly common due to the efficiency and convenience they offer.

Computer-based attendance systems can cover a wide range of components to monitor and manage attendance effectively and accurately. The Attendance and Parents' Alert System (APAS) will cover the following components in the user interface, the researchers used user-friendly interfaces for both administrators and users to access and input attendance data.

Barcodes/ QR code is the mode or method of authentication. The system has database management for storage and management of attendance records and related data. It has the following functions of the integration with student information systems (SIS). The system can also generate the school ID so the school will no longer need to outsource the provision of free ID cards to the students with individualized QR codes for attendance monitoring. The system also highlights real-time monitoring. The APAS has ability to track attendance in real-time, providing immediate feedback to teachers and administrators for up to- date attendance and other reports needed such as SF 1 and SF 2. In the reporting and analytics, generation of attendance reports and analytics, which can help identify trends, patterns, and areas of concern. The APAS also has the text blast function for alerts and notifications. Automatic alerts for administrators, teachers, or parents in case of irregular attendance or tardiness will be sent through SMS or text messages to parents or guardians mobile /contact number in case of needed urgent information or announcement. The system is open for customization for flexibility to tailor the system to the specific needs and policies of the educational institution Adherence to local and national regulations regarding data privacy, security, and access control including teachers, students, parents, and administrators.

### ACTION RESEARCH METHODS

#### Research Design

Descriptive research was utilized in this study. This is a method primarily focused with expressing the while enhancing current state and complex features of a given scenario or condition. To comprehend the causes of a certain phenomenon, it explores the nature of a scenario as it occurs during the study's timeframe (Fraenkel, Wallen, and Hyun 2011). Descriptive research's primary goal is to take a thorough picture of people, things, or situations. According to this research approach, it is imperative that the investigator have a comprehensive grasp or visual aid of the phenomenon being studied prior to the start of data collection.

The researchers sought personal information from the respondents with the intention of using this data to develop rational and well-founded conclusions and study recommendations. The descriptive method is efficient and realistic, especially when considering costs. Another benefit of this method is its versatility; it may be used to gather data that is qualitative, quantitative, or a combination of both. This gives the researcher more options when it comes to choosing data collection methods.

Whether or not statistical methods are used, descriptive research entails a purposeful and methodical process of gathering, evaluating, classifying, and organizing current conditions, practices, beliefs, trends, procedures, and cause-and-effect relationships to derive accurate and meaningful interpretations from the data. This methodology was utilized to determine the validity of the Parents Alert System (APAS).

Conversely, developmental research aims to produce knowledge that is methodically developed from real-world applications. It's a useful type of study that tests theories that have mostly been put forth and supported by customs and established practices. Furthermore, developmental research provides new methods, protocols, and instruments by means of systematic case studies



bolstered by qualitative findings. As a result, developmental research can be used to draw generalizable findings or claims, or it might yield context-specific insights meant to solve issues (Richey and Klein 2005, 23).

**Participants and/or other Sources of Data and Information**

The participants of this action research were the teachers, learners and parents who were selected through random sampling of ZSNHS-SHS to whom which the researcher conducted an interview for the descriptive and qualitative data to be gathered. The goal of descriptive research is to describe a phenomenon and its characteristics. This research is more concerned with what rather than how or why something has happened. Therefore, observation and survey tools are often used to gather data (Gall, Gall, & Borg, 2007). In such research, the data may be collected qualitatively, but it is often analyzed quantitatively, using frequencies, percentages, averages, or other statistical analyses to determine relationships. Qualitative research, however, is more holistic and often involves a rich collection of data from various sources to gain a deeper understanding of individual participants, including their opinions, perspectives, and attitudes. Qualitative research collects data qualitatively, and the method of analysis is also primarily qualitative. This often involves an inductive exploration of the data to identify recurring themes, patterns, or concepts and then describing and interpreting those categories. As to the quantitative part this focus on the survey during the system validation.

Another three (3) expert evaluators also evaluated the performance of the developed Attendance and Parents Alert System (APAS). The evaluators were DepEd Pagadian City Division Information Technology Officer (ITO), DepEd Regional Information Technology Officer (RITO) and DepEd Regional programmer. They are all practitioners in the ICT field and have attended several ICT Trainings.

**Research Instrument**

Data collection encompassed both qualitative and quantitative elements. In terms of qualitative research, interviews were organized and arranged. Participants were provided with the opportunity to articulate their perspectives, emotions, and viewpoints regarding their experiences with the Attendance and Parents Alert System (APAS) as a tool for attendance and parents monitoring in the school. A tool to rate the performance and functionality of the Attendance and Parents Alert System (APAS) was a functionality survey adapted from the criteria given by the Institute of Electrical and Electronics Engineers (IEEE) for Software Test Document (STD).

An interview guide for the parents was also used to get responses from the parents and students and the teacher who facilitated the attendance and parents monitoring.

**Data Gathering Procedure**

The process of gathering data for the study encompassed a series of meticulously executed activities aimed at acquiring essential information. Initially, a formal letter was dispatched to the Schools Division Superintendent, seeking permission to conduct the study within their jurisdiction. In a preliminary stage, the researcher introduced the purpose and significance of the study to the participants, ensuring they were well-informed.

To address ethical considerations, participants were provided with an informed consent form to complete. This step ensured that participants were fully aware of the research's intent and their voluntary participation, and that their involvement was conducted with the utmost confidentiality. Importantly, no coercion was applied to secure their participation.

Additionally, evaluators of the Attendance and Parents Alert System (APAS) utilized a functionality survey tool. This tool gauged the functionality of the application and was adapted from the Institute of Electrical and Electronics Engineers (IEEE) standards typically utilized for Software Test Documents (STD).

**Data Analysis**

This study employed a qualitative research design guided by the principles and methodologies of a case study. This approach sought to delve into how the application's implementation with teachers and students could influence the school's attendance and parents monitoring for governance. To comprehensively analyze and present this qualitative data, content analysis techniques were applied. This involved scrutinizing data obtained from face-to-face interviews, focus group discussions, and essay writing and subsequently categorizing and evaluating it to identify patterns, discern meanings, and formulate conclusions. The resultant patterns and meaningful themes were elucidated and substantiated by incorporating relevant social theories.

Measures like mean, percentage, and standard deviation were employed. Microsoft Excel was utilized for organizing the data and performing the necessary descriptive statistical calculations. The hypothetical mean range classification was adopted as follows: 1.00–1.75 – Very Low; 1.76–2.5 – Low; 2.6–3.25 – High; and 3.26–4.00 – Very High.

**RESULTS AND DISCUSSION**

**Validation of the performance of Attendance and Parents Alert System (APAS).**

Table 1 shows the results of expert-validators validation of the Attendance and Parents Alert System (APAS) in terms of performance anchoring its basis with the corresponding criteria. The overall application performance of the CLASS mobile application was very high with the mean of 4.00; and SD of 0.00. Taking into consideration the range of the deviations, it is evident to be more homogeneous. It means that the responses of the expert validators towards the application's performance terms of the criteria are the same.

Noteworthy, all application performance criteria posted are interpreted as Very High. With a significant response from validators, the table showed commendable results regarding Attendance and Parents Alert System (APAS) performance. Wherein all the indicators such as design, accessibility, Accuracy, Useability, Reliability, Functionality, and efficiency all got the mean of 4.00 and standard deviation of 0.00 respectively. According to one research, for instance, American instructors seldom ever used computers in their classes or schools in a really integrated way, even in "technology rich" schools. It opens the door for quicker and more effective procedures in schools, including the development of this new attendance tracking system. A range of information and communication technology (ICT) interventions for learning and school procedures have been established as a result of the growing use of computers in the home, in the classroom, and in schools. Yet, conflicting results have come from meta-analyses comparing these programs' effects on learning. (Karin Archer 2014-61).

**Table 1. Validation of the Performance of Attendance and Parents Monitoring System (APAS)**

Scale: 1.00–1.75 – Very Low; 1.76–2.5 – Low; 2.6–3.25 High; and 3.26–4.00 – Very High

CRITERIA	MEAN	SD	INTERPRETATION
<i>Design</i>	4.00	0.00	<i>Very High</i>
<i>Accessibility</i>	4.00	0.00	<i>Very High</i>
<i>Accuracy</i>	4.00	0.00	<i>Very High</i>
<i>Useability</i>	4.00	0.00	<i>Very High</i>
<i>Reliability</i>	4.00	0.00	<i>Very High</i>
<i>Functionality</i>	4.00	0.00	<i>Very High</i>
<i>Efficiency</i>	4.00	0.00	<i>Very High</i>
<b>OVERALL</b>	<b>4.00</b>	<b>0.00</b>	<b>VERY HIGH</b>



**Comments/ Suggestions/ Recommendations made by expert validators on the developed Attendance and Monitoring System (APAS)**

**Table 2 Comments and Suggestions of the Expert Validator of the Attendance and Parents Alert System (APAS)**

About the System	Expert Validators Comments and Suggestions
<b>A. APAS as a Better Innovation</b>	<p><i>"It is a better innovation for schools"</i> – V 1</p> <p><i>"This is a new system that most schools still don't have, it's nice that it is being made now for something new."</i> - V 3</p>
<b>B. APAS as Useful in Schools</b>	<p><i>"It is very helpful in schools especially where parents' involvement on the attendance of their children is also taken into consideration"</i> – V 2</p> <p><i>"I guess this system will become very useful in the school, maybe some schools will benchmark if this system will be used."</i> – V3</p>
<b>D. Other Findings</b>	N/A

**Table 2 Presents the comments of expert validators on the Attendance and Parents Alert System (APAS).** According to the validators of the Attendance and Parents Alert System (APAS), the system is a better innovation since accordingly it is very helpful, useful and it serves as a technological advancement. Also, the introduction of Attendance and Parents Alert System not only enhances efficiency but also cultivates a culture of accountability and responsibility among students that is Useful in the schools in the comments of the expert validators it states that the system is very helpful in schools especially where parents' involvement on the attendance of their children is also taken into consideration. Also, since the system is very useful in school, it can be benchmarked by others too. In the educational progress, the integration of technology has incessantly propelled schools towards modernization and efficiency. One such groundbreaking innovation, the Attendance Monitoring System (AMS), has emerged as a beacon of transformation within educational institutions worldwide. This technology smoothly integrates academic regularity with technical prowess, revolutionizing the traditional approach of taking attendance. Introducing new technologies and pedagogical techniques into the educational system is one of the largest difficulties facing the field of education. The experience, pedagogical topic knowledge, and digital competencies of teachers and other staff members must be regularly enhanced through additional training in order to guarantee a high standard of instruction (H. Demarle-Meusel, M. Rottenhofer, B. Albaner and B. Sabitzer 2020 1-3)

**Comments and Feedback of Parents in using the Attendance and Monitoring System (APAS)**

Factor of the APAS	Teacher-Experts Comments and Suggestions
<b>A. Useability</b>	<p><i>"It is fine because it is very operational and it's nice because as parent I will really know if my child really goes in the school."</i> RP 1</p> <p><i>"It is easier have the attendance because accordingly, my child doesn't need to write his name on a paper, he just needs to scan it."</i>- RP 2</p> <p><i>"It's easy to use and very functional."</i> – RP 4</p>

<b>B. Efficiency</b>	<p><i>"It is very nice since the parents will get information through text message if the students are already in school and already go out of the school"</i> – RP 3</p> <p><i>"It's very nice since the parents will really be informed of the child's attendance."</i> – RP 5</p> <p><i>"it is a relief as a parent knowing that my child is already in school since she just ride a public transportation going to school."</i>- RP 7</p> <p><i>"It makes me updated of my child's whereabouts."</i> – RP 11</p> <p><i>"It is okay as for me since as a parent I don't usually ask my child what time she is in and out of school, now I can know already. It makes me feel involved."</i> – RP- 15</p> <p><i>"I like it for monitoring purposes."</i> – RP 10</p> <p><i>"I like it since it is for security and assurance."</i>- RP 12</p> <p><i>"I feel more connected or involved with my child now."</i> – RP 6</p>
	<p><i>"Although I cannot reply to the text message it's fine as long as I know that my child is already in school."</i>- RP 13</p>
<b>D.Other Findings</b>	N/A

Parents shared their comments and feedback using the Attendance Monitoring System (APAS). Since one of the objectives of this study is to observe parents, their opinions and input are very important. The concept of parental participation is nuanced and has been described in several ways Antipkina and Ludlow (p. 856).

Several research participants particularly parents shared their appreciation of the system for operational ease and making attendance tracking simpler and more efficient. Accordingly, the system Attendance and Parents Alert System (APAS).

Moreover, parents are being involved in their children's whereabouts and felt assured that their sons and daughters are already in school. For them they feel more connected and involved in their children's school-life due to the system. Some respondents shared how receiving updates motivates them and make them feel better about the travel of their children from home to school especially those who travel using public utility vehicles.

Parents talked about how it felt to get text messages about their kids for the first time. They are expressing excitement and happiness about the new experience while yet looking in wonder. The following definitions of parental involvement were found to be used in various articles by Wilder [209–211], and they pertain to parent-child communication about school, home supervision, homework assistance, homework checking, expectations and aspirations for education, attendance and participation in school activities, reading aloud to children, communication with schools, parenting style, and parental attitudes toward education.

Additionally, some of the parent's responses focus on the limitation of the text blast functionality of the Attendance and Parents Alert System (APAS). Accordingly, there in an inability to reply to the text messages, with the understanding that the primary purpose is to know the child's attendance status. However, It was well accepted by the parent.

When respondents repeatedly use terms like "nice," "great," "very nice," and "okay" to describe their experience with the attendance notification system, it indicates a strong positive emotional response. Collectively, these positive expressions highlight a range of emotions—from satisfaction and delight to contentment and acceptance—indicating that the respondents generally view the attendance notification system favorably. These terms



showcase the diverse ways individuals express their positivity and satisfaction, emphasizing the system's perceived benefits and positive impact on their experiences as parents involved in their child's education. The study suggested a web-based facial recognition student attendance system as a solution to issues with tracking attendance. The suggested method uses a Convolutional Neural Network (CNN) to identify faces in photos, a K-NN to categorize student faces, and a deep metric learning to create facial embedding. The computer can therefore recognize faces. Because it makes life easier and more sophisticated for Tata Sutabri, Ade Kurniawan, Pamungkur, and Raymond Erz Saragih, Raymond Erz Saragih, and Ade Kurniawan, the system has received a lot of acclaim from end users (2019, 269–271).

**Changes or Improvements to make Attendance and Monitoring System (APAS) more useful to learners, parents, teachers, and administrators.**

Table 4 Changes or Improvements to make Attendance and Monitoring System (APAS) more useful to learners, parents, teachers, and administrators.

About the System	Expert Validators Comments and Suggestions
<b>A. Design</b>	<i>"It is well designed, no need to be changed but rather developed" -V1.</i>  <i>"It is very nice!" - V2</i>
<b>B. Functions</b>	<i>"No need to be change just develop for future recommendations and observations of the stakeholders." – V3</i>  <i>"I want to respond to the messages sometimes but there is a note that says "This is a computer generated message please do not reply." Maybe let us reply. – Parent 4</i>
<b>D. Other Findings</b>	N/A

Based on the responses on the validators, The system is already well-designed so, there is no need to change it but rather develop. The system need not to be changed perhaps needs to be develop for future recommendation of the stakeholders. Parents also, would want to respond to text messages. Though in the SMS that they receive it says that this is an automated message and replies are not encouraged. The researchers are planning to add a function like e-mails or SMS for parents to interact into. Though, it is also encouraged that parents should go to school for personal purposes, some features as communication between school and parents shall be added.

**CONCLUSIONS AND RECOMMENDATIONS**

The study aimed to conceive and validate the Attendance and Parent Alert System (APAS), designed to address practical real-life problems involving students' attendance monitoring and parents monitoring. Also, production of SF1 and SF 2 in Zamboanga del Sur National High School- Senior High School. The researchers followed Rapid Application Development (RAD Model) as a guiding principle, resulting in the creation of a computer system intended to help teachers, administrator and parents and students in attendance checking processes and parents' monitoring.

Upon meticulous validation by expert validators, the developed computer system was deemed suitable for its intended purpose. This validation encompassed the system's overall performance. The results of this validation effort were notably positive, achieving an acceptance level that is apparent in all aspects, including design, accessibility, accuracy, useability, reliability, functionality, and efficiency. The core objective of this evaluation was to ascertain whether the computer system (APAS) fit for use. Based on the validation, other the overall system performance of the Attendance and Parents Alert System (APAS) was very high (M = 4.00; SD = 0.00). It is also evident that the application's design garnered the rating (M = 4; SD= 0.00), which entails that

all the evaluators agreed that the application's design is very attractive.

The accessibility also got very high remarks with (M = 4.00; SD = 0.00) so as with the rest of the criteria such as accuracy, useability, reliability, functionality, and efficiency which all got very high remarks. Meaning all the criteria validated got the highest score with the mean of 4.00 and the standard deviation of 0.00. This suggests that validators' evaluations uniform and consistent. Additionally, the comments or suggestions of the validators were better innovation and second is that the system is useful in schools. Also, the parent's comments and suggestions include the system's convenience and operational Efficiency.

The APAS also offers parental involvement and reassurance, and new experience and novelty. The usage of the system is considered a new experience and a novelty. Moreover, the system garnered many positive emotional responses. Based on the responses on the validators, the system need not to be changed perhaps needs to be develop for future recommendation of the stakeholders. As to the results, it's apparent that the usage of the Attendance and Parents Alert System (APAS) would significantly enhance some of the school processes such as checking of attendance, monitoring of parents, giving school announcement, generating school reports and others.

Drawing from the study's findings and conclusions, the following suggestions and recommendations have been derived through data analysis:

1. Conduct a thorough needs assessment within the school or educational institution. Understand the specific requirements, challenges, and goals related to attendance tracking. Involve teachers, administrators, and other stakeholders in this process to gather diverse perspectives.
2. Define the objectives and desired outcomes of the attendance monitoring system. Determine what you aim to achieve, such as improving accuracy, efficiency, communication, or data analysis.
3. Choose the right technology or combination of technologies that align with the institution's needs and resources. Consider options like biometric scanners, RFID cards/tags, mobile applications, web-based systems, or AI-powered recognition systems. Assess their feasibility, cost-effectiveness, scalability, and compatibility with existing infrastructure.
4. Prioritize data privacy and security throughout the development process. Implement encryption protocols, secure databases, and access controls to safeguard sensitive student information. Ensure compliance with relevant data protection regulations.
5. Design an intuitive and user-friendly interface for teachers, administrators, students, and parents. The system should be easy to navigate, requiring minimal training for users to operate effectively.
6. Ensure the attendance monitoring system integrates seamlessly with other school systems, such as student information systems (SIS), learning management systems (LMS), or administrative databases. Compatibility enhances data sharing and reduces duplication of efforts.
7. Provide customization options to accommodate diverse needs across different grade levels, classes, or educational programs. The system should be flexible enough to adapt to varying attendance-taking methods or special circumstances.
8. Conduct thorough testing and piloting of the system before full implementation. Gather feedback from stakeholders during the testing phase to identify potential issues, usability concerns, or areas for improvement.
9. Offer comprehensive training and ongoing support to teachers and staff members who will use the system. Ensure they understand the system's functionalities and troubleshooting procedures.
10. Establish a process for continuous improvement based on feedback, usage analytics, and evolving needs. Regularly



update the system with new features, enhancements, or security patches to maintain its effectiveness.

11. Set up mechanisms to evaluate the system's performance regularly. Monitor key metrics, such as attendance rates, system uptime, user satisfaction, and compliance with established objectives.

The research's conclusions highlight the Attendance and Parents Alert System's (APAS) enormous potential to improve several school procedures, such as checking attendance, keeping an eye on parents, creating student IDs, and producing reports. The process of creating, setting up, and verifying the system, along with the incorporation of current technology, greatly enhances the effectiveness and quality of the workplace. Significantly important, interest holds a compelling role as a motivational factor in the institution. It elevates the students and teachers the experiences, adapts to technological advancements, solves related problems, and heightens the sense of utility. As part of the recommendations put forth by this study, it's advised to fortify and institutionalize the utilization of the Attendance and Parents Aert System (APAS) at both the school and division level. This can be achieved by organizing seminar workshops targeting concerned teaching and non- teaching staff, ensuring widespread adoption and proficiency.

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