JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

"A Study on Parents Perceptions about Automated Attendance Systems and Their Impact on Education"

Gauri Atre [1]
gauriatre3@gmail.com
Mulund college of commerce
Mulund West, Mumbai

Chetna Panchal[1]
chetnasp999@gmail.com
Mulund college of commerce
Mulund West, Mumbai

Seema Attrade
attardeseema13@gmail.com
Mulund college of commerce
Mulund West, Mumbai

Abstract:

The integration of automated attendance systems in educational institutions has increased significantly with advancements in digital technology. This study examines the benefits of automated attendance in Education and explores parents' perceptions regarding its effectiveness, reliability, and impact on student safety and communication. Using a mixed-method research design, data were collected from parents through structured questionnaires to assess their views on real-time attendance monitoring, automated notifications, and the overall transparency such systems provide. Findings indicate that parents perceive automated attendance as highly beneficial, particularly in enhancing safety, improving communication between Educational Institute and home, and reducing manual errors. However, concerns related to data privacy and system reliability were also noted. The study concludes that while automated attendance systems are widely accepted by parents, successful implementation requires addressing technical and ethical challenges to ensure trust and long-term adoption. This research contributes valuable insights for Educational Institutions, policymakers, and Ed Tech developers aiming to strengthen student monitoring and parental engagement through technology.

Key words:

Automated attendance, Educational Institute, Parents, communication, Safety and security,.

Introduction:

Accurate and timely attendance tracking is a critical component of effective Educational Institutions management, influencing student safety, academic monitoring, and communication between institutions and families. Traditional attendance methods—often manual, paper-based, or teacher-dependent—are prone to errors, delays, and inefficiencies that can hinder real-time decision-making. In recent years, automated attendance systems using technologies such as biometrics, QR codes, mobile applications, and facial recognition have emerged as innovative solutions to address these limitations. These systems aim to streamline data collection, reduce administrative workload, and enhance the overall accountability of student presence in educational settings.

Beyond operational efficiency, automated attendance systems play an increasingly important role in strengthening Educational Institutions–parent communication. By providing instant notifications about a child's entry, exit, absence, or late arrival, these tools help parents stay informed and engaged with their child's daily routine. This

immediacy supports parental involvement, reinforces trust in the institution, and contributes to feelings of safety and transparency. As education environments place greater emphasis on student wellbeing and digital transformation, understanding how parents perceive these technologies becomes essential.

The topic gains further relevance as Educational Institutions worldwide adopt digital solutions following broader trends in Ed Tech integration and post-pandemic shifts toward data-driven management. While research has explored the technical effectiveness of automated attendance systems, fewer studies have examined the social and perceptual dimensions—particularly how parents evaluate the benefits, concerns, and overall usefulness of such systems. Investigating parental perceptions offers valuable insight into the acceptance, challenges, and long-term sustainability of these technologies.

This research paper therefore aims to explore the benefits of automated attendance systems in education and analyze parents' perceptions regarding their effectiveness, reliability, and impact on communication and student safety. Understanding these dimensions will help educators, policymakers, and system developers design more responsive and inclusive attendance solutions that align with the expectations of all stakeholders.

Objectives:

1. Automated attendance systems strengthen the communication link between educational institutes and parents. (e.g., for safety, or to follow up on absenteeism).
2. Enable analytics: identify patterns like chronic absenteeism, lateness, or class-wise attendance trends.
3. Provide parents with access to attendance records (via portals or apps), increasing transparency.
4. Enhance Safety and Security
   In emergencies (e.g., fire drills), real-time attendance data helps verify if all students are present.

Hypothesis:

H_{01}: Automated attendance systems do not enhance communication between colleges and parents.

H_{11}: Automated attendance systems enhance communication between college and parents by providing timely alerts regarding student attendance status.

H_{02}: Real-time attendance systems do not significantly improve the safety and security of students, nor do they impact the speed or accuracy of verifying student presence during emergencies.

H_{12}: Real-time attendance systems significantly improve the safety and security of students by enabling quicker and more accurate verification of student presence during emergencies.

Variables:

Independent Variable: Automated Alert
Dependent Variable: Safety and Security

Research Methodology:

A mixed-method approach combining primary and secondary.

- 66 parents from selected Educational institutes using automated attendance systems.
- Random sampling technique.

Tools

- Structured questionnaire (Likert-scale items)

Data Collection

Data collected from different colleges of Mumbai and suburban areas through online forms.

Statistical Methods

- Chi-square test
- T- test

Data Analysis

Quantitative Analysis

- Frequency distribution of parent responses
- Mean and standard deviation for perception scales
- Testing hypotheses using chi-square and t-test

1.Chi-Square Goodness-of-Fit Test Results:

The test compares:

- Observed frequencies (actual responses)
- Expected frequencies (equal distribution assumption)

If p-value < 0.05 → Reject, H_0 → response pattern is *not random* → participants show a *significant opinion trend*.

Question	**Chi-square value**	**p-value**	**Interpretation**
Useful for timely communication	30.41	0.0000011	Strong communication between Colleges and parents
Alerts ensure student safety	72.34	1.34×10^{-15}	Alert ensure strongly student safety
Reduces delay in locating missing students	94.96	1.88×10^{-20}	Extremely effective for locating missing student
Improves safety in fire drills	35.93	0.000000077	Strong agreement pattern

Interpretation:

Ho is Rejected means there is a strong communication between colleges and parents with the help of Automated Attendance systems.

- ❖ Automated Attendance systems enhance communication between college and parents by providing timely alerts regarding student attendance status.
- ❖ Real time alerts ensures strong safety for the students.
- ❖ Automated Attendance systems significantly improve the security of students.
- ❖ Automated attendance systems significantly improve the safety of student.

2.One-Sample t-Test Results (Test Value = 2 = Neutral Response)

Hypothesis:

- **H_0:** $\mu = 2$ (participants are neutral)
- **H_1:** $\mu > 2$ (participants significantly agree)

Questions	Mean	SD	t-value	p-value	Interpretation
Timely Communication	3.26	0.71	13.41	1.41×10^{-19}	Strong communication between Colleges and parents
Alerts Ensure Safety	3.67	0.51	25.02	1.01×10^{-32}	Alert ensure strongly student safety
Locating Missing Students	3.74	0.58	22.90	9.99×10^{-31}	Extremely effective for locating missing student

Interpretation:

Ho is Rejected means there is a strong communication between Real time alerts and safety with the help of Automated Attendance systems.

- ❖ Automated Attendance systems enhance communication between college and parents by providing timely alerts regarding student attendance status.
- ❖ Real time alerts ensures strong safety for the students.
- ❖ Automated Attendance systems significantly improve the security of students.
- ❖ Automated Attendance systems significantly improve the safety of student.

Findings (Sample Summary)

1. **Improved Communication:** 84.4% of parents agreed that automated notifications help them stay informed about attendance.
2. **Enhanced Safety:** Most parents felt assured when they received instant alerts about their child's entry and exit from the college.
3. **Accuracy:** Parents trust automated data more than manual records.
4. **Concerns:** A minority expressed concerns regarding system failures or data privacy.

Discussion

These results support prior studies underscoring how technology contributes to improving institutional operations in education. Parents appreciated transparency and efficiency, reinforcing that automated attendance can strengthen school–parent relationships. However, system reliability and data protection must be prioritized.

Conclusion

Automated attendance offers significant advantages in enhancing communication, safety, and accuracy. Parents generally hold positive perceptions but expect systems to be secure, reliable, and error-free. Educational institutes should focus on training, data privacy policies, and technical upgrades to ensure successful adoption.

Recommendations/ Suggestions

1. Improve system reliability with regular maintenance.
2. Strengthen data privacy measures.
3. Provide Summary of attendance to parents on weekly/monthly basis
4. Provide training for parents on Automated Attendance system use.
5. Encourage two-way communication via Attendance Apps.
6. Attendance Apps should be up to date on a regular basis.

References (Sample)

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