Jurnal Teknologi Pendidikan, Desember 2025, 27 (3), 1073-1085
DOI: http://dx.doi.org/10.21009/JTP2001.6
p-ISSN: 1411-2744 e-ISSN: 2620-3081
Accredited by Directorate General of Strengthening for Research and Development
Available online at http://journal.unj.ac.id/unj/index.php/jtp

Smart Piket Application to Improve Student and Teacher Discipline Productivity Based on Android

Muhammad Qadri[1(*)], Muhammad Ichfan Askar[2], Charles S Toyani[3], Andryanto Aman[4]
[1,2,3]Universitas Teknologi Akba Makassar, Makassar, Indonesia
[4]Pangkep State Polytechnic of Agriculture, Makassar, Indonesia

Received : September 4, 2025
Revised : November 24, 2025
Accepted : December 29, 2025

Abstract

The problem is that the process of recording student attendance, tardiness, and violations at SMP Negeri 25 Makassar is still done manually, which has the potential to cause errors in recording, delays in conveying information, and a lack of transparency for parents. This study aims to design and develop an Android-based Smart Piket application using the Location Based Service (LBS) method as a solution to automatically record data on tardiness and violations based on time and location, which has not been implemented in the manual system. In addition, this application is equipped with a digital recap feature that can be accessed by teachers, parents, and school officials to increase transparency and speed up the flow of information on student discipline. Data collection was conducted through observation, interviews, and the distribution of questionnaires to application users. System testing was conducted using Black Box Testing and User Acceptance Test (UAT) to assess system functionality. The results of this study indicate that the Smart Piket application has functioned as expected, with a user satisfaction rate of 87.2%. It can therefore be concluded that this application is feasible and effective in improving discipline and facilitating the monitoring of student activities by schools and parents.

Keywords: Recording tardiness, Smart Piket Application, SMPN 25 Makassar

(*) Corresponding Author: mqadri@unitama.ac.id

How to Cite: Qadri, M., Askar, M. I., Toyani, C. S., & A, A. (2025). Smart Piket Application to Improve Student and Teacher Discipline Productivity Based on Android. *JTP - Jurnal Teknologi Pendidikan*, *27*(3), 1073–1085. https://doi.org/10.21009/jtp.v27i3.60096

INTRODUCTION

In this era of ever-evolving globalization, educational institutions are now faced with the challenge of adapting to technological advances in order to improve the quality of their services and learning. The use of technology in education not only supports operational activities (Ahmed & Opoku, 2022; Susilawati et al., 2023; Syed et al., 2021), but also provides solutions for more effective and efficient information management (Dobrica et al., 2023; He et al., 2021; Torab-Miandoab et al., 2023). This technology allows all parties, including students, teachers, and parents, to access information in real time.

Advances in information technology, especially through Android-based devices, present opportunities to develop more efficient and organized solutions (Musa et al., 2023; Rahman et al., 2025). By utilizing Location-Based Service (LBS) technology, schools can implement systems to record student attendance

(Panjaitan & Pakpahan, 2021), document student violations, and provide information about violations and student activities while at school. In addition, this technology can also be used to support communication about assignments that must be given to students if a teacher is unable to attend.

(Abidin & Muhammad, 2024; Chen, 2024; Hamka, 2023) research explains that the presence of teachers on duty plays a strategic role in maintaining the smooth running of teaching and learning activities and order in the school environment. However, the mechanism for implementing duty in this study still relies on manual recording, so it does not yet utilize information technology support. Meanwhile, research by (Honainah et al., 2021) has developed a CodeIgniter-based e-duty application that provides online and offline access features for teachers, duty teachers, and principals to support the continuity of the academic process at MTs Nurul Jadid. However, the proposed system does not yet include functions for recording student violations, location-based attendance monitoring, and communication integration between the school and parents (Agajo et al., 2023; Takyiwa-Debrah, 2023). These limitations indicate the need for the development of a more comprehensive, adaptive, and integrated duty system to support real-time discipline monitoring.

The urgency of this research is to overcome the limitations of manual systems in managing student discipline data and communication between stakeholders in schools. Currently, recording student tardiness and violations is still done manually, where students who are late or violate rules are recorded by hand (Abidin & Muhammad, 2024; Mahanani et al., 2025). This method often causes various obstacles, such as the risk of errors in recording, delays in conveying information, and low accessibility for parents to contact students' activities. These problems can disrupt the operational efficiency of the school, thereby impacting the smooth running of the learning process (Fatoni et al., 2024; Henry et al., 2025; Saba, 2025). In addition, teachers often face difficulties in conveying information to the teacher on duty so that they can assign tasks to students in a timely manner when a teacher is absent.

In facing these challenges, this study aims to design a smart duty roster application, which is intended to facilitate the management of student tardiness and misconduct data. This application also allows teachers to assign tasks even when they are unable to attend, and provides parents with real-time access to monitor their children's tardiness or violations. By involving teachers, duty officers, parents, and principals as users, this application is expected to improve efficiency in data management, support better decision-making, and create a more conducive and productive learning environment.

METHODS

1. Research Design

This study uses the Location Based Service (LBS) Development method. According to (Pranatawijaya, 2021) Location Based Services (LBS) refer to methods that use information about the user's location to offer relevant services. Geographic technologies, such as GPS, Wi-Fi, and cellular systems, form the basis

for LBS to determine the user's position (Boutet & Cunche, 2021; Farahsari et al., 2022). With this information, services can be tailored to their location, including maps, navigation, location-based promotions, and other relevant information. LBS development follows steps similar to other software development processes, but with a specific emphasis on utilizing the user's location as a key component in the system.

Research data was obtained through direct observation of the school attendance recording system, interviews with teachers and students, and the distribution of questionnaires to users as an evaluation tool (Gonzálvez et al., 2021; Llerena et al., 2025; Mondal & Mondal, 2023). System testing was conducted using Black Box Testing to verify the suitability of the application's functions to user needs (Altulaihan et al., 2023; Mahendra & Asmarajaya, 2022), as well as User Acceptance Testing (UAT) to measure the level of user satisfaction and acceptance of the developed system(Abadi et al., 2022). The UAT results were analyzed quantitatively using a percentage-based rating scale, resulting in an interpretation of the application's feasibility.

2. Research Flowchart

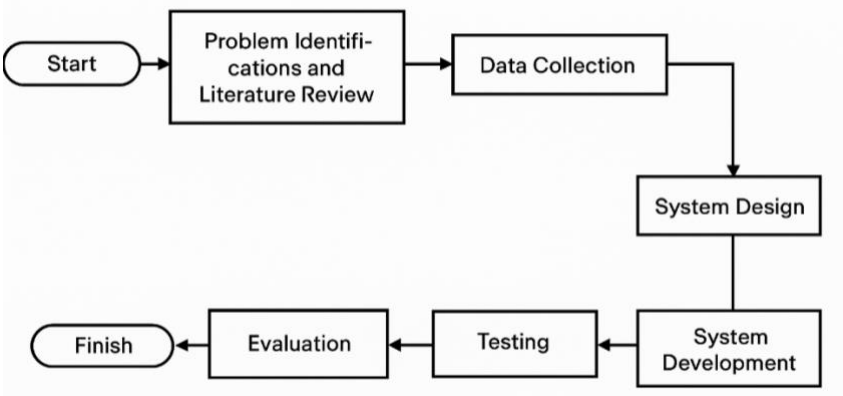

Figure 1. Research Flow Chart

3. Research Process

a. Problem Identification and Literature Review
Identify problems related to manual attendance recording and student violations, as well as communication between schools and parents (Enderle, 2025). In addition, collect theoretical references from previous studies. Direct observation of the manual recording process at SMPN 25 Makassar. Interviews with teachers, security guards, parents, and the principal to understand the obstacles faced.

b. Data Collection
Collecting primary and secondary data to support application development. Conducting further case studies at SMPN 25 Makassar to collect data on user needs. Collecting additional data on the features desired by teachers, security guards, parents, and the principal.

c. Designing the system architecture and user interface (UI) of the application.
Designing the system architecture and user interface (UI) of the application. Creating a database design using Firebase Realtime Database. Designing the

application workflow with LBS and Push Notification technology integration (Kusaeri et al., 2024). Developing UI mockups to ensure the application is user-friendly.

d. Building the System
Implement the main features of the application based on the design that has been compiled. Code the attendance recording feature using LBS. Code the violation and disciplinary points recording feature. Code the feature for teachers to assign tasks when they are absent. Code the monitoring feature for parents through real-time notifications. Code the reporting feature for the principal.

e. Testing
Ensuring that the application functions properly as expected. Verifying that all features work as they should. Ensuring that attendance and violation data recorded by the system is accurate.

f. Evaluation
Collecting feedback from users for application improvements. Conducting trials at SMPN 25 Makassar and gathering input from teachers, staff on duty, parents, and the principal. Compiling recommendations for improvements based on user feedback.

RESULTS & DISCUSSION

At this stage, trials are conducted on the system that has been created to determine how well it can meet user needs. The results of the trials and discussions about the implementation of the system will be presented in this discussion.

Table 1. Main Menu Display Testing

Testing Components	Test Scenario	Applied Results	Test Results
Login Page	Log in with valid data.	Go to the application's main page.	Valid
	Log in with an incorrect email address.	A notification appears saying "something is wrong, the identity does not match.	Valid
	Log in with an incorrect password.	A notification appears saying "something is wrong, the identity does not match.	Valid

Table 2. Testing the Duty Officer Status Display

Testing Components	Test Scenario	Applied Results	Test Results
Officer on Duty Status Page	Display a list of available teachers	The list of teachers is displayed in full along with their data and duty status.	Valid
	Filter by duty status (all/on duty/off duty).	The data displayed corresponds to the selected status filter.	Valid

	Search for teacher names.	Displays the search results for the name.	Valid
	Edit teacher data.	Redirects to the edit button and displays the data edit page.	Valid

Table 3. Student Misconduct Hearing

Testing Components	Test Scenario	Applied Results	Test Results
Student Violations Page	Displaying a list of student violations.	Display complete student violation data entered by teachers.	Valid
	Adding new student violation data.	Display new data with complete information.	Valid
	Editing student violation data.	Display the edit form and edit data, which can be updated and saved.	Valid
	Searching for violation data Deleting data	Display results according to the data searched.	Valid
		The selected data is deleted from the list.	Valid

Table 4. Class Assignment Display Testing

Testing Components	Test Scenario	Applied Results	Test Results
Class Assignment Page	Display class assignment data.	Data display based on date, including class, teacher, subject, and status.	Valid
	Add new class assignment data.	Display new data with the appropriate information.	Valid
	Change assignment status.	Display status changes from “not yet assigned” to “already assigned”.	Valid
	Delete class assignment data.	Class assignment data deleted from the data.	Valid
	Filter data by class name/teacher/subject.		
	Filter by assignment status.	Display data according to search results.	Valid
	Filter by class, teacher, subject, or assignment time.	Display data according to the selected status.	Valid
	Reset all filters	Filter and display data according to the selected filter combination.	Valid

	Refresh Data	All filters return to their default positions and all data is displayed again.	Valid
		The table reloads and displays the latest data.	Valid

Manual Program

1. Login Page

   Figure 2 shows the login page display when the admin user accesses the application.

Figure 2. Login Page Display

2. Home Page

   Figure 3 shows the home screen when the administrator first logs into the application, which provides an overview of the application, such as the amount and data chart.

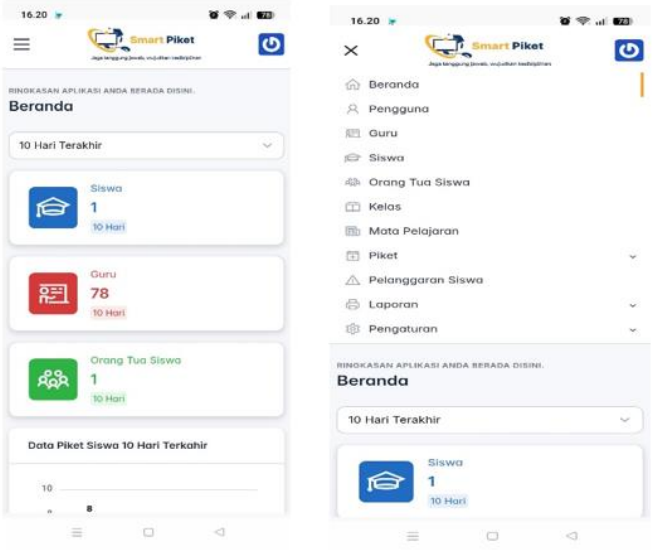

Figure 3. Home Page Displa

3. BK Account Page
Figure 4 shows the BK account home page, displaying a summary of student violations per class.

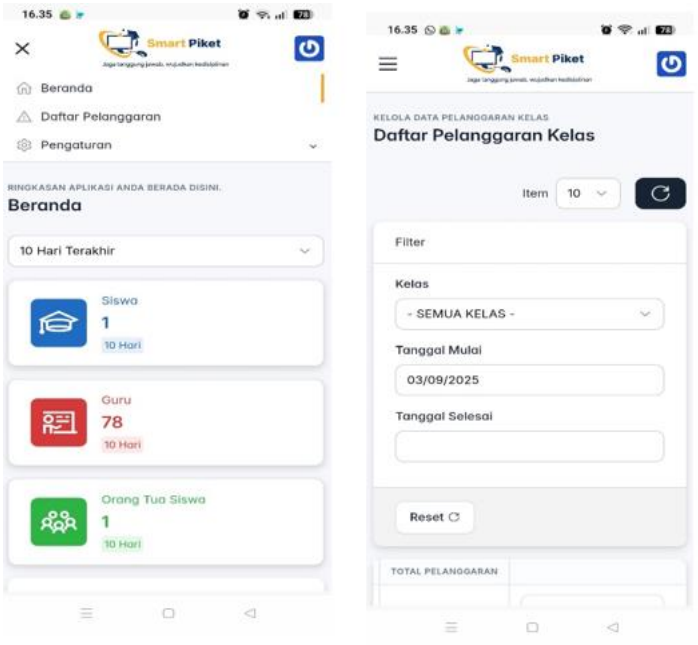

Figure 4. BK Account Page Display

4. Principal Account Page
Figure 5 shows the principal's home page, where the principal can view violations for each class.

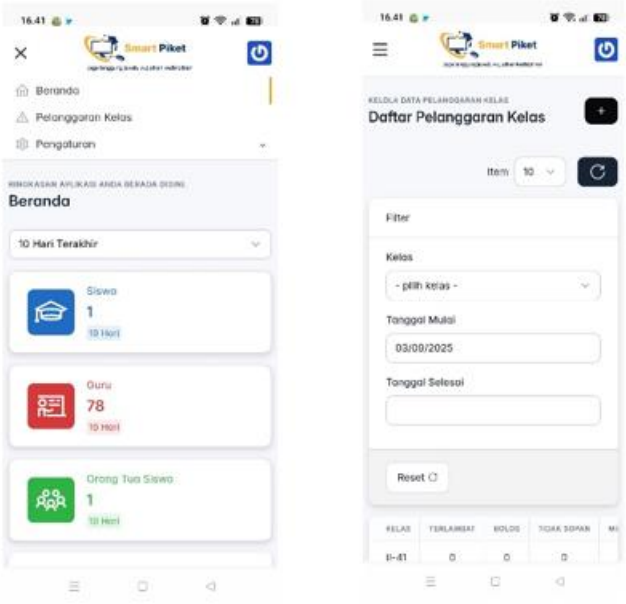

Figure 5. Principal Account Page Display

5. Parent Home Page

Figure 6 shows the parent homepage, where parents can view their children's violations.

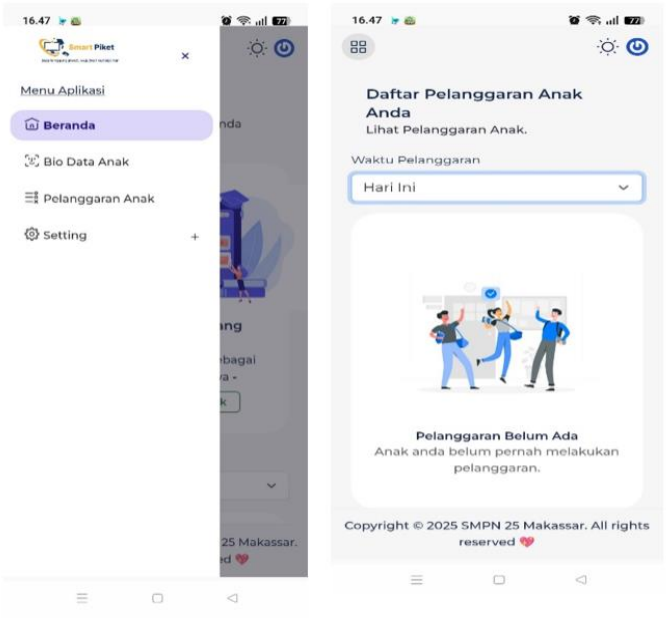

Figure 6. Parent Page Display

6. Teacher Account Page

Figure 7 shows the Teacher's homepage, where teachers can view their students as homeroom teachers, allowing them to monitor their students' violations.

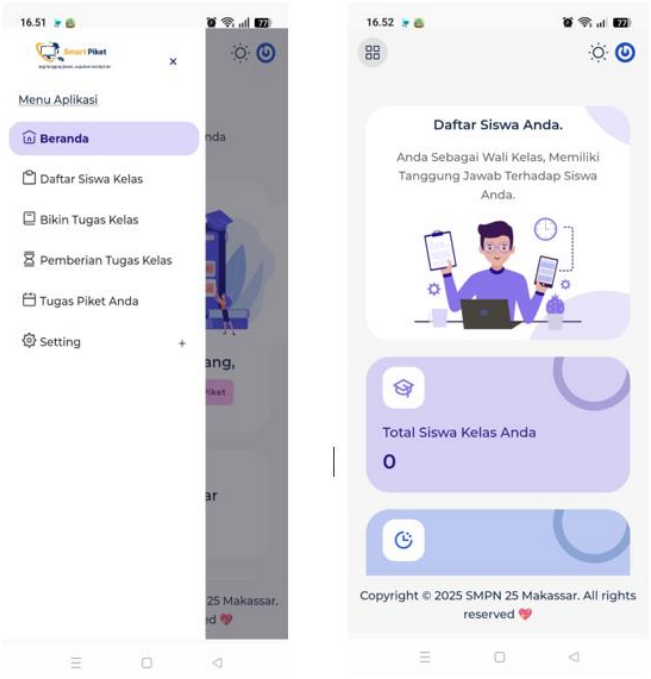

Figure 7. Teacher Page Display

Questionnaire Results

Table 5. Calculation of Questionnaire Answers

Aspect	Questions	Answer					Value					Result
		SS	S	CS	TS	STS	SS	S	CS	TS	STS	
							x5	**x4**	**x3**	**x2**	**x1**	
Usability	Do you think this application is easy to use?	11	7	2	0	0	55	28	6	0	0	89
Functionality	Do you think this application helps improve the discipline of students and teachers?	13	7	0	0	0	65	28	0	0	0	93
	Do you think this application is not burdensome for students and teachers?	5	10	5	0	0	25	40	15	0	0	80
User Interface	Do you think this app provides personalized recommendations based on your preferences?	6	11	3	0	0	30	44	9	0	0	83
Performance	Do you think this application is worth implementing permanently at SMPN 25 Makassar?	12	7	1	0	0	60	28	3	0	0	91

From the test results, the following conclusions can be drawn:

1. Analysis of the first question
   The table above shows the scores of 20 respondents
   The result for the first question, which is 89.
   The average score is 89 / 20 = 4.45
   The percentage score is 4.45 / 5 x 100 = 89%.
2. Analysis of the second question
   The table above shows the scores of 20 respondents
   The result for the second question is 93.
   The average value is 93/ 20 = 4.65.
   The percentage score is 4.65 / 5 x 100 = 93%.
3. Analysis of the third question
   The table above shows the scores of 20 respondents
   The respondents' score for the third question is 80
   The average score is 80 / 20 = 4.00
   The percentage score is 4.08 / 5 x 100 = 80%.

4. Analysis of the fourth question
   The table above shows the scores of 20 respondents
   The respondents' score for question four is 83.
   The average value is 83/ 20 = 4.15.
   The percentage score is 4.15 / 5 x 100 = 83%.
5. Analysis of the fifth question
   The table above shows the scores of 20 respondents
   The respondents' score for the fifth question is 91
   The average score is 91 / 20 = 4.55
   The percentage is 4.55 / 5 x 100 = 91%.

For tests that have been conducted by analyzing each statement, the overall test results are taken from the sum of the test results for each question divided by the number of statements. Test results = statement 1 + statement 2 + statement 3 + statement 4 + statement 5 / number of questions

= 89 + 93 + 80 + 83 + 91 / 5
= 436 / 5
= 87.2%

Based on the results of the questionnaire testing distributed to 20 respondents, an average percentage of 87.2% was obtained. This result shows that the application being tested received a very favorable rating from the respondents.

CONCLUSION

Based on the results of research conducted on the Smart Piket Application for Improving Student and Teacher Discipline and Productivity Based on Android, it can be concluded that the Smart Piket Application has been successfully designed and implemented, and is capable of improving the effectiveness of discipline management in schools. The evaluation results show that this application is easy to use, does not burden users, and is efficient in assisting the recording and monitoring process compared to manual methods. The user satisfaction rate reached 87.2%, indicating that this application is feasible to implement and can have a positive impact on improving student and teacher discipline. However, further development is still needed to optimize the application.

Some recommended developments include the integration of WhatsApp Gateway for sending automatic notifications to parents regarding student attendance and violations, the addition of a disciplinary analytics report feature to help principals and homeroom teachers monitor tardiness patterns visually, improved data security through a multi-layered authentication system, and expansion of the application's implementation to more schools so that its benefits can be felt more widely.

REFERENCES

Abadi, S., Maseleno, A., Khumaidi, A., & Iskandar, M. N. (2022). Peningkatan Kualitas Sekolah Digital Melalui Aplikasi Absensi Guru Sekolah Berbasis Android Pada SMA Negeri 1 Sukoharjo. *NEAR: Jurnal Pengabdian kepada Masyarakat*, *1*(2), 116–121. https://doi.org/10.32877/nr.v1i2.435

Abidin, Z., & Muhammad, N. (2024). Effective Classroom Management as a Quick Solution to Improve Student Participation and Motivation in the Learning Process. *Zabags International Journal of Education*, *2*(2), 88–104. https://doi.org/10.61233/zijed.v2i2.22

Agajo, J., Omokaro, I., Braimoh, I., Onyebuchi, N., Ali, N. O., & Oluwaseyi, O. E. (2023). Development of A Remote Monitoring System for Young School Pupils Using Geofencing Technique. *2023 2nd International Conference on Multidisciplinary Engineering and Applied Science (ICMEAS)*, 1–6. https://doi.org/10.1109/ICMEAS58693.2023.10429884

Ahmed, V., & Opoku, A. (2022). Technology supported learning and pedagogy in times of crisis: The case of COVID-19 pandemic. *Education and Information Technologies*, *27*(1), 365–405. https://doi.org/10.1007/s10639-021-10706-w

Altulaihan, E. A., Alismail, A., & Frikha, M. (2023). A Survey on Web Application Penetration Testing. *Electronics*, *12*(5), 1229. https://doi.org/10.3390/electronics12051229

Boutet, A., & Cunche, M. (2021). Privacy protection for Wi-Fi location positioning systems. *Journal of Information Security and Applications*, *58*, 102635. https://doi.org/10.1016/j.jisa.2020.102635

Chen, A. X. (2024). Exploring parental perspectives and engagement in shared reading with digital books: A comparison of urban and rural Chinese families during the Covid-19 pandemic. *International Journal of Educational Research*, *127*, 102394. https://doi.org/10.1016/j.ijer.2024.102394

Dobrica, V., Duško, L., & Lj, V. S. (2023). USE OF INFORMATION TECHNOLOGIES IN HIGHER EDUCATION FROM THE ASPECT OF MANAGEMENT. *International Journal of Cognitive Research in Science, Engineering and Education*, *11*(1), 143–151.

Enderle, C. (2025). "So That You Can Feel Well": Perspectives of Students with Social, Emotional and Behavioral Difficulties on Factors that Support School Attendance. *School Mental Health*, *17*(3), 935–956. https://doi.org/10.1007/s12310-025-09764-z

Farahsari, P. S., Farahzadi, A., Rezazadeh, J., & Bagheri, A. (2022). A Survey on Indoor Positioning Systems for IoT-Based Applications. *IEEE Internet of Things Journal*, *9*(10), 7680–7699. https://doi.org/10.1109/JIOT.2022.3149048

Fatoni, M. H., Fatimah, M., Santoso, B., & Syarifuddin, H. (2024). The Role of School Administration in Improving Operational Effectiveness and Quality of Education. *International Journal of Educatio Elementaria and Psychologia*, *1*(6), 335–345. https://doi.org/10.70177/ijeep.v1i6.1400

Gonzálvez, C., Kearney, C. A., Vicent, M., & Sanmartín, R. (2021). Assessing school attendance problems: A critical systematic review of questionnaires. *International Journal of Educational Research*, *105*, 101702. https://doi.org/10.1016/j.ijer.2020.101702

Hamka, H. (2023). The Role of Principals on Teacher Performance Improvement in a Suburban School. *QALAMUNA: Jurnal Pendidikan, Sosial, Dan Agama*, *15*(1), 371–380. https://doi.org/10.37680/qalamuna.v15i1.2409

He, W., Zhang, Z. (Justin), & Li, W. (2021). Information technology solutions, challenges, and suggestions for tackling the COVID-19 pandemic. *International Journal of Information Management*, *57*, 102287. https://doi.org/10.1016/j.ijinfomgt.2020.102287

Henry, Brown, S., & Jones, J. (2025). Creating Educational Solutions for Optimizing Learning Factory Operations and Outcomes. *International Transactions on*

Education Technology (ITEE), *3*(2), 134–146. https://doi.org/10.33050/itee.v3i2.790

Honainah, H., Lismawati, A. N. A., Imaniyah, N., Agustin, A., Ramadhany, A., & Asmani, A. (2021). Pendampingan Penerapan Aplikasi E-Piket di MTs Nurul Jadid Untuk Menjaga Kestabilan Proses Belajar Mengajar (KBM) Berbasis Codeigniter. *Ilmu Komputer Untuk Masyarakat*, *2*(1), 23–29. https://doi.org/10.33096/ilkomas.v2i1.903

Kusaeri, A., Jaelani, I., & Minarto, M. (2024). Implementasi Payment Gateway Dan Whatsapp Gateway Pada Sistem Informasi Manajemen Anggota Pengembang Indonesia Berbasis Web Menggunakan Framework Laravel. *Polygon : Jurnal Ilmu Komputer Dan Ilmu Pengetahuan Alam*, *2*(5), 32–42. https://doi.org/10.62383/polygon.v2i5.209

Llerena, L., Castro, J. W., & Rodriguez, N. (2025). Evaluating the usability of open source software tools in e-learning: A systematic mapping study and case study. *Journal of Computers in Education*. https://doi.org/10.1007/s40692-025-00360-3

Mahanani, S., Suparman, & Saputra, W. N. E. (2025). School Strategies in Recording Student Discipline Violations through the TPD App. *Jurnal Praktik Baik Pembelajaran Sekolah Dan Pesantren*, *4*(02), 117–128. https://doi.org/10.56741/pbpsp.v4i02.1075

Mahendra, G. S., & Asmarajaya, I. K. A. (2022). Evaluation Using Black Box Testing and System Usability Scale in the Kidung Sekar Madya Application. *Sinkron : Jurnal Dan Penelitian Teknik Informatika*, *6*(4), 2292–2302. https://doi.org/10.33395/sinkron.v7i4.11755

Mondal, H., & Mondal, S. (2023). Methods of collecting and recording attendance of medical students in a classroom: A systematic review. *Journal of Education and Health Promotion*, *12*(1), 427. https://doi.org/10.4103/jehp.jehp_737_23

Musa, H. S., Krichen, M., Altun, A. A., & Ammi, M. (2023). Survey on Blockchain-Based Data Storage Security for Android Mobile Applications. *Sensors*, *23*(21), 8749. https://doi.org/10.3390/s23218749

Panjaitan, J., & Pakpahan, A. F. (2021). Perancangan Sistem E-Reporting Menggunakan ReactJS dan Firebase. *Jurnal Teknik Informatika Dan Sistem Informasi*, *7*(1). https://doi.org/10.28932/jutisi.v7i1.3098

Pranatawijaya, V. H. (2021). PENERAPAN LOCATION BASED SERVICED (LBS) DALAM PROTOTIPE PENGENALAN RUANGAN DENGAN METODE EXTREME PROGRAMMING. *Jurnal Teknologi Informasi: Jurnal Keilmuan Dan Aplikasi Bidang Teknik Informatika*, *15*(1), 92–99. https://doi.org/10.47111/jti.v15i1.1936

Rahman, K., Arismunandar, H, N., & Hakim, A. (2025). Needs Analysis of an Integrated Android-Based Academic Information System in Higher Education. *Journal of Science and Education (JSE)*, *6*(1), 1168–1179. https://doi.org/10.58905/jse.v6i1.667

Saba, R. S. (2025). The Role of Educational Management Information Systems in Improving School Operational Efficiency. *JME Jurnal Management Education*, *3*(01). https://journal.sabajayapublisher.com/index.php/jme/article/view/483

Susilawati, E., Lubis, H., Kesuma, S., Pratama, I., & Khaira, I. (2023). FACTORS AFFECTING ENGINEERING INSTITUTES OPERATIONAL EFFICIENCY: EXPLORING MEDIATING ROLE OF DIGITAL TECHNOLOGIES ADOPTION IN TEACHING/LEARNING. *Operational Research in Engineering Sciences: Theory and Applications*, *6*(1), 252–273.

Syed, A. M., Ahmad, S., Alaraifi, A., & Rafi, W. (2021). Identification of operational risks impeding the implementation of eLearning in higher education system. *Education*

and Information Technologies, *26*(1), 655–671. https://doi.org/10.1007/s10639-020-10281-6

Takyiwa-Debrah, A. (2023). *A geofence and IoT-based solution for child abduction in Ghanaian schools*. https://hdl.handle.net/20.500.11988/1136

Torab-Miandoab, A., Samad-Soltani, T., Jodati, A., & Rezaei-Hachesu, P. (2023). Interoperability of heterogeneous health information systems: A systematic literature review. *BMC Medical Informatics and Decision Making*, *23*(1), 18. https://doi.org/10.1186/s12911-023-02115-5