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JURNAL MANAJEMEN PENDIDIKAN ISLAM

THE EFFECT OF USING THE QR CODE ABSENCE INFORMATION SYSTEM ON STUDENT DISCIPLINE

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This research is intended to assess how the use of an information system influences QR Code-based attendance on student discipline at SMP Negeri 2 Bandar Lampung. The study employed a quantitative framework with a causal associative design, and the population of the research comprises consisted of 1,074 students, with a sample of 292 respondents determined using the Slovin formula at a 5% margin of error and using a robability sampling approach, respondnets were chosen through simple random sampling. Data collection employed a likert scale questionnaire with scores from 1 to 4, and analysis was conducted using the SEM-PLS technique supported by SmartPLS version 4. It can be inferred from the findings that QR Code-based attendance has a positive and significant effect on student discipline, with an R-square value of 0.441. The hypothesis testing results show a t-statistic value of 18.459 and a p-value of 0.000. These findings demonstrate that an integrated and real-time attendance system can improve punctuality, reduce fraudulent practices, and foster students' responsibility toward their academic obligations. This study highlights that the utilization of information technology in attendance management represents an effective strategy for enhancing student discipline.

Keywords: Information System, QR Code Attendance, Discipline

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INTRODUCTION

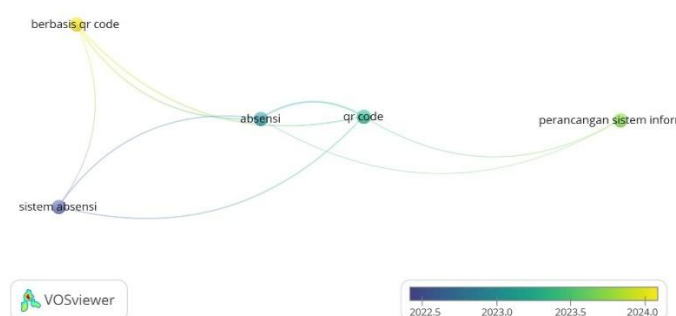
Education is a continuous learning process that occurs throughout an individual's lifetime and takes place in various contexts, significantly contributing to individual development (Ujud et al., 2023). The primary objective of education is to shape individuals into fully developed human beings, characterized by inner peace, intellectual competence, and strong faith. Through education, students' potential is cultivated so that they become intelligent, faithful, knowledgeable, and creative individuals, while also developing into responsible individuals with democratic characteristics (Sankar, 2025).

With regard to increasingly intensive globalization, advancements in information technology have generated substantial impacts across various sectors, including educational institutions, which are required to adapt to these technological developments. This evolution has triggered numerous transformations in the utilization of technology, including the transition from manual systems to digital systems (Shenkoya and Kim, 2023). Currently, the use of information technology plays a crucial role in facilitating various human activities, including the management of student attendance administration integrated with database systems (Butsiarah and Markani, 2021).

In managing the administrative system of an educational institution, recording students' attendance constitutes one of the essential components that supports the smooth implementation of the learning process. Attendance records not only function as documentation of presence but also serve as an indicator for assessing the level of participation and discipline among students in school. Nevertheless, many educational institutions in Indonesia still rely on manual attendance systems. The implementation of such systems gives rise to several limitations, including low time efficiency, suboptimal recording processes, a high potential for data falsification, and the presentation of reports in physical form, which poses risks to data confidentiality and may lead to data loss. Therefore, a more innovative approach to attendance systems is needed to optimize the effectiveness of attendance documentation also to improve the quality of administrative services related to student attendance (Sari, Harapan, and Indrawati, 2025). An attendance system utilizing QR codes introduces an innovative method to resolve the various challenges encountered in the attendance recording process (Novelan and Syahputra, 2023).

The achievement of an information system's objectives in supporting educational activities can be explained through according to the DeLone and McLean Information system success model, the level of effectiveness of an information system is determined by several key dimensions, namely system quality, information quality, service quality, system use, and user satisfaction (McLean, 2003). In the context of educational management, the implementation of a technology-based attendance information system with high system quality and ease of use can have a positive impact on the effectiveness of managing students' attendance administration.

The widespread utilization of technology enables students to record their attendance more quickly and efficiently through the process of scanning the available codes. This approach not only streamlines the attendance procedure but also increases the precision of attendance records. Therefore, the implementation of more effective and precise solutions is required to properly document students' attendance (Widiyanti and Widiati 2021). Several keywords related to QR Code-based attendance and student discipline were analyzed using the VOSviewer software, as visualized in Figure 1.1 below.



Source: Generated using VOSviewer.

Figure 1.1 Keywords Related to the QR Code-Based Information System and Student Discipline

Based on the results of the review of the bibliometric analysis visualization using VOSviewer software, the mapping of several keywords related to the utilization of technology in student attendance systems indicates an interconnection among concepts such as *information systems*, *QR Codes*, and *attendance systems*. This relationship suggests that the use of technology in attendance management has become an important area of study in the field of education, particularly in improving the efficiency of managing student

attendance. However, studies that specifically examine the influence of QR Code-based attendance information systems on students' discipline remain relatively limited. This condition indicates the existence of a research gap concerning the relationship between the use of QR Code-based attendance information systems and students' discipline.

In the context of academic information systems, attendance constitutes a strategic component because it is directly associated with students' level of discipline and their active participation in the process of acquiring knowledge and skills (Saripuddin, 2022). Referring to the concept of discipline put forward by Agus Wibowo, discipline refers to behavior that reflects obedience and orderliness in complying with various rules and regulations (Wibowo, 2012). Student discipline is an essential element in creating a conducive and orderly learning environment. It encompasses compliance with school regulations, punctuality in carrying out activities, and consistency in fulfilling responsibilities as students (Masinambow, Lengkong, & Rotty, 2025). The cultivation of discipline from an early age plays a significant role in shaping students' sense of responsibility, independence, and self-control (Aizah & Santoso, 2024). The value of discipline is also an important principle in Islamic teachings, emphasizing orderliness, responsibility, and consistency in fulfilling obligations (Ilhami, Samudra, A., Nurhasanah, B. A., & Jhauzal, 2025). Individuals who possess students highly disciplined individuals are more likely for show stonger persistence in learning , thereby providing students with opportunities to achieve academic success at school. Discipline also represents obedience to established rules, particularly the provisions ordained by according to the Qur'an, surah An-Nisa (4): 59 Allah SWT states that, which states:

يَا أَيُّهَا الَّذِينَ آمَنُوا أَطِيعُوا اللَّهَ وَأَطِيعُوا الرَّسُولَ وَأُولَى الْأَمْرِ مِنْكُمْ ۚ فَإِن تَنَازَعْتُمْ فِي شَيْءٍ فَرُدُّوهُ إِلَى اللَّهِ وَالرَّسُولِ إِن كُنتُمْ تُؤْمِنُونَ بِاللَّهِ وَالْيَوْمِ الْآخِرِ ۚ
ذَلِكَ خَيْرٌ وَأَحْسَنُ تَأْوِيلًا ۚ

Meaning:

“O you who believe, obey Allah and obey the Messenger, and those in authority among you. Then, if you disagree over anything, refer it to Allah (the Qur'an) and the Messenger (his Sunnah), if you truly believe in Allah and the Last Day. That is more appropriate and better in its outcome.” An-Nisa 4:59, (Mushaf, 2015).

According to the findings of a preliminary interview conducted with November 26, 2025, at SMP Negeri 2 Bandar Lampung, it was found that the adoption of an attendance system utilizing QR code, which has been in use since 2023, has been operating effectively. By implementing this system, attendance recording becomes faster, more accurate, and more transparent, which supports the improvement of students' discipline, particularly in terms of punctuality and the prevention of fraudulent practices such as proxy attendance. Furthermore, the system facilitates teachers and parents in monitoring attendance in real time and supports periodic evaluation. Although several challenges remain, including limited internet connectivity and the initial adaptation process among students, overall the QR Code the implementation of the system has positively influenced monitoring and supported the growth of student discipline.

Previous research conducted by Puput Liyawati entitled “*Analysis related to the adoption of QR code technology in attendance system to boost learners motivation to attend Grade XII IPS 1 Students*” indicates that technology-based learning media can motivate students to become more disciplined and creative. The implementation of this system assists teachers in monitoring student attendance more quickly and accurately, while simultaneously fostering a positive culture toward the utilization of technology within the

school environment (Liyawati, 2023). Another study was conducted by Mohamad Anas Sobarnas et al., entitled “*QR Code and Internet of Things-Based Student Attendance System with Real-Time Attendance Notification to Parents.*” This study aimed to develop an automated attendance system capable of improving the accuracy of attendance records and accelerating the delivery of attendance information to parents. The results revealed that the designed system provides a more efficient workflow compared to the conventional manual method, enabling automatic attendance recording and instant notification delivery after the QR Code is scanned. Furthermore, the system has the potential to enhance student discipline as well as improve information transparency between parents and the school (Sobarnas, Abdillah, & Imamuddin, 2026).

Although previous studies have examined the use of QR Code-based attendance systems, a research gap still exists. Earlier studies have primarily emphasized the utilization of QR Code attendance to enhance students’ attendance motivation, encourage the implementation of technology within instructional practices, and develop QR Code-based attendance systems integrated with IoT technology to increase the level of accuracy in attendance recording and deliver real-time notifications to parents. These studies demonstrate that the implementation of QR Code technology can improve the efficiency of student attendance management. However, there has been no study that specifically investigates its direct impact on students’ discipline within the educational environment. Therefore the present study is intended to empirically assess the influence of applying of information system-based QR Code attendance system on students’ discipline at SMP Negeri 2 Bandar Lampung. Based on this research objective, the hypotheses are formulated as follows: H_0 the use does not significantly affect of an information system-based QR Code attendance system on students’ discipline at SMP Negeri 2 Bandar Lampung. Meanwhile, the Alternative Hypothesis (H_1) states that there is a significant effect of the use of an information system-based QR Code attendance system on students’ discipline at SMP Negeri 2 Bandar Lampung.

Research Methodology

A quantitative method with a causal associative design was utilized in this study. Associative analysis represents a form of research problem formulation aimed at examining the relationship between two or more variables. Meanwhile, a causal relationship refers to a cause-and-effect linkage between variables. Accordingly, the independent variable in this study functions as the variable that exerts influence, whereas the dependent variable represents the variable that is affected (Sugiyono, 2017).

This study was conducted at SMP Negeri 2 Bandar Lampung, located at Jl. Pramuka No.108, Rajabasa Nunyai Village, Rajabasa District, Bandar Lampung City, Indonesia. The population of this study comprised all students of SMP Negeri 2 Bandar Lampung, totaling 1,074 students. The sampling technique employed in this research was probability sampling using the simple random sampling method, which is a sampling technique that provides an equal opportunity for every member of the population to be selected as a research sample. To determine the sample size from the population, the Slovin formula was applied with a 5% margin of error. The overall number of samples included in this research, as determined by the calculations, was 292 students. The research instrument utilized in this study utilizing a closed ended questionnaire based on a likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). This instrument was designed to facilitate respondents in providing their answers through predetermined alternative response options.

Data obtained through questionnaires were analyzed by applying structural equation modeling (SEM) utilizing the partial squares (PLS) method. Analysis was carried

out using the SEM-PLS technique with the assistance of SmartPLS version 4 was selected because it offers advantages in simultaneously analyzing the relationships between latent variables and their indicators, and it is capable of accommodating relatively small sample sizes without requiring strict assumptions of data normality.

The initial stage of the analysis process included assessing the measurement model (outer model) to confirm its validity both convergent and discriminant and the reliability of the constructs. Subsequently, the inner model that illustrates the structural relationships among variables was analyzed to assess the accuracy of the construct estimations. This assessment was conducted by examining the R-square values and hypothesis testing results (Setiabudhi Hatta, 2025).

RESULTS AND DISCUSSION

Results

A. Overview of Respondent Characteristics

This study was conducted at SMP Negeri 2 Bandar Lampung, involving 292 respondents. The description of the research object presents respondent characteristics categorized by gender also grade level. As present below section outlines the results of the respondents' descriptive statistics according to each of these characteristics.

Table 1.1 Respondent Characteristics by Gender

No.	Gender	Frequency (n)	Percentage (%)
1	Males	138	47,3%
2	females	154	52,7%
Total		292	100%

Source: SmartPLS 4 Output, Processed Primary Data (2026).

Based on Table 1.1, the respondents in this study consisted of 138 males (47.3%) and 154 females (52.7%).

Table 1.2 Respondent Characteristics by Class.

No.	Class	Total	Percentage (%)
1	VII	57	19,5%
2	VIII	82	28,1%
3	IX	153	52,4%
Total		292	100%

Source: SmartPLS 4 Output, Processed Primary Data (2026).

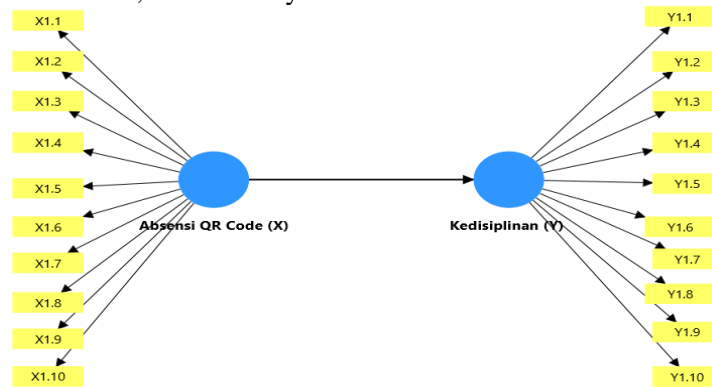
Based on Table 1.2, the respondents in this study were classified by grade level, consisting of 57 students (19.5%) from Grade VII, 82 students (28.1%) from Grade VIII, and 153 students (52.4%) from Grade IX.

B. Measurement Model (Outer Model)

The PLS method applies a measurement model to examine the validity of the constructs and reliability of the research instrument. This model aims to ensure that each indicator accurately and consistently measures the intended variable. According to Imam Ghozali, within the outer model, the relationship between observed indicators and their underlying variables is evaluated, with the purpose of assessing the validity and reliability of a model (Ghozali, 2020).

Figure 1.2 presents the latent variables analyzed in this study. The model illustrates the relationship between latent variables and the indicators used to measure them. Since latent variables cannot be measured directly, they must be represented through a set of

observable indicators. In this study, there are two latent variables: QR Code Attendance (X) as the independent variable, measured by indicators X1.1–X1.10, and Discipline (Y) as the dependent variable, measured by indicators Y1.1–Y1.10.



Source: SmartPLS 4 Output, Processed Primary Data (2026).

Figure 1.2. Latent Variable Model

Convergent Validity Test

Convergent validity testing was conducted to assess the relationship between each indicator and its corresponding latent variable. This test includes the evaluation of convergent validity through the loading factor, where the outer loading value must meet the established criterion, namely exceeding 0.7 (Abdillah, 2015). The outer loading values obtained in the initial stage of testing are presented as follows:

Table 1.3 Outer Loading Results of the First-Stage Convergent Validity Test

	QR Code Attendance (X)	Discipline (Y)	Information
XI 1	0.735		Valid
XI 10	0.768		Valid
XI 2	0.719		Valid
XI 3	0.553		Invalid
XI 4	0.636		Invalid
XI 5	0.742		Valid
XI 6	0.832		Valid
XI 7	0.772		Valid
XI 8	0.751		Valid
XI 9	0.562		Invalid
YI 1		0.741	Valid
YI 10		0.716	Valid
YI 2		0.756	Valid
YI 3		0.727	Valid
YI 4		0.752	Valid
YI 5		0.730	Valid
YI 6		0.694	Invalid
YI 7		0.826	Valid
YI 8		0.622	Invalid
YI 9		0.780	Valid

Source: SmartPLS 4 Output, Processed Primary Data (2026).

Based on Table 1.3, the outer loading values indicate that X1.3, X1.4, X1.9, Y1.6, and Y1.8 are below 0.7; therefore, these items were eliminated from the model. Consequently, a second-stage test was conducted as follows.

Table 1.4 Results of the Outer Loadings for the Stage 2 Convergent Validity Test

	QR Code Attendance (X)	Discipline (Y)	Information
XI 1	0.732		Valid
XI 10	0.801		Valid
XI 2	0.722		Valid
XI 5	0.718		Valid
XI 6	0.852		Valid
XI 7	0.780		Valid
X1.8	0.720		Valid
YI 1		0.723	Valid
YI 10		0.730	Valid
YI 2		0.719	Valid
YI 3		0.745	Valid
YI 4		0.780	Valid
YI 5		0.726	Valid
YI 7		0.843	Valid
YI 9		0.792	Valid

Source: SmartPLS 4 Output, Processed Primary Data (2026).

Referring to table 1 4, the findings from the second phase of testing show that the outer loading values are above 0.7

Discriminant Validity Test

Discriminant validity testing was conducted to ensure that each construct within the latent variables is clearly distinct from one another. The indicators in this study are considered to meet the requirements of discriminant validity when each indicator shows a higher cross loading on its assigned construct compared to other constructs (Sihombing, P et al., 2024). The following presents the results of the cross-loading test.

Table 1.5 Discriminant Validity Test Results Based on Cross Loadings

	QR Code Attendance (X)	Discipline (Y)	Information
XI 1	0.732	0.295	valid
XI 10	0.801	0.443	valid
XI 2	0.722	0.279	valid
XI 5	0.718	0.274	valid
XI 6	0.852	0.535	valid
XI 7	0.780	0.363	valid
XI 8	0.720	0.263	valid
YI 1	0.381	0.723	valid

YI.10	0.273	0.730	valid
YI 2	0.306	0.719	valid
YI 3	0.315	0.745	valid
YI 4	0.494	0.780	valid
YI 5	0.321	0.726	valid
YI 7	0.418	0.843	valid
YI 9	0.357	0.792	valid

Source: SmartPLS 4 Output, Processed Primary Data (2026).

Table 1.5 reveals that every indicator loads more strongly on its own construct than on other constructs. Therefore, the cross-loading values presented above confirm that the discriminant validity criterion has been satisfied.

Reliability Test

The reliability test aims to evaluate the level of accuracy, consistency, and stability of an instrument in measuring the constructs under investigation. A construct is considered reliable when the composite reliability score is above 0.7. (Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle 2019).

Table 1.6 Composite Reliability Values

	Composite reliability (rho_c)	Information
QR Code Attendance (X)	0.906	Reliable
Discipline (Y)	0.915	Reliable

Source: SmartPLS 4 Output, Processed Primary Data (2026).

Table 1.6 demonstrates that each variable has a composite reliability score exceeding 0.7. Accordingly, it can be concluded that all indicators used in this study are reliable and effective in measuring their respective constructs.

C. Structural Model (Inner Model)

R-Square value (R²)

R-square is utilized to measure the level of influence of exogenous latent variables on endogenous latent variables. With an R-square reaching 0.75, the model can be considered to have a strong level of explanatory ability explanatory power, a value of 0.50 reflects a moderate level of influence, while a value of 0.25 indicates a weak explanatory power. (Ghozali, Iman 2020).

Table 1.7 summary of R-Square (R²) values

	Coefficient of determination	Adjusted coefficient of determination
Discipline (Y)	0.441	0.439

Source: SmartPLS 4 Output, Processed Primary Data (2026).

Table 1.7 presents the R-Square value for the Discipline variable, which is 0.441. This indicates that 44.1% of the variance in student discipline can be explained by the QR

Code attendance variable examined in this study. Meanwhile, the remaining 55.9% is influenced by other factors beyond the variables included in this research.

Hypothesis Testing

Bootstrapping is a technique used to test hypotheses in research. The data used for the bootstrapping process are obtained during the measurement model evaluation stage. In the structural model, hypothesis testing is conducted to examine the assumed relationships among latent variables through a simulation procedure. The bootstrapping test also aims to determine the direction of the relationships and the level of significance among these variables. Hypothesis testing is performed by comparing the obtained t-statistic (t-value). A hypothesis is considered significant when the t-value exceeds the one-tailed t-table value of 1.66 at the 5% significance level, or when the p-value is less than 0.05 (Ketchen 2022).

Table 1.8 Bootstrapped path coefficient results

	Observed sample value (O)	t-value calculated from the ratio O to STDEV	Probability value	Information Provided
QR Code Attendance (X) -> Discipline (Y)	0.664	18.459	0.000	Signifikan

Source: SmartPLS 4 Output, Processed Primary Data (2026).

Based on the results presented in Table 1.8, the calculated t-value is 18.459, which is greater than the critical t-value of 1.66, and the significance level is 0.000 (< 0.05). Therefore, QR Code attendance has a significant effect on student discipline. Accordingly, the alternative hypothesis (H_1) is accepted, while the null hypothesis (H_0) is rejected.

Discussion

The Influence of QR Code Attendance Information System on Student Discipline

According to the outcomes of this research, the hypothesis testing process using bootstrapping revealed the obtained t-value is 18.459, exceeding 1.66, while the p-value is 0.000, indicating it is below 0.05. The findings show that the use of the QR Code attendance system has a positive and significant effect on student discipline. This study demonstrates that the better the implementation of the QR Code attendance system, the higher the level of student discipline.

Based on the research findings, it is evident that the implementation of technology-based information systems can enhance the effectiveness of monitoring students. An integrated, real-time attendance system can improve control, transparency, and accountability in recording attendance. The use of a QR Code attendance system encourages students to arrive on time, reduces opportunities for misconduct, and fosters a sense of responsibility toward their academic obligations. Consequently, the utilization of technology in the attendance system serves not only as an administrative tool but also as a mechanism for promoting students' discipline.

Student attendance is a critical aspect of educational administration. This assertion aligns with the view of T.H.F. Harumy, as cited by Ferdiansyah, that attendance systems play a vital role in schools. The presence of an attendance system supports various activities conducted within the school, making its implementation an essential form of institutional improvement (Ferdiansyah & Syafitri, 2022). Furthermore, the study by Wahyuni Dinasari

indicates that manual attendance recording processes are generally inefficient and require more time and resources (Dinasari, Budiman, & Megawaty, 2020).

Furthermore, the use of QR Code-based attendance is considered to carry relatively low risks of error and maintenance costs compared to manual methods (D. A. Rahayu & E. Vahmi, 2022). This aligns with the findings of Fadhilah Dirayati and Sukemi, who indicated that QR Code, as a modern technology, can support attendance recording processes more efficiently and accurately. The implementation of this technology has the potential to enhance students' compliance in participating in and completing activities as prescribed by the school authorities (Fadhilah Dirayati & Sukemi, 2019). Based on the DeLone and McLean Information System Success Model, the success of an information system is evaluated through five core dimensions: system quality, information quality, service quality, system usage, and user satisfaction. In this context, a QR Code attendance system that demonstrates high system quality and provides rapid and accurate attendance information encourages students to utilize the system optimally. Effective use of the system subsequently influences students' behavioral outcomes, particularly in terms of attendance discipline at school.

According to Farikhah et al. (2022), discipline is the behavior of adhering to rules and habits in accordance with time and place, which can be developed through repeated practice and personal commitment. This study aligns with the view of Muliando, Cahyadi, and Widjajakusuma, who state that discipline is formed through consistent compliance with regulations (Muliando Sindu, 2006). This process concurrently shapes students' discipline, particularly by cultivating the habit of arriving at school on time, as one of the factors contributing to indiscipline in schools is lateness (Anzalena, R., Yusuf, S., & Lukman, 2019). Furthermore, other research indicates that students' disciplinary development can be enhanced through continuous habituation supported by consistent supervision (Dewi, Asyiah, & Nurhabibah, 2024). Discipline is not solely established by rules but through ongoing practice in a structured environment. Attendance systems are effective as regulatory tools to facilitate this habituation process, gradually fostering students' awareness of adhering to attendance rules without requiring constant reminders (Dirman & Haryati, 2024). This perspective is consistent with modern educational management approaches, which emphasize the importance of leveraging technology to enhance school management effectiveness (Zahirah et al., 2026).

Subsequent research indicates that the QR Code system accelerates the attendance process, reduces errors and fraudulent practices, and receives positive responses from both students and teachers due to its speed, accuracy, and real-time functionality. Although dependent on an internet connection, this system is considered effective in supporting school administration and enhancing student discipline (Azka Maliya & Firman Jaya, 2025). Nevertheless, the development of student discipline is not solely influenced by the attendance system but is also shaped by other factors, such as the family environment. According to Shochib (2014), parental parenting practices have a significant function in shaping the foundations of discipline and promoting its growth, enabling students to cultivate disciplined behavior. The adoption of a QR code attendance system encourages students to arrive on time and comply with prevailing regulations, in line with the concept of discipline, which emphasizes orderliness and responsibility. Thus, this study reinforces the theory that the utilization of information technology in educational management contributes to the formation of disciplined behavior through more effective, accurate, and transparent monitoring mechanisms.

CONCLUSION

Based on the results of the research conducted at SMP Negeri 2 Bandar Lampung, it can be concluded that the use of an information system in QR Code-based attendance contributes positively and significantly to students' discipline. Evidence from the hypothesis testing further confirms this findings, which indicate a t-statistic value of 18.459 (>1.66) with a p-value of 0.000 (<0.05). Furthermore, the model's R-square value of 0.441 suggest 44,1 % of the changes in student discipline are attributable to the QR Code attendance variable, while the remaining variance is influenced by additional variables not covered in this research. The obtained findings further suggest that the implementation of an integrated and real-time QR Code attendance system can enhance punctuality in attendance, reduce fraudulent practices such as proxy attendance, and foster students' sense of responsibility toward their academic obligations. This study highlights that the utilization of information technology in attendance management represents an effective strategy for improving students' discipline. Therefore, schools are recommended to continue optimizing the implementation of QR Code attendance systems. In addition, future research is encouraged to incorporate additional variables, such as learning motivation or parental supervision, in order to obtain a more comprehensive understanding of the factors influencing students' discipline.

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