



Case Study: Implementation of Electronic Tilang in School Environment and Its Impact on Students

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Abstract: Implementing electronic ticketing in the school environment aims to improve driving discipline and student traffic safety. This case study reveals that implementing e-ticketing effectively reduces traffic violations and enhances compliance with rules. In addition, this program also plays a role in driving safety education. However, there are challenges in the form of psychological impact on students who feel pressured by close supervision. With the proper psychological and educational support, these negative impacts can be minimized so that the main objectives of this program can be achieved.

Keywords: Driving safety; Education; Electronic ticketing, Learners; Psychological impact; Traffic discipline

Introduction

In recent years, technological developments have significantly impacted various aspects of life, including traffic law enforcement. One growing popular innovation is electronic ticketing or e-ticketing, which utilizes digital technology to detect and crack down on traffic violations. Implementing this system in various significant cities has positively improved people's compliance with traffic rules. However, the implementation of e-LTE in the school environment is still relatively new and requires special attention (Aditya Pratama et al., 2023; Nugroho, 2022; Quistberg et al., 2019).

Traffic violations among students are an essential issue to resolve. Many students use motorized vehicles to go to school, and often, they violate traffic rules, such as not wearing helmets, riding more than two people, and parking carelessly. These violations can potentially endanger not only their safety but also that of others around them. Therefore, effective measures are needed to discipline learners in driving (Leonita et al., 2022; Rothman et al., 2022).

Implementing electronic ticketing in the school environment is emerging as a potential solution to overcome this problem. By using cameras and sensors installed at various strategic points, such as school gates and parking areas, traffic violations can be detected automatically. Data from these cameras is then analyzed, and violators will receive tickets electronically (Awoniyi et al., 2019; Oluwajana et al., 2020; Park & Song, 2021).

This system not only increases the efficiency of law enforcement but also provides a deterrent effect for violators. In addition, the implementation of e-LTE in schools also has educational value. This system teaches students to be more disciplined and responsible when driving. They will be more aware of the importance of obeying traffic rules and the impact of the violations they commit. This Education is expected to form better driving habits from an early age, which will positively impact the long run (Fliss et al., 2020; Mathew et al., 2022; Rahman et al., 2019).

However, as with other innovations, implementing electronic ticketing in the school environment also faces several challenges. One of the main challenges is the

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psychological impact on learners. The presence of surveillance cameras that constantly monitor their activities can cause feelings of discomfort and pressure. This requires a prudent approach on the part of the school to ensure that learners are not disturbed by this system (Batra et al., 2021; Browning et al., 2021; Ren et al., 2021).

On the other hand, adequate socialization and Education are the keys to the successful implementation of e-LTE in schools. Schools must actively conduct educational campaigns on driving safety and traffic rules. Thus, learners understand that they are being watched and realize the reasons behind implementing this system. Parental participation is also significant to support this program to run well (Espelage et al., 2021; Pissia & Costa, 2019).

Continuous evaluation is also needed to ensure the effectiveness of the e-ticketing system. Data regarding the number of violations and the compliance of learners with traffic rules need to be analyzed periodically. The results of this evaluation can be used to make adjustments and improvements to the existing system so that the main objectives of implementing e-LTE can be better achieved (Devlin & Fisher, 2021; Vu Hong, 2021; Zieher et al., 2021).

Collaboration between schools, parents, and local governments is also an essential factor in the success of this program. With support from all parties, the e-ticketing system can be implemented more effectively and have a broader positive impact. In addition, the existence of clear regulations and continuous socialization will help in creating a safer and more orderly school environment (Botchway, 2023; Factor, 2018; Paccaud et al., 2021; White & McKenna, 2020).

Method

This study uses qualitative and quantitative approaches to examine the implementation of electronic ticketing in the school environment and its impact on students. This approach was chosen to gain a comprehensive understanding of the effectiveness and challenges faced in implementing the e-ticketing program. Data were collected through surveys, in-depth interviews, and participatory observations in several schools that have implemented this system (Anderson, 2020; Hamilton & Finley, 2019; Mojarro et al., 2018).

The survey was conducted on learners, teachers, and parents in the schools that were the subjects of the study. The questionnaire included questions regarding the level of compliance with traffic rules before and after the implementation of e-ticketing, perceptions of the presence of surveillance cameras, and the psychological impact felt by students. This survey aims to collect

quantitative data that can be analyzed to see changes in behavior and attitudes toward driving safety.

In this study, purposive sampling is used to ensure that the selected sample has high relevance and in-depth information per the research objectives. The selected schools have implemented an electronic ticketing system, with criteria including location in urban and suburban areas, many learners, and a record of traffic violations before and after implementation. The selected students are those between 15 and 18 years old who actively use motorized vehicles to school and have received socialization about electronic tickets. In addition, teachers and parents interviewed are those who are involved in driving safety education programs and have insight into changes in students' traffic behavior (Ames et al., 2019; Andrade, 2021; Campbell et al., 2020; Denieffe, 2020; Varlik & Günbayi, 2022).

By purposive sampling, the study selected 5 schools with a total of 250 learners, as well as 50 teachers and 50 relevant parents. This selection allows researchers to gain a comprehensive perspective from various parties involved in implementing electronic ticketing so that research results can reflect multiple contexts. This approach ensures that the selected sample provides representative data and allows for in-depth analysis of the effectiveness of electronic ticketing systems and their impact on traffic discipline as well as the psychological well-being of learners.

In-depth interviews were conducted with several students, teachers, and school security officers to gain deeper insight into their experiences with the e-ticketing system. This interview aims to identify the challenges faced in implementation and understand the psychological and social impact of this system. Qualitative data from these interviews will be used to supplement and enrich the findings from the survey (Mark Lee & Al-Mansour, 2020; Nance & Heise, 2023; Quintero Valverde et al., 2023; Shin & Kim, 2022).

Participatory observation is carried out by directly observing the situation in the school environment during a specific period. Researchers followed the students' driving behavior, interaction with surveillance cameras, and the response to the tickets received. This observation aims to collect empirical data on the effectiveness of the e-ticketing system in enforcing traffic discipline and identify problems that may not be revealed through surveys or interviews (Smith et al., 2020; van Haperen et al., 2019).

Data collected from surveys, interviews, and observations will be triangulated to ensure the validity and reliability of the findings. Quantitative data analysis uses descriptive and inferential statistical methods, while qualitative data is analyzed using coding techniques to identify key themes. The results of this analysis will be used to provide relevant and practical

recommendations for schools and related parties in optimizing the implementation of electronic tickets in the school environment.

Result and Discussion

Improved Traffic Discipline

Implementing electronic ticketing in school settings has significantly improved driving discipline among learners. Data from the survey shows that 80% of students claim to comply more with traffic rules after the e-ticketing system. Direct observations also support these findings, with reduced numbers of traffic violations such as not wearing helmets and parking carelessly.

Survey data involving 250 learners from five schools showed that most students felt more responsible for obeying traffic rules. Before the implementation of e-ticketing, only about 50% of students claimed always to wear helmets while driving. After implementation, this figure increases to 85%. In addition, the number of violations, such as indiscriminate parking, was drastically reduced from 30 to only 5 cases per month.

One of the factors contributing to this discipline improvement is an intensive socialization and education program on the importance of driving safety. The schools participating in the study held various activities such as seminars, workshops, and safe driving simulations. These programs explain traffic rules and provide an in-depth understanding of the risks and consequences of violations (Bakhtari Aghdam et al., 2020; Mark Lee & Al-Mansour, 2020; Riaz et al., 2019).

Improved traffic discipline is also reflected in changes in students' driving behavior. Interviews with teachers and parents revealed that students became more cautious and disciplined while on the road. Many students are now prioritizing safety, not only for themselves but also for their friends who ride along. This collective awareness shows that e-ticketing impacts individuals and creates a culture of driving safety among students.

The e-ticketing technology involves installing surveillance cameras around the school area that automatically monitor traffic violations. Breach data is sent in real-time to a central system, which issues electronic tickets to violators. The system has proven effective in detecting and cracking down on violations quickly, providing a strong deterrent effect for violators. Speed and accuracy in law enforcement are critical factors in improving traffic discipline (Bojesen & Rayce, 2020; Vuhong, 2022).

Most of the learners gave positive responses to the implementation of e-tickets. They claim to feel safer and more comfortable driving in the school environment. Some students even stated that they felt motivated to

abide by the rules, knowing their violations would be monitored. In addition, the existence of electronic tickets also helps students who previously lacked the discipline to pay more attention to their safety on the road.

Teachers and parents also fully support the implementation of e-ticketing. They see an increase in driving discipline in school and outside the school environment. Teachers report that students are becoming more aware of the importance of traffic safety, which is also reflected in their attitudes in class. Parents feel calmer because their children obey traffic rules and behave more responsibly.

While there are many benefits, implementing e-ticketing also faces some challenges. Some students feel pressured by the intense surveillance, and there are also privacy concerns. To address this, schools are working closely with authorities to ensure that surveillance systems are implemented fairly and transparently. In addition, psychological support is provided to students who feel depressed, and educational programs are constantly being refined to reduce negative impacts.

Overall, implementing electronic ticketing in the school environment has succeeded in improving student traffic discipline. This increase is seen from survey data and direct observation and changes in more disciplined and responsible behavior. With the support of intensive socialization and Education, as well as fast and precise law enforcement, e-ticketing has created a better driving safety culture among students. This success shows that technology can be crucial in educating and disciplining the younger generation to become more compliant and safety-conscious riders.

Driving Safety Education

One of the positive impacts of implementing e-LTE is increasing students' awareness of the importance of driving safety. Schools that implement this system also conduct socialization and Education about traffic rules. The survey shows 70% of students feel more educated about driving safety after an e-ticket.

The schools participating in the e-LTE program held various socialization activities to raise awareness about driving safety. These programs include seminars, workshops, and group discussions involving traffic experts, police, and parents. At the workshop, students were given information about traffic accident statistics, factors causing accidents, and the importance of obeying traffic rules.

In addition to socialization, the school also conducts practical workshops that provide students with hands-on driving safety experience. The workshop covers driving simulations, correct use of helmets, and techniques to avoid road hazards. Students can practice what they have learned in safe and controlled situations,

which helps them understand and internalize the principles of driving safety.

Teachers play an essential role in educating students about driving safety. They provide in-class information and integrate traffic safety topics into various subjects. For example, in a math lesson, a teacher might use traffic accident data as teaching material to teach statistics. In language lessons, students may be asked to write an essay on obeying traffic rules. This integration helps students understand that driving safety is essential to everyday life.

The school also utilizes various learning media to convey driving safety messages. Educational videos, posters, and brochures containing information about traffic rules and safe driving techniques were distributed throughout the school. Videos showing simulated accidents and how to avoid them are shown in classrooms and public areas of the school. The medium is designed to grab students' attention and reinforce safety messages.

Parents are also involved in driving safety education programs. The school held informative sessions for parents, who were informed about the e-ticketing program and how they could support their children in obeying traffic rules. Parents are encouraged to discuss the importance of driving safely with their children and set a good example.

This intensive driving safety education has shown a positive impact on student behavior. Data from surveys and interviews show that after attending educational programs, students become more aware of the risks of driving without obeying traffic rules. They reported changes in attitude, such as always wearing a helmet, avoiding overspeed, and being more cautious on the road. Many students have also begun to influence their peers to be more obedient to traffic rules (Lewis et al., 2021; Papadakaki et al., 2020; Perego et al., 2021).

Schools continue to evaluate the effectiveness of driving safety education programs through surveys and feedback from students, teachers, and parents. The results of this evaluation are used to develop and improve the program to make it more effective. For example, if it is found that students still have difficulty understanding some aspects of driving safety, the school might add additional training sessions or change teaching methods (Ismail et al., 2019; Sharwood et al., 2023).

The implementation of e-LTE, accompanied by driving safety education programs, has had a significant positive impact. Increased awareness and behavior change among learners shows that this approach effectively educates students about the importance of driving safety. With support from teachers and parents and various learning media, the program has succeeded in creating a solid driving safety culture in schools.

Ongoing efforts to evaluate and develop the program will ensure that driving safety messages remain relevant and effective in keeping students safe on the road.

Psychological Impact and Solutions

The implementation of electronic ticketing in the school environment, although it has many benefits in improving traffic discipline, also has a psychological impact on some students. Some students report feeling anxious and depressed with constant supervision. They think constantly being watched can cause stress and reduce comfort in school activities. This shows the need for a more sensitive approach to implementing e-LTE to maintain students' psychological well-being (Arima et al., 2020; Browning et al., 2021; Yang et al., 2021).

Research shows that a constant sense of being watched can lead to increased anxiety among students. Uncertainty regarding potential speeding tickets every time they make a small mistake can increase mental stress. Some students may feel a loss of freedom and privacy, which can hurt their mental health. Observations and interviews with students revealed that this tension can affect their concentration in learning and social interaction (Alnaimat et al., 2023; Corpuz, 2023; Saulle et al., 2022).

Schools should be aware of the importance of providing psychological support to students who experience the negative impact of e-ticketing implementation. School counselors should be available to help students who feel anxious or depressed. This support can include individual counseling sessions, discussion groups, or mental health programs to help students cope with stress. Creating a supportive and open environment in which to discuss their feelings is an essential first step.

Involving students in the decision-making process regarding the rules and implementation of e-ticketing can reduce the feeling of being over-supervised. When students feel they have a say in the regulations that affect them, they tend to be more accepting and obedient to those rules. Schools can hold discussion forums where students can provide input and discuss e-ticketing policies. This inclusive approach also helps students understand the policy's purpose and how they can actively create a safe environment.

One way to reduce anxiety is to provide students with a clear understanding of the purpose of e-tickets. Schools must explain that the main purpose of e-tickets is to improve driving safety and protect all road users, including students themselves. By understanding that these policies are well-intentioned and not merely punitive, students are more likely to feel comfortable with the system (Chen et al., 2021; Mzadi et al., 2022; Zhang et al., 2020).

In addition to enforcing the rules, schools must also praise and reward students who abide by traffic rules. Recognition of good behavior can increase students' motivation to comply with the regulations and feel rewarded for their efforts. These awards can be certificates, symbolic awards, or special activities designed to reward students who abide by the rules.

Schools can reduce negative psychological impacts by providing additional training and Education that helps students properly understand how to use the e-ticketing system. This training could include a detailed explanation of how e-tickets work, how to avoid violations, and what to do if they receive a speeding ticket. Providing more profound knowledge makes students feel more prepared and less anxious. Schools must continuously monitor and evaluate the psychological impact of e-ticketing implementation. Periodic surveys and feedback sessions with students can provide valuable insight into how these systems affect their well-being. Based on the results of this evaluation, schools can make the necessary adjustments to improve student welfare.

Creating a supportive atmosphere at school is critical to reducing the negative psychological impact. Schools must ensure the environment is friendly, open, and supportive of dialogue about students' feelings and experiences. Support from teachers, staff, and fellow students can help create a sense of safety and comfort for all students.

Cooperation with parents is also essential in overcoming the psychological impact of e-tickets. Parents must be informed about the e-ticketing system and its effects on their children. With a good understanding, parents can provide the emotional support their children need at home and collaborate with schools to find the best solutions.

Conclusion Implementing e-LTE in the school environment requires a more sensitive approach to overcome the psychological impact students feel. Psychological support, an inclusive approach to decision-making, clear Education, and respect for good behavior are some of the steps that can be taken to ensure students' wellbeing is maintained. Schools can reduce psychological distress by creating a supportive and collaborative environment and helping students feel more comfortable and safe with the e-ticketing system.

Recommendations for Further Implementation

Based on the results of the study, it is recommended that schools take several strategic steps to optimize the implementation of the e-ticketing system and overcome existing challenges. These measures are designed to ensure that all students can maximally feel the benefits of the e-ticketing system while minimizing the negative impacts that may arise.

Education and socialization programs regarding driving safety need to be improved on an ongoing basis. Schools should continue hosting seminars, workshops, and practical activities that teach students the importance of obeying traffic rules. This Education should cover the ground rules and any special situations students may encounter while driving. Educational content must constantly be updated to stay relevant to the latest traffic safety and driving technology developments.

Psychological support is vital for learners who feel pressured by the e-ticketing system. Schools should provide counseling services that are easily accessible to students. School counselors should be trained to deal with issues associated with anxiety and stress resulting from close supervision. In addition, mental health programs that support students' emotional well-being should be implemented thoroughly, including relaxation activities, stress management, and social skills development.

Regular evaluations of e-ticketing systems should be conducted to ensure they continue to be practical and relevant. Schools must collect data regularly on traffic violations, student compliance rates, and the psychological impact students feel. Based on this data, schools can assess the success of the e-ticketing system and make necessary adjustments. The evaluation should also involve feedback from students, teachers, and parents to gain a comprehensive perspective.

Encouraging parents to support driving safety programs at home is very important. Schools should hold informative sessions and discussions with parents to explain the purpose and benefits of the e-ticketing system. With a good understanding, parents can help enforce driving discipline at home and set an excellent example for their children. The collaboration can also create a consistent environment between home and school, reinforcing driving safety messages.

Inclusive policy development involves students in the decision-making process related to the e-ticketing system. Schools may form committees or forums involving student representatives to provide input on traffic policies and rules. By involving students, schools can ensure that policies implemented are well received and perceived as part of a concerted effort to create a safe environment.

Schools should also consider improving infrastructure and technology that supports the implementation of e-tickets. Installing more sophisticated surveillance cameras, improved network quality for data transmission, and integration with broader law enforcement systems can improve system effectiveness. Investment in this technology must be balanced with training for school staff to operate and maintain the devices.

Finally, schools must continue to promote a safety culture throughout the school environment. This can be done through driving safety campaigns, awards for students demonstrating good driving behavior, and integrating safety topics into the school curriculum. By building a strong safety culture, schools can ensure that important messages about driving safety are received and lived by the entire school community. With these measures, schools can improve the implementation of the e-ticketing system, ensure the sustainability of driving safety programs, and create a safe and supportive environment for all learners.

Conclusion

Implementing electronic ticketing in the school environment has proven effective in improving student traffic discipline. The significant decrease in traffic violations and increased awareness of driving safety show that this system can be a powerful tool in educating and disciplining students. Intensive Education and socialization by the school also play an essential role in internalizing the values of driving safety among students so that they are more obedient to traffic rules. However, electronic tickets also have psychological impacts that need to be overcome with a wiser approach. Some students feel pressured by close supervision, so schools need to provide psychological support and involve students in the decision-making process regarding implementing this system. With an inclusive and sustainable approach, electronic ticketing can be optimized to create a safer and more orderly school environment and form good driving habits from an early age.

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In writing this article, the authors do not have any conflict of interest.

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