



Perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics

Rajendra Kunwar^{a1}, Tribhuvan University, Nepal

Suggested Citation:

Kunwar, R. (2024). Perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics. *World Journal on Educational Technology: Current Issues* 16(3), 215-234. <https://doi.org/10.18844/wjet.v16i3.9335>

Received on March 28, 2024; revised on May 18, 2024; accepted on June 11, 2024.

Selection and peer review under the responsibility of *Prof. Dr. Huseyin Uzunboylu*, University of Kyrenia, Cyprus
©2024 by the authors. Licensee *United World Innovation Research and Publishing Center*, Sht. Ilmiye Sakir Sokak, No: 9/2 Ortakoy, Lefkosa, 2681, Cyprus

This article is an open-access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

©iThenticate Similarity Rate: 5%

Abstract

The use of CCTV cameras has been increasing in educational settings due to their potential benefits in enhancing security, monitoring student behavior, and promoting a conducive learning environment. This study aims to explore the perceptions of administrators, teachers, and students regarding the use of CCTV cameras in schools and their impact on learning mathematics. The study adopts a mixed-method approach, incorporating semi-structured interviews and observations to examine the presence of CCTV cameras and their influence on classroom dynamics and behaviors in teaching and learning mathematics. Semi-structured interviews were conducted with school administrators, teachers, and students from six schools in Nepal. The analysis of the data revealed five main themes: individual privacy, autonomy and trust, school context and learning environment, discipline and safety measures, and school management system, along with limitations and constraints. These themes encompassed discussions on the potential benefits of CCTV cameras in promoting discipline, safety, and classroom management, as well as concerns related to privacy, autonomy, trust, student motivation, engagement, critical thinking skills, and classroom dynamics. The findings provide valuable insights for policymakers, school administrators, and educators to make informed decisions and develop appropriate guidelines for the responsible integration of CCTV cameras in educational settings.

Keywords: Administrators; CCTV cameras; learning environment; mathematics; monitoring; perceptions; students; teachers.

* ADDRESS FOR CORRESPONDENCE: **Rajendra Kunwar**, Tribhuvan University, Nepal
E-mail address: rajendrailam@gmail.com

1. INTRODUCTION

The integration of technology in Nepalese schools, including the use of CCTV surveillance, has gained prominence in recent years (Shrestha, 2018). CCTV cameras are seen as a means of enhancing student safety, deterring misconduct, and improving overall school security (Meishar-Tal et al., 2022). While schools face challenges related to student behavior, strategies such as CCTV cameras can help mitigate these issues and create a secure learning environment (Fisher et al., 2021; Luo et al., 2023). However, the use of CCTV cameras in schools has raised concerns about privacy and potential misuse (Bryan & Warnick, 2007). Despite the controversies, many parents and educators in Nepal consider CCTV cameras necessary for student safety. It is important to understand the perspectives of stakeholders, including students, teachers, and administrators, to ensure the responsible and ethical use of CCTV cameras in Nepalese schools (Ghimire & Rana, 2023). This knowledge can inform the development of policies and procedures that prioritize privacy, safety, and ethical considerations.

The use of CCTV cameras has become widespread worldwide, driven by technological advancements and concerns for public safety (Perry-Hazan & Birnhack, 2016, 2019; Zahrawi & Shaalan 2023). From its early applications in security and monitoring, CCTV technology has evolved to address various security threats and improve resource monitoring (Thimbleby, 2013; Tatler, 2021; Dharan & Mukhopadhyay 2023). The COVID-19 pandemic has further increased the demand for CCTV cameras to enforce social distancing and health regulations (Himeur, 2022). However, the use of surveillance technology should carefully consider privacy aspects and the positive and negative societal functions of anonymity (Sætra, 2022; Thimbleby, 2013; Serebrennikov & Skougarevskiy 2024).

In the education sector, CCTV cameras are increasingly used to enhance student safety, prevent bullying and violence, and improve overall school security (Fisher et al., 2021). Understanding the perceptions of school stakeholders, including administrators, teachers, and students, can inform policies and practices related to the use of CCTV cameras in schools, particularly regarding students' perspectives on school surveillance (Ghimire & Rana, 2023).

1.1. Conceptual background

1.1.1. Use of CCTV in school

The use of security cameras, including CCTV cameras, has gained popularity in workplaces and educational institutions for security and safety purposes (Meishar-Tal et al., 2022; Rosenblat et al., 2014). CCTV cameras are seen as effective tools for preventing and minimizing deviant behaviors, drug crimes, and violent crimes, contributing to a secure environment (Nickerson et al., 2008; Thimbleby, 2013; Rajadurai et al., 2023). Their visibility can act as a deterrent, but the initial deterrent effect may diminish over time (Taylor, 2011). Educators may request their installation to ensure safety, but implementing cameras retrospectively may not improve students' perception of safety and can even increase anxiety and negatively impact the school climate (Rasmussen & Johnson, 2008; Taylor, 2011; Kunwar et al., 2023).

In special education classrooms, CCTV cameras are considered more beneficial for the safety of vulnerable students with disabilities who may be unable to report abuse (Amos et al., 2015). However, their presence should not create a false sense of security, and ongoing staff training should remain a priority (Meishar-Tal et al., 2022). The use of CCTV cameras in schools can help improve student safety, and reduce bullying and violence, but privacy, surveillance, and misuse concerns must be addressed (Rathod et al., 2021; Birnhack & Perry-Hazan, 2020). Responsible and ethical implementation is crucial, considering privacy and safety principles (Fisher et al., 2021).

CCTV cameras are widely used for monitoring activities and addressing social violence, including in schools (Ways & Pearson, 2018; Hope, 2009). In Nepal, they are employed to monitor various areas within schools, such as classrooms, libraries, labs, and playgrounds, to improve teaching, learning, and

Kunwar, R. (2024). Perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics. *World Journal on Educational Technology: Current Issues* 16(3), 215-234. <https://doi.org/10.18844/wjet.v16i3.9335>

other school activities (Meishar-Tal et al., 2022). However, their use should be carefully considered and implemented to ensure responsible and ethical practices (Fisher et al., 2021).

Disciplinary issues in Nepalese secondary and higher secondary schools, such as the misuse of leisure time, threats, harassment, bullying, fighting, teasing, displays of physical strength, and drug abuse, are on the rise and pose challenges for teachers and administrators (Adhikari & Tamrakar, 2017). Urban areas face additional difficulties due to the complexity of daily life and limited parental supervision (Ma et al., 2022). These problems have led to family separations, disrupted child-rearing, and fragmented support within families (Simkhada et al., 2017). Consequently, many students deviate from discipline, engaging in problematic behaviors that hinder their school engagement (Hwang et al., 2021; Slough et al., 2008).

This study is significant as it examines the perspectives of stakeholders on the use of CCTV cameras in mathematics classrooms. By considering school administrators, teachers, and students, it provides a comprehensive understanding of how different groups perceive CCTV camera usage. The study identifies the potential benefits and drawbacks of using CCTV cameras for learning mathematics, shedding light on the impact of technology on teaching and learning. It also contributes to the existing research on CCTV camera usage in schools, informing educators and policymakers about its implications. Understanding these perspectives will help make informed decisions about CCTV camera implementation, ensuring it benefits students and supports their learning.

In Nepal, despite technological advancements, many schools still rely on traditional corporal punishment, leading to child rights violations (Mishra et al., 2010). Some parents even authorize schools to use such disciplinary measures due to their inability to manage their children. To address these issues and improve student discipline, some schools have installed CCTV systems. This study aims to explore the perceptions of multiple stakeholders and provide a comprehensive understanding of the potential benefits and challenges associated with using CCTV cameras in mathematics classrooms.

1.2. Literature review

The use of CCTV cameras in Nepalese schools has gained popularity in recent years, with many educational institutions implementing surveillance systems for security and safety purposes (Meishar-Tal et al., 2022). However, the specific use of CCTV cameras in mathematics classrooms has not been widely explored. Research conducted in India by Chug (2007) found that mathematics teachers were in favor of using CCTV cameras to monitor student behavior and improve discipline, believing that it could reduce instances of cheating and enhance student performance.

Similar studies conducted in Nepal by Ghimire and Rana (2023) found that teachers and parents generally supported the use of CCTV cameras in classrooms, while students expressed concerns about privacy and intrusion. These studies also highlighted the potential benefits of CCTV cameras in improving student behavior and reducing cheating. However, a study conducted by Perry-Hazan & Birnhack (2019) found that the use of CCTV cameras in classrooms negatively affected student motivation and engagement, as students felt more pressure to perform and were less likely to participate in class discussions.

In Nepal, Ghimire and Rana (2023) found that high school students generally had positive perceptions of CCTV camera use in classrooms, believing it could improve discipline and reduce cheating. However, they also had concerns about privacy and intrusion, and some felt that the cameras created a stressful learning environment. A literature review conducted by Soares and Fassini (2021) highlighted the potential for CCTV cameras to improve discipline but found limited evidence of their impact on academic performance. The review also emphasized the need for further research on student motivation and engagement in mathematics classrooms.

Kunwar, R. (2024). Perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics. *World Journal on Educational Technology: Current Issues* 16(3), 215-234. <https://doi.org/10.18844/wjet.v16i3.9335>

Studies conducted in Malaysia by Shamsuddin and Kassim (2019) revealed similar findings, with students expressing concerns about privacy and intrusion while acknowledging the potential benefits of CCTV cameras. However, the studies also found that the use of CCTV cameras had negative effects on student motivation and engagement. A study conducted in Israel by Birnhack and Perry-Hazan (2020) suggested that while CCTV cameras could monitor social behavior in certain contexts, they neglected privacy rights and made students uncomfortable sharing personal moments. The study concluded that CCTV cameras did not significantly enhance academic achievement.

In the context of Nepal, limited studies have been conducted on the use of CCTV cameras in schools. Adhikari and Shrestha (2016) found that the majority of stakeholders supported their use, citing improved discipline and reduced misbehavior as potential benefits. However, concerns about privacy, intrusion, and the cost of maintenance were also raised. Another study in Nepal found that teachers generally had positive perceptions, while students had concerns about privacy and a potentially stressful learning environment (Aryal & Koirala, 2021).

Overall, the literature suggests that the use of CCTV cameras in mathematics classrooms is a complex issue with varying perceptions among stakeholders. While some believe it can improve discipline and reduce misbehavior, others have concerns about privacy and its impact on student motivation and engagement. Further research is needed to better understand the effects of CCTV cameras in mathematics classrooms and develop guidelines for their responsible and effective use. Additionally, CCTV surveillance can have broader applications in resolving disputes, monitoring anti-social behavior, and identifying issues related to mathematics learning that may affect student performance (Chug, 2007).

1.3. Purpose of study

This research aims to investigate the perceptions of school administrators, teachers, and students regarding the utilization of CCTV cameras in mathematics classrooms. Furthermore, the study aimed to evaluate the impact of this technology on teaching and learning outcomes, classroom management, and overall student behavior in private schools. The research questions for this study were:

- i) What are the perceptions of school administrators, teachers, and students regarding the use of CCTV cameras in school?
- ii) How do school administrators, teachers, and students perceive the impact of CCTV cameras on learning mathematics?

2. METHOD AND MATERIALS

2.1. Research Design

This study was based on a qualitative research design using the thematic analysis method. The qualitative research design provides a valuable approach to understanding complex social phenomena and can offer live experiences (Tomaszewski et al., 2020). It aimed to gain a deep understanding of a research subject rather than predicting outcomes, as in the positivist paradigm (Denzin & Lincoln, 2011). Qualitative research seeks to create knowledge by understanding individuals' unique perspectives and the meaning they attach to those perspectives (Creswell & Poth, 2018). By exploring the contexts, qualitative research can provide rich and detailed insights into the experiences and perspectives of individuals and groups (Tomaszewski et al., 2020).

2.2. Data collection tool

In this study, a semi-structured interview was used as the research tool to explore the perceptions and subjective experiences of school administrators, teachers, students, and the overall school context regarding the use of CCTV and its impacts on learning mathematics. The interviewing protocol included open-ended questions about perceptions of camera installation and presence, difficulties

encountered, behavioral changes, monitoring, school management, and the influence of technology on math teaching and learning. An inductive thematic analysis strategy was used to analyze the interviews, involving coding the data and identifying recurring themes. The themes were then categorized into five thematic categories, as presented in the results and discussion section.

2.3. Participants

The study included six school administrators, three from primary schools, and the remaining were from secondary schools in Kathmandu Valley, all of which were equipped with CCTV. The study comprised twelve student participants (three males and five females) aged between 14-17 in grades VIII and X. Similarly, six teacher participants (3 males and three females) from the same schools were chosen. All the participants were chosen purposively based on their gender and level of school. The schools were selected based on criteria such as a wide school compound, being well-equipped with CCTV for at least two years, and having at least 20 students in the sampled grade. The selected schools were observed by the researcher through on-site visits to check for basic criteria. Likewise, mathematics teachers were selected purposively as the teacher participants. The details of the participant selection are presented in Table 1.

Table 1
Participants' Selection with Code

School Category	Head Teacher		Teacher		Student		Total
	Male	Female	Male	Female	Male	Female	
Basic School B ₁	-	HT ₁	T ₁	T ₂	S ₁	S ₂	5
Basic School B ₂	HT ₂	-	T ₃	-	S ₃	S ₄	4
Basic School B ₃	HT ₃	-	-	T ₄	-	-	2
Secondary School S ₁	-	HT ₄	T ₅	-	S ₅	S ₆	4
Secondary School S ₂	HT ₅	-	T ₆	-	-	S ₇	3
Secondary School S ₃	-	HT ₆	-	-	-	S ₈	2
Total	3	3	4	2	3	5	20

2.4. Data collection procedures

The study utilized 20 individual interviews to gather data. Participants were recruited through personal contacts or schools, and consent forms were signed by all participants. Parental consent was also obtained for students under 18. The interviews were conducted in April 2023, in the participants' homes and schools. Individual interviews provide a more comfortable and secure environment for participants to share sensitive information (Cohen et al., 2011). This allows participants to express their thoughts, feelings, and experiences more freely and in greater detail. Individual interviews involve only one participant and the interviewer, reducing susceptibility to peer pressure and group dynamics (Cohen et al., 2011). Thus, individual interviews were conducted to explore in-depth perceptions about the use of CCTV in schools. The interview protocol included general factual questions regarding CCTVs and open questions to elicit opinions regarding the CCTVs' installation and usage. Separate interview guidelines were used for school administrators, teachers, and students, and these were verified by a senior researcher from Tribhuvan University.

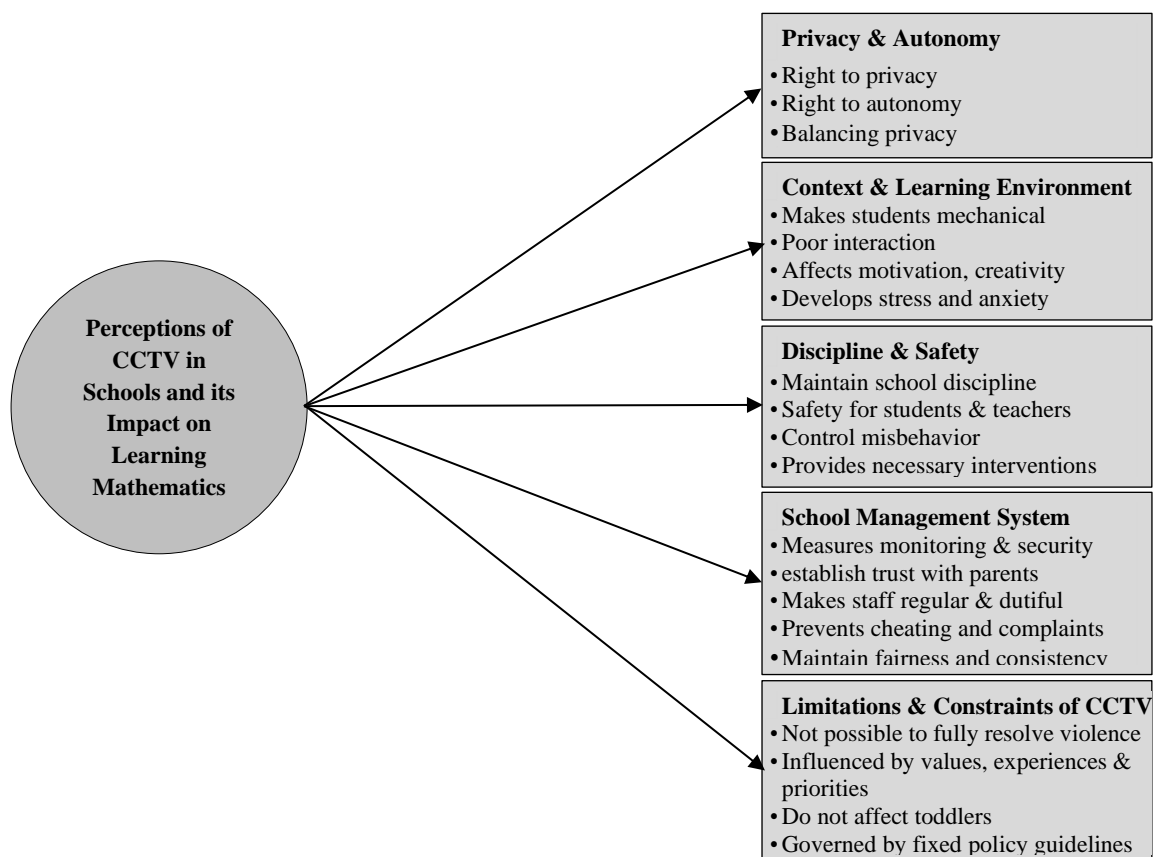
The interviews were conducted face-to-face and lasted between 15 and 25 minutes. The researchers recorded and transcribed all interviews. An inductive thematic analysis strategy (Braun et al., 2019) was employed to analyze the data obtained from the interviews. Recurring themes were organized into five thematic categories, as presented in the Results section.

2.5. Data analysis

The thematic analysis method was used to analyze and interpret the various perceptions explored by school administrators, teachers, and students through semi-structured interviews about the use of CCTV in schools. It entails a methodical examination of the contents, the discovery of trends, themes, and other pertinent characteristics, and the formulation of conclusions from the findings (Braun et al., 2019). A thorough examination of the data is possible through the rigorous, inductive, and intuitive method of thematic analysis (Humble & Mozelius, 2022). The process involves comparing the content to identify similarities, differences, and patterns, which are used to identify key themes or concepts obtained from school administrators, teachers, and students (Humble & Mozelius, 2022). This method emphasizes the importance of transparency, rigor, and reflexivity in addressing the research problem (Braun et al., 2019).

The data obtained were analyzed using the thematic analysis method (Braun et al., 2019). It should be noted that we did not have any pre-existing stance or involvement in policies related to the use of CCTVs in schools. Therefore, our research was not influenced by any biases for or against the use of CCTVs. The design and conduct of our interview questions were based solely on existing literature. However, during the interviews, we did raise and discuss public concerns regarding the increasing number of violent incidents that occur in schools. The themes presented in this study were formulated by extracting input from the participants and informed by relevant literature (Campbell et al., 2013). The thematic framework for analyzing the perception of administrators, teachers, and students regarding the use of CCTV in schools and its effect on learning mathematics is presented in Figure 1. The results based on the themes are presented in the following section, along with discussions.

Figure 1
Thematic Framework for Analyzing the Use of CCTV in Schools



3. RESULTS

This study explores the perceptions of school administrators, teachers, and students regarding the use of CCTV cameras in schools and their impact on mathematics learning. It comprises five themes that emerged from the data, which include the perceptions of the participants from three different perspectives- students, teachers, and administrators. To identify discernible patterns and potential interconnections between the perceptions of different groups, the results are presented separately according to the perspectives of students, teachers, and administrators. Particular attention has been paid to outlining the perceptions drawn from each group based on five thematic areas.

3.1. Individual privacy, autonomy, and trust

Violation of Students' Privacy: Regarding privacy, autonomy, and trust in the installation of CCTV cameras in schools, five out of eight student participants expressed the same view: every individual has personal matters, issues, and information that are highly private and cannot be disclosed to others due to factors such as their interests, age, gender, culture, and experiences. Each person has the right to keep this information confidential. However, the use of CCTV exposes private actions and information, which can become public and pose a significant risk to students. For example:

I stay here for about seven hours. I cannot stay without sharing privacy matters like age, gender, and other individual problems with the friend but we feel it is difficult due to the recording system (S₂ & S₆)

I am opposed to the use of CCTV cameras in classrooms. It's an invasion of our privacy and it makes me feel uncomfortable knowing that someone might be watching me and recording my activities...(S₃)

The use of CCTV is essential in playgrounds and streets but having them on every corner inside the school compound feels like I am living in a surveillance state and have no right to do personal matters inside school premises and we should be like a machine. (S₅ & S₇)

Violation of Autonomy and Trust: The use of CCTV cameras in schools can have a significant impact on students' autonomy and trust. Autonomy refers to the ability of students to make their own choices and decisions, free from external influence or coercion. Students' sovereignty may depend on their background, experiences, and the culture and values of their community. They view individual freedom and independence as essential for developing self-decision-making abilities and self-control in different activities, including learning and other actions and behaviors. Autonomy makes students feel more comfortable and helps to develop good faith, mutual trust, and integrity among friends, teachers, and administrators. In this context, some students expressed their views as:

The use of CCTV cameras can undermine this sense of autonomy and trust, as it creates an environment of constant surveillance and monitoring. This can lead to students feeling like they are being watched and judged, which can be detrimental to their sense of autonomy and independence. (S₁, S₄ & S₇)

The use of cameras infringes on our privacy, autonomy, and trust, and feel uncomfortable with the idea of being constantly watched and monitored. (S₂ & S₈)

They don't trust us and they are constantly monitored for our safety. However, it may be important; we are losing freedom, good faith, and integrity among teachers and peers due to low motivation and interaction. (S₃)

The use of cameras provides an increased sense of security and safety, which can enhance their autonomy and feel more comfortable and secure in their surroundings. (S₁)

The views of teachers and administrators regarding the use of CCTV cameras in school regarding autonomy and trust may depend on a variety of factors, including their personal experiences, professional values, and the specific context of their school. However, in this study, they expressed similar views. For instance:

CCTV cameras are necessary for ensuring student safety and security, and they help to deter potential threats and incidents and also provide valuable evidence. However, it can violate privacy, autonomy, and trust. (HT₁, T₁ & HT₄)

The use of cameras in school may affect privacy, autonomy, and trust but it can help to hold individuals accountable and ensure that appropriate action is taken. (HT₂, T₃ & T₄)

Overall, individual privacy, autonomy, and trust are complex and multifaceted issues that are shaped by a variety of factors. It is important for schools and educators to be aware of these issues and to work to create an environment that promotes respect for individual privacy, autonomy, and trust. However, most of the student participants viewed the use of CCTV cameras in schools as an invasion of their privacy, autonomy, and trust.

3.2. School context and learning environment

In the theme, school context, and learning environment regarding using CCTV, the students expressed various views such as it makes the students mechanical, hampers them to be proactive, punishment, makes idle, poor interaction, makes more formal and inconvenient, affects motivation and creativity, and develops stress and anxiety. Some students agree with a safe and secure learning environment and it can help to deter potential incidents and provide evidence in case of any incidents. However, most of them focus that constant monitoring makes students uncomfortable and affects motivation and creativity.

In the theme, school context, and learning environment regarding the use of CCTV cameras, students expressed various views. Some students believe that CCTV cameras create a safe and secure learning environment, as they can help deter potential incidents and provide evidence in case of any incidents. However, many students expressed concerns that constant monitoring can make students feel uncomfortable and affect motivation and creativity. They feel that the cameras make them feel mechanical and hamper their ability to be proactive. Additionally, some students feel that the use of CCTV cameras as a form of punishment can make them feel idle and create poor interactions with teachers and peers. Others feel that the cameras can make the learning environment more formal and inconvenient, and can even lead to the development of stress and anxiety. Overall, while some students support the use of CCTV cameras for safety and security purposes, most of them express concerns about the impact on their autonomy, motivation, and creativity. For instances,

CCTV cameras can create a sense of safety and security, which can help students feel more comfortable and focused in the classroom. (S₂)

I believe that rather than relying on cameras, schools should focus on building a culture of trust and mutual respect between students and teachers. Everyone should feel safe in school without sacrificing the fundamental rights to privacy and autonomy. (S₁, S₆)

The use of CCTV cameras can make students feel idle and mechanical, affecting their ability to be proactive in the classroom and potentially leading to a loss of creativity. (S₃ & S₈)

The constant monitoring system makes me feel uncomfortable and demotivated, leading to feelings of stress and anxiety. (S₄)

The use of CCTV cameras has been creating an artificial school environment. It opposes student freedom and the natural school environment. (S₈)

Teachers' perspectives on this subject vary. According to some teachers, CCTV cameras can help create a safe and secure learning environment, which can therefore have a good effect on the learning and engagement of students. On the other side, some educators feel that constant observation and scrutiny can foster a climate of distrust and suspicion, which can be harmful to student motivation and engagement and prevent both students and educators from taking proactive measures. The

Kunwar, R. (2024). Perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics. *World Journal on Educational Technology: Current Issues* 16(3), 215-234. <https://doi.org/10.18844/wjet.v16i3.9335>

cameras can also distract teachers and hinder their ability to build strong relationships with their students. For instance,

CCTV cameras can help to create a positive learning environment, which can be beneficial for student engagement and motivation. They can also help to deter negative behavior and promote positive behavior, which can create a more supportive learning environment. (T₂ & T₇)

The use of CCTV cameras may create a negative and tense atmosphere for both students and teachers, which can lead to stress and anxiety among students and teachers. (T₁ & T₄)

CCTV cameras can make students as well as teachers feel uncomfortable, passive, and more formal. This can have a detrimental effect on their motivation and creativity. (T₃)

Regarding the theme of school context and learning environment, school administrators focus on the positive aspects of using CCTV cameras, such as creating a safe and secure learning environment that can be beneficial for student learning and engagement. They also believe that CCTV cameras help students and teachers follow rules, be more regular, and be accountable for their actions. Moreover, a safe and secure school environment can have a positive impact on academic performance as well as the overall well-being of the institution. Some highlights from head teachers include:

It ensures that both teachers and students are regular, accountable, and engaged in their teaching and learning which enhances academic performance. (HT₂)

Parents feel more comfortable sending their children to a school with CCTV cameras, which can help to increase enrollment and support for the school. (HT₃)

In this theme, the head teacher claimed that CCTV cameras are an effective tool for deterring negative behavior and promoting positive behavior in students, which can create a more supportive learning environment and improve the overall academic performance of the students. However, some students and teachers have argued that CCTV cameras make them feel uncomfortable, develop stress, reduce creativity, and idle, which can negatively impact their engagement and motivation.

3.3. Discipline and safety measures

The use of CCTV cameras in schools requires careful consideration of both the benefits and drawbacks. Generally, most participants in this theme viewed CCTV cameras as necessary for ensuring safety, promoting discipline, and preventing misbehavior and cheating. They also acknowledged that the cameras can help control unnecessary complaints and provide evidence for disciplinary action. However, some participants expressed concerns about excessive control and discipline, which they felt could make students and teachers passive and reduce their creativity. They emphasized the importance of balance and suggested that schools should implement policies to ensure that CCTV cameras are used responsibly and transparently. As one participant stated,

While it's important to ensure safety and security in our schools, we also need to be mindful of the potential negative impact of constant monitoring on the learning environment. If it is used in balance can promote safety without sacrificing creativity and autonomy. (S₈)

The use of CCTV cameras in schools can help deter and prevent criminal activities such as theft, bullying, and violence. (HT₁ & T₄)

CCTV cameras in schools can help promote discipline and reduce instances of misbehavior. (S₃ & S₇)

CCTV cameras can help promote discipline and reduce instances of misbehavior. It can help to provide necessary interventions about schools' rules and regulations and create a safe and secure learning environment. (HT₄ & T₃)

The use of CCTV in schools for discipline and safety measures is essential however, schools must ensure that the use of CCTV cameras is consistent with ethical principles and does not violate the rights of students, and staff. (T₂)

Thus, regarding the use of CCTV cameras in schools for discipline and safety measures, most of the participants expressed that CCTV cameras are necessary for ensuring safety, promoting discipline, and preventing criminal activities. However, participants also emphasized the importance of balance and suggested that schools should implement policies to ensure that CCTV cameras are used responsibly and transparently. As such, it is important to consider both the benefits and drawbacks of using CCTV cameras in schools and implement measures to ensure that they are used ethically.

3.4. School management system

The use of CCTV cameras in schools is an important component of a school management system. Within this theme, the focus is on the views of teachers and administrators regarding the use of CCTV cameras in the school management system. Some common views among teachers and administrators include the importance of overall school monitoring, fairness and consistency in the enforcement of school rules, and the importance of staff duty and regularity. Headteachers also emphasized the importance of establishing trust with parents and preventing cheating and complaints in school through the use of CCTV cameras.

The use of CCTV cameras in schools can help improve accountability and transparency in school management. The cameras can help monitor the student activity, and performance of teachers, identify areas for improvement, and ensure that school policies and procedures are being followed. (HT₂ & HT₅)

It helps establish trust with parents by providing them with a window into their child's learning environment. The cameras can also help prevent cheating and complaints by providing evidence of student behavior. (HT₄ & HT₆)

It can be helpful to school management and also maintain fairness and consistency in school. (T₂ & T₄)

Thus, the use of CCTV cameras in schools can enhance accountability and transparency in school management by monitoring student behavior, and teacher effectiveness, identifying areas for improvement, and ensuring compliance with school policies and procedures. CCTV cameras in schools can also contribute to maintaining a safe and secure learning environment by preventing and detecting incidents of misbehavior, bullying, and other forms of criminal activity. However, it is important to ensure that the use of CCTV cameras is balanced and does not compromise the privacy and autonomy of students and teachers. Proper policies and guidelines should be established to ensure responsible and ethical use of CCTV cameras in schools.

3.5. Limitations and constraints

Regarding the limitations and constraints of using CCTV cameras in schools, the participants also discussed its drawbacks. While CCTV cameras can be useful in increasing accountability and transparency as an effective school management system, they are also limited by their reliance on human monitoring and cannot replace the need for human supervision. Additionally, CCTV cameras may not be able to fully resolve incidents of violence or prevent them from occurring. Some instances given by students, teachers, and administrators include concerns about the privacy and ethical implications of constant monitoring, the potential for abuse or misuse of the footage, and the need to balance safety with autonomy and creativity in the learning environment. It is therefore important to carefully evaluate the benefits and drawbacks of using CCTV cameras in schools and establish clear policies and guidelines for their responsible and ethical use. The participants expressed their views as:

Kunwar, R. (2024). Perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics. *World Journal on Educational Technology: Current Issues* 16(3), 215-234. <https://doi.org/10.18844/wjet.v16i3.9335>

It is a manmade object. So, it cannot fully resolve the violence that may happen in the school environment. It cannot be the alternative of humans that have love, wisdom, and empathy (T₁ & T₆)

Human supervision is much better than CCTV in the school context because it is influenced by the personal values, experiences, and priorities of school administrators (S₂ & T₃)

The persons or children who are not yet fully self-aware and do not have a strong sense of personal privacy, CCTV cameras do not affect them. (S₁)

The use of CCTV cameras in schools has been governed by fixed policies and guidelines that are very serious about ethical concerns. It is highly ensured about privacy and ethical issues. (HT₂ & HT₅)

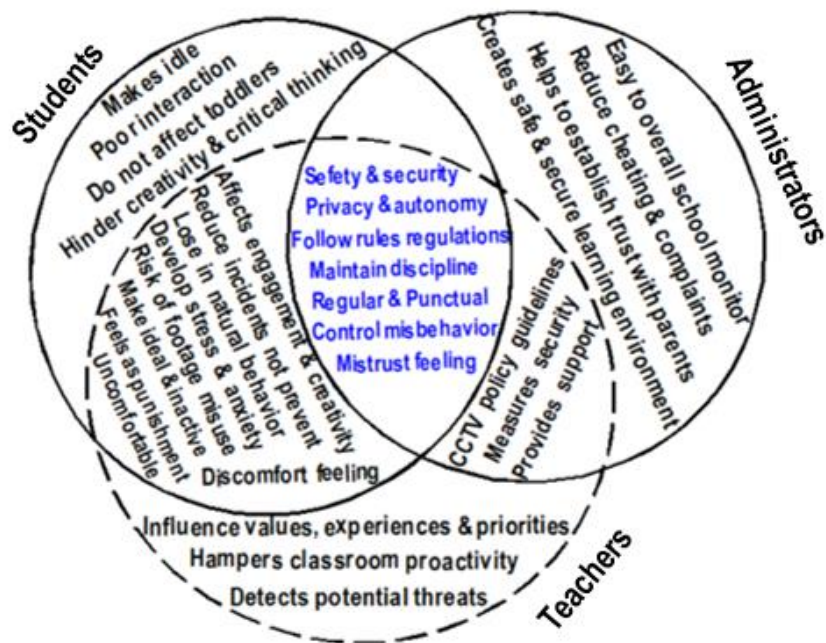
The use of CCTV cameras in schools is a complex issue with a range of benefits and drawbacks that must be taken into account. While cameras can be an effective tool for improving school management and safety, schools must also be mindful of the potential negative impacts and work to mitigate these risks through careful planning, implementation, and ongoing monitoring and evaluation. It is important to strike a balance between the need for safety and security and the privacy and autonomy of students and teachers. Schools should establish clear policies and guidelines for the responsible and ethical use of CCTV cameras, and regularly review and update these policies as needed. In this way, CCTV cameras can be a valuable tool for enhancing school management and safety while also respecting the rights and dignity of all members of the school community.

4. DISCUSSION

Recent years have seen a growing trend in the use of CCTV cameras in schools to improve discipline, safety, and overall school management. However, this has also led to concerns about privacy, autonomy, and trust, particularly from the perspectives of students, teachers, and administrators. This study explores the perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics in a school context. The current research aims to broaden the discussion about the perceived impact of CCTV cameras in schools by examining the perspectives of students, teachers, and administrators. Specifically, it investigates the intersection of their perceptions regarding the use of CCTV cameras and their impact on learning mathematics. In this section, the discussion is presented by outlining the overall perceptions explored by the three groups of participants: students, teachers, and administrators, as shown in Figure 2.

Figure 2

Venn diagram: Perceptions of CCTV Cameras in Schools among Administrators, Teachers, and Students.



The study focuses on five themes: privacy, autonomy, and trust, a school atmosphere and learning environment, discipline, and safety, as well as the school administration system and the constraints placed on CCTV cameras. The participants frequently bring up issues related to trust, privacy, and autonomy. Concerns about the possible invasion of privacy, autonomy, and trust that CCTV cameras may cause are shared by educators, administrators, and students. Both students and teachers are worried about their privacy, autonomy, and security due to the capture and recording of private affairs, actions, and information. They are concerned that the use of CCTV cameras may foster a sense of distrust and surveillance, undermining the trust and goodwill necessary for effective teaching and learning. A study by Jansen et al., (2018) found that teachers thought CCTV cameras would harm school culture and make pupils feel unwelcome. In addition to preserving security, it's crucial to respect people's privacy and autonomy (Birnhack & Perry-Hazan, 2020). By doing so, the school community may create and preserve mutual trust.

Based on the findings of this study, installing cameras in schools is prominent for preventing misbehavior, monitoring security measures, promoting discipline and accountability, preventing cheating and complaints, and maintaining fairness and consistency of school rules and regulations. However, the use of CCTV cameras in schools has raised concerns about individual privacy, autonomy, and trust. When individuals feel that their privacy and autonomy are being violated, they may become less willing to trust the school administration and may be more likely to act in ways that are counterproductive to the school's goals (Lombardi et al., 2019). It is important to consider the privacy and autonomy of students and teachers when utilizing CCTV cameras (Birnhack & Perry-Hazan, 2020). There is also a risk that footage may be misused, leaked, or used to intimidate or harass students or teachers (Birnhack et al., 2018). A study by Meishar-Tal et al., (2022) found that the use of CCTV cameras can create a sense of surveillance and distrust, which can undermine the positive relationships and trust that are essential for effective teaching and learning.

The use of CCTV cameras in schools can affect individual privacy and autonomy, as students and teachers may feel that their every move is being monitored and recorded. This can lead to feelings of discomfort and a sense of loss of privacy and autonomy (Ghimire & Rana, 2022). It also makes students and teachers feel uncomfortable, as they may feel that they are being constantly watched and judged (Birnhack & Perry-Hazan, 2020). This can create a negative atmosphere in the school and impact the learning environment (Squelch & Guthrie, 2012). Similarly, Lombardi et al., (2019) found that the use of CCTV cameras may create a sense of distrust and surveillance among students and teachers, which

Kunwar, R. (2024). Perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics. *World Journal on Educational Technology: Current Issues* 16(3), 215-234. <https://doi.org/10.18844/wjet.v16i3.9335>

can undermine the positive relationships and trust that are essential for effective teaching and learning.

Considering these issues and concerns regarding privacy, autonomy, and trust, schools must carefully consider these issues when deciding whether or not to use CCTV cameras and how to use them ethically and effectively. It is important to establish clear policies and guidelines for the responsible use of CCTV cameras in schools and ensure that these policies are communicated clearly to students, teachers, and administrators. Schools must also regularly review and update these policies as needed to ensure that they remain relevant and effective. This will help to promote a safe and secure learning environment while also respecting the privacy and autonomy of students and teachers.

School context and learning environment are also important factors that influence the perceptions of participants. Participants expressed concerns about the impact of CCTV cameras on the learning environment, such as making students feel mechanical, inactive, idle, anxious, and stressed. They further viewed that the use of CCTV also affects students' motivation, active participation, and creative thinking. The use of CCTV cameras can make students feel like they are being monitored and controlled, which can lead to a sense of being mechanical or robotic. This can hinder their ability to think creatively and independently and may lead to a reduction in student engagement (Squelch & Guthrie, 2012). A study by Ghimire and Rana (2022) found that the presence of CCTV cameras may increase student compliance with rules and regulations, but may also create a sense of anxiety and discomfort that hampers learning (Kunwar et al., 2023). Similarly, constant monitoring makes students uncomfortable, particularly about learning mathematics. They worry that the use of CCTV cameras may create a sense of distraction and discomfort that can undermine the effectiveness of teaching and learning (Meishar-Tal et al., 2022). It also hinders classroom proactivity, as students may feel less comfortable participating in discussions or taking risks in their learning. This can lead to a more passive learning environment that may not engage students as effectively (Kunwar et al., 2023; Meishar-Tal et al., 2022). It can be viewed as a form of punishment rather than a tool for promoting positive behavior. This can create a negative school culture that is focused more on punishment than on positive reinforcement and encouragement (Lombardi et al., 2019). However, according to Meishar-Tal et al. (2022), a majority of students expressed favorable attitudes toward the implementation of CCTV cameras in care centers and classrooms believing that the cameras could enhance classroom management and deter cheating.

Students as well as teachers claimed that constant CCTV surveillance makes students mechanical, idle, less interactive, demotivated, and reduces creativity, which is important to learn mathematics. Increased motivation among students to learn mathematics can lead to greater engagement during the learning process, ultimately resulting in improved outcomes and skill development (Kunwar et al., 2023). This can lead to a less dynamic and less interactive learning environment that may not foster the development of social and interpersonal skills (Mofatteh, 2020). Thus, it can be concluded that the presence of CCTV cameras in the mathematics classroom did not have a significant positive impact on the academic performance of students, which is consistent with the conclusion reached by Birnhack and Perry-Hazan (2020). Similarly, teachers have reported that students do not feel comfortable classroom learning environment that is perceived as formal and inconvenient. This can create a more rigid and less flexible learning environment (Birnhack et al., 2018). Squelch and Guthrie (2012) observed that teachers may become distracted when teaching in a classroom with CCTV cameras.

CCTV cameras can also harm student motivation and creativity, as students may feel that their every move is being monitored and evaluated. This can lead to a sense of pressure and anxiety that may hinder their ability to think creatively and take risks in their learning (Kunwar et al., 2023; Jansen et al., 2018). Similarly, constant monitoring by CCTV cameras can negatively impact students' mental health and well-being (Lombardi et al., 2019). Taylor (2014) argues that the use of CCTV cameras may

Kunwar, R. (2024). Perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics. *World Journal on Educational Technology: Current Issues* 16(3), 215-234. <https://doi.org/10.18844/wjet.v16i3.9335>

create a sense of mistrust among all members of the school community, as teaching methods are individualized and should be respected as a personal right. The use of CCTV cameras in schools can impact the overall school context and learning environment in numerous ways. While they may enhance safety and security, they can also hinder student engagement, creativity, and motivation, and hinder stress and anxiety. Thus, schools must consider these issues carefully when deciding whether or not to use CCTV cameras and how to use them properly.

Discipline and safety are also important themes that emerged from the study. In this study, participants expressed positive views about the potential of CCTV cameras to improve discipline, control violence, and misbehavior, provide necessary intervention, and create a safe and secure learning environment in schools. They believe that the use of CCTV cameras can be an effective tool for developing discipline and safety for students and teachers. This statement is aligned with Lombardi et al., (2019) that CCTV cameras can help to detect and prevent incidents of violence, bullying, and other forms of misbehavior. This can help to create a safer and more secure learning environment for all students (Birnhack et al., 2018). Meishar Tal et al. (2022) found that teachers believed the use of CCTV cameras could deter incidents and improve school safety. It can also help to maintain school discipline by providing teachers and administrators with a tool to monitor student behavior and intervene when necessary. This can help to prevent disruptions and ensure that students can focus on their learning (Chug, 2007; Soares & Fassini, 2021; Squelch & Guthrie, 2012). It can be used as a means to provide necessary intervention in situations where students may be at risk and can be used to quickly identify the problem and provide assistance (Mofatteh, 2020). Likewise, it helps to create a safe and secure learning environment. When students feel safe and secure in their school environment, they are more likely to be engaged in their learning and achieve their better academic goals (Ghimire & Rana, 2022; Jansen et al., 2018).

It can contribute to maintaining discipline and a safe learning environment by controlling incidents of violent and disruptive behavior, maintaining school discipline, providing necessary intervention, and creating a safe and secure learning environment. In conclusion, the use of CCTV cameras in schools is a complex issue that requires careful consideration. While they can enhance safety and security and improve discipline, they can also have negative impacts on student engagement, creativity, and motivation, and contribute to stress and anxiety. Therefore, schools must weigh the pros and cons of using CCTV cameras and ensure that they are used ethically and effectively to maintain discipline and safety without compromising the learning environment. Additionally, it is important to involve all stakeholders, including students, in the decision-making process to ensure that their voices are heard and their concerns are addressed.

Overall, the use of CCTV cameras can make it easier to monitor and manage the school environment, establish trust with parents, ensure that teachers and staff are fulfilling their responsibilities, prevent cheating and complaints, and maintain fairness and consistency in school rules and policies (Lombardi et al., 2019). However, it is important to consider the potential downsides, such as invasion of privacy and the potential for abuse. Schools must ensure that their use of CCTV cameras is consistent with ethical principles and complies with applicable laws and regulations. Additionally, schools should educate students, teachers, and parents about the purposes and limitations of CCTV cameras to help establish a culture of trust and openness.

While the use of CCTV cameras in schools may offer numerous benefits, some limitations, and constraints must be considered. CCTV cameras may help to deter violence and monitor incidents, but they cannot fully resolve violence in schools. This argument was expressed by student participants. In reality, CCTV cameras may not be able to prevent incidents that occur outside the view of the cameras, or they may not be able to identify the perpetrators of violent acts (Squelch & Guthrie, 2012). Furthermore, the effectiveness of CCTV cameras may be influenced by personal values, experiences, and priorities, which can vary widely across different individuals and groups. For instance, some individuals may be more concerned about privacy and the potential for abuse, while others may

Kunwar, R. (2024). Perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics. *World Journal on Educational Technology: Current Issues* 16(3), 215-234. <https://doi.org/10.18844/wjet.v16i3.9335>

prioritize safety and security (Lombardi et al., 2019). Moreover, CCTV cameras may not be effective in monitoring the behavior of younger children, particularly toddlers who may not be aware of the cameras or may not understand their purpose. This can limit the effectiveness of CCTV cameras in preventing incidents and maintaining discipline among younger students (Mofatteh, 2020). The use of CCTV cameras in schools must be governed by fixed policies and guidelines to ensure that they are used ethically and effectively. These policies and guidelines can limit the flexibility of schools in responding to specific incidents or situations, and may also be subject to legal and regulatory constraints (Birnhack et al., 2018).

Mathematics education should aim to promote, rather than hinder, freedom and exploration. According to Cantor (1996), "The essence of mathematics lies precisely in its freedom." While our education may not always actively encourage deep understanding, as learners, we should strive for it nonetheless. Exploration seeks what already exists, while imagination constructs new ideas, or at least ideas that are new to us. In mathematics, freedom is associated with several virtues. The freedom of knowledge fosters resourcefulness. When we have the freedom to explore, it builds fearlessness in asking questions and nurtures independent thinking. The freedom of understanding builds confidence in our knowledge, as understanding creates a solid foundation of facts interconnected by meaning and insight. Authoritarian forms of education have historically hindered the liberation and freedom of the oppressed (Freire, 1973). On the other hand, the freedom to imagine nurtures inventiveness and joyfulness, as it provides space to explore and take delight in the boundless possibilities our minds can conjure.

Teaching and learning are transformative processes that transcend boundaries (Nogueiras et al., 2019). They have the potential to transgress and challenge traditional norms (Hooks, 1994). By embracing freedom in education, teaching becomes a performative act that allows for change, innovation, and spontaneous shifts. This approach creates an environment that draws out the unique elements within each classroom. Transformed and transformative classrooms exemplify Hooks' vision of pedagogy as liberatory for all participants in education, including teachers, students, and institutions (Hooks, 1994).

Curiosity and an autonomy-supportive learning environment enhance intrinsic motivation. These attributes promote confidence, self-identity, and individual growth (Malmquist, 2022). According to Hagger et al., (2015), autonomy in the mathematics classroom creates motivation toward mathematical activities and, thus, has an impact on mathematics performance. Therefore, freedom or individual autonomy can be considered an essential component of learning and practicing mathematics.

In conclusion, the use of CCTV cameras in schools has limitations and constraints that must be considered. While CCTV cameras may help to monitor behavior, enhance safety and security, and prevent incidents, they cannot fully resolve violence, are influenced by personal values and priorities, may not be effective in monitoring younger children, and must be governed by fixed policies and guidelines. CCTV cameras have some drawbacks in a learning environment. CCTV cameras are merely mechanical devices that lack human traits like sensitivity, empathy, and wisdom, so they cannot completely replace a teacher's presence. Students might not feel safe displaying natural behaviors and expressions in the classroom due to constant CCTV surveillance. This might eventually lead students to see learning as more mechanical and devoid of social and emotional aspects of people. If constant CCTV monitoring takes the place of regular, direct instruction and feedback from teachers, it runs the risk of impeding pupils' natural development. CCTV can be used for security, but genuine human connections that support pupils' holistic development are the best ways to promote learning. Thus, schools must consider these limitations and constraints when deciding whether or not to use CCTV cameras and how to use them ethically.

5. CONCLUSION

Kunwar, R. (2024). Perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics. *World Journal on Educational Technology: Current Issues* 16(3), 215-234. <https://doi.org/10.18844/wjet.v16i3.9335>

The use of CCTV cameras in schools to enhance mathematics learning has been found to have both positive and negative impacts on students, teachers, and administrators. While CCTV cameras can help to maintain safety and security, monitor disciplinary violations, and promote fairness and consistency in school rules, they can also lead to feelings of discomfort, inactivity, stress, and anxiety among students and teachers. The intersection of the perceptions of stakeholders regarding the use of CCTV cameras and their impact on learning mathematics in schools include concerns about privacy and autonomy, feelings of mistrust, safety, and security, maintaining discipline, controlling misbehavior, following rules and regulations, and ensuring punctuality and regularity. However, the fact that some perceptions are not shared among stakeholders suggests that there may be divergent opinions and attitudes toward the use of CCTV cameras in schools. This can hurt the overall school activity of teachers and students, as they may have different expectations and experiences with the technology.

The use of CCTV cameras is an effective tool to enhance security surveillance and the overall school management system however, the human traits of a teacher, such as empathy, caring, wisdom, and interactive guiding, cannot be replaced by CCTV cameras. Its continual use in schools may eventually stop pupils from expressing themselves naturally. If this takes the place of regular interaction with teachers, it can potentially have detrimental long-term impacts on learners and impede the learning process. The best way to promote true learning is through compassionate relationships with others that support kids' overall growth. While CCTV has its uses, the classroom atmosphere might be better served by other strategies that encourage children's normal growth and conduct rather than ongoing electronic surveillance that might stunt their development.

On the other hand, schools need to consider ethical principles and meet the needs and expectations of all stakeholders. Clear policy guidelines and the involvement of all stakeholders, including students, teachers, and administrators, are crucial to ensuring the responsible use of CCTV cameras in schools. It is also important to consider the potential negative impacts on motivation, engagement, creativity, and critical thinking skills, and balance them against the benefits of CCTV cameras. The use of CCTV in schools holds a significant position as it can assist in enhancing security, promoting discipline, managing classrooms, and overall school management. However, it cannot replace human resources and must consider the impact on privacy, ethics, and the psychological well-being of students and teachers.

Thus, the research outcomes can provide valuable insights to inform school administrators, teachers, policymakers, and education stakeholders about perceptions, experiences, and potential implications of implementing CCTV cameras in schools. These insights especially in the form of intersection will serve as a foundation for future discussions, policy development, and decision-making aimed at creating a safe and effective learning environment. The results of the study also highlight the need for further research to explore diverse perspectives and ensure more comprehensive and contextually relevant findings.

Conflict of Interest: The authors declare no conflict of interest.

Ethical Approval: The study adheres to the ethical guidelines for conducting research.

Funding: This research received no external funding.

REFERENCES

Adhikari, B., & Shrestha, P. (2016). A study on the use of CCTV in schools in Nepal. *International Journal of Research in Engineering and Technology*, 5(6), 178-181.

- Kunwar, R. (2024). Perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics. *World Journal on Educational Technology: Current Issues* 16(3), 215-234. <https://doi.org/10.18844/wjet.v16i3.9335>
- Adhikari, K., & Tamrakar, S. (2017). Disciplinary problems in secondary and higher secondary schools: A case study of Kathmandu, Nepal. *World Journal of Education*, 7(5), 1-8. <https://doi.org/10.5430/wje.v7n5p1>
- Amos, P., White, J., & Trader, B. (2015). Will cameras in classrooms make schools safer? *TASH position statement on camera surveillance in self-contained classrooms*. <http://www.eoutcome.org/Uploads/PATashUploads/PdfUpload/TASH%20Position%20Statement%20-%20Camera%20Surveillance%20in%20Classrooms,%20Final,%201-20-15.pdf>
- Aryal, B., & Koirala, A. (2021). A study on the use of CCTV in mathematics classrooms in Nepal. *Journal of Mathematics Education*, 14(1), 1-11
- Birnhack, M., & Perry-Hazan, L. (2020). School surveillance in context: High school students' perspectives on CCTV, privacy, and security. *Youth & Society*, 52(7), 1312-1330. <https://journals.sagepub.com/doi/abs/10.1177/0044118X20916617>
- Birnhack, M., Elkin-Koren, N., & Yosef, R. (2018). Surveillance in the classroom: What does the law say? *Journal of Law and Education*, 47(2), 231-245.
- Birnhack, M., Perry-Hazan, L., & German Ben-Hayun, S. (2018). CCTV surveillance in primary schools: normalisation, resistance, and children's privacy consciousness. *Oxford Review of Education*, 44(2), 204-220. <https://www.tandfonline.com/doi/abs/10.1080/03054985.2017.1386546>
- Braun, V., Clarke, V., & Hayfield, N. (2019). A starting point for your journey, not a map': Nikki Hayfield in conversation with Virginia Braun and Victoria Clarke about thematic analysis. *Qualitative Research in Psychology*, 9(1), 1-22. <https://www.tandfonline.com/doi/full/10.1080/14780887.2019.1670765>
- Bryan, R. Warnick, B. R. (2007). Surveillance cameras in schools: An ethical analysis. *Harvard Educational Review* 77(3), 317-343. <https://meridian.allenpress.com/her/article-abstract/77/3/317/31933/Surveillance-Cameras-in-Schools-An-Ethical?redirectedFrom=fulltext>
- Campbell, J. L., Quincy, C., Osserman, J., & Pedersen, O. K. (2013). Coding in-depth semistructured interviews: Problems of unitization and intercoder reliability and agreement. *Sociological methods & research*, 42(3), 294-320. <https://journals.sagepub.com/doi/abs/10.1177/0049124113500475>
- Cantor, G. (1996). Foundations of a general theory of manifolds: *A mathematico-philosophical investigation into the theory of the infinite*. In Ewald, (ed.) Vol. 2. New York: Oxford University Press.
- Chug, T. K. (2007). Teacher's perception of the use of CCTV in classrooms. *The Journal of Indian Education*, 33(1), 46-54.
- Cohen, L., Manion, L., & Morrison, K. (2011). *Research Methods in Education* (7th ed.). Routledge. <https://doi.org/10.4324/9780203720967>
- Creswell, J., & Poth, C. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed). Sage.
- Denzin, N., & Lincoln, Y. (2011). Introduction: The discipline and practice of qualitative research. In N. Denzin & Y. Lincoln (Eds.), *The Sage Handbook of Qualitative Research* (4th ed.). Sage
- Dharan, A. M., & Mukhopadhyay, D. (2023). A comprehensive survey on machine learning techniques to mobilize multi-camera network for smart surveillance. *Innovations in Systems and Software Engineering*, 1-20. <https://link.springer.com/article/10.1007/s11334-023-00533-2>
- Fisher, B. W., Higgins, E. M., & Homer, E. M. (2021). School crime and punishment and the implementation of security cameras: Findings from a national longitudinal study. *Justice Quarterly*, 38(1), 22-46. <https://www.tandfonline.com/doi/abs/10.1080/07418825.2018.1518476>
- Freire, P. (1973). *The pedagogy of the oppressed*. New York. The Seabury Press.

- Kunwar, R. (2024). Perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics. *World Journal on Educational Technology: Current Issues* 16(3), 215-234. <https://doi.org/10.18844/wjet.v16i3.9335>
- Ghimire, S. N., & Rana, K. (2023). CCTV in schools: An examination of perceived value of surveillance. *Journal of Education for Students Placed at Risk (JESPAR)*, 28(4), 351-379. <https://www.tandfonline.com/doi/abs/10.1080/10824669.2022.2092110>
- Hagger, M. S., Sultan, S., Hardcastle, S. J., & Chatzisarantis, N. L. (2015). Perceived autonomy support and autonomous motivation toward mathematics activities in educational and out-of-school contexts are related to mathematics homework behavior and attainment. *Contemporary educational psychology*, 41, 111-123. <https://www.sciencedirect.com/science/article/pii/S0361476X14000757>
- Himeur, Y., Al-Maadeed, S., Almaadeed, N., Abualsaud, K., Mohamed, A., Khattab, T., & Elharrouss, O. (2022). Deep visual social distancing monitoring to combat COVID-19: A comprehensive survey. *Sustainable cities and society*, 85, 104064. <https://www.sciencedirect.com/science/article/pii/S2210670722003821>
- Hooks, B. (1994). *Teaching to transgress: Education as the practice of freedom*. New York, NY: Routledge.
- Hope, A. (2009). CCTV, school surveillance, and social control. *British Educational Research Journal*, 35(6), 891-907. <https://www.tandfonline.com/doi/abs/10.1080/01411920902834233>
- Humble, N., & Mozelius, P. (2022). Content analysis or thematic analysis: Similarities, differences, and applications in qualitative research. In *European conference on research methodology for business and management studies*, 21(1), 76-81. [https://books.google.com/books?hl=en&lr=&id=M2R2EAAAQBAJ&oi=fnd&pg=PA76&dq=Humble,+N.,+%26+Mozelius,+P.+\(2022\).+Content+analysis+or+thematic+analysis:+Similarities,+differences+and+applications+in+qualitative+research.+In+M.+A.+Y.+Oliveira+%26+C.+Costa+\(Eds.\),+Proceedings+of+the+European+Conference+on+Research+Methodology+for+Business+and+Management+Studies+\(Vol.+21,+pp.+76-81\).+Academic+Conferences+International+Limited.&ots=Nv7qpW2C10&sig=VkX94gBf5H1UG2JX8MhTx0Rvlw0](https://books.google.com/books?hl=en&lr=&id=M2R2EAAAQBAJ&oi=fnd&pg=PA76&dq=Humble,+N.,+%26+Mozelius,+P.+(2022).+Content+analysis+or+thematic+analysis:+Similarities,+differences+and+applications+in+qualitative+research.+In+M.+A.+Y.+Oliveira+%26+C.+Costa+(Eds.),+Proceedings+of+the+European+Conference+on+Research+Methodology+for+Business+and+Management+Studies+(Vol.+21,+pp.+76-81).+Academic+Conferences+International+Limited.&ots=Nv7qpW2C10&sig=VkX94gBf5H1UG2JX8MhTx0Rvlw0)
- Hwang, S., Waller, R., Hawes, D. J., & Allen, J. L. (2021). The influence of antisocial behavior and callous-unemotional traits on trajectories of school engagement and achievement in South Korean children. *Journal of Youth and Adolescence*, 50, 788-802. <https://link.springer.com/article/10.1007/s10964-021-01414-2>
- Jansen, A. M., Giebels, E., Van Rompay, T. J., & Junger, M. (2018). The influence of the presentation of camera surveillance on cheating and pro-social behavior. *Frontiers in Psychology*, 9, 1937. <https://www.frontiersin.org/articles/10.3389/fpsyg.2018.01937/full>
- Kunwar, R., Pokhrel, J. K., Khanal, B., & Sapkota, H. P. (2023). A Case Study on Effectiveness of Online Teaching and Learning Mathematics: Teacher's Perspective. *Mathematics Teaching Research Journal*, 15(2), 143-165. <https://eric.ed.gov/?id=EJ1394814>
- Kunwar, R., Pokhrel, J. K., Sapkota, H., & Acharya, B. R. (2022). Mathematics learning: Misconceptions, problems, and methods of making mathematics learning fun. *American Journal of Education and Learning*, 7(2), 98-111. <https://ideas.repec.org/a/onl/ajoeal/v7y2022i2p98-111id719.html>
- Lombardi, E., Traficante, D., Bettoni, R., Offredi, I., Giorgetti, M., & Vernice, M. (2019). The impact of school climate on well-being experience and school engagement: A study with high-school students. *Frontiers in Psychology*, 10, 2482. <https://www.frontiersin.org/articles/10.3389/fpsyg.2019.02482/full>
- Luo, S., Ban, Y., Qiu, T., & Liu, C. (2023). Effects of stress on school bullying behavior among secondary school students: Moderating effects of gender and grade level. *Frontiers in Psychology*, 14, 1074476. <https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1074476/full>

- Kunwar, R. (2024). Perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics. *World Journal on Educational Technology: Current Issues* 16(3), 215-234. <https://doi.org/10.18844/wjet.v16i3.9335>
- Ma, J., Mahat, P., Brøndbo, P. H., Handegård, B. H., Kvernmo, S., & Javo, A. C. (2022). Family correlates of emotional and behavioral problems in Nepali school children. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0262690>
- Malmquist, C. (2022). Curiosity, motivation, autonomy, and lifelong learning in education and the United States Marine Corps. <https://digitalcommons.unl.edu/teachlearnstudent/135/>
- Meishar-Tal, H., Forkosh-Baruch, A., Levy, L., & Shenkar, T. (2022). Implications of CCTV cameras on child-care centers' routines, peer relationships, and parent-teacher relationships: child care educators' opinions. *International Journal of Child Care and Education Policy*, 16(1), 9. <https://link.springer.com/article/10.1186/s40723-022-00102-3>
- Mishra, N., Thakur, K. K., Koirala, R., Shrestha, D., Poudel, R., & Jha, R. (2010). Corporal punishment in Nepalese school children: Facts, legalities and implications. *Journal of Nepal Paediatric Society*, 30(2), 98-109. <https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=6252ddb29f6368220d6387e1b65478c140fc3c7>
- Mofatteh, M. (2021). Risk factors associated with stress, anxiety, and depression among university undergraduate students. *AIMS public health*, 8(1), 36. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7870388/>
- Nickerson, A. B., & Martens, M. P. (2008). School violence: Associations with control, security/enforcement, educational/therapeutic approaches, and demographic factors. *School Psychology Review*, 37(2), 228-243. <https://www.tandfonline.com/doi/abs/10.1080/02796015.2008.12087897>
- Nogueiras, G., Iborra, A., & Kunnen, S. E. (2019). Experiencing transformative learning in a counseling masters' course: A process-oriented case study with a focus on the emotional experience. *Journal of transformative education*, 17(1), 71-95. <https://journals.sagepub.com/doi/abs/10.1177/1541344618774022>
- Perry-Hazan, L., & Birnhack, M. (2016). Privacy, CCTV, and school surveillance in the shadow of imagined law. *Law & Society Review*, 50(2), 415-449. <https://www.cambridge.org/core/journals/law-and-society-review/article/privacy-cctv-and-school-surveillance-in-the-shadow-of-imagined-law/02EA06320187BE1790329947B8DDD015>
- Perry-Hazan, L., & Birnhack, M. (2019). Caught on camera: Teachers' surveillance in schools. *Teaching and teacher education*, 78, 193-204. <https://www.sciencedirect.com/science/article/pii/S0742051X1830845X>
- Rajadurai, S., Ah, S. H. B. A. B., Zainol, R. B., Azman, Z. B., & Rajadurai, M. M. (2023). Issues with the application of CPTED in urban development: a case of City X, Malaysia. *Security Journal*, 36(3), 558-588. <https://link.springer.com/article/10.1057/s41284-022-00353-2>
- Rasmussen, C., & Johnson, G. (2008). The Ripple Effect of Virginia Tech: Assessing the Nationwide Impact on Campus Safety and Security Policy and Practice. *Midwestern Higher Education Compact*. <https://eric.ed.gov/?id=ED502232>
- Rathod, S., Chauhan, A., & Patel, P. (2021). Impact of CCTV surveillance system on school safety. *International Journal of Advanced Research in Computer Science and Software Engineering*, 11(5), 471-475.
- Rosenblat, A., Kneese, T., & Boyd, D. (2014). Workplace surveillance. *Open Society Foundations' Future of Work Commissioned Research Papers*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2536605
- Sætra, H. S. (2022). The ethics of trading privacy for security: The multifaceted effects of privacy on liberty and security. *Technology in Society*, 68, 101854. <https://www.sciencedirect.com/science/article/pii/S0160791X21003298>

- Kunwar, R. (2024). Perceptions of school administrators, teachers, and students on the use of CCTV cameras and their impact on learning mathematics. *World Journal on Educational Technology: Current Issues* 16(3), 215-234. <https://doi.org/10.18844/wjet.v16i3.9335>
- Serebrennikov, D., & Skougarevskiy, D. (2024). A tale of four cities: Exploring security through environmental characteristics of CCTV equipment placement. *Journal of Computational Social Science*, 1-32. <https://link.springer.com/article/10.1007/s42001-024-00323-1>
- Shamsuddin, N. A., & Kassim, N. A. (2019). The perceptions of Malaysian secondary school students towards the use of CCTV in the classroom. *Journal of Educational and Social Research*, 9(4), 97-104.
- Shrestha, S. (2018). CCTV cameras in schools: Safety or surveillance? *The Himalayan Times*. Retrieved from <https://thehimalayantimes.com/kathmandu/cctv-cameras-in-schools-safety-or-surveillance/>
- Simkhada, P. P., Regmi, P. R., van Teijlingen, E., & Aryal, N. (2017). Identifying the gaps in Nepalese migrant workers' health and well-being: a review of the literature. *Journal of travel medicine*, 24(4), tax021. <https://academic.oup.com/jtm/article-abstract/24/4/tax021/3095989>
- Slough, N. M., McMahon, R. J., & Conduct Problems Prevention Research Group. (2008). Preventing serious conduct problems in school-age youth: The Fast Track Program. *Cognitive and behavioral practice*, 15(1), 3-17. <https://www.sciencedirect.com/science/article/pii/S1077722907000995>
- Soares, J. L., & Fassini, J. A. (2021). The use of CCTV cameras in mathematics classes: A systematic review. *Revista Brasileira de Pesquisa em Educação em Ciências*, 21, e0326.
- Squelch, J., & Guthrie, J. (2012). CCTV and school security: The moral economy of a technological fix. *British Journal of Sociology of Education*, 33(1), 107-126.
- Tatler, B. W. (2021). Searching in CCTV: effects of organisation in the multiplex. *Cognitive Research: Principles and Implications*, 6(1), 11. <https://link.springer.com/article/10.1186/s41235-021-00277-2>
- Taylor, E. (2011). Awareness, understanding, and experiences of CCTV amongst teachers and pupils in three UK schools. *Information Polity*, 16(4), 303–318. <https://doi.org/10.3233/IP-2011-0247>
- Taylor, E. (2014). *Surveillance schools: Security, discipline, and control in contemporary education*. Palgrave Macmillan
- Thimbleby, H. (2013). Technology and the future of healthcare. *Journal of public health research*, 2(3), jphr-2013. <https://journals.sagepub.com/doi/abs/10.4081/jphr.2013.e28>
- Tomaszewski, L. E., Zarestky, J., & Gonzalez, E. (2020). Planning qualitative research: Design and decision making for new researchers. *International journal of qualitative methods*, 19, 1609406920967174. <https://journals.sagepub.com/doi/abs/10.1177/1609406920967174>
- Ways, B., & Pearson, B. C. (2018). Evaluating the effectiveness of CCTV in Baltimore, Maryland. *Spatial Analysis, Modelling, and Planning*. [https://books.google.com/books?hl=en&lr=&id=gVmRDwAAQBAJ&oi=fnd&pg=PA79&dq=Ways,+B.,+%26+C.+Pearson,+B.+\(2018\).+Evaluating+the+Effectiveness+of+CCTV+in+Baltimore,+Maryland.+Intech+Open.+https://doi.org/10.5772/intechopen.79076&ots=plmtkL4Aij&sig=K KCVFlioZbMZwH9tp-nD7WWyJ-U](https://books.google.com/books?hl=en&lr=&id=gVmRDwAAQBAJ&oi=fnd&pg=PA79&dq=Ways,+B.,+%26+C.+Pearson,+B.+(2018).+Evaluating+the+Effectiveness+of+CCTV+in+Baltimore,+Maryland.+Intech+Open.+https://doi.org/10.5772/intechopen.79076&ots=plmtkL4Aij&sig=K KCVFlioZbMZwH9tp-nD7WWyJ-U)
- Zahrawi, M., & Shaalan, K. (2023). Improving video surveillance systems in banks using deep learning techniques. *Scientific Reports*, 13(1), 7911. <https://www.nature.com/articles/s41598-023-35190-9>