

## Effectiveness of CCTV Cameras Installation In Crime Prevention

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**Abstract** - *This thesis, entitled, —Effectiveness of CCTV Cameras Installation in Crime Prevention* aimed to determine the effectiveness of closed circuit television cameras in Batangas City, usefulness in crime prevention with respect to traffic violations, crimes against property and crimes against person and to propose an action plan based on the results of the study. Descriptive type of research was utilized; data were gathered through a self-made questionnaire for 150 randomly selected participants composed of administrative personnel and CCTV operators from different sectors in Batangas City and police officers. Study revealed that CCTV camera is highly effective in crime prevention specifically crime against person and property by recording the scenes that can help in solving the reported theft or robbery incidents. Locating suspicious character in the streets and monitoring the incoming and outgoing individuals from establishments.

**Keywords:** *Closed circuit television camera, effectiveness of CCTV camera*

### INTRODUCTION

As nations develop and their economies grow bigger, social problems also intensify. One great concern deals with peace and order as well as safety and security of the people. Various psychologists would render different explanations to the cases of crimes but what is apparent even to the most innocent individual is that crimes are everywhere. Anyone can be a victim of crime; which fosters fear to a lot of people. Knowing its responsibility, the government of different nations have launched various innovations on how to prevent crimes. One of these innovations is the use of CCTV.

A common goal of most CCTV systems has been the prevention of crime and disorder through deterrence. Claims are also made that CCTV provides public reassurance and therefore reduces fear of crime, which may, in turn, increase the use of public spaces (Bennett & Gelsthorpe, 2010). CCTV has popularly been used worldwide. It can be found in large buildings, wide establishments or areas such as malls or park. It is also need on streets for monitoring and supervising traffic flow. Its effectiveness to provide useful information has been attested by many agencies and establishments. In California and neighboring states, CCTV's were used of security measure such as identification of people specially before entering a highly security facility such as pent house and executive offices.

In the Philippines, CCTV has been popular on stores, gasoline stations, streets, elevators, laboratory, banks, condominiums, hallways and privately owned area. One of the most popular use of CCTV was the case of It's Showtime Host, Vhong Navarro, against Cedric Lee and Deniece Cornejo where it proved several points such as identification of people involved and time lapsed when incident happened. Also, the case wherein Magaspac's identity was revealed; PO3 Magaspac a traffic police at Pasay who was caught asking extra money to truck drivers passing the expressway.

Batangas City, like many other cities in the country leaps to progress by its growing number of facilities, establishments, and roadways. It has also embraced the installation and use of CCTV in malls, educational institutions, banks, and intersections and diversion roads to provide coverage on their area of responsibility. The resident however, is not anymore surprised to its presence because of its popularity, its functional use and capability as security tool. LPU-B for instance, encoded time of employees' attendance, student behavior inside laboratory and classrooms that evidence a query through CCTV footage supervised and monitored by MIS Department in cases of property destruction or stealing. Police officers in Batangas City, Philippines use them to prevent crime and catch lawbreakers in the act. The residents downtown of the same cities help the police officers to minimize various criminal activities.

The popularity and use of Closed Circuit Television (CCTV) camera has grown rapidly since the technology was first introduced. As students under the BS Criminology Program and with motivation from two professional courses, the researchers became highly interested in exploring all means on how crime can be minimized.

The researchers chose to conduct the study on CCTV cameras due to the increasing number of violations done by the community members, the irregularities made by the people around the area, the different person in contact with the premises and various incidents during events that can be solved through the aid of CCTV footages. This study could be used as basis for the improvement of the future generation technology. In addition, this study was anchored on the concept of how effective are CCTV cameras as tool for community properties' safety and security.

### **OBJECTIVES OF THE STUDY**

The study generally aimed to determine the effectiveness of closed-circuit television cameras (CCTV). Specifically, it sought to assess the effectiveness of CCTV cameras; to determine the usefulness of CCTV Cameras in crime prevention with respect to traffic violations, crimes against property and crimes against person; and to propose action plan based on the results of the study.

### **METHOD**

#### **Research Design**

The main objective of this study is to determine the Effectiveness of CCTV in Crime Prevention. With this objective in mind, the researchers used the descriptive type of research. The descriptive method is a fact finding method with adequate interpretation dealing with the questions based on the present and current phenomenon (Good, 2011). The researches believed that this design is the most appropriate since the study involves the collection of data concerning the current status of the subjects under study. As its name connotes, this method simply describes what exists.

### **Participants of the Study**

The study utilized 150 respondents from different sectors in Batangas City composed of 16 (10%) administrative personnel 's, 35 (23.30%) Police Officers and 15 (10%) CCTV Operators. The participants were randomly selected from the three groups of respondents with mixed gender, varying age, different year levels and different level of educational attainment and position in the institution.

### **Instrument**

The researchers used a self-made questionnaire to gather the needed information. The researchers presented a questionnaire to people with expertise in the field for validation. The respondents were asked to answer the questionnaires that the researchers provided, given the assurance that their identifications were kept confidential and the information gathered were just use for educational attributes.

### **Procedure**

The researchers were given instructions to conduct and perform several interviews to gather details and information to seemingly be the subject of the study due to some circumstances and security issues of different individuals to be interviewed the researches were not able to gather the data and consulted the adviser and panels for better technique to do. Due to state of affairs, the researchers proceeded to develop and present one set of questionnaire to their research adviser for approval. The individual concerns with the study were briefly oriented about the purpose of the research before they were asked to answer the questionnaire to gather valid and reliable data. The researchers disseminated the questionnaires individually to each concern and they were requested to answer the questions truthfully for this was a big help to the development of the said research.

### **Data Analysis**

The needed data were tallied, encoded and interpreted using different statistical tools. These include frequency distribution, weighted mean and Analysis Variance (ANOVA) which were used based on the objectives of the study. The data were also

treated using 0.05 alpha levels to test the hypothesis of the study. In addition, all data were computed using statistical software, PASW version 18 to further analyse the results. The given scale was used to interpret the result of the data gathered: 3.50 – 4.00 = Highly Effective; 2.50 – 3.49 = Effective; 1.50 – 2.49 = Less Effective; 1.00 – 1.49 = Not Effective

## RESULTS AND DISCUSSION

**Table 1. Percentage Distribution of the Groups of Respondents (n=150)**

<b>Group</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Security Personnel & IT Expert	16	10.70
CCTV Operators	15	10.00
Police Officer	35	23.30

The largest percentage of respondents were from the police officers with the percentage of 23.30% with the total no. of 35 police officers, the second largest percentage is from Security personnel and IT Specialist with the total no. of 16 (10.70%), third one and the lowest percentage of respondents were the CCTV operators with the total no. of 15 (10%).

CCTV operators were of the lowest rank because nowadays, only few establishments require CCTV function to be monitored 24/7. An establishment owner thinks that CCTV is more valuable in aiding severity officers and deter violators, in turn CCTV installation in their premise there was no person employed to monitor such. Due to the increasing demands of the use of CCTV cameras and the innovations made by man and technology.

It is shown on the effectiveness of CCTV in Table 2 that the composite mean of 3.53 indicates that the respondents assessed it as highly effective. Among the items cited, CCTV being able to record the scenes that can help in solving the reported theft or robbery incident got the highest mean score of 3.72 and rated highly effective. The same concept is expressed by Marcus (2010) the use of CCTV cameras have helped in capturing thieves, traffic violators, employees involved in red tape, and even suspects for killings. Its presence in a place such as streets, residential areas and commercial establishments serves as deterrence to crime.

Moreover, people with the knowledge that a CCTV camera was installed, refrained themselves from committing such act for the fear of being caught and punished. Also, it helps the police officers in the detection and apprehension of suspected person. (uplb.edu.ph).

**Table 2. Effectiveness of CCTV (N= 66)**

	<b>Indicators</b>	<b>WM</b>	<b>VI</b>	<b>Rank</b>
1.	It deters crime and help reducing violations that can be committed.	3.34	Effective	10
2.	Records the scenes that can help in solving the reported theft or robbery incident.	3.71	Highly Effective	1
3.	It helps in monitoring the employees and administrative personnel to avoid dishonesty with their tasks.	3.55	Highly Effective	3
4.	It eliminates the opportunity of the violators to do violations.	3.69	Highly Effective	2
5.	It saves man power to the security guards on duty for patrolling the school premises.	3.53	Highly Effective	5
6.	CCTV saved footages that can help solve the incidence of misbehaviors.	3.51	Highly Effective	7
7.	It can also lessen the opportunity of the couples on scandalous acts.	3.41	Effective	9
8.	It helps to solve vandalism and malicious mischief within the institution or establishments.	3.53	Highly Effective	5
9.	In can also capture the individuals that will leave the vicinity earlier than indicated time of leave.	3.53	Highly Effective	5
10.	The installation of CCTV cameras is considered as a low cost method of keeping the administrators eye on security of its people and establishments.	3.45	Effective	8
<b>Composite Mean</b>		<b>3.53</b>	<b>Highly Effective</b>	

Welsh and Farrington (2010) stressed that CCTV is an environmental crime prevention tool which provide a surveillance function that worked to deter people from committing crime in the area in which it issued. Research suggests that the CCTV is most

successful in reducing or solving crime when there is an active police interest providing surveillance information to inform the setting up of CCTV. They also emphasized that there is active police interest in providing surveillance information, involving in monitoring of CCTV and providing evidence on such were the sounds for most success in reducing and solving crime.

Second was its ability to eliminate the opportunity of the individuals to commit violations with weighted mean of 3.69 and the item stating its ability to help in monitoring, employees and administrative personnel with weighted mean of 3.55. Three other items obtained assessment of highly effective with weighted mean of 3.53; number 5, number 8 and number 9 stated the contents of items 5, 8, and 9 respectively CCTV has the ability to eliminate opportunity for, due to adaption of theory of psychology of omnipresence in a slightly different and technical manner. With CCTV camera, scenes are recorded with specific time, duration and location. It has advantage of being always on watch thereby ensuring that every situation that may take place under CCTV camera, evidence is available and proper action can be executed.

Other items were assessed as effective only and installation of CCTV cameras is considered as a low cost method of keeping the administrators eye on security of its people and establishments (3.45), can also lessen the opportunity of the couples to possess Public Display of Affection (PDA) (3.41) and deters crime and help reducing violations that can be committed by the students and employees (3.34) ranked the least.

Table 3 presents the effectiveness of CCTV Cameras in preventing traffic violation. The composite mean of 3.32 indicates that the respondents assessed it as effective.

Among the items cited, CCTV cameras serves as an evidence for an offense committed got the highest mean score of 3.47 and rated effective. This perception of the respondents can be attributed to the most commonly seen from TV programs and news where incidence of robbery and theft were reported and evidenced by CCTV footage.

It was followed by capability of the CCTV records the exact nature of violation or accidents with the mean score of 3.45 and rated effective. Third on the rank was its capability to help the police investigators in solving vehicular accidents with a mean

score of 3.44 rated to be effective. Perceptions of residents, the table from the point of the respondents, they perceived that the CCTV camera is often useful in preventing traffic violation.

**Table 3. Usefulness of CCTV Cameras in Preventing Traffic Violation**

<b>Indicators</b>	<b>WM</b>	<b>VI</b>	<b>Rank</b>
1. Prevent traffic violation in a certain area where CCTV's are installed.	3.01	Useful	10
2. CCTV cameras identifies violators on traffic rules	3.35	Useful	5.5
3. CCTV camera monitors traffic violation	3.37	Useful	4
4. CCTV helps the police investigators in solving vehicular accidents.	3.44	Useful	3
5. Proves one's offense against traffic rules	3.28	Useful	8
6. Documents the everyday routine of traffic	3.34	Useful	7
7. CCTV cameras act as monitoring device in major roads.	3.35	Useful	5.5
8. CCTV prevents crimes on streets.	3.13	Useful	9
9. CCTV records the exact nature of violation or accidents	3.45	Useful	2
10. CCTV cameras serves as an evidence for an offense committed.	3.47	Useful	1
<b>Composite Mean</b>	<b>3.32</b>	<b>Useful</b>	

*Legend: 3.50 – 4.00 = Very Useful; 2.50 – 3.49 = Useful; 1.50 – 2.49 = Less Useful 1.00 – 1.49 = Not Use*

On the other end, the mean of 3.47, which stated that CCTV serves as an evidence for an offense committed while the lowest mean of 3.01 was obtained by item no. 1, which states that prevent traffic violation in a certain area where CCTV 's are installed.

This finding is supported by the literature that the enforcement of the bus lanes, moving traffic and parking contraventions using CCTV camera is being implemented in different cities to help reduce traffic congestion, improve journey times for transport users, penalize inconsiderate motorists, improve road safety, and reduce carbon dioxide emissions (Ratcliffe, 2009).

Other item was assessed as effective also and proves one 's offense against traffic rules (3.28), CCTV prevents crimes on streets (3.13) and prevent traffic violation in a certain area where



CCTV's are installed (3.01) ranked the least. This finding is supported by the study of Canberra (2004), which stated that it had been found out that CCTV has the ability to prevent property crime, particularly vehicle crime violations is indeed one of the reasons why the government is installing CCTV on road streets.

**Table 4. Usefulness of CCTV Cameras in Crimes Against Persons (N=150)**

	<b>Indicators</b>	<b>WM</b>	<b>VI</b>	<b>Rank</b>
1.	The use of CCTV camera helps locate suspicious character in the streets.	3.47	Useful	1
2.	The use of CCTV camera reduces crimes and criminals.	3.36	Useful	5
3.	The CCTV camera is used to apprehend the criminals.	3.45	Useful	2
4.	Thru CCTV camera the officers can monitor the action of the perpetrators.	3.44	Useful	3
5.	CCTV camera helps the police investigator in solving crime by providing lead.	3.32	Useful	6
6.	The presence of CCTV camera mitigates riding in tandem incident.	2.99	Useful	13.5
7.	The CCTV serves as a tool to identify the strategies used by the perpetrator in committing the act.	3.25	Useful	9
8.	The CCTV camera helps to distinguish other persons who may have serve as accomplice to the crime.	3.31	Useful	7
9.	There is a feeling of safety among individuals who stay in areas where there is CCTV.	3.15	Useful	10
10.	The CCTV camera reduces tendency of a criminal to personally attack a stranger on the streets.	3.13	Useful	11
11.	Monitoring of remote entrances into site/ schools buildings.	2.99	Useful	13.5
12.	Record and surveillance of toilet entrances to record time of entry for management purposes and to show who was present at time any damage has taken place.	2.92	Useful	15
13.	Protection of staff and student.	3.01	Useful	12
14.	For visitor monitoring.	3.27	Useful	8
15.	Protection of the institutional employees from outsiders.	3.42	Useful	4
<b>Composite Mean</b>		<b>3.23</b>	<b>Useful</b>	

*Legend: 3.50 – 4.00 = Highly Useful; 2.50 – 3.49 = Useful; 1.50 – 2.49 = Less Useful; 1.00 – 1.49 = Not Useful*

Based on Table 4, all items listed above relating to the usefulness of CCTV in preventing crimes against persons were considered as effective by the respondents. The use of CCTV camera helps locate suspicious character in the streets obtained a weighted mean of 3.47 and ranked 1. It was followed by the CCTV camera is used to apprehend the criminals (3.45) as rank 2, thru CCTV camera the officers can monitor the action of the perpetrators (3.44) ranked 3 and protection of the institutional employees from outsiders (3.42) as rank 4.

Shepherd and Matthews (2010) noted that CCTV may deter potential offenders who perceive an increased risk of detection and it may direct security personnel to locations where precursors to offending have been detected, which may head off their translation into crime and reduce the severity of harm. Sivarajasingam et al. (2015) emphasized that the presence of CCTV may induce people to take elementary precautions for fear that they will be shared by being shown on CCTV.

The lowest four items were protection of staff and student (3.01), the presence of CCTV camera mitigates riding in tandem incident (2.99), monitoring of remote entrances into site/ schools buildings(2.99) and the lowest weighted mean of 2.92 and with a verbal interpretation of —effective was obtained by item number 12, which states that it can record the surveillance from the toilet entrances to record time of entry for management purposes and to show who was present at time any violation has taken place. Visible or hidden CCTV cameras may alert a watchman or employee to the commission of a crime (Coupe and Kaur, 2005).

This finding is justified by the literature of Clarke and Cornish (2010) which state that CCTV aims to increase the perceived risk of capture; a factor which, assuming the offender is behaving in a rational manner, will demotivate the potential offender.

Table 5 showed the effectiveness of CCTV cameras in crimes against property. It was identified that the use of CCTV cameras in crimes against property was useful with a composite mean of 3.40. Its functions on monitoring the incoming and outgoing individuals from the establishment through the CCTV ranked first with the weighted mean of 3.71, verbally interpreted as —highly useful. Second was the installation of CCTV that can serve as a barrier for the possible offenders with the weighted mean of 3.63

and third was its ability to lessen the incidences of pulling the fire alarms of the lobbies with weighted mean of 3.57, both interpreted as —highly usefull respectively.

**Table 5. Usefulness of CCTV Cameras in Crimes Against Property**

<b>Indicators</b>	<b>WM</b>	<b>VI</b>	<b>Rank</b>
1. The CCTV aids in monitoring banks, malls or Other establishment.	3.40	Useful	9
2. The CCTV guards and secure properties against criminal tendencies	3.18	Useful	13
3. The presence of CCTV reduces property related crime	3.05	Useful	15
4. Reduce theft of motor vehicles and some other forms of acquisitive crimes in areas where there are CCTV cameras.	3.25	Useful	12
5. Secures the properties where the CCTV is Located	3.12	Useful	14
6. The CCTV distinguishes the items taken by the criminals or thieves	3.44	Useful	8
7. The CCTV records the position of the property and where and how they were stolen	3.35	Useful	10
8. The installation of CCTV serves as a barrier for the possible offenders.	3.63	Highly Useful	2
9. Monitors the incoming and outgoing individuals from the establishment through the CCTV.	3.71	Highly Useful	1
10. The CCTV prevents theft in board daylight.	3.34	Useful	11
11. Records the scenes that can help in solving the reported theft or robbery incident.	3.45	Useful	6.5
12. Protection of the staff, students and employee vehicles.	3.47	Useful	5
13. Protection of the institutional equipment from robbery or theft by students or outsiders.	3.45	Useful	6.5
14. It is the eye for the premises or the places that cannot be supervise by man.	3.55	Highly Useful	4
15. It lessens the incidences of pulling the fire alarms of the lobbies.	3.57	Highly Useful	3
<b>Composite Mean</b>	<b>3.40</b>	<b>Useful</b>	

*Legend: 3.50 – 4.00 = Highly Useful; 2.50 – 3.49 = Useful; 1.50 – 2.49 = Less Useful; 1.00 – 1.49 = Not Useful*

The last two items ranked the least were its capability to secure the properties where the CCTV is located; and its presence reduce property related crime with weighted mean value of 3.12 and 3.05, both verbally interpreted as —usefull respectively.

Commercial establishments had large number of transactions everyday such as communications and selling. Through the use of CCTV cameras, they were able to monitor the transaction done inside their establishments throughout the day. Also, they were able to monitor any unnecessary incidences inside the establishments.

There are 70 times more privately owned surveillance cameras as a new study revealed. It claims that some 2.7 million CCTV cameras are owned by private businesses and individuals. The research found out that the reason surrounding the use of private cameras include the protection of property, crime detection, and safety.

The presence of CCTV cameras in a place such as streets, residential areas and commercial establishments serves as deterrence to crime. People, with the knowledge that a CCTV camera was installed, refrained themselves from committing such act for the fear of being caught and punished. Also, it helps the police officers in the detection and apprehension of suspected person. CCTV cameras may also encourage people to be more security conscious. These cameras drive offenders away from committing offenses that take time, as they run a greater risk of capture.

The items obtaining last mean score were its usefulness in guarding and securing properties against criminal tendencies (3.18), its function to secure properties near CCTV location (3.12) and its ability to reduce property related crime (3.05) were interpreted as —usefull respectively. CCTV may record all that it sees but also limits its views to what is included in its frame. There may be several types of CCTV but its positioning and type shall be a primary consideration otherwise the greatness promised by CCTV may be limited and the user may be left at disadvantage CCTV system.

**Table 6. Difference of Responses on the Effectiveness of CCTV Cameras**

<b>Effectiveness</b>	<b>F-value</b>	<b>p-value</b>	<b>Interpretation</b>
Effectiveness	0.647	0.586	Not Significant
Preventing Traffic Violation	0.289	0.834	Not Significant
Crimes Against Persons	0.742	0.529	Not Significant
Crimes Against Property	0.234	0.873	Not Significant

*Legend: Significant at p-value < 0.05*

Based from the result, all computed p-values were all greater than 0.05 alpha levels, thus the null hypothesis of no significant difference on the effectiveness of using CCTV is accepted. This means that there is no significant difference observed and implies that all groups of respondents have the same view on its effectiveness.

## **CONCLUSIONS**

CCTV cameras are a highly effective tool in crime prevention. CCTV is useful in traffic violation, crime against property and crime against persons. Types of respondent do not affect the effectiveness of CCTV camera in crime prevention.

## **RECOMMENDATION**

Schools may install CCTV cameras in the entrance and exit areas for the monitoring of student and employee behaviour and attendance. The city government specifically the engineering office may assess a geometrical placement of CCTV on streets considering its visual clarity or pixel value and amount of resolution to ensure valuable recorded information for identification of persons and vehicle involved. The city government may consider appointing or hiring a qualified individual to monitor CCTV operation to ensure prompt response in case of crime or violation detection, file retrieval and minor trouble shooting. For those interested, especially of private and commercial establishments, they may seek assistance of professional people engaged in CCTV operation for appropriate CCTV types and areas of replacement to ensure effective and efficient function. Similar studies may be conducted using different variables. Researchers may consider presenting the paper

to public, sending copies to several establishments for dissemination and utilization of results of the study.

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